Security Analysis

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Chapter I

Investment Scenario

After reading this chapter, you will be conversant with:

- Concept of Investment
- Investment Objectives and Constraints
- Investment Classification
- Financial Markets
- Real Investment Avenues

CONCEPT OF INVESTMENT

We can define investment as the process of, 'Sacrificing something now for the prospect of gaining something later'. Our definition implies that there are three dimensions to an investment – time, today's sacrifice and prospective gain.

We can, of course, think of a number of transactions which will qualify as 'investments' as per our definition. Consider, for example, the following transactions:

1. In order to settle down, a young couple buys a house for Rs.3 lakh in Bangalore.
2. A wealthy farmer pays Rs.1 lakh for a piece of land in his village.
3. A cricket fan bets Rs.100 on the outcome of a test match in England.
4. A government officer buys 'units' of Unit Trust of India worth Rs.10,000.
5. A college professor buys, in anticipation of good return, 100 shares of Reliance Industries Ltd. for Rs.40,000.
6. A lady clerk deposits Rs.5,000 in a Post Office Savings Account.
7. Based on the rumor that it would be a hot issue in the market in no distant future, our friend John invests all his savings in the newly floated share issue of Fraternity Electronics Ltd., a company intending to manufacture audio and video magnetic tapes to start with, and cine sound tapes at a later stage.

A common feature of all these transactions is that something is sacrificed now for the prospects of gaining something later. For example, the wealthy farmer in transaction 2 sacrifices Rs.1 lakh now for the prospects of crop income later. The lady clerk in transaction 6 sacrifices Rs.5,000 now for the prospect of getting a larger amount later due to interest earned on the savings account. Thus, in a broad sense, all these seven transactions qualify as investment.

Are all Investments Speculative?

We know that investment means sacrificing or committing some money today in anticipation of a financial return later. The investor indulges in a bit of speculation as to how much return he is likely to realize. There is an element of speculation involved in all investment decisions. It does not follow though that all investments are speculative by nature.

Genuine investments are carefully thought out decisions. They involve only calculated risks. The expected return is consistent with the underlying risk of the investment. A genuine investor is risk averse and usually has a long-term perspective in mind. The government officer's investment in the units of UTI (transaction 4), the college professor's Reliance stockholding (transaction 5), and the lady clerk's Post Office Savings Deposit (transaction 6), all may be regarded as genuine investments. Each person seems to have made carefully thought out decision and each has taken only a calculated risk.

Speculative investments on the other hand are not carefully thought out decisions. They are based on rumors, hot tips, inside dopes and often simply on hunches. The risk assumed is disproportionate to the return expected from speculation. The intention is to profit from short-term market fluctuations. In other words, a speculator is relatively less risk averse and has a short-term perspective for investment. Our friend John's decision to invest all his savings in the new issue of Fraternity Electronics based only on the rumors (transaction 7) may be labelled as speculative investment. John does not seem to have carefully thought out this decision. He is taking a high risk by putting all his savings in just one stock and that too in a new stock.

So, an investment can be distinguished from speculation by (a) the time horizon of the investor and (b) the risk-return characteristics of the investments. A genuine investor is interested in a good rate of return, earned on a rather consistent basis for a relatively long period of time. The speculator, on the other hand, seeks opportunities promising very large returns, earned rather quickly. In this process, he assumes a risk that is disproportionate to the anticipated return.

From the foregoing discussion, it cannot be however, inferred that there exists a clear-cut demarcation between investment stocks and speculative stocks. The same stock can be purchased as a speculation or as investment, depending on the motive of the purchaser. For example, the decision of the professor to invest in the stock of Reliance Industries is considered as a genuine investment because he seems to be interested in a regular dividend income and prospects of long-term capital appreciation. However, if another person buys the same stock with the anticipation that the share price is likely to raise to Rs.350 very quickly and gain from the rise, such decision will be characterized as speculation.

Are Investment and Gambling the Same?

Gambling is defined in Webster's Dictionary as 'An act of betting on an uncertain outcome'. Since the prospective return on investment is uncertain at the time investment is made, one may say that there is an element of gambling involved in every investment. This is particularly so in the case of those investments in respect of which little information exists at the time of investment decision. However, genuine investments cannot be labelled as gambling activities.

In gambling, the outcome is largely a matter of luck; no rational economic reason can be given for it. This is in contrast to what we can say about genuine investments. Unlike investors and speculators, the gamblers are risk lovers in the sense that the risk they assume is quite disproportionate to the expected reward. Though the pay-off, if won, is extraordinary, the chances of winning the bet are so slim that no risk averse individual would be willing to take the associated risk. The cricket fan's bet of Rs.100 on the outcome of test match in England (transaction 3) is an act of gambling; it is not a genuine investment.

It should, however, be noted that a clear demarcation between investment, speculation, and gambling is not always easy. Often it becomes a matter of degree and opinion. Aggressive investors are likely to decide on investments based, among other things, on their speculative and gambling instincts more than the defensive or conservative investors do.

Having understood what genuine financial investments are, let us consider the objectives sought to be fulfilled by investors seeking such investments.

INVESTMENT OBJECTIVES AND CONSTRAINTS

Investment Objectives

Rationally stating, all personal investing is designed in order to achieve a goal, which may be tangible (e.g., a car, a house, etc.) or intangible (eg., social status, security, etc.). Goals can be classified into various types based on the way investors approach them viz:

a. **Near-term High Priority Goals**

These are goals which have a high emotional priority to the investor and he wishes to achieve these goals within a few years at the most. Eg: A new house. As a result, investment vehicles for these goals tend to be either in the forms equivalent to cash or as fixed-income instruments with maturity dates in correspondence with the goal dates. Because of the high emotional importance these goals have, investor, especially the one with moderate means will not go for any other form of investment which involves more risk especially where his goal is just in sight.

b. **Long-term High Priority Goals**

For most people, this goal is an indication of their need for financial independence at a point some years ahead in the future. Eg: Financial independence at the time of retirement or starting a fund for the higher education of a three-year old child. Normally, we find that either because of personal preference or because the discounted present value is large in

relation to their resources, the time of realization for such goals is set around 60 years of age for people of moderate means. Because of the long-term nature of such goals, there is not a tendency to adopt more aggressive investment approaches except perhaps in the last 5 to 10 years before retirement. Even then, investors usually prefer a diversified approach using different classes of assets.

c. **Low Priority Goals**

These goals are much lower down in the scale of priority and are not particularly painful if not achieved. For people with moderate to substantial wealth, these could range from a world tour to donating funds for charity. As a result, investors often invest in speculative kinds of investments either for the fun of it or just to try out some particular aspect of the investment process.

d. **Enterpreneurial or Money Making Goals**

These goals pertain to individuals who want to maximize wealth and who are not satisfied by the conventional saving and investing approach. These investors usually put all the spare money they have into stocks preferably of the company in which they are working/owning and leave it there until it reaches some level which either the individual believes is enough or is scared of losing what has been built-up over the years. Even then, the process of diversification and building up a conventional portfolio usually takes him a long time involving a series of opportunities and sales spread over many years.

Investment Constraints

An investor seeking fulfillment of one of the above goals operates under certain constraints:

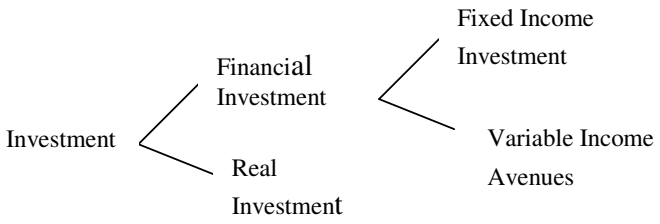
- Liquidity
- Age
- Need for Regular Income
- Time Horizon
- Risk Tolerance
- Tax Liability.

The challenge in investment management, therefore, lies in choosing the appropriate investments and designing a unit that will meet the investment objectives of the investor subject to his constraints. To take on this challenge the first step will be to get acquainted with the different types of investments that are available in our financial market.

INVESTMENT CLASSIFICATION

Broadly speaking investment can be categorized as follows:

This study will concentrate more on the financial investment part and so only financial instruments are elaborated with a brief introduction to real investments.



Security Forms of Financial Investment

We know that the recipient of money in a financial investment issues a document or a piece of paper to the investor (supplier of money), evidencing the liability of the former to the latter to provide returns. This document also outlines the rights of the investor to certain prospects and/or property and sets the conditions under which the investor can exercise his/her rights. This document is variously called 'Security Certificate', 'Note' and so on.

The term 'security' is a generic term used generally for those documents evidencing liabilities that are negotiable – that can be bought and sold in the stock market. The security form of investment has received great impetus since 1980 following the Central Government's liberal policy towards foreign investments – direct and portfolio, streamlining of licensing, capital issues, and other procedural formalities to facilitate faster capital formation; providing incentives for exports; and encouraging private sector to tap the primary market for meeting their long-term capital requirements.

There are different types of securities conferring different sets of rights on the investors and different sets of conditions under which these rights can be exercised. They are gilt-edged securities, corporate debentures, preference shares and equity shares. The important characteristic features of these securities are described below.

Gilt-Edged Securities

The debt securities issued by the government and semi-government bodies are called gilt-edged securities. They comprise the treasury bills and the dated securities (also called bonds or dated loans) of the central government, state government, and semi-government bodies like Port Trusts and State Electricity Boards. They are the acknowledgments of debt incurred by the issuing government or semi-government body. Gilt-edged securities thus represent the public borrowings of the issuing government or semi-government bodies. Over the years, the central and state governments and the semi-government bodies have made an extensive use of these securities for meeting their short and long-term resource requirements.

Treasury Bills: These short-term securities are issued by the RBI on behalf of the Central Government. Currently, the T-Bills having a maturity of 91 and 364 days only are being traded. No interest is paid on these bills. Instead they are sold at a discount. In other words, the buyer pays a price less than the face value of the bill and receives the full face value on the last day of maturity. The difference between the discount price and face value represents the interest income to the investor.

Example: Suppose the 91-day treasury bills of Rs.100 each are sold for Rs.99 per bill. The buyer pays Rs.99 and will receive Rs.100 after 91-days from the Government of India for every bill he buys today. These bills are said to have been sold at

$\frac{\text{Re.1}}{\text{Rs.100}} \times \frac{365\,\text{days}}{91\,\text{days}} \times 100 = 4.01\%$ discount per annum. The rupee income, the buyer makes for 91-days investment is Re.1 per bill and the return on his investment works out to be

$\frac{\text{Re.1}}{\text{Rs.99}} \times \frac{365\,\text{days}}{91\,\text{days}} \times 100 = 4.05\%$ per annum.

Since April 1st, 1996 the sale of treasury bills by Public Debt Office of the RBI had been stopped. Now it is carried out by the RBI by conducting auctions: Weekly for 91 days T-bills and fortnightly for 364 days T-bills.

The discount rate on treasury bills being very low, the return to the investor is meager. However, they are the safest and the most liquid securities you can find in the market. They are a safe investment because the central government will never default on making payment when the bills mature. They are liquid because the commercial banks are ready to buy them at any time due to the facility of rediscounting with the RBI. There is however little public interest in treasury bills because of the availability of equally safe investment opportunities providing a better return and also because they are sold in large denominations. Frequent buyers of treasury bills are the commercial banks, state governments, and semi-government bodies. Due to rediscounting facility, the RBI generally ends up holding nearly 80 percent of the outstanding treasury bills at any given time.

As against the periodic issue of the ad hoc treasury bills to the RBI in the past, the government is now raising funds through the Ways and Means financing.

Since the RBI has started selling treasury bills auction, through, the discount rate is now determined by market forces and on a competitive basis. The discount rates on treasury bills increase as the number of days to maturity increase. However, the discount rates on T-Bills are lower than the rates on the dated government securities.

Central Government Dated Securities: These securities of the central government have a maturity period longer than one year and carry a fixed rate of interest. The interest is payable semi-annually and the payment is usually made by issuing coupons which can be encashed at any bank. Though these securities are redeemed at par, their issue price can be higher or lower than the face value depending upon the prevailing market conditions.

These securities are held either in the form of promissory notes or stock certificates. The difference between a promissory note and a stock certificate is that while the former is negotiable and transferable by a simple endorsement, a stock certificate can be transferred only by executing a transfer deed and submitting a copy of the deed to the RBI. The RBI issues a new certificate to the transferee. A promissory note has to be presented to RBI every time the payment of interest is due, but no such presentation of the stock certificate is required because the RBI knows who the present owner is and mails the interest coupon to him on the due date. The public/recognized provident funds are required to hold these securities only in the form of stock certificates.

The coupon rate on the central government dated securities is higher than the discount rate on treasury bills, due to the fact that the maturity of dated securities is longer. Hence, there is a need for providing liquidity premium to the investor. These securities are the next best alternative from the stand point of safety. There is no default risk, but the real value of income and capital returned on maturity could be lower due to possible inflation. The market for central government securities is captive in the sense that certain institutions such as commercial banks, Life Insurance Corporation (LIC), General Insurance Corporation (GIC), development financial institutions like the Industrial Development Bank of India (IDBI), recognized/public provident funds, registered trusts, government and semi-government bodies are required by law to invest at least a certain percentage of their investible funds in the central government securities. Besides the central government, and the state governments also issue dated securities.

Recently, a number of innovations have been introduced in the gilt-edged securities market. The credit policy announced by the Bank on April 21, 1992, underlined the need for the center to reduce its dependence on the RBI and the banking system for its credit requirements. As a first step in this direction, treasury bills of varying maturities have been introduced by the RBI which would help to widen the market for treasury bills. Moreover, in order to develop dated securities as monetary instruments with flexible yields to suit investors' expectations, the Government of India also offered to sell dated securities of 5 years maturity in auctions. The Discount and Finance House of India (DFHI) started offering a two way quote in government securities with the intention of developing a secondary market.

SEMI-GOVERNMENT DATED SECURITIES

These are the promissory notes issued by the institutions and corporations set-up by the central/state governments. They also include the securities of municipal corporations. The semi-government bodies such as electricity boards, housing boards, port trusts, central and state financial institutions issue securities to meet the financial needs of their developmental activities. Semi-government securities are guaranteed by their respective governments and carry a higher coupon rate or lower issue price than for their counterpart state government dated securities.

The price quotations for gilt-edged dated securities are reported to stock exchange for inclusion in the official quotations list by the licensed dealers. While the issue of securities, payment of interest, and transfer of the central and state government securities are handled by the RBI, the issue, interest payment and transfer of semi-government securities are handled by the commercial banks for a fee. As mentioned earlier, the gilt-edged securities market is dominated by the institutional investors like the LIC, GIC, banks, and provident funds. There are a few members of the stock exchanges who specialize in gilt-edged securities. But they operate primarily as brokers and not as dealers.

Corporate Debentures

Corporate debentures are the promissory notes issued by the joint stock companies in the private sector. They are thus the debt obligations of the issuing corporation. Like government securities, they have an issue price at which they are originally issued, a coupon interest rate, and a specified maturity date.

Debenture Trust Deed

When a debenture issue is sold to the investing public, the debenture trust deed calls for appointing a trustee. Banks, insurance companies and firms of attorneys usually act as trustees to corporate debenture issues. The main job of the trustee is to look after the interest of debentureholders by ensuring that the company adheres to the provisions of the indenture – the agreement entered into between the issuing company and the debentureholders. To perform their role effectively, the trustees are vested with adequate powers which include the right to appoint a nominee director on the board of the company in consultation with the institutional debentureholders.

The indenture is a legal document describing in considerable detail the contractual relationship between the issuing company and the debentureholders. This agreement specifies, among other things, the periodicity of interest payment; mode of redemption of debentures; collateral securities, if any; rights of the debentureholders in the event of default; rights, duties, and responsibilities of the trustee to the issue; and restrictive covenants such as limit on dividend payment, restriction on the company's capacity to create additional debt, etc. If corporate debentures are placed privately with one or more institutions like LIC, UTI and banks, then no trustee is appointed and no indenture is created. Instead, there is a loan agreement between the parties with similar provisions as in an indenture.

Special Features of Corporate Debentures

Corporate debentures are less liquid and more risky than government securities. They do not have a captive market; the success of an issue and the marketability of debentures subsequent to the issue depend largely on the reputation of issuing corporation, financial market conditions, and the interest shown by the institutional investors. Since prompt payment of interest and repayment of principal on the due dates depend upon the earnings prospects and the financial conditions of the issuing corporation (which tend to fluctuate over time), the investors will naturally demand a higher return on corporate debentures than on government securities. The prevailing market returns on these securities are generally consistent with this expectation.

In most cases, the interest on corporate debentures is payable semi-annually. There are, however, some issues with annual or quarterly interest payment. It is mandatory on the part of the company to pay interest irrespective of its financial conditions.

In the event of a default, the debentureholders have the right to force the company to go into liquidation. If liquidated, they have a priority claim over shareholders in the sense that their accrued interest and principal amount are paid-off first before anything from the operating income and liquidation proceeds is distributed to shareholders.

The maximum rate of interest payable on debentures was fixed from time to time. All restrictions on interest rates on debentures and public sector undertakings, other than tax-free bonds of the public sector undertakings are now removed. The interest rate on such debt instruments will hereafter be governed by the market forces. The interest rate and period of redemption shall be approved by the government on a case-by-case basis.

TYPES OF DEBENTURES

Debentures can be classified into two or more categories along the following dimensions: Security, transferability, and convertibility.

Straight and Mortgage Debentures

Based on security dimension, debentures can be classified as unsecured (or straight) debentures and secured (or mortgage) debentures. Unsecured debentures have no charge on any specific asset(s) of the company while secured debentures carry a fixed or floating charge on the assets of the company. The usual practice is to create a charge on the immovable properties of the company both present and future by way of an equitable mortgage. The equitable mortgage is effected by depositing the title deeds relating to the mortgaged assets in favor of the trustees of the debentureholders. The public limited companies issuing debentures to the public are permitted to issue only secured debentures.

Registered and Bearer Debentures

As per dimension of transferability, debentures can be classified as registered and unregistered debentures. Unregistered debentures (or bearer debentures) are freely negotiable and can be transferred by a simple endorsement. On the other hand, registered debentures can be transferred only by executing a transfer deed and filing a copy of it with the company. The registered debentureholders receive interest cheques from the company whereas interest is paid on bearer debentures only upon presentation. According to the Companies Act, 1956, only registered debentures are to be issued to public.

Convertible and Non-convertible Debentures

Debentures can also be classified into convertible and non-convertible debentures depending upon whether they carry a conversion feature or not. Convertible debentures are the ones which can be converted into equity shares at the option of the debentureholders. In this case, the ratio of conversion (the number of shares exchanged for the converted portion) or alternatively the conversion price (the price at which equity shares are exchanged for the converted portion of the debentures), and the period during which the conversion can be effected are specified at the time of the issue. Convertible debentures can be either fully convertible or partly convertible. In the case of partly convertible debentures, the non-converted portion will carry interest until it is repaid as per the provisions in the indenture. Of late, non-convertible debentures have been issued with warrants which entitle the holder to buy a specified number of shares on a specified future date at a fixed price.

For example, Tata Metaliks Ltd. came out with a public issue in May, 1993 of 23,22,000, 14% secured redeemable Partly Convertible Debentures (PCDs) of Rs.125 each, the terms of which are as follows:

a. Each PCD will have a face value of Rs.125 and shall consist of two parts.

   Part A Convertible portion of Rs.40.

   Part B Non-Convertible portion of Rs.85.

b. Part A of each PCD will be automatically and compulsorily converted into 4 equity shares of Rs.10 each at par on allotment.

c. Part B of the PCD will be redeemed at par in three installments of Rs.28, Rs.28 and Rs.29 at the end of 7th, 8th and 9th years respectively from the date of allotment.

'Convertible' Zero-Coupon Bond

A zero-coupon bond is a loan instrument slightly different from a debenture. A debenture is usually offered at a face value (say Rs.100), earns a stream of interest (say, 14 percent p.a.) till redemption and is redeemed with or without premium. Unlike the above, a zero-coupon bond, say a five-year bond, may be offered at a discount (say, at Rs.50), fetches no periodic interest and is redeemed at the face value (say, Rs.100). The return on such a bond when subscribed to at Rs.50, is also about 14 percent. It is just that in this case the interest is reinvested in the company for a period of five years. A zero-coupon bond may also be redeemed by allocation of ordinary share(s). For want of better terminology, such a bond has been referred to as a 'Convertible' zero-coupon bond.

Redemption

Irredeemable corporate debentures are perhaps non-existent. In fact, all corporate debentures are redeemable and the redemption takes place in a pre-specified manner. Typically, debentures have a term-to-maturity of 7 to 10 years and are redeemed in installments over a period of time. Recently, companies have been permitted to issue debentures of shorter maturities like debentures with a maturity period of one year. Corporate debentures can be redeemed by creating a sinking fund. A sinking fund provision in the indenture requires the issuing company to make periodic payments to the trustees. The trustee can retire the debentures by purchasing them in the market or calling them in a manner acceptable to the debentureholders. In some cases, however, the company itself can handle the retirement with the sinking fund amount.

Debenture Redemption Reserve

The guidelines for protecting the interests of debentureholders requires, among other things, the issuing company to create a Debenture Redemption Reserve (DRR) out of its profits to the extent of 50% of the amount of debentures to be redeemed before the date of redemption. The company can utilize the DRR for redeeming debentures only after 10% of the debenture liability has been actually redeemed by the company.

Call Option

Some debenture issues have a call feature attached to them, which provides an option to the issuing company to redeem debentures at a specified price before the maturity date. In this case, there is, what is known as an effective call option period during which the option can be exercised. The call option period usually commences after 1 to 3 years from the date of allotment. When the debentures are redeemed by call, they are done so at the call price which can be 5% above the par value. The call price is maximum at the start of the effective call option period and declines step-wise towards the face value as the call date approaches the maturity date. The effective call option period and the time-series schedule of call price are announced at the time of issue.

Preference Shares

These are a hybrid variety of securities which have some features of equity shares and some features of debentures. Preference shares carry a fixed rate of dividend. Preference dividend is payable only out of distributable profits. Generally, dividend on preference shares is cumulative. Hence, dividend not paid in one year has to be paid during the subsequent years before equity dividend is paid. All preference shares shall be redeemable within 20 years as per the Companies Act, 1956.

Equity Shares

Investors' Classification of Equity Stocks

Unlike in the West where we find different classes of common stock with differing voting rights and rights to income and assets of the company, the equity stocks of all Indian joint stock companies belong to just one class. The rights and privileges conferred on the shareholders are all the same and they are enjoyable in proportion to one's shareholdings. With the commencement of the Companies Amendment Act, 2000, companies are allowed to issue shares with disproportionate voting rights.

The investment community in India, however, has its own categorization of equity stock, not on the basis of voting or any other right, but on the basis of behavior of prices (and returns) of equity stocks. These categories include Blue chips, Growth stocks, Income stocks, Cyclical stocks, Defensive stocks, Speculative stocks, Glamor stocks, and so on.

Non-security Forms of Financial Investment

There are a number of non-security forms of investment opportunities available to an investor in India. Unlike stocks and debentures discussed above, the certificates or notes evidencing these investments are neither transferable nor are they traded in any organized financial market. Hence, the nomenclature 'Non-security form', although, in the strict sense, is a misnomer.

Broadly, these financial investment media can be classified into (1) National Savings Schemes, (2) Post Office Savings Deposit Schemes, (3) Deposits with Commercial Banks, (4) Corporate Fixed Deposits, and (5) Unit Schemes of UTI.

As can be seen from the above classification, most of the non-security forms of investment are the schemes or the plans of the central government, and the bodies controlled by it. These schemes are meant to mobilize small private savings for public use. Excepting corporate deposits, the other non-security forms of investment provide adequate safety and a reasonable liquidity. Many of these investments also have significant tax advantages. Although nominal returns on these investments are low vis-a-vis security returns, the features of tax advantage and safety can swing many small investors into their fold, particularly the conservative investors. In fact, statistics indicate that nearly 80% of the household savings are in these forms of investment.

The knowledge of non-security forms of investment is important not only because they are popular among small investors, but also because they help in fulfilling an important task of an investor, money manager/investment counselor – to obtain a balanced portfolio that satisfies a given set of objectives. The financial investments in media – security and non-security types differ in their return, risk, liquidity, and tax characteristics. So, it would be possible to form a portfolio by spreading one's investment across these forms such that investment objectives are best served. In this section, we will discuss the salient features of the major non-security forms of investment media available in India.

National Savings Schemes

Over the years, the Government of India has floated several national savings schemes with a view to mobilize private savings for public use. These schemes are operated mainly through the Post Offices because of the familiarity of these places to the masses. Some series of National Savings Schemes are operated through the State Bank of India and other nationalized banks. These series are known as 'Bank Series'. Investment in the eighth series of this scheme qualifies for a tax rebate. At present, the rate of return on NSS is 9% p.a. credited annually on April 1. Interest income qualifies for a limited tax deduction.

Public Provident Fund Scheme

This was introduced on July 1, 1968 and is primarily meant for self-employed individuals. The salaried individuals are also allowed to make contributions to this scheme over and above their contributions to the recognized provident funds in

their organizations. It is a 15-year scheme with a facility to accept the last contribution in the 16th year.

At the option of the investor, the tenure of the account opened under this scheme can be extended by blocks of 5 years each.

A PPF Account can be opened in a Head Post Office or in a branch of SBI or its subsidiaries or at specified branches of some other nationalized banks by an individual on his own behalf or on behalf of a minor of whom he is a guardian or on behalf of a Hindu Undivided Family of which he is a member.

The minimum amount that can be contributed in a year is Rs.100 and the maximum amount is Rs.60,000.

The interest is paid annually, but the rate is determined by the central government from time to time. The current rate of interest is 9.5% per annum compounded annually. The interest on PPF contributions is tax-free under Section 10 of the Income Tax Act, 1961 and the contributions towards the scheme qualify for 20% tax rebate up to Rs.60,000 under Section 88 of the Act. The investment is exempt from Wealth Tax subject to the overall exemption limit of Rs.15 lakh. Besides the tax benefits, the other attractive features of the scheme are as follows:

i. Yearly contributions can be made in one lump sum or in 12 or less installments of varying amounts, in multiples of Rs.5.00.

ii. It provides liquidity as loans and withdrawals are permitted. The application for the first loan can be made in the third year from the year of opening the PPF account. That is, if an investor opened the account in say 2000-01, the application for the first loan can be made in the year 2002-03. The loan amount is restricted to 25% of the balance amount to the credit at the end of the preceding financial year.

    Also one can withdraw 50% of the balance amount to his credit at the end of the sixth year immediately preceding the year in which the amount is withdrawn. That is on 1-4-07, an investor can withdraw 50% of the balance standing to his credit on 31-3-01. Similar withdrawals can be made subsequently at three year intervals with the amount loanable remaining at the 50% of the amount due to ones credit at the end of the sixth year immediately preceding the year in which the withdrawal is made.

iii. A PPF account can be revived by paying a fee of Rs.10 for each year of default along with the arrears of subscription of Rs.100 for each year of such default. The credit balance in the PPF account is not subject to attachment under an order or decree of court with respect to any debt or other liability.

iv. The facility of nomination is available.

Post Office Savings Deposits Schemes

These include savings bank account, time, and recurring deposit accounts. These accounts can be operated in the post offices throughout the country. Interest so earned is totally tax-free under Section 10 of the Income Tax Act.

Interest on the time deposit schemes qualifies for deduction under Section 80L of Income Tax Act. Premature withdrawal of deposits are, however, allowed only after 6 months at a discount.

The Post Office 5-year Recurring Deposit Account carries a comparable compound interest rate (9.5%). The interest on recurring deposits is covered by Section 80L of the Income Tax Act.

Investment in post office/bank accounts also qualifies for exemption under the Wealth Tax Act subject to the overall exemption limit.

Deposits with Commercial/Co-operative Banks

The major deposit schemes of the Commercial/ Co-operative banks include the savings bank account, fixed deposits, recurring deposits, and annuity deposit schemes.

A savings bank account at a commercial bank carries a nominal interest of 4% per annum with some limit on the number of withdrawals (usually 25 times a quarter). If this account is opened with district or industrial co-operative bank, the interest rate is higher by about 1%. The interest is calculated on the monthly minimum balance, but credited to the account twice or four times a year. This is a very liquid interest earning account because frequent withdrawals are permitted.

Banks accept fixed (i.e., term) and recurring deposits. Such deposits for a period longer than 10 years are not accepted by the nationalized banks because of a directive issued by the RBI. Under the fixed deposit scheme, the deposit is made in lump sum initially for a set term, whereas, under recurring deposit scheme, the depositor deposits a certain amount periodically on a regular basis over a specified period of time.

The interest on fixed deposits can be on a compounding or non-compounding basis, but the interest on recurring deposits is always on a compounding basis. Those banks offering simple interest term-deposit schemes generally provide for reinvestment of interest at the rate allowed on term-deposits.

Banks also offer annuity deposit schemes. Under an annuity scheme, a lump sum deposit is made with the bank initially and the bank agrees to make payment of a certain uniform amount at regular intervals over the annuity period, either to the deposit holder or to his nominee. Each periodical payment under the annuity deposit scheme consists of two components – the principal repayment and interest. In the initial years the interest component of the annuity is higher and in the later years the principal component is higher.

Given the rate at which the bank pays interest on the outstanding balance of the principal amount, these periodical uniform payments can be figured out using the PVIFA tables. For example, if one buys a 5-year, 10% annuity deposit certificate for Rs.26,535.6, the annuity he is entitled to receive over the 5-year period can be determined as follows:

$$\text{Annuity} = \frac{26,535.6}{\text{PVIFA}_{(10,5)}}$$

$$= \frac{26,535.6}{3.791}$$

$$= \text{Rs.}7,000$$

It is to be noted that besides these deposit schemes, banks do have other schemes to attract small savings like cash certificate scheme, perennial income scheme, etc. The other points worth noting about bank deposits are (i) premature encashment is possible; (ii) the interest on these deposits is covered under Section 80L of the Income Tax Act; (iii) the Deposit Insurance Corporation offers a cover up to Rs.100,000 per account.

Corporate Fixed Deposits

Investors can also consider depositing their money for a fixed term with companies. These fixed deposits which are considered as a part of the unsecured liabilities of the company, have a maximum maturity period of 3 years and carry a maximum rate of interest of 12.5% (earlier 14%). The public deposits accepted by the companies are governed by the provisions of the Companies (Acceptance of Deposits) Rules, 1975. The important features of this regulation are (a) Public Deposits cannot exceed 10% of the share capital plus free reserves; (b) The maximum maturity period cannot exceed 3 years and the minimum maturity period cannot be less than 6 months; (c) No company with a net owned fund of less than rupees one crore shall invite public deposits. (d) The company inviting public deposits must disclose the prescribed information relating to its financial performance and position. These guidelines apply with certain modifications to finance companies.

The interest on public deposits is paid semi-annually on a cumulative or non-cumulative basis. While the interest rates offered on company deposits are attractive vis-a-vis bank deposits, it should be noted that there is no tax benefit neither on the interest income, nor, does the investment in CFD qualify for any tax rebate.

Besides, company deposits have a higher degree of default risk than bank deposits. For one thing, these deposits do not enjoy any risk cover from the Deposit Insurance Corporation like bank deposits. Further, these deposits are serviced and finally repaid from the earnings of the company which by nature are uncertain and fluctuate over time. To add to this, these deposits are unsecured and rank *pari passu* with other unsecured liabilities for repayment in the event of liquidation. Therefore, the decision to invest in public deposits must be necessarily based on a thorough analysis of the financial stability and profitability of the company[1] or on the credit ratings provided by rating agencies like CRISIL and ICRA.

Units of UTI

The Unit Trust of India (UTI) in the public sector is the only units investment trust in the country. It was set-up in 1964 with a view to mobilize small savings by selling 'units' and invest the proceeds in the corporate stocks and debentures and gilt-edged securities. A unit represents a share in the income earned and in the assets (portfolio of securities) held by the trust under a given scheme. Some important unit schemes offered by UTI are discussed below.

Unit Scheme, 1964

One of the major unit schemes of UTI is the Unit Scheme, 1964. Under this scheme which is an open-ended one, units of the face value of Rs.10 each are sold on a continuous basis at a price quoted by the UTI from time to time. During the month of July, for about 3 – 6 weeks, these units are sold at a special price which normally is lower than the price quoted during the other periods of the year. A unit holder can avail himself of this facility, if so desired, for automatic reinvestment of dividend income in further units at the reduced price.

Unit Scheme, 1971

This unit scheme is a unit-linked insurance plan. Under this scheme, the units are not sold on tap. Instead, they are issued to the participants of the plan. It is a contractual savings plan for a target total contribution of Rs.6,000 at the minimum and Rs.75,000 at the maximum over a period of either 10 years or 15 years. A small amount of the contribution is paid to LIC for the insurance cover and the rest is invested. The total contribution to be made by a participant represents the insurance cover amount and this amount is paid to the nominee or legal heir in the event of the participant's death. The plan also provides for personal accident insurance cover up to Rs.15,000 free of cost to the participant.

Unit Scheme for Charitable and Religious Trusts and Societies

The units sold under the scheme have a face value of Rs.100 and a participating trust or society is required to buy at least a 100 units. A participant can opt for reinvestment of dividends. The investment, however, cannot be withdrawn for the first three years.

Children's Gift Growth Fund 1986

Under this scheme, an irrevocable gift can be given by any adult to any child under 15 years of age. This investment remains with UTI till the child attains the age of 21 years. As it is indicated by the name, its primary aim is to build-up a fund for children. Till the scheme matures, there is an assured dividend of 12.5% p.a. which is automatically reinvested in further units, so the investment grows at a compound rate. Units can be gifted in multiples of 10 subject to a minimum of 50. Units are sold at par at Rs.10 throughout the year.

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1 The company (Amendment) Bill, 1987 has proposed serious penalties for companies defaulting on payment of interest and repayment of these deposits.

Mutual Fund Unit Scheme 1986 (Mastershares)

This scheme provides an opportunity to the investors to participate in the growing equity market. The funds mobilized through Mastershares are invested in a basket of equities spread over a wide range of industries, thus giving the benefit of diversification and spread of risk to the common investor. Mastershares are quoted on the stock market and so can be bought or sold at any time.

Growing Monthly Income Scheme (GMIS'91)

This scheme is launched to satisfy the growing need of middle class investors for regular income schemes and to cope with the rising cost of living. The scheme offers two options. Option 'A' provides regular monthly income of 14.5% p.a. for the first 3 years and 15% p.a. for the last two years with a minimum 2% capital appreciation on maturity. Under Option 'B' invested amount more than doubles itself in 5 years.

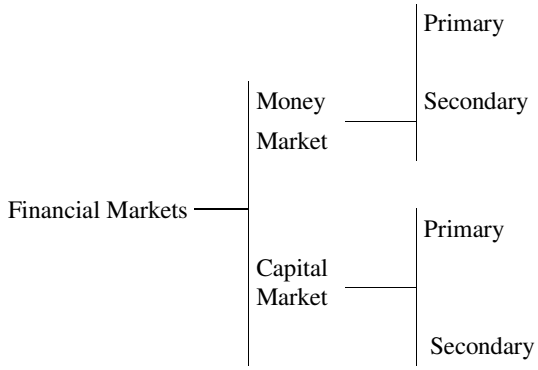
The investment in units under the unit-linked insurance plan qualifies for deduction under Section 88 of the Income Tax Act. The investment in units is also eligible for exemption under the Wealth Tax Act subject to the overall exemption limit. Dividend income qualifies u/s 80L of the IT Act.

FINANCIAL MARKETS

Financial markets are the markets where financial instruments are traded and consist of the following:

- Borrower
- Lender
- Instruments
- Intermediaries.

Financial markets are further divided into two parts. Money market and Capital market as per the structure given below.



Money market is the market for short-term funds, while Capital markets are the markets for the long-term funds. The corporate entities borrow money through the issue of long-term instruments in the primary market, the secondary market refers to the place where such instruments are traded in the stock exchanges. As the secondary market is created for the securities raised in the primary markets, the depth of the secondary market depends upon the primary market. From the investor's point of view, while he can obtain the instruments both by applying for them in the primary market or purchasing them in the secondary market, the liquidity for these instruments is created only in the secondary markets. Hence, the movements in both these markets is important for him.

REAL INVESTMENT

Real investment is the investment in tangible or physical goods which are different from monetary assets or financial claims. The important categories of real assets are

a. Land and house property.

b. Bullion.

c. Precious stones.

d. Art objects.

Land and House Property

Land and House property is also called real estate. This investment is taken by a large number of people for hedging against the inflation rates. A real estate represents a very attractive investment proposition for the following reasons:

1. Capital appreciation of real estate is, in general, very high. Real estate in most of the towns in India have appreciated ten times or so in the last 10-15 years.
2. Loans are available from various quarters for buying or constructing a residential property.
3. For wealth tax purposes, the value of a residential property is reckoned at its historical cost and not at its present market price.
4. Interest on loans taken for buying or constructing a residential home is tax deductible within certain limits.
5. Ownership of a residential property provides psychological satisfaction.

Due to the above formidable advantages, a residential property represents the most important part of the portfolio for most of the investors. But the return on these investments depends on the following rules:

a. The holding period of the property is important.

b. A person who does not have enough time to supervise his property should not invest in it.

c. Property requires care. If it is rented out there is a requirement of repair and maintenance.

d. Investment in real estate is also very risky. Although the average rate of return is high, a cautious investor should not think of property because it involves the exercising of a lot of pressures such as tax payments, capital gains tax, annual property tax and so on.

PRINCIPLES OF INVESTING IN REAL ESTATE

Price

The price of property is most valuable for determination of real estate. The property must be evaluated with regard to its price in relation to its position and its use. Regarding position, it should be situated in a place where higher rent is recoverable. So the productivity will determine the price. Therefore, when an investor buys and sells property he would evaluate it according to its most productive use.

Land as an Asset

Land as an asset is fixed but its demand keeps on increasing every time. The increasing population and affluence will increase the rate and value of land. Land from the point of view of long-term investment can be expected to be a good proposal because it is expected to cover purchasing power risk with the prices of land which keep on increasing. On short-term basis, property cannot be called as a good investment.

Land as Collateral

Land is accepted as collateral by banks and other financial institutions. In India, it is found that almost all banks consider land as a good collateral, but lending on property is restricted by the banks to the market price as a collateral value. If an investor can purchase land and borrow money on such an investment at a lower rate of interest is a good form of investment.

Tax

The purchase of land must always be determined after carefully examining the payment of tax on property. Tax must be paid on house property as well as after property is sold under Capital Gains Act.

Sources of Housing Finance

A major deterrent for investing in house property is the huge investment required. Hence, you may have to explore for sources of loan finance. The organizations that offer housing loan in India are as follows:

Employers:

Many employers offer housing finance at subsidized interest rates.

Life Insurance Corporation: Traditionally, the most important formal source of housing finance, the Life Insurance Corporation has been offering housing finance as a bait to sell insurance policies. It has three main schemes for housing finance: (i) Own Your Home (OYH) Scheme. (ii) Own Your Apartment Scheme. (iii) Property Mortgage Scheme.

Housing Finance Companies: In the last decade, a number of Housing Finance Companies (HFCs) have come into existence. There are presently about 280 HFCs, big and small. Leading the pack is the Housing Development Finance Corporation (HDFC). Other well-known names are Canfin Homes, SBI Homes, Dewan Housing, LIC Housing Finance (this is a subsidiary of LIC set-up to provide housing finance only).

Co-operative Housing Societies: In almost every city, co-operative house building societies exist. They offer a housing loan up to a certain amount to its members.

Schemes of HFCs

The housing finance schemes offered by HFCs fall into three broad categories: (a) straight loans for purchase of a house or for undertaking extensions/repairs, (b) loans linked to savings made by the customer over a period of time, and (c) preferential sanction of loans to depositors.

The typical features of housing finance schemes are as follows:

a. Loans are sanctioned against the mortgage of the house property bought with the loan proceeds.

b. The eligibility interest rates are varying with minimum of 12% and the maximum repayment period is 15-20 years. Table 1 provides information about several HFCs.

c. The repayment is typically in the form of Equated Monthly Installments (EMIs) over the period of the loan. For example, the EMI on a Rs.2 lakh loan from HDFC repayable over a 15-year period presently works out to Rs.2,514 at 12.5% p.a. However, most HFCs are willing to structure the pattern of repayment to suit the convenience of the borrower. For example, the Housing Development Finance Corporation offers a 'Step Up Repayment Facility', under which the installments increase progressively.

Table 1

Housing Finance at a Glance

Features	LIC Hsg Fin	SBI	Dewan Housing	Home Trust	HDFC
Maximum Amount	Rs.50 lakh	Rs.25 lakh	Rs.25 lakh	Rs.10 lakh	Rs.50 lakh
Maximum Tenure	Residents: 20 years NRIs: 7-10 years	15 years	15 years	15 years	15 years
Security	First Mortgage of the property, a guarantor & LIC policy	First Mortgage of the property & a guarantor	Processing fee: % of the property, a guarantor & LIC Policy	First Mortgage of the property, a guarantor & LIC policy	First Mortgage of the property & a guarantor
Processing & other charges	0.5% of loan amount to a maximum of Rs.5,000	Up to 25,000-nil 25,000 to 2 lakh: 0.5% of sanctioned amount to a max. of Rs.5,000 Above 2 lakh: 0.5% amount	Processing fee: 1% of the loan applied. Admn. Charges: 1% of the sanctioned amount	1.2% of sanctioned amount	Processing fee: 0.8% of the loan applied. Admn. Charges:1% of the sanctioned amount
Other features	NA	NA	Double Protection plan	Free personal accident cover	NA
Own contribution	Residents: 20% NRIs: 25%	20% of the sanctionunt	Own construction: 30% Purchase: 20% for purchase	NA	20% of the sanctioned amount
Prepayment charges	1% of the amount prepaid within first 5 years	1 month interest on outstanding loan	Nil	Nil	2% of the amount prepaid

Source: ICFAI Research team.

Bullion – Lure of Gold

Bullion comprising of gold and silver is a favorite avenue of investment to Indian investors as:

- They provide a hedge against inflation
- The sentimental and social value attached to these precious metals
- It has ornamental value and medicinal uses.

GOLD

Gold is one of the most valuable assets in any economy. It has been used in India primarily as a form of saving by the housewives. It used to be a money metal and public memory tells that gold is universally acceptable as a medium of exchange and it is now used for its 'Store of Value' function. Although the price of gold is always on the rise and it fetches higher resale value, in India, it is retained for the feeling of security and status it gives rather than for sale or with the intention of making profit or income on this investment. Gold to the investor in the recent years has become very important mainly because of rise in prices due to inflation. Investment in gold may be in the form of gold coins, gold bars or gold jewelry.

Import of Gold to the Economy

Two years after the government headed by Chandrasekhar came in for flak on its decision to ship out gold to the Bank of England, the Narasimha Rao Government is being applauded for the massive collections recorded under the Gold Bond Scheme. But the objective of both governments was the same: To convert gold into a quasi-financial asset. Once gold is developed into a financial asset it can emerge as an alternative to external borrowings. This means that the government could in future raise dollar resources by using gold as a collateral in international markets. As a result, the country would be able to save on substantial interest charges if commercial borrowings were resorted to. At a conservative estimate, the stock of gold in the country is estimated at around 8000 tonnes.

Liberalization of India's Gold Policy

Before the new gold import policy was introduced, carrying of gold biscuits or bars was banned in India. Average NRI's took home chains or bangles. Since the ban on gold biscuits (TT bars) was withdrawn, most people prefer carrying TT bars each weighing around 116.64 gms. and they take home 42 biscuits weighing less than the 5 kg that is the maximum allowed. Thus the government aided in making gold, a lucrative invetment. Thus, the government aided in making gold, a lucrative investment.

SILVER

Silver is sold in the form of weight in kilograms in India. Like gold, this is a useful hedge against inflation. It is worthwhile to note the following facts about silver.

Demand and Supply

Silver has a wide range of industrial applications. Silver, so used, cannot be recycled and, hence, is lost irretrievably. There has been no major discovery of silver mines in the last several decades. Given the growing industrial demand and a somewhat stagnant supply, the long run prospects of silver may be considered bright.

Price Parity

Historically, the price of silver in India tended to be lower than the price of silver abroad. Hence, it was illegally exported from India. In recent years, the price relationship has reversed. Currently, the price of silver in India is higher than the price of silver abroad.

Form

For investment purposes, silver may be bought in the form of bars – 5 kg bars are the most common. There is a ready market for silver bars. Hence, silver can be traded very easily.

PRECIOUS STONES

Diamonds, rubies, emeralds, sapphires, and pearls have appealed to investors from times immemorial because of their aesthetic appeal and rarity. Diamonds, in particular, have attracted most because of their high per carat value. The quality of a diamond is basically judged in terms of the 4 Cs, viz. carat, color, cut, and clarity.

Carat

This is the unit for weighing diamonds. A carat is about 0.2 grams. Most of the diamonds are less than one carat. The higher the carat value, the higher the price per carat.

Clarity

This refers to how clear a diamond looks. Almost every diamond has some flaw in it in the form of bubbles or lines. The fewer these imperfections, the more valuable a diamond is.

Color

The color of a diamond determines its ability to refract. The most valuable diamonds are brilliant white.

Cut

On the basis of its contour, a diamond is cut. The cut determines the shape of a diamond. The common shapes are rectangles, ovals, and rounds. The cut of a diamond brings out its color and clarity.

While precious stones may have appeal for the affluent investors and those who have skill in buying them, they are not suitable for the bulk of the investors for the following reasons.

Poor Liquidity

Precious stones can be very illiquid. It may not be easy to sell them quickly without giving major price concessions.

Subjectivity in Valuation

The grading process by which the quality and value of precious stones is determined can be quite subjective. It is not uncommon to find a price variation of 20 percent or more in valuation done by two experts.

Substantial Investments

For investment purposes larger precious stones are suitable. Most investment grade precious stones (diamonds, in particular) require huge investments.

No Regular Returns

Precious stones do not earn a regular return during the period they are held. On the contrary, the investor has to incur the costs of insurance and storage.

Art Objects

Objects which possess aesthetic appeal because their production requires skill, taste, creativity, talent, and imagination may be referred to as art objects. According to this definition, paintings, sculptures, etchings, and so on may be regarded as art objects. The value of an art object is a function of its aesthetic appeal, rarity, reputation of the creator, physical condition, and fashion.

This section describes briefly two of the more commonly bought objects, viz., paintings and antiques.

Paintings

Paintings appear to be the most popular among objects of art. In the last decade or so, interest in paintings has grown considerably, thanks to the substantial appreciation in the market value of paintings of Hussain, Raza, Menon, and others.

The prospective investor with an inclination to buy paintings, should bear in mind the following guidelines:

a. **Put bets more on fledging painters:** Works of established painters may be too expensive and beyond the reach of the small investors. More important, the expected appreciation in their value may not be considerable. Hence, it makes more sense to buy good quality paintings done by fledging painters – the potential Hussains of tomorrow. True, when one bets on an 'emerging' painter, he is taking some risk. Often, the potential rewards justify such risk.

b. **Develop a sense for the quality of painting:** Even if the investor does not have the skills of a connoisseur, he can judge the basic qualities of painting by looking at attributes like spontaneity, maturity of strokes, balance of color, and originality. Over a period of time one can refine his sensibility, provided of course he has a basic aesthetic sense.

Antiques

An object of historical interest may be regarded as an antique. It could be a coin, a manuscript, a sculpture, a painting, or any other object.

If one is interested in investing in an antique, bear in mind the following:

a. The owner of an antique is required to register it with the Archeological Society of India. If the registering authority is satisfied about the authenticity of the antique, it issues a 'Certificate of Registration'.

b. Whenever an antique is sold the registering authority has to be informed and the ownership must be transferred.

c. Export of antiques, in general, is banned. In exceptional cases, it is allowed only at the instance of the Director General of the Archeological Society of India.

d. The government has the right to acquire an antique if it is felt that the same must be kept in a museum for the general good.

e. Antiques are available in places like Chor Bazar (Mumbai), Mullick Market (Calcutta), and Burma Bazar (Chennai). However, it may not be easy to get good bargains at these places. To buy antiques at bargain prices, investor has to actively look for them in smaller towns and villages.

f. There is a flourishing market for 'fake' antiques. These are objects which are chemically treated to give an 'antique' look, though they are not genuine antiques.

g. Antiques tend to appreciate in value over time, but in a very unpredictable manner.

h. Antiques seem to make sense only for those who has patience to wait and who derive psychological satisfaction from owning objects of historical interest. One may even argue that, since very few investors have the ability to assess the value of antiques, investments in these may largely be left to connoisseurs.

SUMMARY

- An investment may be defined as a process of sacrificing something now for the prospect of gaining something later.
- Rationally stating all personal investing is designed in order to achieve a goal, which may be tangible (e.g. a car, a house, etc.) or intangible (e.g. Social status, security, etc.)
- Liquidity, age, need for regular income, time horizon, risk tolerance and tax liability are identified as constraints for an investor seeking fulfillment of the goals stated above.
- The investments can be classified into security form and non-security form of financial investment. Gilt-edged securities, corporate debentures, preference shares, equity shares can be grouped under security form of investments. National Savings Scheme, Public Provident Fund Scheme, Post office savings bank deposits, bank deposits, corporate fixed deposits and Units of UTI can be grouped under Non-security form of financial investment.
- The next chapter focuses on the risk-return aspects of the above-stated investments.

Chapter II

Risk and Return

After reading this chapter, you will be conversant with:

- Concept of Risk and Return
- Reduction of Risk through Diversification
- Quantifying Portfolio Returns and Risk
- Measurement of Risk in Portfolio Context
- Security Market Lines and its Applications

Introduction

No investor is obliged to take any amount of risk on his or her investment. One may invest one's money in a government bond or a fixed bank deposit and receive fixed interest. This interest may be called risk-free return (near risk-free) on investment. On the other hand, one may also invest in rather risky investments, in the expectation of earning very high returns. It appeals to commonsense that one will invest in a risky venture only if one expects to earn a return in excess of the risk-free return. But what do we mean by return from a venture? For that matter, what do we mean by riskiness of a venture? Let us have a closer look at the concept of return and risk.

CONCEPT OF RISK AND RETURN

Return

Intuitively, it should be clear that by the term return from a venture we are concerned with benefit from that venture. In the field of finance in general and security analysis in particular, the term return is almost invariably associated with a percentage (for example, return on investment of 15%) and not the amount (like, profit of Rs.100). But then again, even in terms of a percentage, exactly what is return? Is it the return on investment or return on assets (profit as a percentage of assets)? Is it the return on total capital or return on equity? Is it the accounting rate of return or the internal rate of return? In corporate finance, from the corporate perspective, each of these definitions have a specific significance and the use of any one specific definition depends upon the purpose for which the return is being measured. For example, if the purpose is to measure the productivity of capital as a whole, one may measure the return on total capital; if one is concerned with the productivity of assets, one may compute return on assets and so forth.

In security analysis, we are primarily concerned with returns from the investors' perspective. Our main concern is to compute or estimate the return for an investor on a particular investment. The investment is looked by a security analyst as essentially a financial asset, say, a share or a debenture or some other financial instrument. So then, what is the return on a financial asset for the investor?

Single Period Returns

Let us at the outset consider situations where we are concerned with only a single period (say, one day, one week, one month or one year, etc.). Consider the following illustration.

Illustration 1

Let us consider a share whose prices now (period 0 or P_0), one year later (period 1 or P_1), two years later (period 2 or P_2) etc., over a 10 year period are as follows:

Period	P_0	P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8	P_9	P_{10}
Prices	100	110	108	130	154	145	160	170	193	220	264

We need to compute the return from the share in each of the periods.

Solution

If all the prices are cum-dividend (that is, prior to the payment of dividends), the single period return to the investor in period 1 (r_1), period 2 (r_2), etc., could be expressed as below:

$$r_1 = \frac{P_1 - P_0}{P_0} = \frac{110 - 100}{100} = 10\% \qquad \text{Eq. (1)}$$

Similarly,

$$r_2 = \frac{P_2 - P_1}{P_1} = \frac{108 - 110}{110} = -2\%$$

$$r_{10} = \frac{P_{10} - P_9}{P_9} = \frac{264 - 220}{220} = 20\%$$

The computed single period percentage returns (rounded off to the nearest digit) have been shown below:

Period	P_0	P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8	P_9
Returns	10	–2	20	18	– 6	10	6	13	14	20

As analysts or investors, we may want to know the average annual return (single period return) over the period 0 to 10. This may be computed from above as follows:

$$\frac{1}{n}\sum_{i=1}^{n} r_i = \frac{r_1 + r_2 + r_3 + ... + r_{10}}{n} = 10\%. \qquad \text{Eq. (2)}$$

where i is the subscript for the period.

This is nothing but the arithmetic average of the returns over the ten year period. While this computation appears quite reasonable, and serves the purpose in most cases, we run into trouble when the change in prices is rather erratic (See Example 2).

Multi-Period Returns

Let us now consider returns when more than a single period is under consideration. In this context we are concerned with computing the return per period, over a longer period. For example, over a span of ten years, what has been the annual return on a security? Consider the following illustration.

Illustration 2

Period	P_0	P_1	P_2
Prices	100	200	110

What is the per period return in this case? In other words, if P_0, P_1, and P_2 represent prices now, a year from now, and two years from now, what is the annual return over the two year period in this example?

Solution

In this illustration, we have $r_1 = 100\%$ and $r_2 = -45\%$, so that the average annual return = 27.5%.

However, it is obvious that an investor who bought the share for 100 in period 0 and sold it for 110 in period 2, made a return of only 10% over the two year period.

The single period return over the period 0 to 2 ($r_{0,2}$) is arrived at as follows:

$$r_{0,2} = \frac{P_2 - P_0}{P_0} = \frac{110 - 100}{100} = 10\% \qquad \text{Eq. (3)}$$

This return ($r_{0,2}$) can be reduced to an equivalent per period return (r). One way of computing the per period return is as follows:

$$P_0 (1 + r)^2 = P_2, \text{ or } r = \sqrt{(P_2/P_0)} - 1 = \sqrt{1.1} - 1 = 4.88\% \qquad \text{Eq. (4)}$$

Alternatively,

$$(1 + r)^2 = 1 + r_{0,2}, \text{ or } r = \sqrt{(1 + r_{0,2})} - 1 = 4.88\%$$

Thus, r is the annual rate of return on a time adjusted basis.

One could also compute the annual rate of return without adjusting for time.

The unadjusted annual rate of return

$$= r_{0,2} / n = 10 / 2 = 5\%. \qquad \text{Eq. (5)}$$

Thus we see that in this example, the annual rate of return is about 5% per annum, so that the average annual return of 27.5% as computed earlier has little meaning.

Multiplicative Relationships of Returns

In the context of computing multi-period returns, it may be useful to note the following relationships:

$r_{0,2}$ in Example 2 above (from Eq. 3) may be expressed as

$$1 + r_{0,2} = \frac{P_2}{P_0} = \frac{P_1}{P_0} \times \frac{P_2}{P_1} = (1 + r_1) \times (1 + r_2)$$

In general,

$$1 + r_{0,n} = \frac{P_n}{P_0} = \frac{P_1}{P_0} \times \frac{P_2}{P_1} \times \ldots \times \frac{P_n}{P_{n-1}} \qquad \text{Eq. (6)}$$

$$= (1 + r_1) \times (1 + r_2) \times \ldots \times (1 + r_n)$$

where $r_{0,n}$ is the return over the period 0 to n.

Logarithmic Returns

Another important relationship results by taking the natural logarithm of the two sides of Eq. 6 above:

$$\text{Ln}\,(P_n / P_0) = \ln (P_1/P_0) + \ln (P_2 / P_1) + \ldots + \ln (P_n / P_{n-1}) \qquad \text{Eq. (7)}$$

or

$$\ln (1 + r_{0,n}) = \ln (1 + r_1) + \ln (1 + r_2) + \ldots\ldots + \ln (1 + r_n)$$

where 'ln' stands for logarithm with base e, that is, natural logarithm.

Note that by using logarithms, we are able to reduce a multiplicative relationship (Eq. 6) into an additive one (Eq. 7). The additive relationship of the logarithmic returns is much simpler to handle in arithmetic manipulations. For this reason, logarithmic returns frequently find their way into security research.

Once $r_{0,n}$ (or P_n/P_0, which is equal to $1 + r_{0,n}$) has been computed, the time adjusted annual rate of return r is given by:

$$P_0 (1 + r)^n = P_n \text{ or } r = \sqrt[n]{(P_n/P_0)} - 1 \qquad \text{Eq. (8)}$$

alternatively,

$$(1 + r)^n = 1 + r_{0,n} \text{ or } r = \sqrt[n]{(1+r_{0,n})} - 1 \qquad \text{Eq. (9)}$$

Estimation of Return Using Regression Method

We note that the computed value of annual rate of return (r) using Eqs.(8) and (9) depends upon merely two observations; namely, the share price on period 0 and that on period n. All the prices of the intermediate period (P_1, P_2, ... P_{n-1}) are irrelevant to the computation of r (since $r_{0,n}$ depends on only P_0 and P_n – see Eq.(6)). Clearly, the estimate of r can be further improved if all the price observations could be used in the process of estimation. This can be done using a regression procedure with the following specification:

$$\text{Ln}\,(P_n) = \ln (P_0) + \ln (1 + r)\, n + e$$

where n is the time variable and e is the error term.

Through the regression procedure, the coefficient of n, ln (1+r) is estimated, using the data on share prices for the entire period under consideration. The annual rate of return r is then computed from the estimate of ln (1+r).

Measuring Historical (ex-post) Returns

To properly measure the return generated by an investment, one must account for both the price change and the cash flow derived from the asset during the period the asset was held. In other words, we can say that the return (the reward) from the

investment includes both current income and capital gains (or losses) brought about by the appreciation (or depreciation) of the price of the security. The income and capital gains are then expressed as a percentage of the initial investment. Hence, return usually represents the total annual income and capital gain as a percentage of investment.

In bond investment, yield is the compounded rate of return on the purchase price of the bond over its life. Simply stated, it is referred to as yield to maturity. Since yield to maturity includes interest and capital gains or losses, it is also the return. The yield on a common stock, however, assumes no maturity date. Therefore, the stock yield is simply the price of the stock divided into the current dividend; there is no compounding of returns. It is known as the current yield. When bond yields are compared with stock yields, errors of judgment might be made, since the measures are different.

The return on a stock is calculated by including annual gains. If an investor receives Rs.2 per share in dividends and earns Rs.3 per share per year in capital gains and has an average investment of Rs.25, the return on the stock would be 20%.

Consider the following illustration.

	ABC Ltd.	XYZ Ltd.
Price as on 31-3-x_1 (Rs.)	20.00	10.00
Price as on 31-3-x_2 (Rs.)	15.00	15.00
Dividends for the year $x_1 - x_2$	1.00	1.00

Let r stand for the rate of return on investment,

P stand for the price, and

D stand for dividend.

the return from holding, the stock of ABC Ltd. and XYZ Ltd., for one year is calculated as follows:

$$\text{ABC Ltd. } r_{x_2} = \frac{\left(P_{x_2} - P_{x_1}\right) + D_{x_2}}{P_{x_1}}$$

$$= \frac{(15-20)+1}{20} = \frac{-5+1}{20} = \frac{-4}{20} = -0.2 = -20\%$$

$$\text{XYZ Ltd. } r_{x_2} = \frac{\left(P_{x_2} - P_{x_1}\right) + D_{x_2}}{P_{x_1}}$$

$$= \frac{(15-10)+1}{10} = \frac{5+1}{10} = \frac{6}{20} = 0.6 = 60\%$$

Thus, for stocks the return for a particular time period is equal to the sum of the price change plus dividends received, divided by the price at the beginning of the time period. For bonds, the holding-period return is equal to the price change plus interest received, divided by the beginning price.

In general, for the i th asset and the t th time period

$$r_{it} = \frac{\left(P_{it} - P_{i,t-1}\right) + D_{it}}{P_{i,t-1}}$$

The subscript notation used above might seem complex at first. However, it is really a very useful method of keeping track of variables associated with different assets and different time periods.

To compute the ex-post, or historical, average return for the ith stock, we use the standard formula for computing arithmetic means.

$\bar{r}_i = \frac{1}{n}(r_{i1} + r_{i2} + r_{i3} + r_{i4} + ... + r_{in})$where 'n' equals the number of time periods.

This can be expressed as $\bar{r}_i = \frac{1}{n}\sum_{t=1}^{n} r_{it}$

Consider the following illustration. Data is given for PQR Ltd.

Year	Annual returns (%)
1	16.98
2	–11.36
3	7.64
4	21.12
5	–22.14
6	–30.01
7	37.68
8	28.27
9	1.76
10	13.93

The mean annual return of these returns would be,

$$\bar{r}_i = \frac{1}{n}\sum_{t=1}^{10} r_{it}$$

$$= \frac{1}{10}[16.98 - 11.36 + 7.64 + 21.12 - 22.14 - 30.01 + 37.68 + 28.27 + 1.76 + 13.93]$$

$$= \frac{1}{10}(63.87) = 6.387\%.$$

Thus, calculating the arithmetic mean for historical returns is a relatively straightforward process.

The majority of investors tend to emphasize the return they expect from a security. They also tend to view both return and risk in subjective terms. Intuitive judgment is used to make decisions about risk. The reasoning, for example, goes something like this: Chrysler is more risky than General Motors, General Telephone is more risky than AT&T and Polaroid is more risky than Eastman Kodak. And in India, Reliance is more risky than Tisco.

Return also receives subjective and intuitive analysis. The usual statement about return is something like, "The stock offers a dividend yield of 7% and has prospects for future price appreciation". The dividend yield, which is current price dividend into the current rupees dividend is mentioned specifically, but little or no attempt is made to estimate in a formal way the likely impact of capital gains or losses on the total return.

It is, therefore, appropriate to develop a measure of return that includes both dividends or interest and capital gains in the calculation. This measure will then be applied to the calculation of historic or future expected returns. The precise measure of return will make it easier to estimate and judge the magnitude of returns of various securities. The return includes dividends and capital gains. The

best proxy for return is the future expected return. Thus, the basic equation for measuring return for a yearly period or less is

$$= \frac{(P_i - P_0) + D_i}{P_0}$$

where,

P_0 = the rupees beginning price of the security

P_i = the rupees end-of-period price

D_i = the rupees amount of dividends paid in period 1.

Expected Return (ex-ante) of a Security

Frequently, in security analysis, we talk of expected return rather than historical return. Let us now understand the meaning of the term "expected return" in the context of the return on securities through an example.

Illustration 3

Investors' assessment of return on a share of Xylene Corporation under three different scenarios is as follows:

Scenario	Chance	Return (%)
1	0.25	36
2	0.50	26
3	0.25	12

How investors make an overall assessment about the return on the share based on the above anticipated returns under different scenarios?

Solution

As a first step in dealing with so many values, investors tend to ask the question, "What return can we expect on an average?" This is known in statistics as the expected value of the return and is nothing but the sum of each possible return multiplied by the chance of its occurrence. The expected return E(x) in this case will be 25% (being 0.25 x 36 + 0.50 x 26 + 0.25 x 12).

Illustration 4

Consider the following illustration, where the expected value of the returns for a stock is computed when probability of occurence is given.

Conditional return (%) (X_i)	Probability of Occurrence (P_i)	X_iP_i
–24	0.05	–1.20
–10	0.15	–1.50
0	0.15	0
12	0.20	2.40
18	0.20	3.60
22	0.15	3.30
30	0.10	3.00
		9.60

Expected value of returns = $E(x) = \sum_{i=1}^{n} X_i P_i = 9.60\%$

It is important to note that the sum of all the chances must add up to one.

We could generalize the above approach. If the return on a security is expected to be r_1 with a chance of P_1, r_2 with a chance of P_2, ..., and r_n with a chance of P_n, then

the overall assessment of investors is based on the expected value of returns, which is computed as follows:

Expected Return, $E_r = P_1r_1 + P_2r_2 + ... + P_nr_n$

Expected Return of a Portfolio of Securities

The expected return on a portfolio of securities is nothing but the weighted average of the return on individual securities in the portfolio. For a portfolio of two securities:

Expected portfolio return, $E_p = W_1E_1 + W_2E_2$

where,

E_1 is the expected return on security 1

W_1 is the proportion of money invested in security 1

E_2 is the expected return on security 2

W_2 is the proportion of money invested in security 2.

Similarly, the expected return of a portfolio of n assets, E_p is given by:

$E_p = W_1E_1 + W_2E_2 + ... + W_nE_n$, or

$$E_p = \sum_{i=1}^{n} W_iE_i$$

where,

W_i is the proportion of investment in asset i,

E_i is the expected return on asset i, and

N is the total number of assets in the portfolio.

The above fact can be proved using the following illustration.

Stock	Price as on 1.4.x1 (Rs.)	Price as on 31.3.x 2	Yearly Dividend	Rate of Return (%)
X	20	30	2	60.00%
Y	30	40	3	43.33%
Z	50	60	5	30.00%
Portfolio of (X, Y, Z)	100	130	10	40.00%

Rate of return is computed as

$$E_{it} = \frac{(P_{it} - P_{i,t-1}) + D_{it}}{P_{i,t-1}} \text{ (for X, Y, Z)}$$

$$E_{pt} = \frac{(P_{pt} - P_{p,t-1}) + D_{pt}}{P_{p,t-1}} \text{ (for portfolio)}$$

$$X = \frac{(30-20)+2}{20} = 60\%$$

$$Y = \frac{(40-30)+3}{30} = 43.33\%$$

$$Z = \frac{(60-50)+5}{50} = 30\%$$

$$\text{Portfolio} = \frac{(130-100)+10}{100} = 40.00\%$$

The above portfolio return can also be computed as using the formula (for ex-post data)

$E_{pt} = E_{xt}W_x + E_{yt}W_y + E_{zt}W_z$

where,

E_{pt} = Expected return on portfolio

Ex = Expected return on security X

W_x = Proportion of money invested in security X and so on.

$$= 60\% \times \frac{20}{100} + 43.33\% \times \frac{30}{100} + 30\% \times \frac{50}{100}$$

$$= 12\% + 13\% + 15\% = 40\%$$

This confirms that portfolio returns are simply a weighted average of the returns associated with the individual securities in the portfolio.

Risk

Suppose we are evaluating two shares M and N for investment. We have collected data on the returns earned by investors on these shares in the last five years which are as follows:

Share M :	30%,	28%,	34%,	32% and 31%
Share N :	26%,	13%,	48%,	11% and 57%

If we have to choose only one of the two shares for investment, which share shall we choose?

One approach would be to compute the average return for each share and choose the one which has higher average return. If we do that we find that both the shares have an average return of 31%. Can there be any other criterion for choice? Now, most investors would regard Share N (or return on share N) to be riskier as its return fluctuates substantially from year to year. They would, therefore, prefer share M to N. Thus, investors appear to make their choices based on two considerations – expected return and riskiness of returns.

What is Riskiness of Returns?

In the context of security analysis, we interpret risk essentially in terms of the variability of security returns. The most common measures of riskiness of a security are the standard deviation and variance of returns.

Standard Deviation and Variance of Returns

Standard deviation (commonly denoted as σ) of returns merely measures the extent of deviation of returns from the average value of return. Precisely put, standard deviation of returns is the square root of the average of squares of deviations of the observed returns from their expected value of return.

The square of standard deviation is called variance (commonly denoted by σ^2). Thus, variance of security returns is the average value of the squares of deviations of the observed returns from the expected value of return.

The variance is computed as follows:

Variance, $\sigma^2 = P_1 (r_1 - E)^2 + P_2 (r_2 - E)^2 + ... + P_n (r_n - E)^2$

where,

$r_1 \ldots r_n$ = Observed returns;

E = Expected rate of return; and

$P_1 \ldots P_n$ = Probability.

Since variance is the square of standard deviation, we have standard deviation,

$$\sigma = \sqrt{(\text{Variance})}$$

Illustration 5

Let us continue with the shares of Xylene Corporation mentioned in illustration 3. What is our assessment about the risk of these shares?

Solution

Scenario	Chance P	Return (%) r_x	E_x ($P.r_x$)	Deviation ($r_x - E_x$)	$(\text{Deviation})^2$ $(r_x - E_x)^2$	Chance (P) x $(\text{Deviation})^2$
1	0.25	36	9	11	121	30.25
2	0.50	26	13	1	1	0.50
3	0.25	12	3	–13	169	42.25

$E_x = 25$

Variance (σ_x^2) = 73.00 (sum of the last column)

Standard deviation (σ_x) = 8.54%

Thus, the riskiness of a Xylene share as measured by standard deviation is 8.54%.

The equations for quantifying the return, variance and standard deviation of individual security returns for both ex-post and ex-ante data are summarized in the following table:

Table 1

Historical (ex-post)	Expected (ex-ante)
Arithmetic mean return	Expected return
$\bar{r}_i = \frac{1}{n}\sum_{t=1}^{n} r_{it}$	$E(r_i) = \sum_{s=1}^{n} r_{is}P_s$
Variance (Risk)	Variance (Risk)
$\sigma_i^2 = \frac{1}{n-1}\sum_{t=1}^{n}(r_{it} - \bar{r}_i)^2$	$\sigma_i^2 = \sum_{s=1}^{n}[r_{is} - E(r_i)]^2.P_s$
Standard deviation	Standard deviation
$\sigma_i = \sqrt{\frac{1}{n-1}\sum_{t=1}^{n}(r_{it} - \bar{r}_i)^2}$	$\sigma_i = \sqrt{\sum_{s=1}^{n}[r_{is} - E(r_i)]^2.P_s}$

r_{it} = Historical (ex-post) return generated by the ith stock in time period t.

r_{is} = Expected (ex-ante) return for the ith stock assuming that S state of the world occurs.

P_s = Probability that the S state of the world will occur.

REDUCTION OF RISK THROUGH DIVERSIFICATION

Consider an alien planet Delta, which in a given year is either under a spell of hot wave, or a cold wave, either of which is equally likely to prevail. Let us assume that the only two companies constituting the entire market on the planet are an Ice cream firm and a Hot Coffee firm. Assume further that if the hot wave dominates the planet in a given year, the Ice cream company would register a high return of 30%, while the Coffee company would suffer, earning only 10%. If on the other hand the cold wave dominates the planet in a given year, the Coffee company would register a return of 30%, while the Ice cream company would earn only 10%. Thus, on an average both companies are expected to produce a yield of 20%, and they would have the same variance (σ^2).

What should be the best investment strategy for an investor in the above planet?

In this contrived scenario, if we invested in only one of the two companies, our expected return will be 20%, with a σ of 10%. If, however, we split our investment between the two companies equally, so that our investment replicates the total

market in miniature, half of our investment would certainly earn 30%, while the other half would earn 10%, so that our average return would always be 20%, no matter what the vagaries of weather during the year. Clearly, the diversification results in 20% return without risk, whereas holding individual securities was yielding an expected return of 20% with risk (σ = 10%).

In the above example, diversification eliminated all risk because the returns of the two companies moved diametrically opposite to each other: when one return was 30%, the other was 10% and vice-versa. This was because there was only one source of risk on planet Delta – the weather – and it affected the two securities in exactly opposite directions.

Such a situation seldom occurs in real life. More often than not in practice, there are several sources of risk some of which affect only one of the securities, some affect both in opposite directions and some others affect them in the same direction. Clearly, it is important to know what is the net affect of all these multiple causes which affect the security returns. Do the securities move in the same direction or in opposite directions? In either case, what is the strength of the relationship? Statisticians use a measure called correlation coefficient to answer these questions. The correlation coefficient ranges from –1 to +1. If the two returns move exactly opposite to each other, the correlation coefficient is –1, if they move exactly in step with each other, then it is +1, while if the two returns are entirely unrelated to each other, it is zero. A positive correlation coefficient which is less than +1 indicates that the two returns have a tendency to move in the same direction, but are not always in exact step with each other. This kind of imperfect correlation is most commonly observed, since two different securities belonging to two different firms can hardly be expected to move in perfect harmony with each other. Positive correlation between two securities implies, for example, that when the market as a whole booms, both the securities would register a rise in prices, or when the market crashes, both the securities would show a decline in prices.

Variance of a Portfolio of Securities

Let us, next, move from planet Delta to planet Earth and consider a more realistic illustration.

Illustration 6

Consider two securities X and Y with the following attributes:

Expected return on Security X	= 20%
Expected return on Security Y	= 30%
σ of Security X	= 10%
σ of Security Y	= 16%, and
Coefficient of Correlation between the Returns of X and Y	= –1, 0.5, +1

We shall evaluate the impact on the gains from diversification, for the three different values of the correlation coefficients.

Solution

Let us first analyze the case where we hold a portfolio with 40% invested in X and 60% invested in Y. The expected portfolio return is nothing but the weighted average of the expected returns from each security in the portfolio, the weights being the proportion of investment in each security. Therefore, the expected portfolio return will be 26% (being 20 x 0.4 + 30 x 0.6).

Is the standard deviation of portfolio return the same as the weighted average of the σ's of the security returns? That is, would the σ of portfolio return be 13.6% (being 10 x 0.4 + 16 x 0.6)? No, because the variance of portfolio return depends

not only on the variability of the security returns, but also on the correlation coefficient, as shown below:

$$\sigma_p^2 = W_1^2\sigma_1^2 + W_2^2\sigma_2^2 + 2W_1W_2\sigma_{1,2}^{1} \quad \text{Eq. (10)}$$

where,

W_1 and W_2 are the proportions of investment of securities X and Y respectively and

σ_1 and σ_2 are the standard deviations of X and Y respectively

σ_{12} is the co-variance between returns on stocks, X and Y.

But, since the correlation coefficient $\rho_{1,2} = \sigma, \sigma_{1,2} / \sigma_1\sigma_2$, Eq. (10) may also be expressed as:

$$\sigma_p^2 = W_1^2\sigma_1^2 + W_2^2\sigma_2^2 + 2W_1W_2\rho_{1,2}\,\sigma_1 \text{ x } \sigma_2 \quad \text{Eq. (11)}$$

Thus, the σ of portfolio return will be 13.6% only when the two securities X and Y move in perfect tandem with each other, that is, when the correlation coefficient (ρ) between returns on X and returns on Y is +1. So long as X and Y have a correlation coefficient of less than +1, the σ of the portfolio return will be less than 13.6%. For example, if the correlation coefficient is only 0.5, then the σ of the portfolio will be only 12.1% (we shall see shortly as to why this should be so).

The fact that the portfolio σ is only 12.1% as against the weighted average σ of 13.6%, implies there has been some gain from diversification. Let us see why this is so. If we invest all our money in Y, the expected return is 30% and the risk is 16%; while if we invest all our money in X, the expected return is 20% and risk is 10%. We have assumed 6% additional risk for 10% additional return. This implies that if there were no gains from diversification, as we move our money from X to Y, on an average, for every 1% additional return, we have to take 0.6% additional risk. For example, if the correlation is +1, since the σ of portfolio return is nothing but the weighted average of the σ's of security returns, there is no gain from diversification, because every 1% increase in return is accompanied with the average 0.6% increase in risk. It can be shown that except in this extreme case of a correlation coefficient of +1, investing in two securities does result in gains because the increase in risk for every 1% increase in return is below the average increase in risk. In our illustration above, the return rose from 20% to 26% and the risk from 10% to 12.1%, implying that there was only a 0.35% increase in risk for every 1% increase in return. Gain from diversification allows us to get additional return with less than commensurate increase in the risk level.

Illustration 7

Consider a portfolio of two securities with 50% investment in A and 50% investment in B. The characteristics of returns under three different scenarios with different probabilities for the two securities and the portfolio are as follows:

Scenario	Chance P	Return on A r_A (%)	r_A.P	$(\text{Deviation})^2$.P	Return on B r_B(%)	r_B.P	$(\text{Deviation})^2$.P	Portfolio of 0.5 A + 0.5 B
1	0.25	40	10	25	20	5	6.25	30
2	0.50	30	15	0	30	15	12.50	30
3	0.25	20	5	25	20	5	6.25	20
		90	30	50	70	25	25.00	

What is the portfolio variance?

Solution

Expected Return (E)	30	25	27.5
Variance (σ^2)	50	25	18.75

1 In this Chapter; $\sigma_{1,2}$ and $\text{Cov}_{(1,2)}$ are used interchangeably to indicate co-variance.

co-variance ($\sigma_{1,2}$) = [(40 – 30) (20 – 25) x 0.25] + [(30 – 30) (30 – 25) x 0.50] + [(20 –30) (20 – 25) x 0.25] = 0

Correlation Coefficient = $\rho_{1,2} = \frac{\sigma_{12}}{\sigma_1 \text{ x } \sigma_2} = 0$

Portfolio Variance $= \sigma_p^2$

$= 0.52 \text{ x } 50 + 0.52 \text{ x } 25$

$= 18.75\%$

Note that the variance thus arrived is considerably less than the average of variance of A and B, which is 37.5% (75/2).

Let us consider a mechanical procedure which will give correct portfolio variance.

TWO ASSETS CASE

Let us first consider two assets 1 and 2. The rows and columns in the 2 x 2 box below correspond to the two assets as shown. The diagonal boxes starting from the left hand top corner correspond to the variances (σ_1^2), while the other boxes correspond to co-variance terms ($\sigma_{i,j}$). As can be seen in the box, the variance and co-variance terms are multiplied by the weights or proportions associated with the corresponding assets depicted in the rows and columns.

	1	2
1	$W_1^2\sigma_1^2$	$W_1W_2\sigma_{1,2}$
2	$W_1W_2\sigma_{1,2}$	$W_2^2\sigma_2^2$

The variance of the portfolio with two assets σ_p^2 is merely the sum of the expressions in the four smaller boxes above.

$$\sigma_p^2 = W_1^2\sigma_1^2 + W_2^2\sigma_2^2 + 2W_1W_2\,\sigma_{1,2} \qquad \text{Eq. (12)}$$

where $\sigma_{1,2} = \sigma_1\,\sigma_2\,\rho_{1,2}$ and $\rho_{1,2}$ is the correlation coefficient between returns on the two assets, 1 and 2.

The following table summarizes the necessary mathematics for calculating portfolio returns and variances.

QUANTIFYING PORTFOLIO RETURNS AND RISKS

Table 2

Historical (ex-post)	Anticipated (ex-ante)
Historical holding period return:	**Expected holding period return:**
$r_{pt} = \sum_{i=1}^{n} r_{it} W_{it}$	$E(r_p) = \sum_{i=1}^{n} E(r_i) W_j$
Variance:	**Variance:**
$\sigma_p^2 = \sum_{i=1}^{n} \sigma_i^2 W_i^2 + \sum_{j=1}^{n} \sigma_j^2 W_j^2 + 2\Sigma^* Cov_{ij} W_i W_j$	$\sigma_p^2 = \sum_{i=1}^{n} \sigma_i^2 W_i^2 + \sum_{j=1}^{n} \sigma_j^2 W_j^2 + 2\Sigma^* Cov_{ij} W_i W_j$
Co-variance:	**Co-variance:**
$Cov_{ij} = \frac{1}{n-1} \sum_{i=1}^{n} (r_{it} - \bar{r}_i)(r_{jt} - \bar{r}_j) / n-1$	$Cov_{ij} = \sum_{s=1}^{n} [r_{is} - E(r_{is})][r_{js} - E(r_j)] P_s$
Correlation Coefficient:	**Correlation Coefficient:**
$\rho_{ij} = \frac{Cov_{ij}}{\sigma_i \sigma_j}$	$\rho_{ij} = \frac{Cov_{ij}}{\sigma_i \sigma_j}$

W_i = Weight of the ith asset defined as the market value of the ith asset divided by the market value of the portfolio.

* $\Sigma Cov_{ij}W_iW_j$ = Sum of the unique co-variances (multiplied by theirweights)

(when there are n assets in a portfolio there are $\frac{(n^2 - n)}{2}$ unique co-variances)

The last two equations in this table are used to calculate co-variances and correlation coefficients. The following illustrations will help in understanding these concepts more clearly.

Illustration 8

Given the following information, calculate the co-variance between the stocks ACD Co. & AMB Co.

	Mean ($\bar{x}$) %	Standard deviation (σ)
ACD Co.	0.86	7.45
AMB Co.	0.94	6.28

$\rho = 0.46$ (coefficient of correlation)

We know that coefficient of correlation is computed using the following formula

$$\rho = \frac{Cov_{xy}}{\sigma_x \sigma_y}$$

$$\therefore \rho = \frac{Cov_{ACD,AMD}}{\sigma_{ACD}\sigma_{AMD}}$$

Substituting the given values

$$0.46 = \frac{Cov_{ACD,AMD}}{7.45 \times 6.28}$$

$$\therefore Cov_{ACD,AMB} = 0.46 \times 7.45 \times 6.28$$

$$= 21.52156 \simeq 21.52$$

Hence, for calculating the co-variance we can also use the following equation $Cov_{ij} = \rho_{ij}\sigma_i \sigma_j$

(provided the information about the coefficient of correlation is given).

Illustration 9

Use the following data to calculate the variance and standard deviation for a portfolio containing stocks 1 and 2.

$\rho_{1,2} = 0.75$ $\quad \sigma_1 = 10.00, \quad W_1 = 2/3$

$\quad \sigma_2 = 20.00, \quad W_2 = 1/3$

The portfolio contains two stocks 1 & 2 in the proportion of 2/3 and 1/3.

$\therefore$ The portfolio mean return = $r_p = \bar{r}_1 W_1 + \bar{r}_2 W_2$

Portfolio variance $= \sigma_p^2$

$$= \sum_{i=1}^{2} \sigma_i^2 W_i^2 + 2\Sigma Cov_{ij}W_iW_j$$

$$= W_1^2\sigma_1^2 + W_2^2\sigma_2^2 + 2Cov_{12}W_1W_2$$

Cov_{12} is computed using the formula $Cov_{ij} = \rho_{ij}\sigma_i \sigma_j$

$$\therefore \text{Cov}_{12} = \rho_{1,2}\,\sigma_1\,\sigma_2$$

$$= 0.75 \text{ x } 10 \text{ x } 20 = 150$$

$$\therefore \sigma_p^2 = 10^2 \text{ x } \left(\frac{2}{3}\right)^2 + 20^2 \text{ x } \left(\frac{1}{3}\right)^2 + 2 \text{ x } 150 \text{ x } \frac{2}{3} \text{ x } \frac{1}{3}$$

$$= \left(100 \text{ x } \frac{4}{9}\right) + \left(400 \text{ x } \frac{1}{9}\right) + \left(2 \text{ x } 150 \text{ x } \frac{2}{3} \text{ x } \frac{1}{3}\right)$$

$$= \frac{400}{9} + \frac{400}{9} + \frac{600}{9} = \frac{1400}{9} = 155.56$$

We know that the portfolio standard deviation is equal to the square root of the variance of the portfolio

$$\therefore \sigma_p = \sqrt{\sigma_p^2} = \sqrt{155.56} = 12.47\%.$$

'n' Assets Case

In this case we replace the 2 x 2 box by a n x n box as shown below. The rows and columns in the box correspond to the n assets as shown.

	1	2	3		n
1	$W_1^2\sigma_1^2$	$W_1 W_2\sigma_{1,2}$	$W_1 W_3\sigma_{1,3}$	…	$W_1 W_n\sigma_{1,n}$
2	$W_2 W_1\sigma_{2,1}$	$W_2^2\sigma_2^2$	$W_2 W_3\sigma_{2,3}$	…	$W_2 W_n\sigma_{2,n}$
3	$W_3 W_3\sigma_{3,1}$	$W_3 W_2\sigma_{3,2}$	$W_3^2\sigma_3^2$	…	…
…	….	…	…	…	…
n	$W_n W_1\sigma_{n,1}$	$W_n W_2\sigma_{n,2}$	$W_n W_3\sigma_{n,3}$	…	$W_n^2\sigma_n^2$

As before, the diagonal boxes starting from the left hand corner correspond to the variances (σ_i^2), while the other boxes correspond to co-variance terms $\sigma_{i,j}$. Again as before, the variance and co-variance terms are multiplied by the weights or proportions associated with the corresponding assets depicted in the rows and columns.

Again, the variance of the portfolio with n assets (σ_p^2) is the sum of the expressions in the smaller boxes above. The expression resulting from the procedure is as follows:

$$\sigma_p^2 = W_1^2\sigma_1^2 + W_2^2\sigma_2^2 + \ldots + W_n^2\sigma_n^2 + 2W_1 W_2\sigma_{1,2} + 2W_1 W_3\sigma_{1,3} + \ldots + 2W_{n-1} W_n\sigma_{n-1,n}$$

or

$$\sigma_p^2 = \sum_{i=1}^{n}\sum_{j=1}^{n} W_i W_j\sigma_{i,j} \qquad \text{Eq. (13)}$$

[Note that $\sigma_{i,i} = \sigma_i^2$].

Illustration 10

Given the following export data for stocks X, Y & Z, calculate all the unique co-variances and correlation coefficients.

Annual Returns (%)

Year	X	Y	Z
1	6.2	–9.5	26.5
2	3.6	–11.7	–12.3
3	4.0	13.8	2.6
4	2.4	–5.3	10.5
5	0.2	9.5	9.2

Stock X

Year	Return (X_i) %	$(X_i - \overline{X})$	$(X_i - \overline{X})^2$
1	6.2	2.92	8.5264
2	3.6	0.32	0.1024
3	4.0	0.72	0.5184
4	2.4	–0.88	0.7744
5	0.2	–3.08	9.4864
	16.4	0	19.408

$$\overline{X} = \frac{\sum_{i=1}^{n} X_i}{n} = \frac{16.4}{5} = 3.28\%$$

$$\sigma_x^2 = \frac{\sum_{i=1}^{n} (X_i - \overline{X})^2}{n-1} = \frac{19.408}{5-1} = \frac{19.408}{4} = 4.852$$

$$\sigma_x = \sqrt{\sigma_x^2} = \sqrt{4.852} = 2.20\%$$

Stock Y

Year	Return (Y_i) (%)	$(Y_i - \overline{Y})$	$(Y_i - \overline{Y})^2$
1	–9.5	–8.86	78.4996
2	–11.7	–11.06	122.3236
3	13.8	14.44	208.5136
4	–5.3	–4.66	21.7156
5	9.5	10.14	102.8196
	–3.2	0	533.872

$$\overline{Y} = \frac{\sum_{i=1}^{n} Y_i}{n} = \frac{-3.2}{5} = -0.64\%$$

$$\sigma_Y^2 = \frac{\sum_{i=1}^{n} (Y_i - \overline{Y})^2}{n-1} = \frac{533.872}{5-1} = \frac{533.872}{4} = 133.468$$

$$\sigma_Y = \sqrt{\sigma_Y^2} = \sqrt{133.468} = 11.55\%$$

Stock Z

Year	Return (Z_i) (%)	$\left(Z_i - \overline{Z}\right)$	$\left(Z_i - \overline{Z}\right)^2$
1	26.5	19.2	368.64
2	–2.3	–19.6	384.16
3	2.6	–4.7	22.09
4	10.5	3.2	10.24
5	9.2	1.9	3.61
	36.5	0	788.74

$$\overline{Z} = \frac{\sum_{i=1}^{n} Z_i}{n} = \frac{36.5}{5} = 7.3\%$$

$$\sigma_z^2 = \frac{\sum_{i=1}^{n}\left(Z_i - \overline{Z}\right)^2}{n-1} = \frac{788.74}{5-1} = \frac{788.74}{4} = 197.185$$

$$\sigma_z = \sqrt{\sigma_z^2} = \sqrt{197.185} = 14.04\%$$

Since there are 3 stocks, the number of unique co-variances are 3 i.e.,

$$\frac{n^2 - n}{2} = \frac{3^2 - 3}{2} = \frac{9-3}{2} = \frac{6}{2} = 3,$$ namely Cov_{xy}, Cov_{xz} and Cov_{yz}.

$$Cov_{XY} = \frac{\sum_{i=1}^{n}\left(X_i - \overline{X}\right)\left(Y_i - \overline{Y}\right)}{n-1}$$

$$Cov_{XZ} = \frac{\sum_{i=1}^{n}\left(X_i - \overline{X}\right)\left(Z_i - Z\right)}{n-1}$$

$$Cov_{YZ} = \frac{\sum_{i=1}^{n}\left(Y_i - \overline{Y}\right)\left(Z_i - Z\right)}{n-1}$$

Stocks X & Y

Year	$\left(X_i - \overline{X}\right)$	$\left(Y_i - \overline{Y}\right)$	$\left(X_i - \overline{X}\right)\left(Y_i - \overline{Y}\right)$
1	2.92	–8.86	–5.8712
2	0.32	–11.06	–3.5392
3	0.72	14.44	10.3968
4	–0.88	–4.66	4.1008
5	–3.08	10.14	–31.2312
	0	0	–46.144

Co-variance:

$$\therefore \text{Cov}_{xy} = \frac{\sum_{i=1}^{n}\left(X_i-\overline{X}\right)\left(Y_i-\overline{Y}\right)}{n-1}$$

$$= \frac{-46.144}{4} = -11.536$$

Coefficient of correlation:

$$\rho_{xy} = \frac{\text{Cov}_{xy}}{\sigma_x \sigma_y} = \frac{-11.536}{2.20 \times 11.55} = \frac{-11.536}{25.41} = -0.454$$

Stocks X & Z

Year	$\left(X_i-\overline{X}\right)$	$\left(Z_i-\overline{Z}\right)$	$\left(X_i-\overline{X}\right)\left(Z_i-\overline{Z}\right)$
1	2.92	19.2	56.064
2	0.32	–19.6	–6.272
3	0.72	–4.7	–3.384
4	–0.88	3.2	–2.816
5	–3.08	1.9	–5.852
	0	0	37.740

Co-variance:

$$\text{Cov}_{xz} = \frac{\sum_{i=1}^{n}\left(X_i-\overline{X}\right)\left(Z_i-\overline{Z}\right)}{n-1} = \frac{37.74}{4} = 9.435$$

Coefficient of correlation:

$$\rho_{xz} = \frac{\text{Cov}_{xz}}{\sigma_x \sigma_z} = \frac{9.435}{2.2 \times 14.04} = \frac{9.435}{30.888} = 0.30$$

Stocks Y & Z

Year	$\left(Y_i-\overline{Y}\right)$	$\left(Z_i-\overline{Z}\right)$	$\left(Y_i-\overline{Y}\right)\left(Z_i-\overline{Z}\right)$
1	–8.86	19.2	–170.112
2	–11.06	–19.6	216.776
3	14.44	–4.7	–67.868
4	–4.66	3.2	–14.912
5	10.14	1.9	19.266
	0	0	–16.850

Co-variance:

$$\text{Cov}_{yz} = \frac{\sum_{i=1}^{n}\left(Y_i-\overline{Y}\right)\left(Z_i-\overline{Z}\right)}{n-1} = \frac{-16.850}{4} = -4.2125$$

Coefficient of correlation:

$$\rho_{yz} = \frac{\text{Cov}_{yz}}{\sigma_y \sigma_z}$$

$$\rho_{yz} = \frac{-4.2125}{2.2 \times 14.04} = \frac{-4.2125}{162.162} = -0.026$$

The above computations can be summarized as follows:

	X	Y	Z
Mean Return (%)	3.28	–0.64	7.3
Variance (σ_i^2)	4.852	133.468	197.185
Standard deviation (σ_i) %	2.20	11.55	14.040
Co-variance (Cov_{ij})			
X		–11.536	9.435
Y			–4.2125
Coefficient of correlation (ρ_{ij})			
X	1.000	–0.454	0.30
Y	–	1.000	–0.025
Z	–	–	1.000

Now we can construct any types of portfolios, involving these three stocks, and we can easily compute the average rate of return, the variance and the standard deviation for each of these portfolios.

Suppose the following four portfolios are opted

i. Stocks X & Y in equal proportions

ii. Stocks X & Z in equal proportions

iii. Stocks Y & Z in equal proportions

iv. Stocks X, Y & Z in equal proportions.

The average returns, variance and standard deviation for these portfolios can be computed as follows:

i. Portfolio consisting of stocks X & Y in equal proportion:

$$r_{xy} = \overline{X} W_x + \overline{Y} W_y$$

$$= 3.28 \text{ x } \frac{1}{2} + (-)0.64 \text{ x } \frac{1}{2}$$

$$= 1.64 - 0.32 = 1.32\%$$

$$\sigma_{xy}^2 = \sum_{i=1}^{n} \sigma_i^2 W_i^2 + 2\Sigma Cov_{ij} W_i W_j$$

$$= \sigma_x^2 W_x^2 + \sigma_y^2 W_x^2 + 2Cov_{xy} W_x W_y$$

$$= (2.20)^2 \left(\frac{1}{2}\right)^2 + (11.55)^2 \left(\frac{1}{2}\right)^2 + (2)\,(-11.536) \left(\frac{1}{2}\right) \text{ x } \left(\frac{1}{2}\right)$$

$$= 4.84 \text{ x } \frac{1}{4} + 133.4025 \text{ x } \frac{1}{4} - 23.072 \text{ x } \frac{1}{4}$$

$$= \frac{115.1705}{4} = 28.80$$

$$\sigma_{xy} = \sqrt{\sigma_{xy}^2} = \sqrt{28.80} = 5.37\%.$$

ii. Portfolio consisting of stocks X & Z in equal proportion:

$$r_{xz} = \overline{X} W_x + \overline{Z} W_z$$

$$= 3.28 \text{ x } \frac{1}{2} + 7.3 \text{ x } \frac{1}{2}$$

$$= 1.64 + 3.65 = 5.29\%$$

$$\sigma_{xz}^2 = \sum_{i=1}^{n} \sigma_i^2 W_i^2 + 2\Sigma Cov_{ij} W_i W_j$$

$$= \sigma_x^2 W_x^2 + \sigma_z^2 W_z^2 + 2Cov_{xz} W_x W_z$$

$$= (2.20)^2 \left(\frac{1}{2}\right)^2 + (14.04)^2 \left(\frac{1}{2}\right)^2 + 2 \times 9.435 \times \left(\frac{1}{2}\right) \left(\frac{1}{2}\right)$$

$$= 4.84 \times \frac{1}{4} + 197.1216 \times \frac{1}{4} + 18.87 \times \frac{1}{4}$$

$$= \frac{220.8316}{4} = 55.20$$

$$\sigma_{xz} = \sqrt{\sigma_{xz}^2} = \sqrt{55.20} = 7.43\%$$

iii. Portfolios consisting of stocks Y and Z in equal proportion:

$$r_{yz} = \overline{Y} W_y + \overline{Z} Wz$$

$$= -0.64 \times \frac{1}{2} + 7.3 \times \frac{1}{2}$$

$$= -0.32 + 3.65 = 3.33\%$$

$$\sigma_{yz}^2 = \sum_{i=1}^{n} \sigma_i^2 W_i^2 + 2\Sigma Cov_{ij} W_j$$

$$= \sigma_y^2 W_y^2 + \sigma_z^2 W_z^2 + 2Cov_{yz} W_y W_z$$

$$= (11.55)^2 \left(\frac{1}{2}\right)^2 + (14.04)^2 \left(\frac{1}{2}\right)^2 + 2 \times -4.2125 \times \left(\frac{1}{2}\right) \times \left(\frac{1}{2}\right)$$

$$= 133.4025 \times \frac{1}{4} + 197.1216 \times \frac{1}{4} - 8.425 \times \frac{1}{4}$$

$$= \frac{322.0991}{4} = 80.52$$

$$\sigma_{yz} = \sqrt{\sigma_{yz}^2} = \sqrt{80.52} = 8.97\%.$$

iv. Portfolio consisting of stocks X, Y & Z in equal proportion:

$$r_{xyz} = \overline{X} W_x + \overline{Y} W_y + \overline{Z} W_z$$

$$= 3.28 \times \frac{1}{3} - 0.64 \times \frac{1}{3} + 7.3 \times \frac{1}{3}$$

$$= \frac{9.94}{3} = 3.313\%$$

$$\sigma_{xyz}^2 = \sum_{i=1}^{n} \sigma_i^2 W_i^2 + 2\Sigma Cov_{ij} W_i W_j$$

$$= \sigma_x^2 W_x^2 + \sigma_y^2 W_y^2 + \sigma_z^2 W_z^2 + 2 [Cov_{xy} W_x W_y + Cov_{xz} W_x W_z + Cov_{yz} W_y W_z]$$

$$= (2.20)^2 \left(\frac{1}{3}\right)^2 + (11.55)^2 \left(\frac{1}{3}\right)^2 + (14.04)^2 \left(\frac{1}{3}\right)^2 + 2 [-11.536 \times \frac{1}{3} + 9.435 \times \frac{1}{3} \times \frac{1}{3} - 4.2125 \times \frac{1}{3} \times \frac{1}{3}]$$

$$= \quad 4.84 \text{ x } \frac{1}{9} + 133.4025 \text{ x } \frac{1}{9} + 197.1216 \text{ x } \frac{1}{9} + 2 \left[-11.536 \text{ x } \frac{1}{9} + 9.435 \text{ x } \frac{1}{9} - 4.2125 \text{ x } \frac{1}{9}\right]$$

$$= \quad \frac{4.84}{9} + \frac{133.4025}{9} + \frac{197.1216}{9} - \frac{12.627}{9}$$

$$= \quad \frac{322.7371}{9} = 35.86$$

$$\sigma_{xyz} = \sqrt{\sigma^2_{xyz}} = \sqrt{35.86} = 5.99\%$$

The details about the individual stocks and the above mentioned portfolios can be tabulated as:

	Stock X	Stock Y	Stock Z	Portfolio of X & Y	Portfolio of X & Z	Portfolio of Y & Z	Portfolio of X, Y & Z
Mean $\bar{r}_i$ (%)	3.28	–0.64	7.3	1.32	5.29	3.33	3.313
Variance σ^2	4.852	133.468	197.185	28.80	55.20	80.52	35.86
Standard deviation (%)σ	2.20	11.55	14.04	5.37	7.43	8.97	5.99

Illustration 11

Mr. X recently forecasted four economic scenarios which he believes are likely to occur with the given probabilities. Based on these scenarios X, the stock analyst made the following forecasts of the returns for stocks A, B & C.

Economic Scenario	Probability(P_s)	Conditional Returns (%)		
		A	B	C
High Growth	0.20	–13	–4	–9
Low Growth	0.15	16	–2	8
Stagnation	0.40	32	21	16
Recession	0.25	12	20	20

Given the data, we can compute the average mean return, the variance and standard deviation for stocks A, B & C.

We can also compute the co-variance and coefficient of correlation among these stocks.

Apart from this, the average rate of return, variance and standard deviations for the following portfolios can also be computed.

i. Portfolio consisting of stocks A & B in equal proportion

ii. Portfolio consisting of stocks A & C in equal proportion

iii. Portfolio consisting of stocks B & C in equal proportion

iv. Portfolio consisting of stocks A, B & C in equal proportion.

Stock A

Scenario	A_i(%)	P_s(%)	A_iP_s	$A_i - E(\bar{A})$	$[A_i - E(\bar{A})]^2$	$A_i - E(\bar{A})^2 P_s$
1	–13	0.20	–2.6	–28.6	817.96	163.592
2	16	0.15	2.4	0.4	0.16	0.024
3	32	0.40	12.8	16.4	268.96	107.584
4	12	0.25	3.0	–3.6	12.96	3.240
			15.6			274.44

$$\therefore E(\bar{A}) = \sum_{s=1}^{n} A_i P_s = 15.60\%$$

$$\sigma_A^2 = \sum_{s=1}^{n} \left[A_i - E(\bar{A}) \right]^2 P_s = 274.44$$

$$\sigma_A = \sqrt{\sigma_A^2} = \sqrt{274.44} = 16.57\%$$

Stock B

Scenario	$B_i(\%)$	$P_s(\%)$	$B_i P_s$	$[B_i - E\bar{B}]$	$[B_i - E(\bar{B})]^2$	$[B_i - E(\bar{B})] P_s$
1	– 4	0.20	–0.80	–16.30	265.69	53.1380
2	– 2	0.15	–0.30	–14.30	204.49	30.6735
3	21	0.40	8.40	8.70	75.69	30.2760
4	20	0.25	5.00	7.70	59.29	14.8225
			12.30			128.9100

$$\therefore E(\bar{B}) = \sum_{s=1}^{n} B_i P_s = 12.30\%$$

$$\sigma_B^2 = \sum_{s=1}^{n} \left[B_i - E(\bar{B}) \right]^2 P_s = 128.91$$

$$\sigma_B = \sqrt{\sigma_B^2} = \sqrt{128.91} = 11.35\%$$

Stock C

Scenario	$C_i(\%)$	$P_s(\%)$	$C_i P_s$	$[C_i - (\bar{C}) E]$	$[C_i - E(\bar{C})]^2$	$[C_i - E(\bar{C})] P_s$
1	–9	0.20	–1.80	–19.80	392.04	78.408
2	8	0.15	1.20	–2.80	7.84	1.176
3	16	0.40	6.40	5.20	27.04	10.816
4	20	0.25	5.00	9.20	84.64	21.160
			10.80			111.560

$$\therefore E(\bar{C}) = \sum_{s=1}^{n} C_i P_s = 10.80\%$$

$$\sigma_C^2 = \sum_{s=1}^{n} \left[C_i - E(\bar{C}) \right]^2 P_s = 111.56$$

$$\sigma_C = \sqrt{\sigma_C^2} = \sqrt{111.56} = 10.56\%$$

i. Portfolio of stocks A & B in equal proportion:

Scenario	P_s	$A_i(\%)$	$B_i(\%)$	$A_i - E(\bar{A})$	$B_i - E(\bar{B})$	$[A_i - E(\bar{A})] [B_i - E(\bar{B})]$
1	0.20	–13	–4	–28.6	–16.30	93.236
2	0.15	16	–2	0.4	–14.30	–0.858
3	0.40	32	21	16.4	8.70	57.072
4	0.25	12	20	–3.6	7.70	–6.930
						142.520

Co-variance: $Cov_{AB} = \sum_{s=1}^{n} [A_i - E(\bar{A})] [B_i - E(\bar{B})] P_s = 142.52$

Correlation coefficient: $\rho_{AB} = \frac{Cov_{AB}}{\sigma_A \sigma_B} = \frac{142.52}{16.57 \times 11.35} = \frac{142.52}{188.0695} = 0.76$

Expected return: $E(r_p) = \sum_{s=1}^{n} E(r_i)\, W_i$

$= 15.60 \times \frac{1}{2} + 12.30 \times \frac{1}{2}$

$= 7.80 + 6.15 = 13.95\%$

Variance of the Portfolio return: $\sigma^2_{AB} = \sum_{i=1}^{n} \sigma_i^2 W_i^2 + 2\Sigma Cov_{ij} W_i W_j$

$= \sigma_A^2 W_A^2 + \sigma_B^2 W_B^2 + 2\, Cov_{AB} W_A W_B$

$= (16.57)^2 \times \left(\frac{1}{2}\right)^2 + (11.35)^2 \left(\frac{1}{2}\right)^2 + 2 \times 142.52 \times \frac{1}{2} \times \frac{1}{2}$

$= \frac{274.5649}{4} + \frac{128.8225}{4} + \frac{285.04}{4}$

$= \frac{688.4274}{4} = 172.11$

Standard deviation of the portfolio return: $\sigma_{AB} = \sqrt{\sigma^2_{AB}} = \sqrt{172.11} = 13.12\%$

ii. Portfolio of stocks A & C in equal proportion:

Scenario	P_s	A_i(%)	C_i(%)	$[A_i - E(\bar{A})]$	$[C_i - E(\bar{C})]$	$[A_i - E(\bar{A})]$ $[C_i - E(\bar{C})]P_s$
1	0.20	–13	–9	–28.6	–19.80	113.256
2	0.15	16	8	0.4	–2.80	–0.168
3	0.40	32	16	16.4	5.20	34.112
4	0.25	12	20	–3.6	9.20	–8.28
						138.92

Co-variance: $Cov_{AC} = \sum_{i=1}^{n} [A_i - E(\bar{A})]\, [C_i - E(\bar{C})]\, p_s = 138.92$

Correlation coefficient: $\rho_{AC} = \frac{Cov_{AC}}{\sigma_A \sigma_C} = \frac{138.92}{16.57 \times 10.56} = \frac{138.92}{174.9792} = 0.79$

Expected Return: $E(r_p) = \sum_{i=1}^{n} E(r_i)\, W_i$

$= E(A) \frac{1}{2} + E(C) \frac{1}{2}$

$= 15.60 \times \frac{1}{2} + 10.80 \times \frac{1}{2}$

$= 7.80 + 5.40 = 13.20\%$

Variance of the Portfolio Return:

$$\sigma^2_{AC} = \sum_{i=1}^{n} \sigma_i^2 W_i^2 + 2\Sigma Cov_{ij} W_i W_j$$

$$= \sigma^2_A W^2_A + \sigma^2_C W^2_C + 2Cov_{AC} W_A W_C$$

$$= (16.57)^2 \left(\frac{1}{2}\right)^2 + (10.56)^2 \left(\frac{1}{2}\right)^2 + 2 \times 138.92 \times \frac{1}{2} \times \frac{1}{2}$$

$$= \frac{274.5649}{4} + \frac{111.5136}{4} + \frac{277.84}{4}$$

$$= \frac{663.9185}{4} = 165.98$$

Standard Deviation of the Portfolio Return:

$$\sigma_{AC} = \sqrt{\sigma^2_{AC}} = \sqrt{165.98} = 12.88\%$$

iii. Portfolio of stocks B & C in equal proportion:

Scenario	P_s	B_i(%)	C_i(%)	$B_i - E(\bar{B})$	$C_i - E(\bar{C})$	$[B_i - E(\bar{B})]\,[C_i - E(\bar{C})].P_s$
1	0.20	–4	–9	–16.30	–19.80	64.548
2	0.15	–2	8	–14.30	–2.80	6.006
3	0.40	21	16	8.70	5.20	18.096
4	0.25	20	20	7.70	9.20	17.710
						106.36

Co-variance: $Cov_{BC} = \sum_{i=1}^{n} [B_i - E(\bar{B})]\,[C_i - E(\bar{C})]\,P_s = 106.36$

Correlation Coefficient: $\rho_{BC} = \frac{Cov_{BC}}{\sigma_B \sigma_C} = \frac{106.36}{11.35 \times 10.56} = \frac{106.36}{119.856} = 0.89$

Expected Return of the Portfolio: $E(r_p) = \sum_{i=1}^{n} E(r_i)\, W_i$

$$= E(\bar{B})\ \frac{1}{2} + E(\bar{C})\ \frac{1}{2}$$

$$= 12.30 \times \frac{1}{2} + 10.80 \times \frac{1}{2}$$

$$= 6.15 + 5.40 = 11.55\%$$

Variance of the Portfolio Return: $\sigma^2_{BC} = \sum_{i=1}^{n} \sigma_i^2 W_i^2 + 2\Sigma Cov_{ij} W_i W_j$

$$= \sigma^2_B W^2_B + \sigma^2_C W^2_C + 2Cov_{BC} W_B W_C$$

$$= (11.35)^2 \left(\frac{1}{2}\right)^2 + (10.56)^2 \left(\frac{1}{2}\right)^2 + 2 \times 106.36 \times \frac{1}{2} \times \frac{1}{2}$$

$$= 128.8225 \times \frac{1}{4} + 111.5136 \times \frac{1}{4} + 212.72 \times \frac{1}{4}$$

$$= \frac{453.0561}{4} = 113.26$$

Standard deviation of the portfolio return: $\sigma_{BC} = \sqrt{\sigma^2_{BC}} = \sqrt{113.26} = 10.64$

iv. Portfolio consisting of stocks A, B & C in equal proportion:

Expected return: $= \sum_{i=1}^{n} E(r_i)\, W_i$

$$= 15.60 \times \frac{1}{3} + 12.30 \times \frac{1}{3} + 10.80 \times \frac{1}{3}$$

$$= \frac{38.70}{3} = 12.90\%$$

Variance of the Portfolio Return:

$$\sigma^2_{ABC} = \sum_{i=1}^{n} \sigma_i^2 W_i^2 + 2\Sigma Cov_{ij} W_i W_j$$

$$= \sigma_A^2 W_A^2 + \sigma_B^2 W_B^2 + \sigma_C^2 W_C^2 + 2\,[Cov_{AB} W_A W_B + Cov_{AC} W_A W_C + Cov_{BC} W_B W_C\,]$$

$$= (16.57)^2 \left(\frac{1}{3}\right)^2 + (11.35)^2 \left(\frac{1}{3}\right)^2 + (10.56)^2 \left(\frac{1}{3}\right)^2 + 2\left[\left(142.52 \times \frac{1}{3} \times \frac{1}{3}\right) + \left(138.92 \times \frac{1}{3} \times \frac{1}{3}\right) + \left(106.36 \times \frac{1}{3} \times \frac{1}{3}\right)\right]$$

$$= \frac{274.5649}{9} + \frac{128.8225}{9} + \frac{111.5136}{9} + 2\left[\frac{142.52}{9} + \frac{138.92}{9} + \frac{106.36}{9}\right]$$

$$= \frac{274.5649}{9} + \frac{128.8225}{9} + \frac{111.5136}{9} + \frac{775.60}{9}$$

$$= \frac{1290.501}{9} = 143.389$$

Standard Deviation of Portfolio Return:

$$\sigma_{ABC} = \sqrt{\sigma^2_{ABC}} = \sqrt{143.389} = 11.97\%$$

The above computations regarding the individual stocks and the various portfolios can be summarized as follows:

Table 3

	Stock A	Stock B	Stock C	Portfolio of stocks A and B	Portfolio of stocks A and C	Portfolio of stocks B and C	Portfolio of stocks A, B and C
Expected Return (%)	15.60	12.30	10.80	13.95	13.20	11.55	12.90
Variance	274.44	128.91	111.56	172.11	165.98	113.26	143.389
Standard deviation %	16.57	11.35	10.56	13.12	12.88	10.64	11.97
Co-variance							
A	–	142.52	138.92				
B	–	–	106.36				
Coefficient of correlation							
A	1.00	0.76	0.79				
B	–	1.00	0.89				
C	–	–	1.00				

MEASUREMENT OF RISK IN PORTFOLIO CONTEXT

While we discussed the variance of a portfolio of securities as a measure of risk, according to portfolio theory, the total risk (variance) is not the relevant risk in the portfolio context. Also, it is useful to understand that the riskiness of a security when held in isolation is not the same as the riskiness of a portfolio of securities, when that security is included in the portfolio. For such purposes, it may be useful to regard risk or variability in the profits of a firm as being caused by factors specific to an industry as well as those specific to a firm in that industry.

Business and Firm Specific Risks

A little reflection reveals that some of the risk factors may affect the performance of an industry as a whole, while some others affect only a specific firm. For example, the unpredictability of monsoons affecting the profitability of agro-industry in general may be regarded as contributing to the business risk of agro-industry, whereas, sourcing of raw materials (e.g. imported or indigenous) in a specific company affecting its profitability, contributes to its firm specific risk.

In general, however, business risk of an industry or a company is not something which changes often. However, major technological changes may change the riskiness of an industry over a period of time. A company's riskiness may change when it is merging or taking over a new company or investing heavily in a very different line of business altogether.

Business and firm specific risk factors affecting a security may also be understood in terms of unsystematic and systematic risks of diversifiable and non-diversifiable risks. Unsystematic risk is the extent of variability in the security's return on account of the firm specific risk factors. This is diversifiable or avoidable because it is possible to eliminate or diversify away this component of risk to a considerable extent by investing in a large portfolio of securities, say, 15 or more. This is because, the firm specific risk factors are mostly random. For example, if the management of one company in the portfolio is poor, the management of another company in the portfolio may be very good; at a given point of time if the productivity in one company is low, that of another may be high and so on, so that by including sufficient number of securities in a portfolio, such factors tend to cancel out the effect of each other.

However, the systematic or non-diversifiable risk factors cannot be diversified. This is because these factors affect the entire market in a certain direction. For example, a steep increase in the international crude oil prices is almost certain to affect the entire market adversely. Hence, no amount of diversification can make a portfolio free from such risk.

The Non-diversifiable Risk of a Portfolio

In order to understand why a certain amount of risk is always present in a portfolio or the nature of the risk that cannot be diversified away at all, let us consider a case of n securities, the proportion of investment in each security being 1/n. The variance of the portfolio return will be given by Eq. (11). Since there are n diagonal boxes in the n x n box shown earlier, there will be n variance boxes and $n^2 - n$ co-variance boxes. Since the proportion of investment in each security is 1/n, the weight factor in each box will be $1/n^2$. Thus the portfolio variance, σ_p^2, will be given by:

$$\sigma_p^2 = n / n^2 \text{ (Average Variance)} + (n^2 - n) / n^2 \text{ (Average Co-variance)}$$

$$= 1/n \text{ (Average Variance)} + (1 - 1/n) \text{ (Average Co-variance)}$$

When $n \to \infty$, $1/n \to 0$, and we have

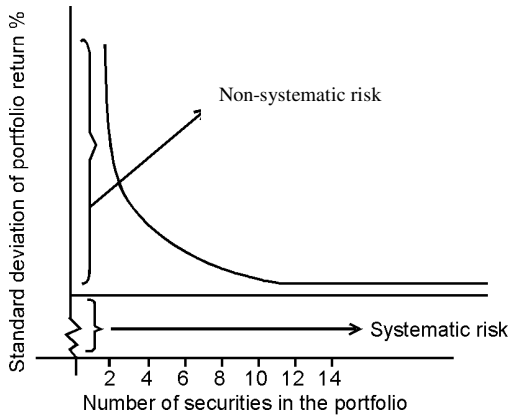
$$\sigma_p^2 = \text{Average Co-variance.}$$

Thus, the residual risk in a well diversified portfolio equals the average co-variance of the securities in the portfolio, representing the market risk. This is the amount of risk that cannot be diversified away no matter how much the diversification of the portfolio.

So then, how large should be the diversification for us to be able to diversify away all the diversifiable risk?

In general, as the number of securities in a portfolio increases, say up to 20 or 25, the diversification reduces the portfolio risk (σ^2) rapidly. However, soon thereafter, the marginal reduction to portfolio risk of any further diversification becomes very small (see Fig 1). Thus, diversified portfolio of about 25 securities selected from different industries more or less represents a market portfolio. Consider for example, the BSE Sensex index which comprises a mere 30 securities, but is deemed to represent the entire market. Again, it is for this reason that both the Sensex Index with its 30 securities and the BSE National Index comprising 100 securities are actually very highly correlated. Clearly, increasing the number of securities from 30 to 100 does not necessarily improve the diversification substantially.

Figure 1: Reducing Risk by Diversification



Risk Decomposition

We have already seen that the total risk of a security is measured in terms of the variance (σ^2) [or standard deviation (σ)] of its returns. We have also seen that the risk comprises both systematic and unsystematic components. How do we split the total risk, namely, the variance, into the systematic and unsystematic risk components? This is relatively simple.

Total Risk of a Security $\quad i = \sigma_i^2$

Systematic Risk of a Security $\quad i = \beta_i^2 \sigma_m^2$

where, β_i is the beta of security i and σ_m^2 is the variance of the market portfolio.

But, $\beta_i = \sigma_{i,m} / \sigma_m^2$ Eq.(14)

Substituting for β_i in Eq. (14), we have

Systematic Risk of Security $i = \sigma_{i,m}^2 / \sigma_m^2$

$$= \frac{\rho_{im}^2 . \sigma_i^2 . \sigma_m^2}{\sigma_m^2} = \rho_{im}^2 \sigma_i^2$$

since $\rho_{i\,m} = \dfrac{\sigma_{i,m}}{\sigma_i \sigma_m}$

where $\rho_{i\,m}$ is the correlation coefficient between the security return and the market return.

Therefore, Unsystematic Risk of a Security i

$$= \sigma_i^2 - \beta_i^2 \sigma_m^2 \qquad \text{Eq.(15)}$$

$$= \sigma_i^2 \ (1 - \rho_{i\,m}^2) \qquad \text{Eq.(16)}$$

In terms of percentage of total risk (security variance):

Systematic Risk $= (\rho_{i\,m}^2 \ \sigma_i^2 / \sigma_i^2) \times 100$

$$= 100\, \rho_{i\,m}^2 \qquad \text{Eq.(17)}$$

Unsystematic Risk $= (\sigma_i^2 \ (1 - \rho_{i\,m}^2) / \sigma_i^2) \times 100$

$$= 100 \ (1 - \rho_{i\,m}^2) \qquad \text{Eq.(18)}$$

BETA (β)

We have discussed the distinction between diversifiable risk and non-diversifiable risk at such length because from the point of view of an investor whose portfolio is well diversified, the diversifiable risk is of no importance as it gets eliminated. What is important to such an investor is the non-diversifiable risk arising from market wide movements of security prices? This is one of the most important conclusions of the Modern Portfolio Theory (MPT)[2].

The MPT, therefore, defines the riskiness of a security as its vulnerability to market risk. This vulnerability is measured by the sensitivity of the return of the security vis-a-vis the market return and is denoted by the Greek letter Beta β. A β of 2 implies that if the market return increases or decreases by 10% over a period, the security return increases or decreases respectively by 20%. Thus, in this case the security return moves twice as much as the market return. A β of 0.5 on the other hand implies that the security return moves only half as much as the market does. The market portfolio which refers to the portfolio consisting of all securities in the stock exchange has a β of 1, since such a portfolio behaves like the market index and moves in line with it. A β of zero characterizes a risk-free security like a government bond whose return is almost insensitive to the market return.

Thus β measures the only kind of risk (the non-diversifiable risk) which matters; the higher the riskiness of a security, the higher the value of its β. A security with a β value greater than 1 is referred to as an aggressive security and one with a β value less than one is referred to as a defensive security.

The β of a portfolio is nothing but the weighted average of the β's of the securities that constitute the portfolio, the weights being the proportions of investments in the respective securities. For example, if the β of security X is 1.5 and that of security Y is 0.9 and we hold a proportion of 70% and 30% of the two securities respectively, the β of the portfolio will be 1.32 (1.5 x 0.7 + 0.9 x 0.3).

Estimating β Values

We have already seen that β is the sensitivity of the security returns to the market returns. The statistical method of estimating this kind of dependence of one variable on another is known as simple linear regression. Typically, the regression specification takes the following general form:

$$Y = a + bX + e$$

2 The first reference to is perhaps owing to the early works of William Sharpe. See, W Sharpe, "A Simplified Model for Portfolio Analysis", Management Science. Vol. 9 (January 1963), pp 277-293.

where, Y and X are dependent and independent variables respectively and e is the error term.

Accordingly, β is estimated from the following regression specification:

$$r_i = \alpha + \beta\, r_m + e \qquad \text{Eq.(19)}$$

where, r_i is the dependent variable representing the return on the security, r_m is the independent variable representing the return on the market portfolio and 'e' is the error term.

If we have access to a computer or to a good statistical calculator, we do not need to know the details of this statistical technique at all. The machine does the hard work and gives us the results. In the case of personal in standard spreadsheet and other software packages.

The security return on any day is defined as:

$$\text{Today's Return} = \frac{\text{Today's Price} - \text{Yesterday's Price}}{\text{Yesterday's Price}}$$

If the market was closed 'yesterday', we must use the price of the previous trading day instead of 'yesterday's price'. Instead of the daily returns defined above, we can compute weekly returns using this week's and last week's price instead of today's and yesterday's price in the above formula. Similarly, we can compute monthly returns also. The market return on any day is similarly defined as:

$$\text{Today's Market Return} = \frac{\text{Today's Index} - \text{Yesterday's Index}}{\text{Yesterday's Index}}$$

Again, weekly and monthly index returns, etc., can be consistently defined.

Once we have computed the security and market returns for a sufficiently long period to get a large number (50 or more) of pairs of returns, we can use the linear regression technique to estimate the β.

There are a few things about β estimation that we must be careful about:

i. ***Daily, weekly or monthly returns:*** We prefer daily returns because it gives us more number of returns and therefore improves the accuracy of the β estimate. In some cases, however, we may use weekly or monthly returns because these may be easier to collect.

ii. ***Period of analysis:*** In general, using a longer period gives us more data to estimate the β correctly. But if we believe that β has changed in the recent past because of any changes in the riskiness of the company, we may wish to use a shorter period. We have found that using daily returns for 18-24 months is usually a good compromise between these conflicting requirements.

iii. ***Exceptional price movements:*** Occasionally, we find that on some specific days, the share price has recorded an exceptional rise or fall of a kind which we do not expect to recur in future. We may sometimes find it advantageous to eliminate the returns of these days before estimating the β.

Some of the factors discussed above do, at times, require some degree of judgment and statistical analysis. For this reason, in many developed countries, there are specialized agencies which perform all this analysis and publish their β estimates for various stocks at regular intervals.

Illustration 12

Let us consider the daily prices of the company X and the daily Bombay Sensitive Index for the period January 2001 – July 2002 (BSE data), based on the trading days. Columns 2 of Table 4 give the share prices (adjusted for dividend, bonus, etc.) and share price indices respectively for January 2001 and June – July 2002. The intermediate values have been omitted, since the objective of this example is

only to illustrate the computation of β and the use of CAPM. Compute the β of ITC for the above period.

Table 4: ITC Price & BSE Sensex Data

Date	Company X Price	BSE National Index	Returns	
			Company X	Index
2001				
January 1	343.00	3260.56	–	–
2	339.25	3225.24	–0.011%	–0.011%
3	336.25	3264.00	–0.008%	0.012%
6	326.00	3252.31	–0.030%	–0.004%
7	323.00	3264.21	–0.009%	0.004%
8	323.00	3288.88	0	0.007%
9	330.00	3362.39	0.022%	0.022%
10	345.75	3418.32	0.048%	0.016%
13	363.00	3453.16	0.049%	0.010%
14	381.00	3492.26	0.049%	0.011%
15	416.25	3646.73	0.093%	0.044%
16	399.75	3455.88	–0.039%	–0.052%
17	395.00	3422.35	–0.012%	–0.009%
20	396.75	3389.49	0.004%	–0.009%
21	395.50	3382.74	–0.003%	–0.002%
22	400.50	3427.09	0.013%	0.013%
24	385.75	3435.62	–0.037%	0.002%
27	402.00	3562.74	0.042%	0.037%
28	403.00	3604.20	0.002%	0.012%
2002				
June 9	647.00	3468.07	0.610%	–0.038%
10	610.75	3311.41	–0.056%	–0.045%
11	623.75	3335.76	0.021%	0.007%
12	647.75	3347.41	0.038%	0.003%
15	603.50	3152.96	–0.068%	–0.058%
16	617.00	3161.08	0.022%	0.003%
17	678.50	3400.95	0.099%	0.076%
18	659.00	3292.33	–0.028%	–0.032%
19	612.25	3143.10	–0.070%	–0.045%
22	630.75	3078.51	0.030%	–0.021%
23	628.00	3037.34	–0.004%	–0.013%
24	644.50	3143.64	0.026%	0.035%
25	646.50	3208.54	0.003%	0.021%
26	640.75	3168.82	–0.009%	–0.012%
29	659.75	3289.56	0.029%	0.038%
30	652.00	3250.69	–0.012%	–0.012%
2002				
1 July	632.75	3230.60	–0.029%	–0.006%
2	634.50	3180.73	0.003%	–0.015%
3	619.00	3089.02	–0.024%	–0.029%
6	650.50	3178.31	0.051%	0.029%
7	653.25	3195.94	0.004%	0.006%
8	673.00	3245.88	0.030%	0.015%
9	693.00	3331.98	0.030%	0.026%
10	703.50	3401.74	0.015%	0.021%
13	675.00	3322.17	–0.040%	–0.023%
14	693.00	3371.50	0.027%	0.015%

Solution first step is to compute the security and market returns. This is done in Columns 3 and 5 of Table 4. We then used a spreadsheet program on a PC to calculate the β. The output from the computer was as follows:

Regression Output

Constant		0.001995
Std. Error of Y Est		0.019766
R Squared		0.999347
No. of Observations	383	
Degrees of Freedom	381	
X Coefficient(s)		1.192726
Std. Error of Coef.		0.073587

The β is nothing but the "X Coefficient" in the above output. The β of Company X for the period is therefore 1.193.

We may also compute the expected return from Company X share based on the above example. During the period January 2001 – July 2002, the market return was about 45% per annum, and the value of β was 1.193.

It is useful to note that mathematically, the β coefficient in specification 19 expressed earlier is given by the following expression:

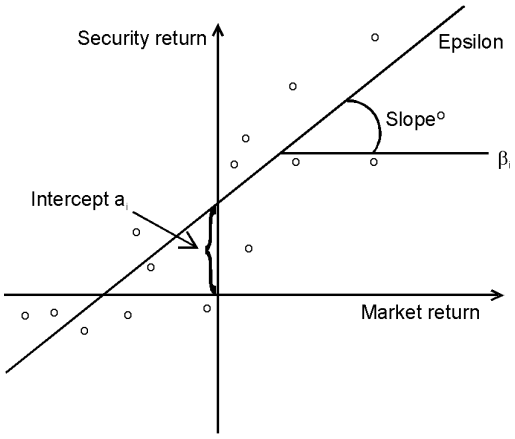
$$\beta = \mathrm{Cov}(r_i, r_m) / \sigma_m^2 \qquad \text{Eq.(20)}$$

Instead of running a regression in order to estimate, it can be directly computed by first computing the co-variance between the security return and the market return and then dividing this co-variance by the variance of the market return.

Further, this relationship between r_i and r_m is a simple linear function and be graphed as follows:

Figure 2

A Hypothetical Regression (Characteristic) Line



The straight line represents the line of best fit between the actual observation of security returns and market returns.

Since it is linear model with
- one independent variable (r_{mt}) and
- one dependent variable (r_{it})

Simple linear regression is the empirical methodology used when dealing with the market model.

Thus, there are clear interpretations of the variables in the equation ($r_{it} = a_i + \beta_i r_{mt} + e_{it}$).

The intercept term 'a_i' can be interpreted as simply the average return on the ith security when the market index return is zero.

In regression analysis, the 'e_{it}' term is a random error term which will have a mean value of zero and is assumed to be unwarranted with the market returns, the error terms of other securities, and the error terms of the same security over time.

More formally the key assumptions in regression analysis regarding the error terms are

$$\begin{aligned} \text{Cov}(e_i r_m) &= 0 \\ \text{Cov}(e_i e_j) &= 0 \\ \text{Cov}(e_i e_t) &= 0 \end{aligned}$$

In addition, by construction, the regression model forces $E(e_i) = 0$

The most interesting parameter is the Beta coefficient β_i.

Beta is the slope of the regression (sometimes referred to as the characteristic line) and is calculated as

$$\left(\beta_i = \frac{\text{Cov}_{im}}{\sigma_m^2} \right)$$

That is, beta measures the co-variance of r_i with r_m divided by the variance of r_m.

Beta is frequently referred to as the measure of a security's systematic risk or market risk, since it indicates the manner in which a security's returns changes systematically with changes in the market's returns.

For example, if the market's return increased by 20% then for a stock with a beta of 1.5 we would expect the security's return to increase by 30% (i.e. 20% x 1.5 = 30%).

Let us consider an example in which a stock has the following regression line

$r_{it} = a_i + \beta_i r_{mt} + e_{it}$

$r_{it} = 3\% + 1.5 r_{mt} + e_{it}$

Since on average, the error term e_{it} equals zero, we will ignore it here. If the market index return is 8%, the return for the stock would be 15% calculated as

$r_{it} = 3\% + 1.5\ (8\%) + 0$

$r_{it} = 3\% + 12\% = 15\%$

If the market return increases by 10% (i.e. from 8% to 18%) the stocks return would increase by 15% to 30% (10 x 1.5 = 15%)

$r_{it} = 3\% + 1.5\ (18\%) + 0$

$r_{it} = 3\% + 27\% = 30\%$

$\therefore$ When market return increased from 8% to 18% = (10% increase)

The security's return increased from 15% to 30% = (15% increase).

Thus, the returns for a stock with beta 1.5 are said to be one and a half times as volatile as the returns for the market index.

To see that beta is a measure of relative market risk, note from equations

$$\text{Cov}_{ij} = \sum_{s=1}^{n} [r_{is} - E(r_i)][r_{js} - E(r_j)]\pi_s$$

or

$$\text{Cov}_{ij} = \frac{\sum_{i=1}^{n} \left(r_{ij} - \bar{r}_i\right)\left(r_{js} - \bar{r}_j\right)}{n-1}$$

that the co-variance of a variable with itself is the variable's variance.

That is $\text{Cov}_{(i,\,i)} = \sigma_i^2$

$\therefore$ As per equation $\left(\beta_i = \frac{Cov_{im}}{\sigma_m^2}\right)$ the beta for market index has to be 1.00

i.e. $\beta_i = \frac{Cov_{mm}}{\sigma_m^2} = \frac{\sigma_m^2}{\sigma_m^2} = 1.00$

By using the market index's beta of 1.00 as a benchmark, one can classify the systematic risk of securities into two groups.

Any stock which has a beta greater than 1.0 ($\beta_i > 1.00$) has above average market-related, systematic risk.

A stock with a beta of less than 1.00 ($\beta_I < 1.00$) has below-average market-related, systematic risk.

Thus, beta provides a convenient measure of relative market risk.

$\beta > 1$ = above-average systematic risk

$\beta < 1$ = below-average systematic risk.

Estimating Betas

Since betas are a measure of market-related risk, investors should be interested in the betas for individual securities and portfolios.

It can be shown that the beta for a portfolio is a weighted average of the betas of the individual securities in the portfolio from the following example,

that is, $\left\{\beta = \sum_{i=1}^{n} \beta_i W_i\right\}$

There are at least three methods of estimating betas:

i. Estimating historical betas based strictly on ex-post return data.

ii. Estimating ex-ante betas based upon explicit probability distribution.

iii. Estimating ex-ante betas by adjusting historical betas, depending upon a variety of factors which may cause the security's beta to change in the future.

HISTORICAL BETAS

Historical betas are calculated using ex-post data and the equations

$$Cov_{im} = \frac{\sum_{t=1}^{n} (r_{it} - \bar{r}_i)(r_{mt} - \bar{r}_m)}{n-1} \text{ and } \left\{\beta_i = \frac{COV_{im}}{\sigma_n^2}\right\}$$

To illustrate the procedure, the hypothetical ex-post returns for 3 stocks are listed, along with a hypothetical return series for a market index.

Illustration 13

Time period	1(%)	2(%)	3(%)	Market index %
1	10	11	–6	11
2	8	4	18	7
3	–4	–3	4	–2
4	22	–2	–5	8
5	8	14	32	9
6	–11	–9	–7	–5
7	14	15	24	12
8	12	13	–17	11
9	–9	–3	2	3
10	12	4	27	10

Stock (1) and Market Index

Year	Returns from stock (1)	$(r_{it} - \bar{r}_i)$	$(r_{it} - \bar{r}_i)^2$	Return from market index	$(r_{mt} - \bar{r}_m)$	$(r_{mt} - \bar{r}_m)^2$	$(r_{it} - \bar{r}_i)(r_{mt} - \bar{r}_m)$
1	10	3.8	14.44	11	4.6	21.16	17.48
2	8	1.8	3.24	7	0.6	0.36	1.08
3	–4	–10.2	104.04	–2	–8.4	70.56	85.68
4	22	15.8	249.64	8	–1.6	2.56	25.28
5	8	1.8	3.24	9	2.6	6.76	4.68
6	–11	–17.2	295.84	–5	–11.4	129.96	196.08
7	14	7.8	60.84	12	5.6	31.36	43.68
8	12	5.8	33.64	11	4.6	21.16	26.68
9	–9	–15.2	231.04	3	–3.4	11.56	51.68
10	12	5.8	33.64	10	3.6	12.96	20.88
	62	0	1029.60	64	0	308.40	473.20

$$\bar{r}_i = \frac{\sum_{i=1}^{n} r_i}{n} = \frac{62}{10} = 6.2\%$$

$$\bar{r}_m = \frac{\sum_{i=1}^{n} r_m}{n} = \frac{64}{10} = 6.4\%$$

$$\sigma_i^2 = \frac{\sum_{t=1}^{n} (r_{it} - \bar{r}_i)^2}{n-1} = \frac{1029.60}{9} = 114.40$$

$$\therefore \sigma_i = \sqrt{114.40} = 10.69579357 \simeq 10.70$$

$$\sigma_m^2 = \frac{\sum_{t=1}^{i} (r_{mt} - \bar{r}_m)^2}{n-1} = \frac{308.40}{9} = 34.27$$

$$\therefore \sigma_m = \sqrt{34.27} = 5.85\%$$

$$Cov_{im} = \frac{\sum_{t=1}^{n} (r_{it} - \bar{r}_i)(r_{mt} - \bar{r}_m)}{n-1}$$

$$= \frac{473.20}{9} = 52.5777778 \simeq 52.58$$

$$\rho_{im} = \frac{Cov_{im}}{\sigma_i \sigma_m} = \frac{52.58}{10.70 \times 5.85} = \frac{52.58}{62.595}$$

$$= 0.840003195 \simeq 0.84$$

$$\beta_{im} = \frac{Cov_{im}}{\sigma_m^2} = \frac{52.58}{34.27} = 1.534286548 \simeq 1.53$$

Stock (2) and Market Index

Year	Returns from stock (2) (%)	$(r_{2i} - \bar{r}_2)$	$(r_{2i} - \bar{r}_2)^2$	$(r_{mi} - \bar{r}_m)$	$(r_{mi} - \bar{r}_m)^2$	$(r_{2i} - \bar{r}_2)(r_{mi} - \bar{r}_m)$
1	11	6.6	43.56	4.6	21.16	30.36
2	4	–0.4	0.16	0.6	0.36	–0.24
3	–3	–7.4	54.76	–8.4	70.56	62.16
4	–2	–6.4	40.96	1.6	2.56	–10.24
5	14	9.6	92.16	2.6	6.76	24.96
6	–9	–13.4	179.56	–11.4	129.96	152.76
7	15	10.6	112.36	5.6	31.36	59.36
8	13	8.6	73.96	4.6	21.16	39.56
9	–3	–7.4	54.76	–3.4	11.56	25.16
10	4	–0.4	0.16	3.6	12.96	–1.44
	44	0	652.40	0	308.40	382.40

$$\bar{r}_2 = \frac{\sum_{i=1}^{n} r_{2i}}{n} = \frac{44}{10} = 4.4\%$$

$$\sigma_2^2 = \frac{\sum_{i=1}^{n} (r_{2i} - \bar{r}_2)^2}{n-1} = \frac{652.40}{9}$$

$$= 72.488889 \simeq 72.49$$

$$\therefore \sigma = \sqrt{72.49} = 8.514040691 = 8.51\%$$

$$\sigma_m^2 = \frac{\sum_{t=1}^{i} (r_{mt} - \bar{r}_m)^2}{n-1} = \frac{308.40}{9} = 34.27$$

$$\sigma_m = \sqrt{34.27} = 5.85\%$$

$$Cov_{2m} = \frac{\sum_{t=1}^{n} (r_{2i} - \bar{r}_2)(r_{mt} - \bar{r}_m)}{n-1} = \frac{382.40}{9}$$

$$= 42.4888889 \simeq 42.49$$

$$\rho_{2m} = \frac{Cov_{2m}}{\sigma_2 \sigma_m} = \frac{42.49}{8.51 \times 5.85} = \frac{42.49}{49.7835}$$

$$= 0.853495636 \simeq 0.85$$

$$\beta_{2m} = \frac{Cov_{2m}}{\sigma_m^2} = \frac{42.49}{34.27} = 1.239859936 \simeq 1.24$$

Stock (3) and Market Index

Year	r_3	$(r_3 - \bar{r}_3)$	$(r_3 - \bar{r}_3)^2$	$(r_m - \bar{r}_m)$	$(r_m - \bar{r}_m)^2$	$(r_{3i} - \bar{r}_3)(r_m - \bar{r}_m)$
1	–6	–13.2	174.24	4.6	21.16	–60.72
2	18	10.8	116.64	0.6	0.36	6.48
3	4	–3.2	10.24	–8.4	70.56	+26.88
4	–5	–12.2	148.84	1.6	2.56	–19.52
5	32	24.8	615.04	2.6	6.76	64.48
6	–7	–14.2	201.64	–11.4	129.96	161.88
7	24	16.8	282.24	5.6	31.36	94.08
8	–17	–24.2	585.64	4.6	21.16	–111.32
9	2	–5.2	27.04	–3.4	11.56	17.68
10	27	19.8	392.04	3.6	12.96	71.28
	72	0	2553.60	0	308.40	251.20

$$\bar{r}_3 = \frac{\sum_{t=1}^{n} r_{3t}}{n} = \frac{72}{10} = 7.2\%$$

$$\sigma_3^2 = \frac{\sum_{t=1}^{n} (r_{3t} - \bar{r}_3)^2}{n-1} = \frac{2553.60}{9} = 283.733333 \sim 283.73$$

$$\sigma 3 = \sqrt{283.73} = 16.84438581 \sim 16.84\%$$

$$\sigma_m^2 = \frac{\sum_{t=1}^{i} (r_{mt} - \bar{r}_m)^2}{n-1} = \frac{308.40}{9} = 34.27$$

$$\sigma_m = \sqrt{34.27} = 5.85\%$$

$$Cov_{3m} = \frac{\sum_{t=1}^{n} (r_{3t} - \bar{r}_3)(r_{mt} - \bar{r}_m)}{n-1} = \frac{251.20}{9} = 27.91$$

$$\rho_{3m} = \frac{Cov_{3m}}{\sigma_3 \sigma_m} = \frac{27.91}{16.84 \times 5.85} = \frac{27.91}{98.514}$$

$$= 0.283309986 \sim 0.28$$

$$ß_{3m} = \frac{Cov_{3m}}{\sigma_m^2} = \frac{27.91}{34.27} = 0.81441494 \sim 0.81$$

The above computations can be summarized in the following table:

	Stock (1)	Stock (2)	Stock (3)	Market Index
$\bar{r}_i$	6.2%	4.4%	7.2%	6.4%
σ_i^2	114.40	72.49	283.73	34.27
σ_i	10.70%	8.51%	16.84%	5.85%
Cov_{im}	52.58	42.49	27.91	34.27
ρ_{im}	0.84	0.85	0.28	1.00
β_{im}	1.53	1.24	0.81	1.00

We know $\rho_{im} = \frac{Cov_{im}}{\sigma_i \sigma_m}$

$\therefore Cov_{im} = \rho_{im}\, \sigma_i\, \sigma_m$

and we know $\beta_{im} = \frac{Cov_{im}}{\sigma_m^2}$

$\therefore$ Substituting the value of Cov_{im} in the above equation,

$$\beta_{im} = \frac{\rho_{im} \sigma_i \sigma_m}{\sigma_m^2} = \rho_{im} \frac{\sigma_i}{\sigma_m}$$

$\therefore \beta_{im} = \rho_{im} \frac{\sigma_i}{\sigma_m^2}$. This is another method of calculating the value of Beta.

$\therefore \beta_{lm} = 0.84 \text{ x } \frac{10.70}{5.85} = 0.84 \text{ x } 1.829059829$

$= 1.536410256 \simeq 1.53$

$\beta_{2m} = 0.85 \text{ x } \frac{8.51}{5.85} = 0.85 \text{ x } 1.454700855$

$= 1.236495726 \simeq 1.24$

$\beta_{3m} = 0.28 \text{ x } \frac{16.84}{5.85} = 0.28 \text{ x } 2.878632479$

$= 0.806017094 \simeq 0.81$

$\beta_{4m} = 1 \text{ x } \frac{5.85}{5.85} = 1 \text{ x } 1 = 1$

Thus, beta is equal to the correlation coefficient for security (i) and the market index, multiplied by the ratio of the standard deviation of the security return to the standard deviation of the market index's returns.

In other words, the security's beta is function of the correlation of the security's returns with the market index returns (ρ_{im}) and the variability of the security's returns relative to the variability of the index returns $\left(\frac{\sigma_i}{\sigma_m}\right)$

$\therefore \beta_{im} = \rho_{im} \frac{\sigma_i}{\sigma_m} = \frac{Cov_{im}}{\sigma_m^2}$

Now notice that the beta for stock (3) is considerably smaller than the beta for stock (1) (i.e. 0.81 vs 1.53).

Yet the standard deviation of stock (3) is substantially higher than the standard deviation for stock (1) (16.84% vs 10.70%).

Why does stock (3) have less systematic risk than stock (1)?

Looking at the equation $\left(\beta_{im} = \rho_{im} \frac{\sigma_i}{\sigma_m}\right)$ the answer becomes quite obvious. For stock (1) ρ_{im} is 0.84 and for stock (3) ρ_{3m} is only 0.28.

Thus, the returns of stock (3) are not nearly highly correlated with the market index as are stock (1)'s returns – Because of this low correlation a large part of the variability of stock (3) returns can be eliminated by diversification. The remaining systematic risk is relatively small, resulting in low Beta.

$\therefore$ Low correlation between security returns and market index returns results in lower Beta (of course depending upon the variability of return of the security).

High correlation between security returns and market index returns results in high Beta value (of course depending upon the variability of returns on the security).

EX-ANTE BETAS

Ex-ante or expected betas can be estimated from explicit probability distribution such as those presented below:

Illustration 14

State of the world	Conditional return				
	π_s	r_{4s}	r_{5s}	r_{6s}	r_{ms}
1	0.20	–18	–13	–4	–9
2	0.25	+16	16	–2	8
3	0.30	+12	32	21	16
4	0.25	+40	12	20	20
	1.00				
	σ_i^2	376.00	245.00	136.50	109.00
	σ_i %	19.39	15.65	11.68	10.44
	$E(r_i)$%	14.00	14.00	10.00	10.00
	Cov_{im}	182.00	129.00	104.00	109.00
	ρ_{im}	0.90	0.79	0.85	1.00
	β_{im}	1.67	1.18	0.95	1.00

We know $\sigma_i^2 = \sum_{s=1}^{n} (r_{is} - \bar{r}_i)^2 \pi_s$

$$\sigma_i = \sqrt{\sum_{s=1}^{n} (r_{is} - \bar{r}_i)^2 \pi_s}$$

$$Cov_{im} = \sum_{s=1}^{n} (r_{is} - \bar{r}_i)(r_{ms} - \bar{r}_m)\pi_s$$

$$\text{Correlation Coefficient} = \rho_{im} = \frac{Cov_{im}}{\sigma_i \sigma_m}$$

$\therefore Cov_{im} = \rho_{im}\, \sigma_i\, \sigma_m$

$$\beta_{im} = \frac{Cov_{im}}{\sigma_m^2}$$

$$\beta_{im} = \frac{\rho_{im}\sigma_i\sigma_m}{\sigma_m^2} = \rho_{im}\frac{\sigma_i}{\sigma_m}$$

Stock (4) and Market Index

Scenario	π_s	r_{4s}	$r_{4s}\,\pi_s$	$r_{4s} - \bar{r}_4$	$(r_{4s} - \bar{r}_4)^2$	$\pi_s \times (r_{4s} - \bar{r}_4)^2$
1	0.20	–18	–3.60	–32	1024	204.80
2	0.25	16	4.00	2	4	1.00
3	0.30	12	3.60	–2	4	1.20
4	0.25	40	10.00	26	676	169.00
	1.00		14.00			376.00

$$E(r_4) = \sum_{s=1}^{n} (r_{4s}\pi_s) = 14\%$$

$$\sigma_4^2 = \sum_{s=1}^{n} \left(r_{4s} - \bar{r}_4\right)^2 \pi_s = 376$$

$$\therefore \sigma_4 = \sqrt{376} = 19.39\%$$

Scenario	π_s	r_m	$\pi_s r_m$	$r_m - \bar{r}_m$	$\left(r_m - \bar{r}_m\right)^2$	$\pi_s \times \left(r_m - \bar{r}_m\right)^2$
1	0.20	–9	–1.80	–19	361	72.2
2	0.25	8	2.00	–2	4	1.0
3	0.30	16	4.80	6	36	10.8
4	0.25	20	5.00	10	100	25.0
	1.00		10.00			109

$$E(r_m) = \sum_{s=1}^{n} (\pi_s r_m) = 10\%$$

$$\sigma_m^2 = \sum_{s=1}^{n} \left(r_{ms} - \bar{r}_m\right) \pi_s = 109$$

$$\therefore \sigma_m = \sqrt{109} = 10.44030651 = 10.44\%$$

Scenario	π_s	$(r_{4s} - \bar{r}_s)$	$\left(r_{ms} - \bar{r}_m\right)$	$\pi_s (r_{4s} - \bar{r}_4)\left(r_{ms} - \bar{r}_m\right)$
1	0.20	–32	–19	121.60
2	0.25	+2	–2	–1.00
3	0.30	–2	6	–3.60
4	0.25	26	10	65.00
				182.00

$$\therefore Cov_{4m} = \sum_{s=1}^{n} (r_{4s} - \bar{r}_4)(r_{ms} - \bar{r}_m)\pi_s = 182$$

$$\rho_{4m} = \frac{Cov_{4m}}{\sigma_4 \sigma_m} = \frac{182}{19.36 \times 10.44} = \frac{182}{202.4316}$$

$$= 0.899069117 \simeq 0.90$$

$$\beta_{4m} = \frac{Cov_{4m}}{\sigma_m^2} = \frac{182}{109} = 1.669724771 \simeq 1.67$$

Stock (5) and Market Index

Scenario	π_s	r_{5s}	$\pi_s . r_{5s}$	$(r_{5s} - \bar{r}_s)$	$(r_{5s} - \bar{r}_s)^2$	$\pi_s . (r_{5s} - \bar{r}_s)^2$	$\left(r_{ms} - \bar{r}_m\right)$	$\pi_s (r_{5s} - \bar{r}_5)\left(r_{ms} - \bar{r}_m\right)$
1	0.20	–13	–2.6	–27	729	145.80	–19	102.60
2	0.25	16	4.0	2	4	1.00	–2	–1.00
3	0.30	32	9.6	18	324	97.20	6	32.40
4	0.25	12	3.0	–2	4	1.00	10	–5.00
	1.00		14.0			245.00		129.00

$$E(r_5) = \sum_{s=1}^{n} (r_{5s} \pi_s) = 14\%$$

$$\sigma_5^2 = \sum_{s=1}^{n}\left(r_{5s}-\bar{r}_5\right)^2.\pi_s = 245$$

$$\sigma_5 = \sqrt{245} = 15.35247584 \simeq 15.65$$

$$Cov_{5m} = \sum_{s=1}^{n}(r_{5s}-\bar{r}_5)(r_{ms}-\bar{r}_m)\pi_s = 129$$

$$\rho_{5m} = \frac{Cov_{5m}}{\sigma_5\sigma_m} = \frac{129}{15.65 \text{ x } 10.44} = \frac{129}{163.386}$$

$$= 0.789541331 \simeq 0.79$$

$$\beta_{5m} = \frac{Cov_{5m}}{\sigma_m^2} = \frac{129}{109} = 1.183486239 \simeq 1.18$$

Stock (6) and Market Index

Scenario	π_s	r_{6s}	$\pi_s . r_{6s}$	$(r_{6s}-\bar{r}_6)$	$(r_{6s}-\bar{r}_6)^2$	$\pi_s.(r_{6s}-\bar{r}_6)^2$	$(r_{ms}-\bar{r}_m)^2$	$\pi_s(r_{6s}-\bar{r}_6)(r_{ms}-\bar{r}_m)$
1	0.20	–4	–0.80	–14	196	39.20	–19	53.20
2	0.25	–2	–0.50	–12	144	36.00	–2	6.00
3	0.30	21	6.30	11	121	36.30	6	19.80
4	0.25	20	5.00	10	100	25.00	10	25.00
	1.00		10.00			136.50		104.00

$$E(r_6) = \sum_{s=1}^{n}(r_{6s}\pi_s) = 10\%$$

$$\sigma_6^2 = \sum_{s=1}^{n}\left(r_{6s}-\bar{r}_6\right)^2\pi_s = 136.50$$

$$\therefore \sigma_6 = \sqrt{136.50} = 11.68332145 \simeq 11.68\%$$

$$Cov_{6m} = \sum_{s=1}^{n}(r_{6s}-\bar{r}_6)(r_{ms}-\bar{r}_m)\pi_s = 104$$

$$\rho_{6m} = \frac{Cov_{6m}}{\sigma_6\sigma_m} = \frac{104}{11.68 \text{ x } 10.44} = \frac{104}{121.9392}$$

$$= 0.85288406 \simeq 0.85$$

$$\beta_{6m} = \frac{Cov_{6m}}{\sigma_m^2} = \frac{104}{109} = 0.95412844 \simeq 0.95$$

Given the above information, the Beta for the stock can also be calculated as

$$\beta_{4m} = \rho_{4m}\frac{\sigma_4}{\sigma_m} = 0.90 \text{ x } \frac{19.39}{10.44} = 0.90 \text{ x } 1.85729693 = 1.671551724 \simeq 1.67$$

$$\beta_{5m} = \rho_{5m}\frac{\sigma_5}{\sigma_m} = 0.79 \text{ x } \frac{15.65}{10.44} = 0.79 \text{ x } 1.499042146$$

$$= 1.184243295 \simeq 1.18$$

$$\beta_{6m} = \rho_{6m}\frac{\sigma_6}{\sigma_m} = 0.85 \text{ x } \frac{11.68}{10.44} = 0.85 \text{ x } 1.118773946$$

$$= 0.950957854 \simeq 0.95$$

The above computations can be tabulated as follows:

	Stock (4)	Stock (5)	Stock (6)	Market
Expected return [$E(r_i)$] %	14.00	14.00	10.00	10.00
Variance (σ_i^2)	376.00	245.00	136.50	109.00
Standard deviation (σ_i)%	19.39	15.65	11.68	10.44
Cov_{im}	182.00	129.00	104.00	109.00

ADJUSTED BETAS

The purchase of an asset gives the investor a claim on the assets' future cash flows. Thus, investors are concerned with ex-ante (expected) earnings, dividends, interest payments, etc.

Likewise, investors are generally concerned with ex-ante risk.

The historical variability and systematic risk of a security is of use to an investor only if it provides some indication of the future variability and systematic risk of the security.

Ex-ante betas can be calculated directly from explicit probability distributions. However, in many (if not most) cases, such explicit probability distributions are not available.

Under these circumstances, one procedure for estimating future betas is first to measure the security's historical beta and then to adjust this estimate up or down, depending upon a number of factors.

One of the most common adjustments is to correct for the tendency of individual security betas to 'regress toward the mean' over time.

Blume (in 'Betas and their Regression Tendencies') found that very high betas, measured over a particular time period, tend to be lower (closer to 1.0) during the next time period and that very low betas tend to be higher when measured during the subsequent time period.

For example, if a stock measured for the 5 year time period 1980-1984 was 1.6, it might be measured as 1.4 during the next 5 year period.

Because of this tendency of betas to regress toward the mean beta (1.0) over time, many services which provide estimates of betas adjust upward very low historical betas and adjust downward very high historical betas.

A number of other adjustments are made to historical betas in order to arrive at a better estimate of a security's future beta.

As just one example, if a firm substantially increases the amount of debt in its capital structure, one should consider adjusting its historical beta upward since betas have been shown to be a positive function of financial leverage.

(The original theory linking betas and financial leverage was done by R S Hamada 'The Effect of a Firm's Capital Structure on the Systematic Risk of Common Stocks'.)

In general, Hamada, demonstrated theoretically that the more leverage the firm uses, the higher stock's beta.

The relationship was then verified empirically.

SECURITY MARKET LINES

One of the contributions of modern portfolio theory to the field of investments is the concept of Security Market Line (SML).

The SML simply represents the average or normal, trade-off between risk and return for a group of securities – where risk is measured typically, in terms of the securities betas.

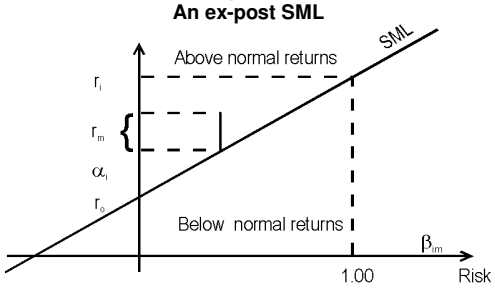
(The risk measures do not have to be limited to beta. For example, Kidder, Peabody and Company constructs a SML using as its measure of risk what it terms its Fundamental Risk Estimate (FRE)).

The FRE is a composite risk measure based on the securities betas and other more traditional risk measures such as financial leverage.

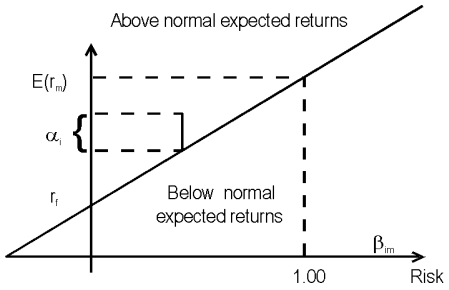
The following figures illustrate both an ex-post and an ex-ante SML.

Figure 3

An ex-post SML



An ex-ante SML



Normal return $N(\bar{r}_i) = r_0 + r_i\beta_{im}$	Required return $R(r_i) = r_f + \beta_{im}[E(r_m) - r_f]$
r_o = intercept of ex-post SML	r_f = risk-free interest rate
r_i = slope at SML	$E(r_m) - r_f$ = slope of SML
$\alpha_i = \bar{r}_i - N(\bar{r}_i)$	α = $E(r_i) - R(r_f)$
$= \bar{r}_i - (r_o + r_i\beta_{im})$	$= E(r_i) - [r_f + \beta_{im}[E(r_m) - r_f]$

In the ex-post SML, average historical rates of return for securities are plotted against their betas for a particular time period.

Typically, a straight line is fitted to the plots, by regression and this is called the SML.

Thus, the SML represents the "normal" or average, trade-off between return and risk.

The SML can be written as

Normal return : $N(\bar{r}_i) = r_o + r_i\beta_{im}$

r_o = intercept of the SML

r_i = slope of the SML.

Those securities which plot above the ex-post SML generated above normal returns for their risk (as measured by their beta) for the particular time period used in constructing the SML.

Those securities which plot below the SML generated below normal rates of returns for the systematic risk.

The amount by which a security's return differed from the normal return for its level of risk is simply the vertical distance of the security's plot on the graph from the SML.

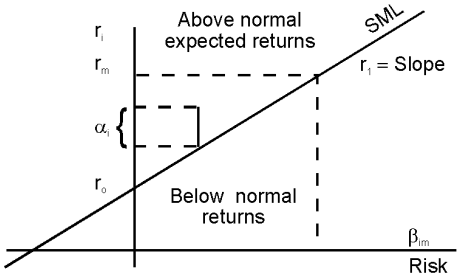
This vertical distance is called the security's abnormal return or its alpha.

Thus, alpha is calculated as

$$\left.\begin{aligned}\alpha_i &= r_o - N(\bar{r}_i)\\ r_i &= (r_o + r_o\beta_{im})\end{aligned}\right\} \text{ ex-post alpha}$$

It is easy to see that securities with above normal returns have positive alpha and securities with below normal returns have negative alphas.

Figure 4



Normal return : $N(\bar{r}_i) = r_o + r_i\beta_{im}$

r_o = intercept of the SML

r_i = slope of the SML

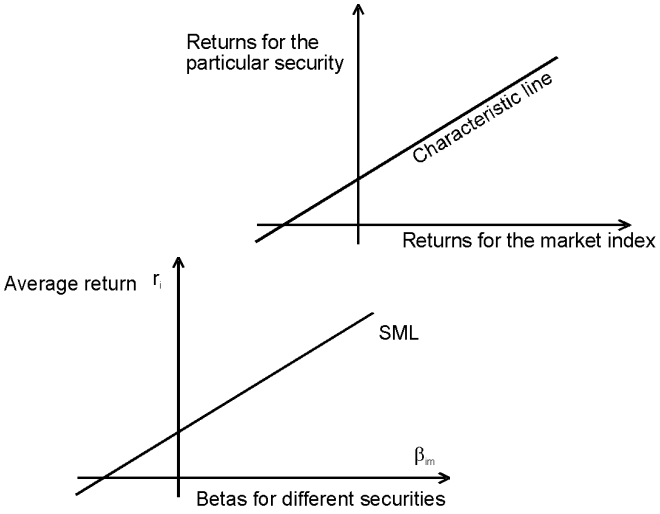
$\alpha = \bar{r}_i - N(\bar{r}_i)$

$= \bar{r}_i - (r_o + r_i\beta_{im})$

$\alpha > 0$: above normal returns

$\alpha < 0$: below normal returns.

Figure 5



Students should note that the SML is not the same as the characteristic line for a simple security.

[Security Market line ≠ Characteristic line]

For a characteristic line, the y-axis represents the returns for a particular security and the x-axis represents the returns for the market index.

The slope of the characteristic line is the beta for the particular security involved. The y-axis of the ex-post SML represents the average returns for a number of different securities. (For the ex-ante SML the y-axis represents expected returns).

The x-axis for the SML represents the betas for different securities.

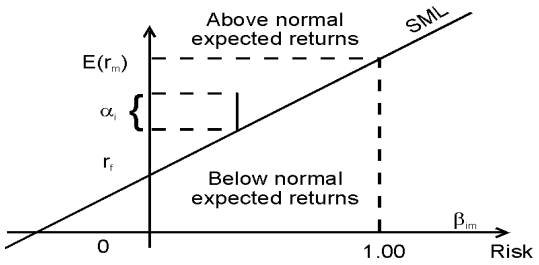
Thus, a unique characteristic line is needed for each individual security in order to determine its beta.

Then the average (or expected) returns for each security are plotted against their respective betas on a Single Market Line (SML).

To construct an ex-ante SML, analysts must estimate the expected returns and risk of individual securities.

These returns and risk estimates can then be plotted and a regression line fitted to the observations.

Figure 6



Required return

$R(r_i) = [E(r_m) - r_f]\ \beta_{im}$

r_f = risk-free interest rate

$E(r_m) - r_f$ = slope of the line SML

$\alpha = E(r_i) - R(r_i)$

$= E(r_i) - [r_f + [E(r_m) - r_f]\ \beta_{im}$

Here we assumed that the assumptions of the CAPM are correct.

Therefore, the intercept of the SML is equal to the risk-free rate (r_f) and the slope is equal to $E(r_m) - r_f$.

We will use the term required return denoted by $R(r_i)$ to refer to the average, or normal return implied by an ex-ante SML.

Required return $R(r_i) = r_o + r_i\beta_{im}$

If the assumptions at the CAPM are correct, then

$R(r_i) = r_f + [E(r_m) - r_f]\ \beta_{im}$

Each security's ex-ante alpha is calculated as the difference between the expected return and the "required" return implied by the SML.

$\alpha = E(r_i) - R(r_i)$

$\mathbf{= E(r_i) - [r_f + [E(r_m) - r_f]\ \beta_{im}}$

Illustration 15

$E(r_4) = 14\%$, $\beta_{4m} = 1.67$, $E(r_m) = 10\%$

$E(r_6) = 10\%$, $\beta_{6m} = 0.95$

Now suppose the CAPM assumptions are valid and

$R_f = 3\%$

Then

$R(r_i) = r_f + (E(r_m) - r_f)\ \beta_{im}$

$R(r_4) = 3 + (10 - 3)\ 1.67$

$= 3 + 7 \times 1.67 = 3 + 11.69 = 14.69\%$

$R(r_6) = r_f + (E(r_m) - r_f)\ \beta_{im}$

$R(r_6) = 3 + (10 - 3)\ 0.95$

$= 3 + 7 \times 0.95 = 3 + 6.65 \quad = 9.65\%$

$\alpha_4 \quad = E(r_i) - R(r_i) = 14 - 14.69 = -0.69\%$

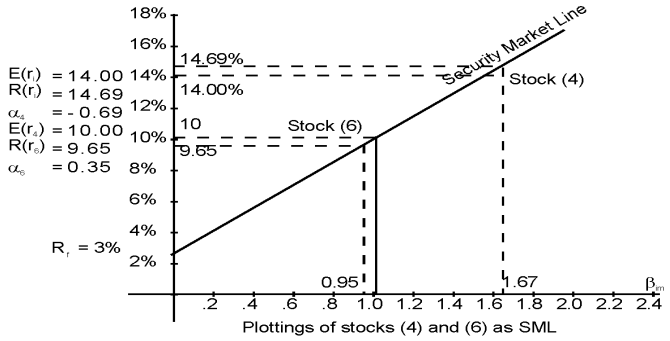
$\alpha_6 \quad = E(r_i) - R(r_i) = 10 - 9.65 \quad = 0.35\%$

Thus, based on the set of expectations and the SML of equation

$R(r_i) = 3\% + (E(r_m) - r_f)\ \beta_{im}$

Stock (4) would be considered overpriced since it has a negative alpha, and stock (6) would be considered underpriced because it has a positive alpha.

Figure 7



$\alpha_4 = -0.69 \therefore$ Stock (4) is overpriced

$\alpha_6 = 0.35 \therefore$ Stock (6) is underpriced

Stock (4) plots below the SML.

Stock (6) plots above the SML.

Applications of Security Market Lines

There are a number of applications of ex-post SML.

Among these are

i. Evaluating the performance of portfolio manager.

ii. Tests of asset-pricing theories, such as the CAPM.

iii. Tests of market efficiency.

Some of the applications of ex-ante SMLs are

i. Identifying undervalued securities.

ii. Determining the consensus, 'price of risk' implicit in current market prices.

APPLICATIONS OF EX-POST SMLS

The performance of portfolio managers is frequently evaluated based on security market line-criteria. Large positive alphas indicate above normal performance and negative alphas indicate below normal performance.

Unfortunately, the measurement of performance is not quite as simple as it might first appear.

Find the relative performance of a portfolio manager, as measured by alpha, can vary depending upon which index is used to determine the beta of the portfolio.

Perhaps more importantly, one would prefer a measure of performance which is predictive in nature. That is, if a portfolio manager performed well in the past he will also perform well in the future. Unfortunately, no such consistency among portfolio managers has been demonstrated.

Many researchers have attempted to test the validity of the CAPM by constructing ex-post SML's.

However, these studies are particularly vulnerable since the CAPM specifies that betas are to be measured against the returns for the market portfolio – the value of weighted portfolio of all risky assets.

Since the true "market portfolio" is not observable proxies have to be used in its place and these proxies may give results which are different from those that would be obtained if one was able to use the market portfolio.

Another area of inquiry utilizing ex-post SMLs involves the testing of market efficiency.

Broadly speaking efficient markets imply the absence of abnormal returns.

That is, all securities are correctly priced and provide a normal return for their level of risk. Tests of this nature require a model to specify what constitutes a normal return.

Tests of market efficiency which utilize the market model assume that a normal return plots on the SML and that abnormal returns are measured by alpha.

A number of tests of market efficiency have utilized this general technique.

APPLICATIONS OF EX-ANTE SMLS

The most obvious use of ex-ante SMLs is for identifying under and overvalued securities.

Unlike some of the ad hoc methods of identifying mispriced securities which have traditionally been used in the securities industry, the use of a security market line allows one to quantify how much a security is over or underpriced. The general procedure is for security analysts to estimate the expected return for individual securities over some future holding period – for example the next 5 years.

The analysts also estimate the risk associated with each security. The risk measure may be the security's ex-ante, beta, or it may be a more traditional measure of risk. In order for the SML concept to be valid, two conditions must be met:

i. Security returns must be a function of a single factor.
ii. The functional relationship must be linear.

One of the strongest arguments for constructing SMLs based on the market model is that there is a well-developed theory (CAPM) which suggests that return is a linear function of beta.

Thus, before using a risk measure other than beta in constructing a SML, one should have strong evidence supporting the alternative risk measure.

Another application of ex-ante security market lines is their use in determining the "market price of risk".

A security market line is then fitted by regression to these expected returns and risk (beta estimate producing an equation similar to the equation)

$$E(r_i) = r_0 + r_i\beta_{im}$$

One can see from this equation that the slope of the SML (r_i) is a measure of the "market price of risk" in the sense that for each unit of Beta, the expected return for a security increased by an amount equal to (r_i). By constructing SMLs in this manner at various points of time, one can observe how the price of risk changes with market cycles.

The steeper the slope of the SML, the higher the price of risk, and vice versa. Expressed in other terms, the steeper the slope of the ex-ante SML the more averse investors (in the aggregate) are to assuming additional risk.

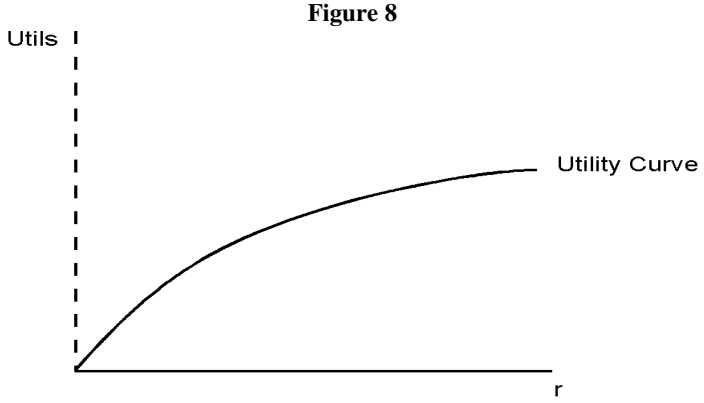
Application of Utility Theory to Risk Return Analysis

The two parameters in security evaluation are the expected return and the variability in the rate of return (measured by the standard deviation of the rates of return). Since we have assumed that rational investors are risk-averse, it follows that, among two securities that provide the same expected return, preference will be for the security with lower risk. Utility theory provides an elegant theoretical support to this argument. In this note, we shall examine the relevance of this theory to our hypothesis.

Utility theory points that when the wealth of an individual increases, so does his or her satisfaction or utility derived from it but the amount of satisfaction derived from one additional rupee at a higher level of wealth is less than the satisfaction derived from one additional rupee at a lower level of wealth. In other words, the total utility or satisfaction is an increasing function of wealth, whereas, the marginal utility is a decreasing function of wealth. The behavior of most rational economic units conform to this logic.

There is a direct correspondence between rate of return and wealth, if the rate of return is high, the wealth so created is large. So, wealth and rate of return can be used interchangeably for utility analysis. Calling one unit of satisfaction as UTIL, the relationship between satisfaction and return (r) can be graphically represented as follows:

Figure 8



Let us consider the two alternative investment propositions.

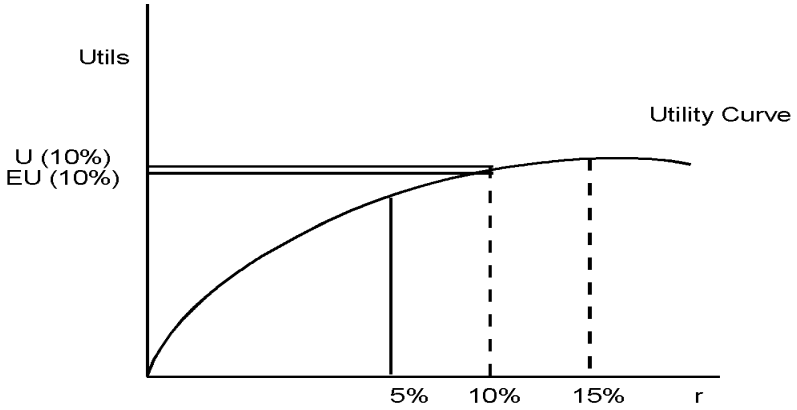
Proposition I with certain return outcome of 10%. Proposition II having uncertain outcomes of either 5% or 15% with 50-50 chance. So, the expected value (E_u) of Proposition II's outcome (i.e. 0.5 x 5% + 0.5 x 15% = 10%) is the same as the certain outcome of Proposition I. Consistent with what the utility theory points, if we assign 10 utils for 5% outcome, 18 utils for 10% outcome, and 24 utils for a 15% outcome, the utility implications of the given propositions are as follows:

Proposition I provides 18 utils i.e. U (10%).

Proposition II provides 0.5 x 10 utils + 0.5 x 24 utils = 17 utils i.e. E_u (10%).

From the standpoint of utility or satisfaction, clearly Proposition I is better than Proposition II. The above may be graphically depicted as follows:

Figure 9



The return outcome of Proposition I is certain, hence it is a no risk proposition. Whereas, the return outcome of Proposition II is uncertain, hence it is a risky proposition. The fact that the expected utility from proposition I is more than the

expected from Proposition II implies that no risk (or less risky) proposition is preferred to a risky (or more risky) proposition by the expected utility maximizer, if the expected return from both the propositions is the same.

Utility theory also provides support to the consideration of standard deviation of returns as a measure of risk of a security. How? In the above graphs, we have described the relationship between Utils and return by way of drawing a utility curve. Alternatively, the relationship can be described in the form of a quadratic function defined as follows:

$u(r) = ar - br^2$, where a and b are constants.

The argument that quadratic utility function best fits the utility behavior of rational economic units is attributed to Von. Neumann J and Morgenstern U; Theory of Games and Economic Behavior. The argument is justified on the ground that the first derivative with respect to 'r' is positive whereas the second derivative is negative, i.e. $\frac{\partial u(r)}{\partial r} > 0$ and $\frac{\partial^2 u(r)}{\partial r^2} < 0$ which implies that the utility function is an increasing function of 'r' but at a decreasing rate.

Since the outcomes of most investments are uncertain, investors are said to maximize their expected utility. Taking the expectation of the above utility function, the function that investors attempt to maximize can be expressed as follows:

$$E[u(r)] = aE(r) - bE(r^2)$$

A further expansion of the expected utility function shows that it is a function of expected return and standard deviation of returns and that the expected utility is an increasing function of expected return and a decreasing function of the standard deviation of returns:

$$E[u(r)] = aE(r) - b[\partial^2 + E(r)^2] = f[E(r), \partial^2 r]$$

It also follows that if investors utility function is quadratic in form, the two parameters of the distribution of returns that matter for evaluation are the expected value and the standard deviation, the former representing benefit and the latter representing risk. They both must be considered together. Utility theory thus provides a sound theoretic foundation for the consideration of both expected return and risk in security evaluation.

SUMMARY

- The risk associated with a common stock is interpreted in terms of the variability of its return. The most common measures of riskiness of security are standard deviation and variance of returns.
- Unsystematic risk is the extent of the variability in the security's return on account of the firm specific risk factors. This is also called diversifiable or avoidable risk factors.
- Systematic risk refers to factors which affect the entire market and hence the firm too. This is also called non-diversifiable risk.
- If a portflio is well diversified, the unsystematic risk gets almost eliminated. The non-diversifiable risk arising from the wide movements of security prices in the market is very important to an investor. The modern portfolio theory defines the riskiness of a security as its vulnerability to market risk. This vulnerability is measured by the sensitivity of the return of the security vis-á-vis the market return and is called beta.

- The concept of security market line is developed by the modern portfolio theory. SML represents the average or normal trade-off between risk and return for a group of securities. Here the risk is measured typically in terms of the beta values. The ex-post SML is used to evaluate the performance of portfolio manager; tests of asset-pricing theories, such as the CAPM and to conduct tests of market efficiency. The ex-ante SML is used to identify undervalued securities and determine the consensus, price of risk implicit in the current market prices.
- Alpha of a security helps to determine whether the scrip is underpriced (it is then eligible to be purchased) or overpriced (it is then eligible to be sold).
- With this background, the next chapter focuses on the stock market in India.

Chapter III

Regulations of Financial Markets

After reading this chapter, you will be conversant with:

- Regulation of Financial Markets
- Organization of Securities and Exchange Board of India (SEBI)
- Functions and Powers of SEBI
- Tax Aspects in Securities
- Self-regulation of the Markets

Introduction

The major thrust of the securities market reforms is upon the improvement of the operational and allocative efficiency of the markets by correcting the exogenous and structural factors impeding the functioning of the system. Efficient intermediation is of paramount importance in making the capital markets more vibrant and dynamic. To sustain the market growth and crystallize the increased awareness and interests of a discerning and growing pool of investors, it was essential to overcome the inadequacies and curb the malpractices in the market. It can be observed from the global experience that capital markets cannot develop in a healthy manner without effective regulations for disclosures, listing, trading, liquidity, intermediation, settlements, accounting, etc. The regulatory policy must focus on visible and effective maintenance of market discipline and professionalization of intermediation and support services.

The Government felt the need to set-up a regulatory body to ensure investor protection and promotion, and growth of vibrant securities market. The Securities and Exchange Board of India (SEBI) was constituted on 12th April, 1988 as a result and established as a statutory body on 21st February, 1992. Regulation of the Indian securities market required the SEBI to simultaneously perform both disciplinary and developmental roles. The two roles ought to be complementary and carefully synthesized. The disciplinary dimension involves providing for disincentives and penalties for errant and unfair behavior which harm the market. The development dimension is a positive aspect that involves providing incentives to market participants to engage in a constructive role. The functions of the financial markets and their regulation are briefly discussed hereunder.

REGULATION OF FINANCIAL MARKETS

Historical Perspective

The securities market in India has a long history spanning over a century. The Bombay Stock Exchange is the oldest stock exchange with its origin in the informal trading of stocks in the 1850s and 60s. Its formal operations commenced in 1875. Prior to independence the securities market was largely unregulated. In 1947, the Capital Issues (Control) Act was passed which formalized and continued its control over the issue of securities imposed during the second world war. This Act was administered by the Office of the Controller of Capital Issues (CCI), which was a part of the Ministry of Finance in the Central Government. In 1956 The Securities Contract (Regulation) Act, 1956 (SCRA) was enacted, which brought stock exchanges, their members and contracts in securities that could be traded, under the regulation of the Central Government through the Ministry of Finance.

In India, companies are incorporated, regulated and liquidated under the purview of The Companies Act, 1956. This Act is administered by the Department of Company Affairs (DCA) in the Ministry of Law, Justice and Company Affairs of the Central Government. The Companies Act, 1956 specifies the form and contents of the prospectus required to accompany an issue of securities. Legislations were also enacted to provide statutory role to Chartered Accountants, Cost Accountants and Company Secretaries. Matters relating to form and contents of financial statements and other matters relating to the disclosures of information to the members are governed by DCA, and in some instances through the professional bodies.

During the first four decades of independence, the securities markets in India remained in the backwaters of the Indian financial system. The capital markets did not develop in consonance with the rest of the economy due to the limitations imposed on the role of the private sector and the control on issue of securities.

Dilution of the holdings of multinational companies at low prices in the late seventies kindled the interests of the lay investors. However, the interests soon dampened and could not be sustained for long. It was not until the middle of the next decade that the interest was rekindled again and became widespread to have a palpable impact on the growth of the securities market. The changes introduced in the economic policies of the late eighties also provided an active stimulus to the market. Besides, paucity of resources of the financial institutions, hitherto the sole purveyors of long-term capital, forced companies to tap capital markets.

However, the trading and settlement infrastructure was poor and the disclosure norms were largely of an ad hoc nature. This was accompanied by very poor enforcement of regulations and penal action was hardly initiated against violators.

It is in this context that the need was felt for a single independent regulatory body empowered to supervise and regulate the securities market. Thus, Securities and Exchange Board of India (SEBI) was set-up initially as an administrative arrangement and later as a statutory body.

A major task of SEBI is to provide reassurance that it is safe to undertake transactions in securities. It was empowered adequately and assigned the responsibility to (a) protect the interests of investors in securities, (b) promote the development of the securities market, and (c) regulate the securities market. Its regulatory jurisdiction extends over corporates in the issuance of capital and transfer of securities, in addition to all intermediaries and persons associated with securities market. All market intermediaries are registered and regulated by SEBI. They are also required to appoint a compliance officer who is responsible for monitoring compliance with securities laws and redressal of investor grievances.

To achieve these objectives, SEBI maintained a continuous interface with the stock exchanges on various issues related to investor protection, improvement in the quality of intermediation and building an automated market infrastructure. SEBI extends its control over the 22 stock exchanges in the country. In this area, SEBI has directed its efforts towards encouraging the stock exchanges to become effective self-regulatory organizations.

Since its inception, SEBI has initiated more programs for the development of capital markets rather than acting as watchdog (Table 1). Perhaps this attitude of SEBI is responsible to a certain extent for market volatility.

Table 1

Developments	Shortcomings
Transformation of the trading, clearing and settlement infrastructure.	No dent on price manipulation.
Transformation to a paperless market and transparent trading system.	Poor rate of conviction and very few cases of exemplary penal action.
Introduction of rolling settlement – cutting the settlement cycle.	No due process for framing or changing regulations.
Setting up of the Central Listing Authority.	Waking up to trouble spots too late in the day.
Introduction of derivative trading.	Turning a blind eye to bullish markets.
Use of Greenshoe option for IPOs through book building route.	Inadequate implementation of existing disclosure norms.
Demutualization of stock exchanges.	Regulatory bias towards corporate sector and large investors.

Source: Treasury Management, July 2004.

Despite all the changes in the equity market, there have been some spectacular cases of fraud and market manipulation in the securities markets in the 1990s. The equity market suffered from a series of crises both major and minor. The most important of these were the four crises of 1995, 1997, 1998 and 2001[1]:

- In 1995, the Bombay Stock Exchange closed for three days in the context of payments problems on M. S. Shoes.
- In 1997, there was a scandal where CRB Mutual Fund defrauded its investors, which cast doubts upon the supervisory and enforcement capacity of SEBI and RBI.
- In Summer 1998, there was an episode of market manipulation involving three stocks (BPL, Sterlite, and Videocon). A variety of questionable methods were employed at the BSE to avoid a failure of settlements. The actions partly led to the dismissal of the BSE President by SEBI.
- March 2001, saw the second dismissal of a BSE president, the dismissal of all elected directors on the Bombay Stock Exchange and the Calcutta Stock Exchange, and payments failures on the Calcutta Stock Exchange.

The most common feature in all crises discussed above is the leveraged market manipulation. Investigation has revealed many situations where the administrators of the securities exchanges failed to enforce the stated rules, or explicitly violated rules.

All the above discussed crises have had significant negative effects on the stock market either in terms of price or liquidity. The most important challenge to the policy maker at this stage has been that of addressing this vulnerability to crises. To protect the stock market from further crisis, it was imperative to identify the proper market design.

However, after these major scandals, SEBI was bent upon adopting more stringent regulatory measures to benefit all the market participants but these regulatory developments have certain shortcomings also (see table 1). Now the question is whether or not these regulatory measures play a constructive role in protecting the hard money of the investor.

The appointment of Ghyanendra Nath Bajpai as the Chairman, SEBI and securities market regulator in February 2002 was received with a cheer in the market. Being proactive, SEBI and Bajpai have set a new order in the Indian securities market.

The foremost aim of Bajpai was to restore investor confidence. For this, he spelt out a four-pronged game plan of information sharing, corporate governance, enforcement and investor education. The first pillar, information sharing, involves a need for disclosures that are adequate, appropriate and potent enough to help the investor make choices and maintain trust in the market. Corporate governance, the second pillar, should not be just another function of an organization but should be of trust, since investors have entrusted their money to corporations. Enforcement of SEBI regulations, the third pillar, would help ensure that violators are kept at bay, and reassure the investors that violators would be punished. The fourth pillar, investor education, has to be widespread i.e., investors should be able to interpret and make use of the information available.

SEBI has drawn a comprehensive 'Strategic Action Plan' that enables more disclosure, a greater degree of enforcement and the strengthening of the capital market structure. The plan envisages achievement of strategic aims laid down for: (a) investors, (b) corporates, (c) markets, and (d) regulatory regime. The Strategic Action Plan has identified four key spheres and has set strategic aims for each of them.

1 Ajay Shah and Susan Thomas "Policy Issues in the Indian Securities" 2001

By opting for a "big bang" approach in announcing these reforms, rather than slow reforms, SEBI has also dexterously avoided falling prey to any resistance from the market players, who otherwise would have built up pressure had they anticipated that the regulator was planning such a sequel of reforms. In August 2003, SEBI barred Samir Arora, the famed fund manager of Alliance Capital Mutual Fund, and the FII/sub-accounts of US-based Alliance Capital Management, from trading directly or indirectly in the capital market with allegations of insider trading. The ban on Samir Arora is an example that Bajpai is not diffident about exercising the powers vested in SEBI.

SEBI is now reviewing all old regulations and introducing modifications, wherever necessary. There is an expansion of the derivatives segment, the corporatization and demutualization of the bourses, the central listing authority, sweat equity norms, delisting norms, etc. It has also undertaken a partial implementation of straight through processing since December 2002, while most other markets across the world still have delivery-against-payment systems. It has already amended the takeover code and modified the portfolio management services guidelines. Disclosure standards have been improved: initial public offer documents are becoming more streamlined with more information on business and revenue models. As far as corporates are concerned, it has streamlined accounting standard requirements. For mutual funds, it has laid down comprehensive risk management guidelines, an unprecedented move even on a global level.

Previously, when SEBI committees made recommendations there were accusations that they reflected the views of certain people with vested interests. Therefore, SEBI now posts the reports of the committees on its website and invites comments and suggestions from the general public. These are small changes, but they will certainly have a profound effect on the investors' confidence. Investors can now give valid comments and suggestions. SEBI's orders are put on the website, so that all categories of investors know the reasons behind the orders issued. The intention is to make regulatory decision-making totally transparent.

At SEBI, Bajpai has taken up organizational restructuring to induce efficiency and harmonize its activities. A number of new divisions have been created and people have been moved around and homogeneous activities have been consolidated. Bajpai's teams undertook inspections of large brokers with an unprecedented scale of actions against them. In 2002-03, 135 brokers and 58 sub-brokers were inspected, 122 had their registrations cancelled and 24 were suspended. In 2002-03, SEBI filed 229 prosecutions against 848 persons and passed 561 orders – a record in SEBI's history. The institution has added strength to surveillance and investigation that is effective enough to visualize in advance what is happening in the market and identifies any lapses and takes proactive steps. SEBI has won the right to undertake search and seizure operations for insider trading and market manipulations but with the rider that only the Chairman or a magistrate can authorize such an exercise[2].

Philosophy of Regulations

Markets depend upon credibility and fairness. A sound regulatory framework is expected to provide transparency, maintain market integrity, fairness and ensure investor protection. A school of thought believes that markets are inherently efficient and over-regulation leads to inefficiency in the market. This school of thought argues for minimal or no regulations. However, it is seen that lack of adequate regulations can lead to manipulations and market abuses, which endanger the market integrity and damage the investors' confidence. In addition, fairness in the market is essential for price discovery, which in turn leads to better investor participation. Regulation also helps in reducing the systemic risk in the market.

2 Portfolio Organizer, March, 2004

The perception of sound regulation is as important as the reality of regulation. The very existence of a regulatory body improves the confidence of the market participants and investors.

Objectives of SEBI

According to the preamble of the SEBI Act, 1992, the objectives of SEBI are threefold:

- To protect the interest of the investors in securities.
- To promote the development of securities market in India.
- To regulate the securities market.

ORGANIZATION OF SECURITIES AND EXCHANGE BOARD OF INDIA (SEBI)

The Securities and Exchange Board of India organizes its affairs through a board. The board consists of the following members:

a. A Chairman.

b. Two members from amongst the officials of the Ministry of the Central Government dealing with Finance and Administration of the Companies Act, 1956.

c. One member nominated by the RBI from among its officials.

d. Five other members, nominated by the Central Government, of whom at least three shall be whole-time members.

The Chairman and the members should be persons of ability, integrity and standing who have shown capacity in dealing with problems of the securities market. They are required to have good knowledge or experience in the areas of finance, law, economics, accountancy, administration, or any other discipline deemed useful by the Central Government.

SEBI also has four advisory committees for primary market and secondary market derivatives markets and for mutual funds to provide advisory inputs in framing policies and regulations. These committees constitute the market players, recognized investor associations and eminent persons associated with capital markets. These committees are non-statutory and their advice is only recommendatory in nature.

Departments of SEBI

Under its internal administrative arrangements, SEBI is divided into various departments in order to concentrate on various aspects of the securities market. These departments are as follows:

i. **Primary Market Department:** This department looks after the policy matters and regulatory issues concerning the primary market. The department is responsible for regulations regarding underwriters, registrars to issue, credit rating agencies, share transfer agents, debenture trustees, merchant bankers, bankers to an issue and portfolio managers. The department also deals with disclosure norms and investor protection and regulations regarding various SROs.

ii. **Secondary Market Department:** All the regulations and protection of secondary markets is done through this department. Regulations and committees regarding stockbrokers, sub-brokers, delisting of securities, demutualization and corporatization of the stock markets are handled by this department.

iii. **Venture Capital Department:** The venture capital department, as the name suggests, is entrusted with the job of regulating Indian and foreign venture capital firms.

iv. **Mutual Funds Department:** The Mutual Funds Department is responsible for the regulation of mutual funds that operate in the securities market.

v. **Collective Investment Schemes Department:** This department regulates the Collective Investment Schemes (CIS). Any scheme or arrangement made or offered by any company under which the contributions, or payments made by the investors, are pooled and utilized with a view to receive profits, income, and produce or property, is managed on behalf of the investors is a CIS.

vi. **Takeover Department:** This department takes care of the substantial acquisition of shares and takeover of companies.

vii. **Legal Department:** The legal department undertakes the job of providing legal advisory services to the organization. It also handles all litigations and other legal issues.

viii. **Foreign Institutional Investors Department:** The Foreign Institutional Investors Department regulates the registration and functioning of all FIIs in India.

ix. **Depositories Department:** Regulation of Depository Participants (DPs) and Custodians of Securities is done by this department.

x. **Derivatives Department:** This department regulates and promotes the market for derivative instruments.

xi. **Investigation, Enforcement and Surveillance Department:** This department is the watchdog of the securities market. Its responsibilities include investigating and surveying security markets and their transactions to catch persons involved in acts proscribed by the SEBI Act.

The head office of SEBI is located at Mumbai and it has established regional offices at New Delhi, Kolkata and Chennai.

FUNCTIONS OF SEBI

According to the SEBI Act, 1992, the main functions of SEBI are:

1. Regulating the securities market.
2. Recognition and regulation of the Stock Exchanges.
3. Registering and regulating the working of various intermediaries including merchant bankers, registrars, share transfer agents, stock brokers, sub-brokers, debenture trustees, bankers to the issue, underwriters, portfolio managers, etc.
4. Registering and regulating the functioning of depositories, custodians and depository participants.
5. Registration of Foreign Institutional Investors.
6. Registering and regulating the working of Venture Capital Funds, Mutual Funds and other collective investment schemes including plantation schemes.
7. Promotion and Regulation of Self-Regulatory Organizations.
8. Prohibiting fraudulent and unfair trade practices relating to the securities market.
9. Prohibiting insider trading in securities.
10. Regulating substantial acquisition of shares and takeover of companies.
11. Promoting investor education and training of intermediaries.
12. Conducting research relating to securities market.

13. Call information, undertake inspection, conduct inquiries and order audit of stock exchanges, intermediaries, mutual funds or any other person associated with the securities market.

14. Perform the functions and exercise the powers of the Central Government under The Securities Contract (Regulation) Act, 1956. These powers have now been delegated to SEBI.

POWERS OF SEBI

For the purpose of regulation of the securities market, SEBI has been vested with all the powers of a Civil Court as per Code of Civil Procedure, 1908. The powers include:

i. The discovery and production of any books of accounts and other documents.

ii. Summoning and enforcing the attendance of persons and examining them on oath.

iii. Inspection of any books, registers and other documents.

iv. To inspect any book, register, other documents and records of a listed company or a public company (not being any of the intermediaries mentioned above) intending to get its securities listed on a stock exchange where the Board suspects the company of indulging in insider trading or fraudulent and unfair trade practices related to the securities market.

v. Issuing commission for the examination of witnesses or documents.

vi. During an investigation or a pending enquiry, in order to protect the interests of investors or the securities market, the Board may

   a. Suspend trading of a stock in a stock exchange.

   b. Restrain persons from accessing the securities market and prohibit any person associated with the securities market to buy, sell or deal in securities.

   c. Suspend any office bearer of any stock exchange or self-regulatory authority.

   d. Impend and retain the proceeds or securities of any transaction under investigation.

   e. Attach after the specified process, for a period not exceeding one month, the bank account(s) or any intermediary or person associated with the securities market in a matter involving violation of the provisions of the SEBI Act.

   f. Direct any intermediary or person associated with securities market not to dispose of or alienate an asset forming past of any transaction under investigation.

   The Board may take any of the measures in clause (d), (e) and (f) in respect of any listed company or a public company intending to get its securities listed, where it suspects the company to be indulging in insider trading or fraudulent and unfair trade practices relating to the securities market.

vii. With respect to prospectus, offer documents and advertisements soliciting money, the Board may for the protection of investors,

   a. *Specify by regulation*

      – Matters relating to issue of capital, transfer of securities and matters incidental thereto.

      – The manner in which such matters are disclosed.

b. *Specify by special orders*

- Prohibit any company from issuing prospectus, any offer document or issue advertisements, soliciting money for issue of securities.
- Specify the conditions subject to which these documents can be issued.

viii. The Board may specify the requirements for listing and transfer of securities.

In addition to the above, the other powers of SEBI are:

- Levy penalties for certain offenses.
- Levy fees and other charges.
- Issue orders/directions in the interest of investors or orderly development of securities market. However, such orders can be issued only after conduct of an inquiry.
- Hear appeals by companies against the decision of stock exchanges to refuse listing of their securities.
- Suspend or cancel the registration of any intermediary.

Appeal against SEBI Order

Any person aggrieved by an order of SEBI can file an appeal petition to the Central Government. Such appeal has to be filed within 30 days from the date of communication of the order. However, the Central Government may extend the period by a further 15 days if it is satisfied that the appellant had sufficient cause for not preferring the appeal within 30 days.

Major Steps Initiated by SEBI

REGISTRATION OF INTERMEDIARIES

Registration of almost all market participants in the securities market is made mandatory by SEBI. As of 31st March, 2002, the following categories and number of intermediaries were registered with SEBI:

Table 2: Number of Intermediaries Registered with SEBI

S. No.	Type of Market Intermediary	Number of Registered Intermediaries
1	Merchant Bankers	145
2	Underwriters	54
3	Portfolio Managers	47
4	Debenture Trustees	40
5	Bankers to an issue	68
6	Registrar to an issue and share transfer agent (Categories I and II)	161
7	Brokers	9,687
8	FIIs	490
9	Sub-accounts	1,372
10	Custodians of Securities	12
11	Mutual Funds (Public Sector)	9
12	Mutual Funds (Private Sector)	29
13	Domestic Venture Capital Funds	34
14	Foreign Venture Capital Funds	2

Source: SEBI.

All sub-brokers and credit rating agencies also need to compulsorily register themselves with SEBI.

In addition to the above, SEBI brought Sub-brokers and Credit Rating Agencies within the registration framework. SEBI has made registration of sub-brokers vide SEBI (Stock Brokers and Sub-Broker) Rules, 1992 mandatory. The problem of unregistered sub-brokers continues to prevail due to operational constraints in implementing the rules. Hence, SEBI has decided that stamping of transfer deed by an unregistered sub-broker would render the delivery void. Further, SEBI has cautioned the investors not to deal with unregistered sub-brokers as this would deny them access to arbitration and other grievance redressal mechanism of stock exchanges, in case of any dispute.

SUB-BROKERS

As regards the regulation of sub-brokers, Section 11(2) of Securities and Exchange Board of India Act, 1992 provides that SEBI shall register and regulate the working of stockbrokers and sub-brokers. In fulfillment of the above, SEBI carries out inspections of the books and records of stock-brokers to verify whether:

- Books of accounts, records and other documents are being maintained in the manner specified by the Securities Contracts (Regulation) Rules, 1957 and SEBI (Stock Brokers and Sub-Brokers) Regulations, 1992.
- The provisions of the SEBI Act, the Securities Contracts (Regulation) Act and the provisions made thereunder are being complied with by the broker.
- Adequate steps for redressal of grievances of the investors are being taken and the conditions of registration as a stockbroker are complied with.

According to the SEBI (Credit Rating Agencies) Regulations, 1999, it is mandatory for a credit rating agency to get itself registered with SEBI in order to rate securities of listed and unlisted companies desirous of getting their securities listed on a recognized stock exchange.

The process of mandatory registration brings about some entry barriers for the intermediation industry. The norms include minimum capital adequacy, adequate infrastructure, association of qualified and experienced personnel, etc. This enables SEBI to effectively monitor their functioning and enforce the regulatory fiats.

REDRESSAL OF INVESTOR GRIEVANCES

In its pursuit of protecting the interests of investors in securities and the promotion and development of securities in the country, SEBI has a comprehensive investor grievances redressal mechanism. A standardized complaint format is available at all offices of SEBI and on the SEBI website for the convenience of investors. The complaints received from investors are acknowledged and a reference number is sent to the complainant. Complaints are taken up with the companies concerned. The SEBI officers also hold meetings with the company officials to impress upon them their obligation to redress the grievances of investors. Recalcitrant companies are referred for prosecution. During its decade long functioning, the SEBI received more than 27 lakh grievances from investors. Of these, nearly 26 lakh grievances were redressed by the companies, which indicate a redressal rate of 94.86 percent. This shows the commitment of SEBI towards investor services in order to achieve the goal of its formation.

REGULATIONS REGARDING BUY-BACK OF SECURITIES

SEBI issued regulations for the buy-back of listed securities, which came into force in 1999. A listed company, after passing a special resolution to such effect, may buy-back its specified securities by any of the following methods:

a. From existing security holders on a proportionate basis through a tender offer.

b. From the open market through book-building process and/or stock exchange.

c. From odd-lot holders.

However, a company shall not buy-back its shares from any person through negotiated deals, whether on or of the stock exchange or through spot transactions or through any private arrangements.

All such shares bought back shall be physically extinguished or, if they are already dematerialized, destroyed by the manner prescribed by SEBI (Depositories and Participants Regulations), 1998. The company cannot hold such shares as investments.

SEBI has also recognized investor associations to further the cause of investor protection. The following Investors' Associations were registered with SEBI as on March 31, 2002:

i. All Body Corporate Shareholders' Forum, Hyderabad.

ii. Consumer Education and Research Society, Ahmedabad.

iii. Ghatkopar Investors' Welfare Association, Mumbai.

iv. Investors' Grievances Forum, Mumbai.

v. Jagrut Grahak Mandal, Patan (Gujarat).

vi. Kovai Investors' Association, Coimbatore.

vii. Midas Touch Investors' Association, Kanpur.

viii. Tamil Nadu Investors' Association, Chennai.

ix. The Gujarat Investors' and Shareholders' Association, Ahmedabad.

The use of Consumer Courts to bring class action suits against erring issuers is being encouraged. SEBI is educating the investors and making them aware of the availability of institutional mechanisms to solve their problems.

PRIMARY MARKETS

The major change brought about by SEBI in the primary markets was the improvement in the quality of disclosure norms for IPOs or listed companies raising additional capital through the securities markets. SEBI's attempts are directed towards ensuring full and fair disclosure by issuers. SEBI has also set a standard for companies that can issue securities through the securities market. An unlisted company, in order to issue its securities, has to have a pre-issue net worth of Rs.1 crore in 3 out of the last 5 years, and should have made profits in at least 3 out of the preceding 5 years. Also, the issue size must not exceed 5 times the companies' pre-issue net worth. There is no restriction of pricing of issues, though issuers have to justify pricing in the offer document. Further, SEBI has prohibited companies from giving future profitability projections in the offer document, to prevent investors from being misled. The offer document issued by companies has come under the ambit of SEBI regulations. The SEBI (Disclosure and Investor Protection) Guidelines 2000 stipulate the contents of the offer document. It also contains the post-issue obligations of the issuer.

Filing all the offer documents with SEBI has been made mandatory. SEBI reserves the right to direct any amendment to the draft offer documents within 21 days from filing the draft. SEBI has also decided to treat all the offer documents filed with it as public documents and put the same on Internet. This enables SEBI to deal with public complaints of misstatements before the issue opens for the public. SEBI has now delegated the task of vetting the offer document to the Lead Manager. The Lead Manager is required to exercise due diligence with regard to the accuracy and adequacy of the disclosures made in the offer document.

SEBI has allowed issuer companies to access the market through book building. Book building facilitates the process of price discovery and also reduces transaction costs. SEBI has raised the limits for listing on regular stock exchanges to Rs.5 crore. Issues below Rs.5 crore in size are permitted to be listed only on OTCEI. As market making is mandatory to list on OTCEI, this move provides liquidity to securities of small cap companies. SEBI issued guidelines for issue related advertisements to prevent fraudulent inducements to invest. It permits reservation for certain categories of investors of public issues both on firm and competitive basis. Further, in case of private placement of equity by listed companies, it has directed that they take place only at market related prices.

SECONDARY MARKETS

The ability of companies to mobilize capital from the market depends, to a large extent, on the efficiency and liquidity of the secondary market. Investors must have confidence that they will be able to exit from the investment at prices reflective of its future earning potential. The main focus of SEBI's efforts have been the modernization of market infrastructure and to introduce risk containment measures.

The major reform initiated by SEBI is to direct all the stock exchanges to introduce online screen based trading. By the end of 2002, there are 23 stock exchanges, accounting for 99.8% of the total trading in securities. SEBI introduced on-line screen based trading at BSE & NSE. Further, to ensure effective clearing mechanism, SEBI has directed all stock exchanges to set-up clearing house/clearing corporation to settle all trades only through them. By the end of 2002, 24th stock exchange called the 'Capital Stock Exchange, was set-up, and all the 24 stock exchanges set-up clearing houses while the NSE has set-up a clearing corporation viz. National Securities Clearing Corporation Ltd. NSCCL assumes the counterparty risk for all the trades executed on the capital market segment of NSE. SEBI has also advised the stock exchanges to set-up a Trade Guarantee Fund. This would ensure timely completion of settlement in the event of defaults by member brokers. Rolling settlements have been introduced in BSE and NSE from July 2, 2001. The carry forward system has been discontinued. The system of margin collection has been streamlined and the concept of mark-to-market margin has been introduced. A number of checks and balances have been introduced in the modified system to prevent its abuse. SEBI has also introduced the Stock Lending Scheme to facilitate timely delivery of securities. The introduction of depositories has helped to overcome the problems of bad deliveries and reduce the transaction costs. SEBI is encouraging the investors to dematerialize their holdings.

SEBI has introduced capital adequacy norms for brokers. Further, SEBI has directed that the upper limit for gross exposure would be fixed at 20 times the sum of their base minimum capital and additional capital. This is in addition to the intra-day trading limits of 33 1/3 times the sum of their base minimum capital and additional capital. SEBI has been encouraging the process of corporatization of broking houses. As on 31st March, 2002, 3682 of the 9687 registered brokers were corporate entities, representing approximately 38% of the total.

SEBI has directed stock exchanges to amend their listing agreements to enforce continuing disclosures. The cash flow statement, which is a part of financial statements in several countries, is not mandatory under the Companies Act, 1956. The inclusion of cash flow statement has been made a condition for continuation of listing. The listing agreement has also been modified requiring companies to provide shareholders with complete unabridged accounts. Companies have been directed to disclose actual utilization of funds and actual profitability against the projected utilization of funds and profitability projections given in the offer document. SEBI has also accepted the Bhave Committee Recommendations for quarterly disclosure of financial performance and disclosure of material events by companies immediately after their occurrence.

DERIVATIVES MARKET

The term "Derivative" indicates that the instrument has no independent value, i.e., its value is entirely "derived" from the value of the underlying asset. The underlying asset can be securities, commodities, bullion, currency, livestock or anything else. The term Derivative has been defined in Securities Contracts (Regulations) Act, as "A Derivative includes:

a. A security derived from a debt instrument, share, loan, whether secured or unsecured, risk instrument or contract for differences or any other form of security;

b. A contract which derives its value from the prices, or index of prices, of underlying securities".

Though derivatives were in use in the US capital markets since the seventies, they were introduced in India only in the 21st century. SEBI, in 1996, constituted a committee under the chairmanship of Mr. L C Gupta to develop appropriate regulatory framework for derivatives trading in India. Consequently, in the year 2000, SEBI permitted the NSE and BSE to commence trading in index futures contracts based on the S&P CNX Nifty and BSE 30 (Sensex). This was followed by the approval to trade in options in these two indices and options on individual securities in June and July 2001 respectively. Futures contracts on individual stocks were launched in November 2001.

SEBI has allowed for only screen-based trading in the derivatives market, and the minimum contract size is Rs.2 lakh. Two types of margins are allowed in derivatives trading; the initial margin, which is the higher of 'worst case scenario + calendar spread charges' or short option minimum charge, and the 'mark-to-market' margin, which is calculated based on certain formulae.

SEBI has taken many measures to protect investors in derivatives market. The investors money is to be kept separately by the trading member and cannot be used against the liability of the member or another investor. The trading member has to supply each investor with a 'risk disclosure document' that explains the risks associated with the derivative instrument he is investing in.

Since its inception, growth in the trading of derivatives instruments in the market has been substantial. The average monthly volumes of derivatives trades are Rs.50,000 crore; with the single day all-time high of Rs.4,172.26 crore on 1st March, 2003 on the NSE.

REGULATIONS REGARDING SUBSTANTIAL ACQUISITION OF SHARES AND TAKEOVERS

In order to tackle the loopholes in the Indian market for corporate control, and protection of the interests of minority shareholders, SEBI has issued regulations regarding the substantial acquisition of shares and takeovers.

The regulations stipulate that when an acquirer acquires share to make his total holding equal to 5 percent, 10 percent or 14 percent of the shares or voting rights or a combination of both, shall disclose, at every stage, the aggregate of his shareholdings or voting rights in the company to the target company and to the stock exchange where the shares of the target company are listed.

When the acquirer's stake reaches 15% or more voting rights of the company, such an acquirer has to make an open offer for an additional 20% stake in the target company. If such a public offer results in the public shareholding being reduced to 10% or less in the target company, or already the public shareholding is 10% or less, the acquirer shall either make an effort to buy the outstanding shares remaining with the public in accordance with the delisting guidelines issued by the SEBI or undertake to disinvest its shares so as to satisfy with the listing agreements. Also, no acquirer who has acquired, with the provisions of law, more than 15% but less than 75% of the shares or voting rights of the company shall acquire additional 5% of the shares in any financial year, without making a public announcement to that effect.

REGULATIONS REGARDING CORPORATE GOVERNANCE

In line with its endeavor to promote the capital markets and protect investors, the SEBI had appointed a committee, headed by Mr. Kumar Mangalam Birla to recommend certain practices for corporates to improve their corporate governance. Focus on corporate governance and related issues is an inevitable outcome of a process, which leads firms to increasingly shift to financial markets as the pre-eminent source of capital. In the process, more and more people are recognizing that corporate governance is indispensable to effective market discipline. Strong corporate governance is thus indispensable to resilient and vibrant capital markets and is an important instrument of investor protection. The benefits of higher corporate governance are mutual, as studies of firms in India and abroad have shown that markets and investors take notice of well-managed companies, respond positively to them, and reward such companies with higher valuations. This committee has recommended some practices that are mandatory on all listed companies, and other recommendations that are advisory in nature.

The main recommendations of this committee are:

i. The composition of the Board of Directors in terms of independent and non-independent directors and executive and non-executive directors.

ii. The definition of independent directors.

iii. Setting up of an audit committee comprising the Board members. It also recommends the composition, powers, functions, frequency of meetings and quorum of such committees.

iv. Disclosure norms regarding remuneration to the Board.

v. Guidelines for the disclosure of Management Discussion and Analysis to be given in the annual report.

vi. The responsibilities and rights of institutional as well as other shareholders.

Implementation of the above recommendations were done in a phased manner and now all the mandatory recommendations are in force.

EMERGENCE OF INSTITUTIONAL INVESTORS

From 1964 to the late eighties, the Unit Trust of India (UTI) was the only institutional investor in the Indian securities market. It was created through an act of parliament to channel small savings of citizens both to speed up the country's industrial growth and offer citizens better returns than other investment options. The liberalization of the Indian economy and the subsequent entrance of private mutual funds changed all this. Since 1993, about 30 mutual funds have started operations. SEBI, in 1996, had come out with the SEBI (Mutual Funds) Regulations. Under these regulations, a mutual fund has to register itself with SEBI in order to deal in the securities market. The regulation also stipulates that all mutual funds are to be incorporated in the form of trusts, and consist of an Asset Management Company (AMC) and a custodian. The regulations also cover the investment objectives, investment and borrowing restrictions, valuation of investment, computation of the Net Asset Value (NAV) and pricing of the units.

The year 2001 was a watershed year in the history of the Indian mutual fund industry. In July that year, UTI froze purchase and sale of units of its flagship scheme US-64 for a period of six months, causing panic among many individuals as well as large institutional investors who had invested in UTI to avail themselves of tax benefits. Shelving its assured return quality, US-64 became a market-return NAV based mutual fund in January 2002. Its opening NAV was Rs.5.81 against the face value of Rs.10. In January 2003, the Government of India bifurcated the UTI into UTI I and UTI II. UTI I is managed by a public administrator, while UTI II was handed over to the State Bank of India, Punjab National Bank, Bank of Baroda and the Life Insurance Corporation, with each institution having an equal share in the company. It also came under the ambit of regulation by SEBI. UTI II was renamed UTI mutual fund in February 2003. As on 31st March, 2003, UTI AMC had under its management, 42 SEBI compliant schemes and 4 offshore funds, aggregating to a corpus of more than Rs.15,000 crore from about 10 million investor accounts.

As on 31st December, 2002, the mutual fund industry had Rs.1,22,600 crore worth of assets under management. Of these, Rs.45,899 core were those of UTI (before bifurcation), Rs.5,553 crore were those of Bank Sponsored AMCs, Rs.6,840 crore were those managed by institutional AMCs and Rs.64,308 crore, or more than 52% of the total assets under management was managed by private sector mutual funds. Among the private sector mutual funds, ICICI Prudential AMC was the largest company with Rs.10,538 crore worth of assets under management.

With regard to the assets under management under the categories of investment objectives, income funds were most popular with investors, garnering more than 63% of the total funds under management. The information about assets under management as on 31st December, 2002 as per investment objective, class and the percentages thereof is given below.

Table 3

Type	Assets under Management (in Rs. crore)	Percentage of Total Assets under Management
Income	77,469	63.19
Growth	14,371	11.72
Balanced	14,164	11.55
Liquid/Money Market	10,801	8.81
GILT	4,316	3.52
ELSS	1,479	1.21
Total	1,22,600	100.00

The mutual funds industry has grown at the rate of more than 20% in 2002, and is poised to grow at a similar rate for the foreseeable future.

Maintaining the Fairness and Integrity of the Markets

Before SEBI was formed, breach of regulations was the norm and compliance was an exception. To promote the investor's confidence it was vital to reverse the situation. SEBI sent a strong message to the market participants that strict observance of regulations was essential. The success of any regulator in exercising enforcement depends on its effectiveness in investigating market abuses and in imposing deterrent penalties. SEBI has been empowered to conduct inspections, investigate violation of regulations and take punitive actions.

SEBI has been authorized to enforce the prohibition of manipulative and unfair trade practices. Price rigging on the stock exchanges through fraudulent practices leads to loss of investor confidence. With the computerization of the trading and settlement system, it has become more difficult to abuse the process. It is virtually impossible to conceal the audit trail of such manipulations. SEBI has also directed the stock exchanges to set-up market surveillance systems backed by adequate infrastructure and manpower. The concept of circuit breakers and price bands has been introduced to check excessive volatility due to speculation. In addition, SEBI itself monitors and investigates irregular price movements.

It is difficult to prove cases of insider trading with conclusive evidence. The use, for profit, of privileged access to price sensitive information by insiders, before it is in the public domain, constitutes insider trading. In an effort to curb this malpractice, SEBI has issued SEBI (Insider Trading) Regulations, 1992 which empowers it to start criminal prosecution against the accused. In addition to this, SEBI has encouraged continuous disclosures and timely dissemination of price sensitive information.

Box 1: Anand Rathi Case: SEBI Decision

Anand Rathi, the former President of the Bombay Stock Exchange (BSE) and his firms were under Sebi probe on charges of seeking price-sensitive information from the surveillance department in March 2001 and allegedly using it to obtain pecuniary advantage for self and for his clients. In the final order The Securities and Exchange Board of India (Sebi) had

1. Imposed a two-year ban on Rathi from assuming any position of honour such as those of director or trustee of any capital market-related organizational entity. The action has been taken under Sec 11 and Sec 11B of the Sebi Act.

2. Suspended Rathi's two broking companies, Anand Rathi Securities and Rathi Capital and Securities, for a period of nine months. Thus, the firms had been barred from carrying out any business activity for a period of nine months. The action was taken under Regulation 26 of the Sebi (Stockbrokers and Sub-brokers) Regulations, 1992.

Source: http://www.domain-b.com/investments/markets/bse/index.html

SEBI has been empowered to carry out inspection of stock exchanges, market intermediaries, mutual funds, etc. The operations of stock exchanges are subject to regular inspection by SEBI. The focus of this inspection is on exchange administration, compliance with all the SEBI regulations and directives and enforcement by the exchange of its own rules, bye-laws and listing agreements. The various deficiencies noticed during the inspections are taken up with the Governing Board. Further, the SEBI nominees on the Governing Board are advised to pursue these matters. SEBI also conducts inspections at random on market intermediaries. In case, serious lapses or violations are noticed during inspections, inquiry proceedings are initiated. Appropriate punitive action like suspension or cancellation of registration is also taken. SEBI has initiated penal action against issuers for misstatements in the offer documents and against merchant bankers failing to exercise their due diligence obligations. In certain cases, SEBI has even directed the companies to refund the entire issue proceeds to the investors.

TAX ASPECT IN SECURITIES TRANSACTION

Tax on Long-Term Capital Gains

According to the existing provisions, securities held for a period of 12 months or more considered as long-term capital assets on transfer of which tax is to be levied on resulting capital gain.

The Finance Act, 2004 introduced a new tax known as Securities Transaction Tax which replaces tax on capital gains on transfer of securities.

Short-term Capital Gains: Short-term capital gains arising from transfer of securities on any recognized stock exchange in India will be taxable at 10%.

Carry Forward and Set-off of Losses: As per the existing provisions, loss from business and profession is allowed to set-off against income from salary.

As per the changes made in Finance Act, 2004 business losses will not be allowed to set-off against salary income.

Discouraging Dividend/Bonus Stripping

Existing Section 94(7) of the Income Tax Act, 1961, provides that, where any person buys or acquires any unit or security within a three-months period preceding the 'record date' and thereafter sells or transfers the same within a period of three months after such record date, and the dividend or unit income is exempt from tax; the loss, if any, arising from sale or purchase shall be ignored to the extent such loss does not exceed the amount of such income or dividend, while computing the assessable income of such person.

The holding period was enlarged to 'nine months after the record date'. And where bonus units are issued in respect of original units, any loss on the sale of original units will be ignored, and the amount of such loss shall be considered as the cost of acquisition of the bonus units. Thus, the proposal envisages preventing the practice of bonus stripping also. The provisions will come into effect from 1-4-2005 and are applied from the assessment year 2005-2006 (previous year 2004-2005).

Securities Transaction Tax (STT)(Section 10(38)): The new Section 10(38) provides for exemption on any income arising from the transfer of securities which are long-term capital assets, if the transaction of sale is entered into on a recognized stock exchange and levy of Securities Transaction Tax (STT) on such transactions.

The Securities Transaction Tax (STT) is leviable on taxable securities transactions entered into in a recognized stock exchange.

'Taxable securities transaction' means a transaction of purchase of securities entered into in a recognized stock exchange in India.

Value on Which Tax is Levied: For transaction relating to 'option in securities', value shall be the aggregate of the strike price and the option premium.

- For transaction relating to 'futures', value shall be the price at which such 'futures' is traded.
- For any other transaction, value shall be the price at which such securities are purchased.
- Every recognized stock exchange is made liable to collect the tax from the purchaser who enters into the specified transaction in that stock exchange.

Quantum of STT: Initially, the STT is @ 0.15% of the value of taxable securities transactions will be levied. Subsequently, some relaxations have been given by the Finance Minister on 22nd July, 2004.

There are two sets of intermediaries in the capital market. The first is the category of persons now subject to capital gains tax. The second set is those who now pay income tax on business profits. The rates of STT will be as follows:

PAN Compulsory for Securities Transaction

The Income Tax (Eighth Amendment) Rules, 2002 made it mandatory for a person to quote Permanent Account Numbers (PAN), issued by the income tax department, for securities transactions of over Rs.1 lakh.

Those who are now paying capital gains tax

Delivery-Based Trade in equity: The rate is being maintained at 0.15 percent i.e. 15 basis points. The levy of the tax will be split equally between the buyer and the seller.

Unitholders holding units in Equity-Oriented Mutual Funds: "Units" will be treated as "securities" and benefit of the new capital gains tax regime will be extended to such unitholders. Like any other equities traded on the stock exchange, they would have to pay STT at 0.15% (i.e., 15 basis points).

Those who are now paying income tax on business profits

Day-traders and arbitrageurs: The rate for these categories will be 0.015 percent (i.e., 1.5 basis points). They will be allowed to take credit for STT against business tax on profits.

Derivative traders (Futures and options): The rate for these categories will be 0.01 percent (i.e.1 basis point). They will be allowed to take the credit for STT against business tax on profits.

STT can be claimed as business expenditure: Credit for STT against business income tax will also be allowed in cases where business profits are declared on delivery based transactions.

Exemption to Bonds: Buying and selling bonds, including Government bonds, will be completely exempt from STT. Similarly, units of mutual funds other than equity-oriented funds will be exempt from STT.

In the case of transfer of unlisted securities which are not through sales entered into in a recognized stock exchange, the existing method of taxation of capital gains will continue to be applied.

Dividend Distribution Tax for Mutual Funds: The income distribution tax payable by Unit Trust of India and mutual funds under Section 115R (2) of the Act is presently at the uniform rate of 12.50 percent. This will continue, a new tax rate of 12.50 percent will apply to distributions made to individuals and HUFs. The rate for distribution to other entities will be 20 percent. This will take effect from 9-7-2004. In addition, education cess @ 2% is payable.

SELF-REGULATION OF THE MARKETS RETAINED AS IT WAS TILL THE END

There is no clear-cut and accepted definition of a Self-Regulatory Organization (SRO) in India. However, The Financial Services Act, 1986 of the UK states "A Self-Regulatory Organization means a body (whether a body corporate or an unincorporated association) which regulates the carrying on of investment business of any kind by enforcing rules which are binding on persons carrying on business of that kind either because they are the members of that body or because they are otherwise subject to control."

Self-Regulatory Organizations (SROs) form an important layer of the regulatory structure in the developed markets. The SRO model has been the most successful in the UK. There are 4 active SROs which come under the overall framework of Securities Investment Board (the equivalent of SEBI in the UK). There is an

Investment Management Regulatory Organization (IMRO) which is an association of Mutual Funds, the Securities and Futures Association (SFA) for stock brokers, the Financial Intermediaries Managers and Brokers Regulatory Authority (FIMBRA) for market intermediaries and the Life Assurance and Unit Trust Regulatory Authority (LAUTRO).

In India, SEBI has been attempting to accelerate the process of self-regulation and encouraging the formation of SROs. The following SROs have been formed in India by the various market participants:

i. Association of Merchant Bankers of India (AMBI)

ii. Association of Mutual Funds of India (AMFI)

iii. Registrars Association of India (RAIN).

Most of the stock exchanges also function as SROs though they have not been given that nomenclature. The important self-regulatory activities are:

Code of Conduct

Most of the SROs have a code of conduct for their members. Though a different code exists for each SRO, they normally include some common principles. All codes advise their members to observe the principles of fairness, integrity and ethics in their business dealings. They are advised to ensure compliance with all the laws and regulations. The members are expected to maintain high standards of professionalism and exercise independent professional judgment. They shall exercise due diligence and proper care while discharging their professional responsibilities. They shall not divulge any confidential information regarding their clients. They are also expected to consistently strive to upgrade their knowledge and skills.

Regulation of the Members

The SROs monitor the functioning of their members with regard to compliance of laws, statutory regulations as well as their own code of conduct. Disciplinary proceedings are initiated against members in case any lapses are noticed. Certain SROs also establish common professional standards to ensure uniformity in the functioning of their members.

Professional Matters

The SROs assist SEBI in formulation of policies as well as various regulations and rules. In addition, some SROs also provide for arbitration in cases of dispute among their members. SROs also conduct professional development and training programs for their members.

In addition to SROs at the institutional level, the individuals operating in the securities market are also governed by the professional body from which they acquire their professional qualification. The members of The Council of Chartered Financial Analysts (CCFA) operate in the securities market. The CFAs engaged in practice offering professional services like consultancy, portfolio management, research, etc., have to strictly abide by the Code of Conduct issued by the CCFA. The CFAs employed by firms operating in the securities industry are expected to maintain high standards of professionalism and ethical behavior in their professional dealings. They are governed by the Code of Conduct of their employers as well as that of the CCFA.

AMFI

The Association of Mutual Funds in India is an SRO (Self-Regulatory Organization) incorporated on August 22, 1995 by various mutual funds. As of March 2003, all 34 mutual funds in operation are its members. The vision of AMFI is, “Developing the Indian Mutual Fund Industry on professional, healthy

and ethical lines and to enhance and maintain standards in all areas with a view to protecting and promoting the interests of mutual funds and their unitholders." AMFI also undertakes investor education and training of agent distributors. The various committees within the AMFI are:

a. Committee on Valuation
b. Committee on Certification Program for Intermediaries & Employees
c. Committee on Best Practices
d. Committee on RBI Related Matters
e. Committee on Risk Management System for Mutual Funds
f. Committee on Registration of AMFI Certified Distributors, and
g. Committee on AMFI taking the Role of Self-Regulatory Organization (SRO).

To measure the success or failure of a mutual fund, its returns need to be compared to some benchmark. Mutual funds investing solely in equity compare to various equity indices like Sensex, Nifty, BSE-PSU and BSE-Teck, etc. For the benefit of mutual funds investing in debt and the money market, AMFI came out with the Mutual Fund Benchmark Indices in March 2002. All these indices have as their base, the prices as on 31st March, 2003. These indices are:

a. **Crisil Composite Bond Fund Index:** The Composite Bond Fund Index is a weighted average index that consists of tracking the returns on the constituents like the Call Index, the CP Index, the AAA Index, the AA Index and the Gilt Fund Index to arrive at the index figure.

b. **Crisil MIP Blended Index:** The MIP Blended Index consists of tracking the returns on the constituents in both the Equity and the Non-Equity sectors of the market. The equity sector is represented in the Index by the Nifty Returns whereas the returns of the Debt Sector are represented by the Composite Bond Fund Index, also designed by Crisil. It is also a weighted index.

c. **Crisil Balanced Fund Index:** The Balanced Fund Index consists of tracking the returns on the constituents like the Crisil Composite Bond Fund Index and the Nifty Index.

d. **Crisil Liquid Fund Index:** The Liquid Fund Index consists of tracking the returns on the constituents like the Call Index and the CP Index.

e. **I-Sec i-BEX:** Launched in 1994 by ICICI Securities Ltd. ICICI Securities' Sovereign Bond Index (i-BEX) currently comprises the most liquid fixed-coupon government securities and is thus representative of the Indian gilts market. i-BEX has emerged as the benchmark of choice across all classes of market participants – banks, financial institutions, primary dealers, provident funds, insurance companies, mutual funds and foreign institutional investors. To cater to the evolving needs of market participants, a new series of bond market indices have been introduced. The new indices along with a composite index have been chosen by AMFI as benchmark gilt indices for mutual funds.

f. **I-Sec Composite Index:** The ICICI Securities' Sovereign Bond Index (i-BEX) launched in 1994, currently comprises the most liquid fixed coupon government securities and is thus representative of the Indian gilts market. i-BEX has emerged as the benchmark of choice across all classes of market participants – banks, financial institutions, primary dealers, provident funds, insurance companies, mutual funds and foreign institutional investors. To cater to the evolving needs of market participants, a new series of bond market indices have been introduced. The new indices along with a composite index have been chosen by AMFI as benchmark gilt indices for mutual funds. The composite index is an average of Si-BEX, Mi-BEX and Li-BEX.

In addition to the development of these indices, AMFI publishes certain industry-relevant data in its year books, annual reports and quarterly updates. Data in the year book and quarterly updates includes latest regulatory information, industry statistics like sales during the period, new schemes launched, gross and net inflow/outflow of funds into the industry, total assets under management of various categories of schemes based on ownership (UTI, Private, Bank sponsored, etc.) and investment objective (income, growth, balanced, etc.). It also gives the total assets under management by each individual AMC. Furthermore, AMFI has prescribed a code of ethics to all member AMCs to endure fairness to investors and to avoid unfair competition and trade practices among various AMCs.

International Organization of Securities Commissions

IOSCO is an international organization of regulatory bodies of securities and SROs of various countries. The main purpose of forming IOSCO is to ensure coordination at the global level among the various national regulators. The Secretariat of IOSCO is located at Montreal in Canada.

The main objectives of IOSCO are:

- To cooperate and promote high standards of regulation in order to maintain just, efficient and sound markets;
- To exchange information on their respective experiences in order to promote the development of domestic markets;
- To unite their efforts to establish standards and effective surveillance of international securities transactions;
- To provide mutual assistance to promote the integrity of the markets by a rigorous application of the standards and by effective enforcement against offenses.

Membership

IOSCO has three categories of membership – ordinary member, associate member and affiliate member. A Securities Commission or a similar Government body is eligible for ordinary membership. If the national regulatory body of a country is already an ordinary member of any other regulatory body with responsibilities for securities regulation or has jurisdiction over any subdivisions of the securities market it can become an associate member. An SRO or an international body with interests in securities regulation is eligible to be the affiliate member of IOSCO.

Functioning of IOSCO

IOSCO members meet every year at an annual conference to discuss important issues relating to international securities and futures market. In addition, IOSCO functions through the committee system. Some of the important committees are:

– The President's Committee which is made up of the presidents of members (ordinary and associate) meets once in a year. The main purpose of this Committee is to achieve the objectives of IOSCO.

– The Executive Committee consists of 19 members and meets at periodical intervals. It looks after the day-to-day functioning of the organization and strives to attain the objectives.

– The Technical Committee, consisting of 16 members, addresses major regulatory issues and generates practical responses to these concerns. This Committee has set-up working groups to look into five major functional areas:

  - Multinational disclosures and accounting

- Regulation of secondary markets
- Regulation of market intermediaries
- Enforcement and exchange of information
- Investment management.

– The Emerging Markets Committee endeavors for the promotion and development of efficient securities and futures market in developing countries. It discharges its responsibilities by setting up minimum professional standards, facilitating exchange of information, transfer of technology and expertise and organizing training programs.

– The SRO Consultative Committee is constituted by the affiliate members of IOSCO. This Committee enables SROs to provide constructive and substantial inputs to the regulatory initiatives of the organization.

IOSCO also has four Standing Regional Committees to address specific regional issues of members. They are:

- The Africa and the Middle-East Regional Committee
- The Asia-Pacific Regional Committee
- The European Regional Committee
- The Inter-American Regional Committee.

SUMMARY

- A market is a location where buyers and sellers come into contact with each other to exchange goods or services. Markets can exist in different forms depending upon the nature of location and mode of contact. The essential features of a market are Existence of the buyers (demand side of the market) and the sellers (supply side of the market), Existence of price for every asset, Allocation of resources, Existence of regulatory mechanism.
- A sound regulatory framework is expected to provide transparency, maintain market integrity, fairness and ensure investor protection. The lack of adequate regulations can lead to manipulations and market abuses, which endanger the integrity of the market and damage the confidence of the investors.
- To fulfill the need of a single independent regulatory body empowered to supervise and regulate the securities market, the Securities and Exchange Board of India (SEBI) was set-up initially as an administrative arrangement and later as a statutory body.
- There are also some self-regulatory organizations present in the financial market; but there is no clear-cut and accepted definition of a Self-Regulatory Organization (SRO) in India. However, SEBI has been attempting to accelerate the process of self-regulation and encouraged the formation of SROs. Various market participants like Association of Merchant Bankers of India (AMBI), Association of Mutual Funds of India (AMFI) and Registrars Association of India (RAIN) are some of the main SROs formed in India.

Chapter IV

Equity Markets and their Structures

After reading this chapter, you will be conversant with:

- Markets and their Function
- Liquidity Capital Formation
- Evolution of the Equity Markets
- Development of Securities Market in India
- Security Market Indicators
- Major Stock Exchanges
- Integration of Stock Exchanges
- Listing of Securities
- Trading Procedure
- Compulsory Demat
- Clearing and Settlement Procedure

Introduction

In this chapter, we will study briefly about markets and their functions and then cover in detail the various nuances of the secondary market in India.

In studying about markets and their functions, we will acquaint ourselves with

i. What is meant by a market?

ii. Features of a market

iii. Efficiency of a market in terms of features like breadth, depth, etc.

iv. Classification of markets and

v. Functions of markets.

In case of secondary markets, we will deal with the following aspects:

- Development of stock market in India.
  (National Stock Market System)
- Organization and management of stock exchanges.
- Membership of stock exchanges.
- Trading procedure.
- Listing of securities.
- Transfer and Transmission of shares.
  - Common irregularities noticed in transfer deeds.
  - Guidelines for good or bad delivery of documents.

The secondary market is that segment of the capital market where the outstanding securities issued by the Central and the State Governments, public bodies, and corporate entities are traded. It is an open auction market where buyers and sellers meet and evolve a competitive price for the securities. Commenting upon the role and functions of a well-organized securities market, the former finance minister Shri CD Deshmukh observed, "The economic services which a well-constituted and efficiently run securities market can render to a country with a large private sector, operating under the normal incentives and impulses of private enterprise are considerable."

"In the first place, it is only an organized securities market which can provide sufficient marketability and price continuity for shares so necessary for the needs of the investors. Secondly, it is only such a market that can provide a reasonable measure of safety and fair dealing in the buying and selling of securities. Thirdly, through the interplay of demand for and supply of securities a properly organized stock exchange assists in a reasonably correct evaluation of securities in terms of their intrinsic worth. Lastly, through such evaluation of securities, the stock exchange helps in the orderly flow of distribution of savings as between different types of competitive investments."

This observation succinctly summarizes the role of a secondary market in a financial system.

The secondary market in India consists of twenty three stock exchanges recognized by the government under the Securities Contracts (Regulation) Act, 1956. These stock exchanges, operating under the rules, bye-laws, and regulations approved by the government, constitute an organized market for the outstanding securities.

MARKETS AND THEIR FUNCTIONS

A market is a location where buyers and sellers come into contact to exchange goods or services.

Markets can exist in different forms depending upon the nature of location and mode of contact. It can have a physical location where buyers and sellers come in direct contact with each other or a virtual location where the buyers and sellers contact each other employing advanced means of communication. There is another form of market where actual buyers and sellers achieve their objectives through intermediaries.

The essential features of a market are

1. Existence of the buyers (demand side of the market) and sellers (supply side of the market);
2. Existence of price for every asset;
3. Allocation of resources;
4. Existence of regulatory mechanism.

One of the essential features of a market is the existence of price for every asset. That is, the consumers have to pay a price to acquire an asset. How can one define price? It can be defined as a certain amount of money expected or given for the sale (exchange) of some asset. Another frequently used term in relation to markets is value. It can be defined as the quality or worth of an asset that makes it valuable. Quantitatively, to rate an asset considering its importance or usefulness (value), we assign it a numerical quantity in terms of money. Does this mean that price and value are one and the same? No. Value can be highly subjective. An asset can have different values in different situations for different persons and accordingly its price changes. So, value and price are related to each other and it can be said that value can be expressed in terms of price of an asset.

The reflection of true value of an asset in its price is an indicator to the existence of an efficient market. The following are some of the other salient features of an efficient market:

1. Breadth: By breadth we understand that there are a large number of rational participants with homogenous expectations in the market. The decision taken by any of these participants will not affect the market in a significant manner.
2. Depth: A market is said to have depth when the volume of securities traded (number of transactions) is very large. This ensures that an investor can enter and exit according to his preference and convenience.

   It essentially indicates the liquidity in the market.
3. Information arbitrage efficiency is said to exist if the participants do not have any scope to reap abnormal profits using information which is of common knowledge.
4. Fundamental valuation efficiency is said to exist if the price of an asset is equal to its intrinsic value. That is, the asset is neither overvalued nor undervalued.
5. Full insurance efficiency is said to exist, if participants can adopt hedging as an effective tool against possible risks in future.
6. Operational efficiency is said to exist, if the operating costs (administrative and transaction costs) are minimum possible to the participants, but still provide a fair return to the intermediaries for their services.
7. Allocational efficiency is said to exist, if the market channelizes resources into projects where the marginal efficiency of capital adjusted for risk differences is the highest. It means that funds flow to such investment opportunities where the returns, risk adjusted basis are highest.

Under these ideal conditions, the markets attain the equilibrium position. That is, the demand for assets matches (equals) their supply.

Classification of Markets

With reference to goods and services traded, the markets can be broadly classified as financial markets and commodities markets. Here, we look at only financial markets.

Financial markets can be broadly classified as

a. Securities markets and

b. Forex markets.

Further, the principal securities markets are

a. Markets for government securities

b. Money markets

c. Capital markets and

d. Derivatives market.

The discussion on exchange markets is beyond the scope of this book.

The Gilt-edged Securities (securities issued by government) are the most liquid securities one can think of. As regarding the money and capital markets, there is no statutory difference as such. But one perceives that in money markets, financial instruments whose maturity does not exceed a period of one year are traded, while in capital markets the maturity period usually exceeds one year.

In derivatives market, risk contract instruments like futures and options are traded.

The primary markets serve the purpose of raising funds in the form of new securities.

Secondary markets facilitate the existing (previously issued) securities to change hands among investors. That is, they facilitate maturity transformation (an investor has a certain idea of the period for which he can commit the funds. Usually, this period is not sufficient for the funds user to remit them back. Therefore, the investor has to find another investor who is willing to make available funds to the user. This he does by selling the securities issued by the funds user to the other investor.)

Functions of Markets

We will look at the functions of the markets taking into account their classification.

The function of primary market is to bring the savers and the users together resulting in transfer of funds from one to the other.

The functions of secondary markets are

1. That the investor should be able to dispose of his stock at the most competitive price. The most competitive price in case of selling is the highest price, while for buying it is the lowest price;
2. They should provide liquidity to the investors without any loss. That is, an investor should be able to convert stock into cash at a short notice;
3. That resulting transaction costs are minimum for the investor.

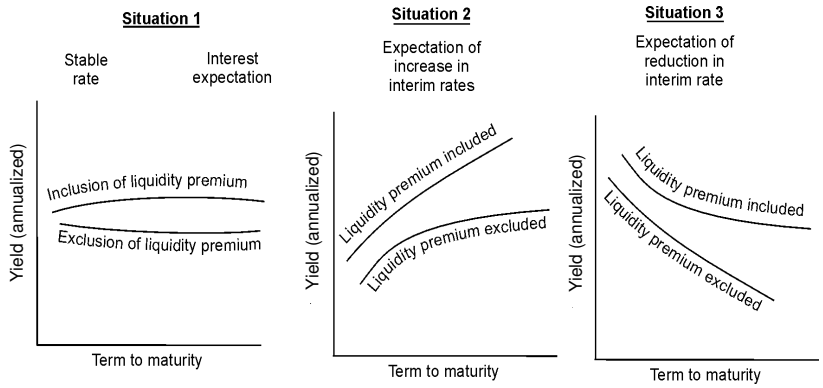
The function of the capital market is to provide funds to organizations on a long-term basis.

LIQUIDITY

Liquidity is one of the important considerations in the investment decisions. Investors prefer securities that are liquid so that they could easily convert them into cash. Securities with a short-term maturity will have higher liquidity. Some investors prefer to access lower return with high degree of liquidity. Obviously, investors prefer higher rate of return for lower liquidities. Liquidity is a critical factor which causes changes in yield curve depending on the investors' liquidity preferences. The institutional use of money market securities is to maintain adequate liquidity.

Preference for more short-term securities has pressure on the yield curve. This is known as 'liquidity preference theory'. The impact of liquidity premium will be different in three different situations. Impact is shown in the figure 1.

Figure 1



Estimation of Forward Rate based on Liquidity Premium

Regardless of the interest rate expectations, the yield curve is affected by the liquidity premium as seen in the figure 1. If we combine expectations theory* with the liquidity theory, the yield on a security will be more than the yield from investments in short-term security, over the same investment horizon. Existence of liquidity premium will have a bearing on the interest rate expectations. A flat yield curve indicates a slight decrease in interest rates.

LIQUIDITY RISK

Liquidity risk arises due to lack of marketability of securities. In a highly volatile interest rate environment, liquidity risk becomes a concern for both individual and institutional investors. In a rising interest rate scenario, investors prefer to hold short-term securities because of their liquid nature. The more liquid an asset the more demand it holds for investment.

CAPITAL FORMATION

Capital Formation has a significant role to play in the development of any economy. In any economy, there is a continuous inflow of money from various sources. The amount of capital formation in the economy during a given period is equal to the amount of investment that takes place in that economy during that period. In order to make investment, the company has to forego distribution of some (or all) of its profits, which could have been otherwise distributed among its shareholders. It decides to deploy a part of its surpluses in purchasing machinery, land or technology or for construction of buildings, roads or other infrastructural facilities. These types of investments undertaken by the companies add to the capital formation. The purpose of any investment is to increase the profit of the future periods. If the investments made now are successful, then the company will have a higher surplus in future periods and in turn will be able to make more and more investments. More and more profitable investments increase the strength of a company and help in the achievement of its objective of staying in the market. Speaking technically, if depreciation is included in the calculation of the capital formation, then it is called gross capital formation and if not, it is called net capital formation.

The company can invest its surplus funds partly or fully for purchasing machinery, building, land, etc. That is, the company can acquire fixed assets that have long-term value. In such a case, the capital formation is known as fixed capital formation. Similarly, the company may also invest in stocks of raw material, inventories or any

* Expectation Theory: The term interest rate structure is determined by the expectations about future interest rates.

other short-term investments. The latter type of capital formation is termed as short-term capital formation or change in inventories. From an economic point of view, fixed capital formation carries a greater importance than change in inventories.

The public sector enterprises play a significant role in the formation of capital because of size and accessibility to huge resources. The public sector enterprises have a significant amount of investment in fixed assets such as land, building, machinery, etc. Moreover, they operate in many areas where private investments are either not feasible or not forthcoming.

Domestic savings are major sources of funds for short-term and long-term finances in India. Banks are the basic source of funds available to the business enterprises. Domestic saving also plays a key role in meeting the requirement of the business enterprises through subscription to shares, debentures, etc. Therefore, role of domestic saving can never be secondary to any other factor where capital formation is concerned.

Successful investing requires clear-cut objectives and attractive target markets. If not, the investments in assets will not yield any profit. Over the past few years, the investment scenario in India has been encouraging. Because of growth in the consumer population, investment opportunities are also widening. A good investment climate always plays a catalytic role in boosting the capital formation in the country. This, in turn, depends on several factors such as political stability, government policies, consumer behavior, etc.

While the factors conducive for capital formation have been found to exist in the Indian economy for quite long, capital formation is not yet satisfactory due to the following reasons:

- Investment made during the earlier years is not contributing to the surplus, with many of the public sector undertakings becoming perennially sick.
- Poor implementation of the plans.
- The emphasis on liberalization helped to introduce more reforms despite the political influences. The disinvestment of the public sector undertakings and the encouragement of private enterprise – domestic and foreign – should go a long way to improve the capital formation and investments in the country in due course of time.

The Gross Capital Formation of India (at current prices) has increased from Rs.1,98,412 crore in 1993-94 to Rs.5,01,305 crore in the year 2000-2001, thereby showing an increase of more than two and a half times in 8 years. Also, the growth rate of Gross Capital Formation by Asset and Institution (GCFAI) and Gross Capital Formation by Industry (GCFIND) have increased by about 162% and 126% respectively, but as a percentage of GDP, there have not been any significant increases. On the contrary, the GCFIND has decreased as a percentage to GDP. The GCF (at constant prices) during this 8-year period grew by 74%. The percentage increase in GCF to GDP has increased during the period, and the GCF (at current prices) stood at Rs.5,01,305 crore in 2000-2001. The data regarding GCF, GCFAI and GCFIND from 1993-94 to 2000-2001 is given below.

Table 1: Gross Capital Formation (At Current Prices)

	Rs. in crore			% to GDP_{mp}		
FY	GCF	GCFAI	GCFIND	GCF	GCFAI	GCFIND
93-94	1,98,412	1,82,619	1,81,133	23.09	21.25	21.08
94-95	2,63,356	2,36,784	2,48,740	26.00	23.38	24.56
95-96	3,18,975	3,15,179	3,38,268	26.85	26.53	28.47
96-97	3,34,661	3,02,781	3,17,894	24.46	22.13	23.23
97-98	3,80,552	3,49,142	3,40,316	25.00	22.93	22.35
98-99	4,04,819	3,72,018	3,26,517	23.02	21.16	18.57
99-00	4,55,228	4,44,423	3,75,881	23.26	22.71	19.21
2000-01	5,01,305	4,78,192	4,08,998	24.01	22.90	19.59

Source: CMIE December, 2001

Table 2: Gross Capital Formation (At Constant Prices)

	Rs. in crore			% to GDP_{mp}		
FY	GCF	GCFAI	GCFIND	GCF	GCFAI	GCFIND
93-94	1,98,412	1,82,619	1,81,133	23.09	21.25	21.08
94-95	2,43,882	2,19,245	2,29,879	26.38	23.72	24.87
95-96	2,70,546	2,67,323	2,84,557	27.18	26.85	28.59
96-97	2,68,326	2,42,806	2,52,555	25.14	22.75	23.66
97-98	2,93,831	2,69,605	2,61,541	26.35	24.18	23.46
98-99	3,00,715	2,76,355	2,40,672	25.44	23.38	20.36
99-00	3,29,115	3,21,299	2,68,527	25.98	25.36	21.20
2000-01	3,45,320	3,29,397	2,74,917	26.26	25.05	20.90

Note: The data on Gross Capital Formation (GCF), Gross Capital Formation by Asset and Institution (GCFAI) and Gross Capital Formation by Industry (GCFIND) do not match due to errors and omissions and lack of details regarding the industry-wise break-up.

Source: CMIE, December, 2001.

EVOLUTION OF THE EQUITY MARKETS

The size of the world stock market grew steadily in the 1970s and 1980s and crossed the $12 trillion figure in 1993. The share of the US market decreased tremendously from more than 50% to less than 35%. In recent years, the importance of Asia has grown dramatically and its share in the world market has multiplied three times. During 1980s, the stock markets emerged rapidly in the developing countries. In Africa, stock markets opened in Egypt, Morocco and Ivory Coast, but with limited growth. The growth has been faster in Latin America, especially in Brazil and Mexico. However, the most dynamic growth was experienced in Asia, particularly in India, Indonesia, Malaysia, Thailand, Korea and Taiwan. Most of these markets were closed to the foreign investors, but after 1994 these markets have progressively opened to the international investors. This is evident as market capitalization of Taiwan, Korea, and Thailand has increased two fold during that period. In 2000, the total market capitalization of emerging markets represents around 8% of the world market capitalization. Again, the transaction volumes in some of these countries were very large.

For example, Taiwan's transaction volume in 1993 was larger than that of France or Germany, which signifies the rapid growth witnessed by these countries. In the early 1990s, due to a wave of liberalization, countries falling under Eastern Europe such as Hungary and Poland opened their market to attract the foreign investments. The New York Stock Exchange is in the top position, in terms of transaction volume followed by the Tokyo Stock Exchange and London Stock Exchange. However, depending on the market activity, turnover on major stock exchanges can vary widely from one year to the next. Therefore, comparison of national market liquidity based on this variable could lead to different conclusions if different years were observed. Moreover in any given year, the United States, Japan, the United Kingdom, Germany, Hong Kong, France, or some other countries may turn out to be the most active equity markets. Another informative scale is the degree of concentration of the market capitalization found in the developed markets. Any investor would like to know the constituent of the markets by comparing the proportion of top ten firms' market capitalization with respect to the total market capitalization of the national market. If national market is dominated by the smaller firms, institutional firms will not be willing to invest for the fear of poor liquidity. Again it will be more convenient for an investor to watch the performance of the larger firms if the market is dominated by larger firms. But, larger firms offer less opportunity for diversification and active portfolio management. American market is not confined to some larger firms because the top 10 firms represent less than 15% of the total market capitalization. The largest firm in the United States represents less than 2% of the total market capitalization of NYSE. On the other hand, the top 10 Dutch firms account for more than 70% of

the Amsterdam Stock Exchange. Similarly, top ten firms of Singapore, Italy, Hong Kong, Australia and Malaysia account for more than 40% of the total market capitalization of their respective national stock markets.

Emerging Equity Markets

The term emerging equity market here refers to the developing countries, ("countries in transition") and the advanced economies like those of Hong Kong, China, Israel, the Republic of Korea, Singapore and Taiwan. After the Mexican crisis in 1995, private capital flow in the emerging markets increased from $192.8 billion in 1995 to $235.2 billion in 1996. Underlying the surge of total private flows in 1996 were both strong Foreign Direct Investment (FDI) and portfolio flows. FDI continued to grow rapidly, representing the largest component of flows, while portfolio flows almost doubled. As portfolios rebound vigorously, bank lending fell off, though they continued to grow strongly in particular regions such as Asia. Across the emerging markets, during 1996 and 1997, investor sentiment shifted away from Asia in view of the regional slowdown, concerns about the current account deficits of some countries, and uneasiness about the state of the property and financial sectors, in favor of Latin America, where growth picked up, inflation slowed, and there was visible progress in strengthening and restructuring banking systems. The growth of total flows to Asia moderated, while flows to Latin America more than doubled. In mid 1997, however, as the Thai Baht came under severe speculative attack, pressure spilled to a number of countries both within and outside the region, where institutional investors saw parallels in economic circumstances and structure. Consequently in 1997, FDI to emerging markets peaked at $269 billion and then fell as a result of the Asian Crisis, to reach $154 billion in the year 2000.

The emerging equity markets have now become more stable, liquid and self sufficient because of larger investment flows, intensive research and more liberalized economic policy. Emerging equity markets offer potentially attractive rates of return, in part because the combination of low-cost resources and technology transfers often produce large profit margins for firms operating in such environments. The main problem faced by these emerging equity markets is lack of substantial confidence of international investors and macroeconomic and political instability. Although each emerging equity market has its own characteristics, a broad picture can be judged through historical experiences which may provide a general idea of long-term development of these markets. Initially, when a market achieves considerable economic and political stability and begins implementing liberalized policies, equity price rises after which the confidence of domestic investors is gained and it becomes well accepted as an attractive investment avenue. In the next phase, equity market will face pressure for greater accessibility and lower cost of funding, which will further accelerate in the liberalization process. As deregulation leads to an increase in equity market liquidity and a rise in risk adjusted returns, an international investor begins to realize the benefit of diversification and of course the benefit of investing in such an emerging equity market. Countries which belong to this phase are India, Pakistan, Philippines, Colombia, Poland, and the Czech Republic. In the third phase, market offers a good return, new stocks and corporate bonds which can be absorbed easily by the investors. This increased activity gives rise to more effective intermediation, while the growing need for a risk transfer will increase the need of the equity and hedging instruments like futures, options, etc. Malaysia, Indonesia, Thailand, Argentina, Venezuela, Turkey, Singapore, Korea, Hong Kong, Taiwan, Mexico, Greece and Hungary can be considered to be in the third phase. It should be noted here that the length of these broad phases may vary from one country to another. In general, periods of global economic expansion tend to accelerate the pace of the development of capital markets in general and of emerging markets in particular.

Box 1: MSCI Revamp – Implications on India

With the revamping of Morgan Stanley Capital International Index, Asia has become the riskiest market in the world. The changes in the methodology of calculation of the index from market capitalization to free float ratio can sound the deathknell for many of the funds that are closely tracking this index. While the revamp has improved the prospects of northeast Asia, the losers include Singapore, Hong Kong, Malaysia, Thailand, Indonesia, Philippines and India. There's lot more waiting for the investors as this revamp has opened up a lot of opportunities for bottom fishing. The MSCI changes would also ultimately help in establishing corporate governance standards in Asian companies.

In India, under the new index calculation methodology, MSCI will adjust the free float weights using an adjustment factor. It will be rounded off to the nearest 5 percent. For example, if the free float is 13.2 percent, it will be included as 15 percent in its total market capitalization. However, when the foreign ownership limit is more restrictive than the free float, and if there are no foreign strategic investors, the inclusion factor will be equal to the foreign ownership limit. Therefore, the investments of companies in India, which have a good amount of free float, but the FII limit is less than the free float, would be restricted to the FII limit. It has been clarified that securities with a free float of 15 percent will not be eligible for inclusion in the index. In exceptional cases, where it is likely to improve the investment opportunities, those securities would be included in the category. Since the free float is quite low in certain industrial sectors, India's weightage in emerging market index has shown a decline.

MSCI intends to increase its coverage from 60 percent to 85 percent of free float adjusted market capitalization within each group in each country. India is represented by the MSCI India index, which has 73 companies covering 24 industries. Infosys has the highest weightage of 14 percent followed by Hindustan Lever with 12 percent.

Changes made in the MSCI Index announced on May 19, 2001 are:

- India's weightage down by 3.01 points to 4.49 percent from around 7.5 percent in the Morgan Stanley Capital International-Emerging Markets (MSCI-EM).
- The number of Indian companies down from 73 to 59.
- Companies removed are Sun Pharma, Jaiprakash, Essel Packaging, Escorts, DSQ Software and Aptech.
- Companies like Reliance Industries, Reliance Petrol, HDFC, Infosys were included in the index exactly one year after being dropped.

Source: "MSCI: Good News, Bad News", by Assif Shameen, Portfolio Organizer, August 2001.

Major Differences among Markets

Historical and cultural differences explain most of the significant differences in stock-trading practices around the world. A brief outline of the major factors in market structures and trading procedures are discussed here.

HISTORICAL DIFFERENCES

Every stock exchange has its own distinct identity with a clearly defined objective and legal set-up. However, all the exchanges can be categorized into the following types:

1. Public bourses
2. Private bourses
3. Bankers' bourses.

Public Bourses

The origin of this type of bourses can be found in the legislative work of Napoleon. These type of bourses are regulated by the government, brokers are appointed by the government and they command a complete monopoly over all the settlements. Brokerage firms are private and new brokers are proposed to the state for nomination by the brokers' association. Earlier stock exchanges in Belgium, France, Spain, Italy, Greece and some Latin American countries were run by the governments. Before its deregulation, the Paris bourses were of this type. Commissions and other relevant matters were decided by the government. The main beneficiaries of this system are brokers because they command complete monopoly as their number is fixed. Even for a private deal arranged by two banks, the transactions had to legally go through the brokers. Deregulation affects this kind of bourses, because brokers tend to lose their earlier monopoly.

Private Bourses

Private Stock Exchanges are originally founded by the independent members for the purpose of stock trading. Many private stock exchanges can work within one country. For example, functioning of several stock exchanges in the US, Japan and Canada. However, in some countries like the UK, one prominent stock exchange dominates the other small stock exchanges. Although these bourses are private, they are not free of public regulation. But a mix of self-regulation and government supervision is required to make all these exchanges Self Regulatory Organizations (SROs). In private exchanges, members are supposed to perform all the work on the floor of the exchange and commissions are usually fixed in accordance with the agreement between stock exchanges and public authority. Private bourses are active in Canada, Australia, South Africa and Japan.

Bankers' Bourses

In some countries, only banks are permitted to trade in stocks. For example, in Germany, the Banking Act allows only banks to function as brokerage firms and so they enjoy a complete monopoly. Bankers' bourses are found in some other countries like Austria, Switzerland and the Netherlands. These type of bourses can be private or semi-public entities. Their main function is to provide a convenient place for banks to interact. Many regional bankers' bourses are directly linked to the local Chambers of Commerce. Bankers can trade directly without any involvement of official bourses but regulation is applied to both the bourses and the attached bank.

Differences in Trading Procedures

Trading procedures differ across different equity markets according to their operational set-up and legal obligations. The most important differences are given below.

CASH VS FORWARD MARKETS

Cash settlement is very popular in most of the stock markets, where transactions should be settled within a short span of time. Margin trading is also available in these markets. The United States, Canada, Japan and Switzerland are good examples of the cash markets. Margin trading is an integral part of these markets. To understand margin trading, consider an investor who buys 1000 shares of ABC at $10 per share, but does not have sufficient money, so he borrows $10000 from a broker to buy the shares. The broker holds the shares as collateral. But the value of the collateral is uncertain and can drop if there is a decline in the stock price. Suppose if the stock price drops to $8, the stock loses $2 per share and the collateral $2000 in value. To protect brokers' interest, investor has to deposit margin money with the bourses. Again interest charge has to be paid on the amount borrowed. Margin trading is very costly compared to trading on an organized futures market, because private contract must be paid for each deal.

Forward stock market gives a good base for levered stock trading. The major forward markets are London, Paris and Rio de Janeiro. The Paris bourses provide an excellent example of forward market. In this market, all transactions are settled at the end of a fixed period, which can be a month or a fortnight. For example, in Paris bourses, all the transactions are settled at the end of the month on the settlement day, whereas in London bourses the deals are settled in a fortnight. So, we can say that forward market follows periodic settlement system. In most forward markets, a deposit is required to guarantee an open position. The main feature of this market is that the price of the stocks remains fixed even if it changes during the settlement period. Settling of the account after a certain fixed period simplifies the trading procedure, but it also attracts opportunity for short-term speculation. On the Paris bourses, both smaller stocks and bonds are traded on cash basis.

CALL VS CONTINUOUS QUOTATION

A continuous market provides uninterrupted trading throughout the day and market makers ensure the required liquidity for this continuous trading. New York Stock Exchange (NYSE) is a good example of this kind of trading. In NYSE, market maker quotes both the bid and ask price (offer price). These two-way quotes establish the firm responsibility of a market maker, because normal investors transact with the dealers who provide the most favorable price to them. The market makers will adjust their quotation according to the demand and supply of the stock. These types of the markets are often called dealer markets or price driven markets.

In auction markets, active market makers do not exist and demand and supply of the securities is directly related to the transaction price. The trading of the stocks will not be on a continuous basis and any stock can be traded only once or a few times per day. This type of market is called call or fixing market, in which orders are batched together until the auction and are executed at a single price that matches the demand and supply.

Two major types of orders are submitted in an auction market, i.e., market order and limit order. In market order, customer will accept the price fixed in the auction. On the other hand, in limit order system, the price is determined by the maximum price which a customer is willing to give or the minimum price at which the customer is willing to sell the share. When the bourses official writes a higher price, some limit sell orders will be removed from the supply of stocks and some limit buy orders will be added to the demand for shares. This process results in an equilibrium price. In Tokyo, the call auction system determines the morning and afternoon starting price. A call auction market is also called order driven market because all traders openly post their orders and the transaction price is derived through equilibriating the demand and supply of the stock.

MICROSTRUCTURE OF THE MARKET

All stock exchanges in the world are using the electronic technology to automate the trading process. The main purpose of any trading procedure is to discover the best price for investors. The convenient system of trading helps in getting a fair price without providing any favorable term to any counterparty.

Again a good trading procedure helps in reducing the transaction cost and provides a transparent and liquid market. There are several controversial issues in the microstructure of stock trading system. For example, there is a lot of disagreement on how to measure transaction cost. Sometimes, it is called the difference between the price, including commissions and the price of the previous market. In other words, it can be taken as a sum of commissions, taxes and other market impacts.

Issues relating to various market microstructures are discussed in this section.

PRICE-DRIVEN VS ORDER-DRIVEN SYSTEMS

Computerized trading systems basically follow two different approaches depending on the dominance of either the dealers or brokers. The London Stock Exchanges Automated Quotation (LSEAQ) and the National Association of Securities Dealers Automated Quotation (NASDAQ) are price-driven or quote-driven systems. In this kind of trading system, there are no automatic quotes because the market maker does not know the form of the final contract. The quote-driven system allows the market maker to buy a limit order at the bid price and sell it at the offer price.

The Paris, Tokyo and most of the European and Asian markets are order-driven markets. The limit order book is the heart of these trading systems. After assessing the standing orders, a trader can judge the nature of the trade. The NYSE follows a mixture of these two systems. In NYSE, the limit order is in private knowledge of the specialist, and the brokers are likely to keep their limit orders a secret and keep them with their floor brokers to trade in the most suitable manner. In all cases, a limit order gives a free trading option to other market participants. In an order-driven market, it is the trader who submits the order but in a price-driven market, the dealer posts a firm quote and provides free option. In a price-driven market, dealers can face the risk of being picked off. The trouble of the automation is to reduce market liquidity by affecting the interest of the dealers or normal investors to place limit orders. London dealers quote for large sizes, compared to all the other markets, and hence their cost of being picked off by not updating the quotes quickly can be high. In the order-driven system, there is a danger in placing the order due to the absence of well developed markets. Again in the absence of an active market, execution of large transactions can be difficult because of the absence of the depth in the market.

INFORMATION EMISSION AND TRANSPARENCY

Transparency in the market is of utmost importance because it gives the market a kind of stability and proper information about the past and the recent trades. Automation enhances the transparency in the market because a large amount of information is available to the public. The New York Stock Exchange is less transparent, as the limit order book is a private information and cannot be revealed to everybody. Some traders trade on the basis of private information, while some trade with the help of the publicly available information. The presence of the informed traders can create trouble for the normal traders. A well informed trader can pick-up some shares after getting some private information. On the London market, dealers quote for big transactions and the well informed investors can trade with several traders before any of them comes to know about the transaction. Informed traders do not want to disclose the information. Entering publicly large orders can reveal information to the rest of the market which can be immediately discounted in the value of the share. This problem is obvious to large transactions called blocks. The problem in the informational trading is more acute in face to face trading. In all countries, particular systems have been developed to handle bulk and small orders. For example, London permits the publication of the bulk orders to be delayed for a period of 90 minutes to permit market makers to unwind the position they have taken.

MARKET FRAGMENTATION

Liberalization and automation of the equity markets have increased the competition among domestic markets as well as the international markets. For example, the London Stock Exchange accounted for 20% to 50% of the total volume of trades in French, Dutch and German shares. Various overseas stocks are traded on the floor of the NYSE. Buying futures on some index is sometimes an alternative to buying a diversified portfolio of shares and this causes fragmentation in the market. Domestic markets are protecting their interest by imposing certain rules to off-exchange trades. The obvious presence of fragmentation and competition has improved the efficiency of the markets.

INTERNATIONALIZATION

Development of the global equity market is the first step in the internationalization of equity trading. Many developed countries have opened overseas branches to cater to their foreign investors. The US, Britain, Japan are the main countries to attract the foreign investors. Some stock markets believe that they can safeguard their global interest by establishing links with other markets. This pattern is most famous among the futures and options market. The NASDAQ system is available to the investors in England and Singapore. The international stock exchange in London and the NASDAQ have agreed not to enforce competition among themselves by ignoring the quotes and trading for common shares. Automation of trading procedure has allowed some stock exchanges to attract a significant amount of the foreign company shares.

ANONYMITY AND REPUTATION

Some investors and traders would prefer to maintain anonymity to get a better price in their deal. On the other hand, market makers and brokers would like to build a reputation for their skills. They try to advertise their competency and skills to attract more clients. In NASDAQ, for small orders, brokers can provide their choice for the particular market makers. But this is a dangerous practice since it weakens the dealer's incentive to publish the best price.

DEVELOPMENT OF SECURITIES MARKETS IN INDIA

Evolution

The origin of stock market in India goes back to the later part of the Eighteenth Century. The earliest security dealings were transactions in loan securities of the East India Company, the dominant institution of those days. Corporate shares came into picture by 1830's, and assumed significance with the enactment of the Companies Act in 1850. The introduction of limited liability marked the beginning of the era of modern joint stock enterprises. This was followed by the American Civil War in 1860-65. However, the bubble burst with the end of the Civil War and a disastrous slump followed. It was long and severe. It also resulted in complete ostracism of the broker community. The tremendous social pressure on the brokers led to their forming an informal association which later gave birth to 'The Native Share and Stock Brokers' Association', (now known as the Bombay Stock Exchange) in 1887. This stock exchange played a major role during the phase of recovery from the seven-year depression. It continued to grow in stature and size of operations and became the nerve center of all financial activity and the first one to be recognized by the Government of India.

The cotton textile industry which contributed a lot in the establishment of the Bombay Stock Exchange, was also the prime factor in the development of Ahmedabad as a center for dealing in stocks and shares. As new cotton textile mills were floated and the volume of business grew, the 'Ahmedabad Share and Stock Brokers' Association' was formed in 1894, which later came to be known as the Ahmedabad Stock Exchange.

The next stock exchange was established in Calcutta in 1908. The industries that contributed to its birth and subsequent development were jute, coal and mining. Like the Bombay Stock Exchange, it was born out of a crisis; when the boom of 1904-08 broke and a need was felt for an organized body for mutual protection of brokers and safety of the trade.

With the World War I, all imports into India ceased and the Indian manufacturers were faced with a boom. The three stock exchanges flourished during the period of prosperity. However, the boom also led to the formation of many rival stock exchanges. The World War II also resulted in a boom and mushroom growth of stock exchanges. However, many of them perished during the slump that followed.

Most of the other stock exchanges languished till 1956 when the government came out with a comprehensive legislation called the 'Securities Contract (Regulation) Act' to regulate the functioning of stock exchanges. This legislation made it mandatory on the part of the stock exchanges to secure recognition from the Central Government. Only the established stock exchanges in Mumbai, Ahmedabad, Calcutta, Chennai, Delhi, Hyderabad and Indore were recognized under the Act. More stock exchanges were recognized subsequently. At present there are twenty three such recognized stock exchanges in India including the OTCEI and National Stock Exchange. The names of these stock exchanges with their geographical location, and the date of receiving government recognition are given in the following table.

Table 3: Recognized Stock Exchanges in India

Sl. No.	Name of the Exchange & Location	Date of initial recognition
1.	The Stock Exchange, Mumbai	31-03-1957
2.	The Ahmedabad Stock Exchange Association Ltd.	16-09-1957
3.	The Calcutta Stock Exchange Ltd., Calcutta	10-10-1957
4.	Madras Stock Exchange Ltd., Chennai	15-10-1957
5.	The Delhi Stock Exchange Association Ltd., New Delhi	09-12-1957
6.	The Hyderabad Stock Exchange, Hyderabad	29-09-1958
7.	Madhya Pradesh Stock Exchange, Indore	24-12-1958
8.	Bangalore Stock Exchange Ltd., Bangalore	16-02-1963
9.	Cochin Stock Exchange Ltd., Ernakulam, Cochin	10-05-1979
10.	The Uttar Pradesh Stock Exchange Association Ltd., Kanpur	03-06-1982
11.	Pune Stock Exchange Ltd., Pune	02-09-1982
12.	Ludhiana Stock Exchange Association Ltd., Ludhiana	29-04-1983
13.	The Gauhati Stock Exchange Ltd., Gauhati	01-05-1984
14.	Kanara Stock Exchange Ltd., Mangalore	09-09-1985
15.	The Magadh Stock Exchange Ltd., Patna	11-12-1980
16.	Jaipur Stock Exchange Ltd., Jaipur	09-01-1989
17.	Bhubaneswar Stock Exchange Association Ltd., Bhubaneswar	05-06-1989
18.	Saurashtra Kutch Stock Exchange Ltd., Rajkot	10-07-1989
19.	The Vadodara Stock Exchange Ltd., Baroda	05-01-1990
20.	The Coimbatore Stock Exchange Ltd., Coimbatore	18-09-1991
21.	The Meerut Stock Exchange Ltd., Meerut	20-09-1991
22.	National Stock Exchange	26-4-1993
23.	Over The Counter Exchange of India (OTCEI), Mumbai	23-08-1994

The recognition accorded to a stock exchange is normally valid for a period of 5 years or a shorter period as prescribed. It is renewed after the expiry of that period, subject to a satisfactory performance of the exchange during this period. The stock exchanges located at Mumbai, Calcutta, Chennai, Ahmedabad, Delhi, Hyderabad, Madhya Pradesh and Bangalore have been granted permanent recognition.

The Bombay Stock Exchange is the principal stock exchange in the country accounting for nearly 70 percent of the aggregate paid-up share capital of all listed companies[2] and 80 percent of the aggregate market capitalization[3] of the listed companies.

2 Listing is the means for admitting the securities of a company to the trading privileges of a stock exchange. All companies whose shares and/or debentures have been listed on the recognized stock exchange(s) are called listed companies.

3 The aggregate market capitalization is the aggregate market value of the paid-up share capital of listed companies.

Recent Developments

In the past few years, the Indian Capital Markets have grown phenomenally. This has to be attributed to the various changes which have been brought about, especially, by SEBI. Since the abolition of the office of the Controller of Capital Issues and the repeal of Capital Issues Control Act, and the conferring of statutory status to SEBI, one has observed a qualitative as well as quantitative changes in the nature of capital markets.

Foremost amongst these being the Institutionalization of the capital markets. From a mere 8 exchanges in 1978, the number has gone up to 23 with the recognition of National Stock Exchange. This has been necessitated by the exponential increase in the number of investors across the country.

Mutual Funds have also increased in popularity, as can be gauged from the fact that they have mobilized over Rs.1,10,000 crore. The entry of private sector mutual funds such as Kothari and Morgan Stanley led to an increase in competition due to which one can observe new products being introduced and better service being made available to customers.

In order to regulate their functioning SEBI has come out with SEBI (Mutual Funds) Regulations in 1993, which lays down the framework which governs the functioning of Mutual Funds. Mutual Funds are required to set-up Asset Management Companies with 50% independent directors, separate trustee boards or companies with a minimum of 50% independent trustees and to appoint independent custodians to ensure an arm's length relationship between trustees, fund managers and custodians.

The entry of Foreign Institutional Investors has been another major development. The SEBI has permitted foreign portfolio investment only through broad based funds such as mutual funds, etc., Foreign participation has also been permitted in various areas of Financial Services through joint ventures, with the approval of the Foreign Investment Promotion Board.

Intermediaries in the primary and secondary markets such as Merchant Bankers, Bankers to the Issue, Share Transfer Agents, Registrars to the Issue, Underwriters, Brokers, sub-brokers, etc. must be registered with the SEBI. Regulations have been issued by SEBI to govern their functioning. Codes of Conduct, Capital Adequacy and other norms and a system of monitoring and inspecting their operations has been instituted to enforce compliance.

One very important development which has far reaching consequences is the emergence of Credit Rating Agencies such as the CRISIL, ICRA and CARE. This shall go a long way in protecting the interests of investors of debt instruments.

Above all, the recognition of OTCEI and NSE shall go a long way in promoting fair and transparent dealings in Stock Markets.

SEBI has taken several steps, since its establishment, to reform the securities markets. Some of the important ones are summarized below:

- All companies which access the Capital Markets are free to price their issues, subject to certain conditions.
- Restrictions on Rights and Bonus Issues have been removed.
- Issuers are required to meet SEBI guidelines for Disclosure and Investor Protection.
- The use of "Stock Invest" by individuals and mutual funds, to mitigate the locking in of funds.

- In case of oversubscription, SEBI has directed to have a system of proportionate allotment.
- Indian development financial institutions and mutual fund can be allotted up to 75% of the issue amount.
- Allotment to categories of FIIs and NRIs/OCBs is up to a maximum of 24%, which can be further extended to 30% with the approval of RBI.
- Number of collection centers has been reduced to a minimum of 30.
- Advertisement codes have been issued with regard to public and rights issues.
- Capital gains through investment in new issues are exempted from taxes.
- Underwriting of issues has been made optional.
- Firms have been allowed to raise funds through the scheme of bought-out deals to reduce the cost of raising funds through the Capital Markets.

Secondary Markets

Some of the major changes introduced in the secondary market include:

- Permission to BSE for BOLT extension from SEBI.
- Revival plans of OTCEI on lines of Dave Committee Report.
- Registration of stockbrokers and sub-brokers has been made compulsory.
- Brokers are required to maintain separate accounts of their transactions on behalf of clients and on their own behalf.
- Issuance of contract note has been made compulsory.
- Jumbo Transfer Deeds have been introduced.
- Special sessions for odd lot dealings have been introduced to facilitate odd lot trading.
- Corporate Membership has been permitted subject to certain conditions.
- Introduction of Rolling Settlements.
- Introduction of options/futures.

Stock Issuing Market

The stock issuing market in the Indian context refers to the primary market for equity and preference shares. The operation of this market is governed by the provisions of the Indian Companies Act, 1956 and the recently issued SEBI guidelines.

According to the Companies Act, a public company, or a private company which is a subsidiary of a public limited company, can issue only two kinds of shares– equity and preference shares.

The basic difference between the two classes of shares is in terms of the rights/privileges attached to them. Preference shareholders have a claim prior to that of equity shareholders with respect to dividends, and also repayment of capital in the event of liquidation. Equity shareholders, on the other hand, enjoy the exclusive rights to

a. Vote on every resolution placed before the company. (A preference shareholder also acquires the right to vote if the preference dividend is in arrears for a specified period of time.)

b. To maintain their proportional ownership by purchasing the additional equity shares offered by the company.

The Companies Act requires the company to offer any issue of additional equity capital to existing shareholders on a pro rata basis.

The other important distinction is with respect to their entitlement to dividends. Preference shares carry a fixed rate of dividends. It should, however, be noted that neither preference dividend nor equity dividend is an obligatory payment for the company. Further, the company can declare dividends out of distributable profits only after transferring a specified percentage of such profits to the general reserves of the company, the percentage varying with the rate of dividend declared.

Equity share capital constitutes the bulk of the paid-up share capital of any company. Preference shares have not been popular with the investing public because there is no legal obligation to pay preference dividends and the dividend rate is rather modest. Even the recently introduced instrument called 'Cumulative Convertible Preference Shares (CCPS)' which provides for the compulsory conversion of preference shares into equity shares within five years from the date of issue, has failed to evoke the expected response.

A company is also allowed to issue debentures, by offering to the public by issue of a prospectus. Debenture is an acknowledgment of a debt under a seal of the company and containing a contract for repayment of a principal sum on specified date and for the payment of interest at a fixed rate until the principal is repaid.

Modes of Raising Capital

A company can raise share capital from the primary market in three ways:

i. Public issue

ii. Rights issue

iii. Private placement.

Of these, the public issue is the most popular mode of raising share capital. The rights issue comes next in popularity. Raising funds through private placement is the least popular way and investors in this case are generally financial institutions.

Public issue method of raising capital involves raising of funds direct from the public, i.e. primary market. Public limited companies can raise share capital through public issue. Private companies, insurance companies and government companies are not permitted to offer their shares for public subscription. Public issue is a fairly elaborate and complex process.

Rights issue is a method of raising additional finance from existing members by offering securities to them on pre-emptive basis.

In private placements, funds are raised in the primary market by selling the securities to the investors either singly or institutionally.

In addition, the company can also issue bonus shares to the existing shareholders of the company by capitalizing the free reserves and profits of the company.

PLANNING A CAPITAL ISSUE

Successfully raising capital from the market needs well planned and chalked out marketing strategy. It is, therefore, essential to make an analytical study of various sources, the quantum, the appropriate time, the cost of raising capital and the possible impact of such resources on the overall capital structure and profitability of the company, besides the law governing their issue. There should be proper balancing between the shareholders' funds and the fixed interest bearing funds. Capacity of the company to serve its debt should be given due consideration in fixing the quantum of different sources. Issue of shares or debentures to the public through prospectus will provide an opportunity to the investors. However, response from these investors will depend upon the special features of the issue.

LAW GOVERNING CAPITAL ISSUES

While raising the funds due regard has to be given to the following Acts, Rules, Regulations and Guidelines.

i. Provisions of the Companies Act, 1956 (see table 2)

ii. SEBI Guidelines and Clarifications (see note on SEBI and SEBI Guidelines)

iii. The Securities Contracts (Regulation) Act, 1957

iv. The Securities Contracts (Regulation) Rules, 1957.

The students are required to have a reasonable working knowledge in respect of the following sections of the Companies Act, 1956, which have a bearing on the capital market activities.

Table 4: Law Governing Capital Issues

Sl. No.	Section No.	Contents
1.	55	Dating of prospectus.
2.	56	Matters to be stated and reports to be set out in the prospectus.
3.	57	Expert to be unconnected with formation or management of company.
4.	58	Experts' consent to issue of prospectus containing statement by him.
5.	58A	Deposits not to be invited without issuing an advertisement.
6.	58B	Provisions relating to prospectus to apply to advertisement.
7.	59	Penalty and interpretation.
8.	60	Registration of prospectus.
9.	61	Terms of contract mentioned in prospectus or statement in lieu of prospectus not to be varied.
10.	62	Civil liabilities for misstatements in prospectus.
11.	63	Criminal liability for misstatements in prospectus.
12.	64	Document containing offer of shares or debentures for sale to be deemed prospectus.
13.	65	Interpretation of provisions relating to prospectuses.
14.	66	Newspaper advertisements of prospectus.
15.	67	Construction of references to offering shares or debentures to the public etc.
16.	68	Penalty for fraudulently inducing persons to invest money.
17.	68A	Personation for acquisition etc., of shares.
18.	69	Prohibition of allotment unless minimum subscription received.
19.	70	Prohibition of allotment in certain cases unless statement in lieu of prospectus delivered to Registrar.
20.	71	Effect of irregular allotment.
21.	72	Applications for and allotment of shares and debentures.
22.	73	Allotment of shares and debentures to be dealt in on stock exchange.
23.	75	Return as to allotments.
24.	76	Power to pay certain commissions and prohibition of payment of all other commissions, discounts, etc.

Sl. No.	Section No.	Contents
25.	77	Restrictions on purchase by company or loans by company for purchase of its own or its holding company's shares.
26.	78	Applications of premiums received on issue of shares.
27.	79	Power to issue shares at a discount.
28.	80	Power to issue redeemable preference shares.
29.	80A	Redemption of irredeemable preference shares etc.
30.	81	Further issue of capital.
31.	82	Nature of shares.
32.	83	Numbering of shares.
33.	84	Certificate of shares.
34.	85	Two kinds of share capital.
35.	86	New issue of share capital to be only of two kinds.
36.	88	Prohibition of issue of shares with disproportionate rights.
37.	89	Termination of disproportionately excessive voting rights in existing companies.
38.	91	Calls on shares of same class to be made on uniform basis.
39.	92	Power of company to accept unpaid share although not called up.
40.	93	Payment of dividend in proportion to amount paid-up.
41.	94	Power of limited company to alter its share capital.
42.	94A	Share capital to stand increased where an order is made under Section 81(4).
43.	95	Notice to Registrar of consolidation of share capital, conversion of shares into stock, etc.
44.	96	Effect of conversion of shares into stock.
45.	97	Notice of increase of share capital or of members.
46.	98	Power of unlimited company to provide for reserve share capital on re-registration.
47.	99	Reserve liability of limited company.
48.	100	Special resolution for reduction of share capital.
49.	106	Alteration of rights of shareholders of special classes of shares.
50.	107	Rights of dissentient shareholders.
51.	113	Limitation of time for issue of certificate.
52.	114	Issue and effect of share warrants to bearer.
53.	115	Share warrants and entries in register of members.
54.	116	Penalty for personation of shareholder.
55.	117	Debentures with voting rights not to be issued hereafter.
56.	118	Right to obtain copies of and inspect trust deed.
57.	119	Liability of trustees for debentureholders.
58.	120	Perpetual debentures.
59.	121	Power to re-issue redeemed debentures in certain cases.
60.	122	Specific performance of contract to subscribe for debentures.

Sl. No.	Section No.	Contents
61.	123	Payments of certain debts out of assets subject to floating charge in priority to claims under the charge.
62.	150	Register of members.
63.	151	Index of members.
64.	152	Register and index of debentureholders.
65.	181	Restriction on exercise of voting right of members who have not paid calls etc.
66.	182	Restrictions on exercise of voting right in other cases to be void.
67.	Schedule II	Matters to be specified in prospectus and reports to be set out therein.

Book Building

The book building process is a price discovery mechanism in an Initial Public Offer (IPO). It is a mechanism in which an IPO issuing company can discover a better offer price based on the price and demand discovery. Under this process, over the period for which the book for the IPO is open, bids are collected from investors (wholesale and retail) using the network of the NSE/BSE/lead managers at various prices, which are above or equal to the floor price. The floor price is a minimum bid price and it is fixed as a starting point for the bidding process. The offer/issue price is then determined after the bid closing date based on certain evaluation criteria.

The Process

- Bidding shall be permitted only if an electronically linked transparent facility is used
- Issuing company nominates a lead merchant banker called book runner, and syndicate members with whom orders can be placed by the investors
- Issuing company should disclose the number of securities to be issued, price band, nominated lead merchant banker, syndicate members with whom orders can be placed by the investors.
- With the help of the syndicate, member investor can quote the share price. The process is called bidding. Bids price should always be more than the floor price and it can be revised before closure of the issue.
- After the closure of issue the book runner evaluates the bids using certain evaluation criteria. These evaluation criteria may have been based on price aggression, investor quality or earliness of bids, etc.
- The book runner and the company conclude the final price at which it is willing to issue the stock and allocation of securities.
- Securities are allocated to the successful bidders.

Guidelines for Book Building

Some important guidelines for book building are discussed below:

In case the issuer chooses to issue securities through the book building route then as per SEBI guidelines, it can issue securities in the following manner:

- 100% of the net offer to the public through the book building route.
- 75% of the net offer to the public through the book building process and 25% through the fixed price portion.
- Under the 90% scheme, this percentage would be 90 and 10 respectively.
- The date of opening and closing of the bidding (not less than 5 days).
- The investors shall have the right to revise their bids.

SEBI guidelines governing book building are covered in annexure I of this chapter.

NSE and BSE's Book Building System

- BSE and NSE offer the book building services through the book building software that runs on the BSE private network.
- This system is one of the largest electronic book building networks anywhere spanning over 350 Indian cities.
- Bids are placed electronically through syndicate members and the information is collected online in real-time until the bid date ends.
- In order to maintain transparency, the software gives visual graphs displaying price v/s quantity on the terminals.

Table 5: Difference between shares offered through book building and through normal public issue:

Features	Fixed price process	Book building process
Pricing	Price at which the securities are offered/allotted is known in advance to the investor.	Price at which securities will be offered/allotted is not known in advance to the investor. Only an indicative price range is known.
Demand	Demand for the securities offered is known only after the closure of the issue	Demand for the securities offered can be known everyday as the book is built.
Payment	Payment is made at the time of subscription whereas refund is possible after allocation.	Payment only after allocation.

Source: bseindia.com

Reverse Book Building[4]

'Reverse book building' is similar to the process of book building, which is aimed at securing the optimum price for a company's share. In the case of book building, the issuing company decides the price of the security it is selling by allowing the investors to decide the number of shares and the price they would be interested in. In 'reverse book building', the acquirer company offers to buyback shares from the shareholders. The investors' aim is to sell the shares to exit from the company. This process is used for efficient price discovery.

As per the 'reverse book building' system, shareholders can bid by taking the floor price as a benchmark, and the price at which maximum shares are tendered will be the offer price. However, there is no cap for bidding. This floor price is arrived at as the average of 26 weeks traded price preceding the date of the public announcement. The companies do not accept the bids, which are below the floor price. Bidding is to be done only in the electronic form, and through the stock exchanges trading mechanism, similar to the current book building process. Therefore only those shareholders with dematerialized shares will be allowed to bid. This is to ensure that the entire process is undertaken with ease and transparency is maintained.

Buy-back of Shares

The much awaited proposal of buy-back of shares was cleared by the Union Cabinet on 26th October, 1998. The prudential norms for buy-back of shares in case of listed shares will be evolved by SEBI, while for unlisted shares they will be evolved by the Department of Company Affairs.

4 Portfolio Organizer, March, 2004

The buy-back of shares will be permitted only for restructuring the equity and not for treasury operations. The cabinet also ruled against evaluating the buy-back proposal on a case to case basis, but allowed for such provisions which calls for stringent punishment including provisions for imprisonment in case of any violations.

Any company which wants to buy-back its shares, should do so only after the shareholders have given their mandate in that direction through a special resolution following an approval from the Board of Directors.

However, the government did not come up with any specific measures regarding the applicability of buy-back of shares provision for Fera companies. These companies by using the buy-back route, may buy the shares from the public and extinguish them, resulting in the increase of the promoter's stake. This obviates the need for seeking FIPB/RBI approval for enhancing promoters' stake.

SECURITY MARKET INDICATORS

The general movement of the stock market is usually measured by averages or indices consisting of groups of securities that are supposed to represent the entire stock market or its particular segments. Thus, Security Market Indices (or) Security Market Indicators provide a summary measure of the behavior of security prices and the stock market.

Here, a detailed discussion regarding the salient features of the principal share price index numbers used in India i.e., the Bombay Stock Exchange Sensitive Index (BSE Sensex) and the Bombay Stock Exchange National Index (BSE National Index) has been given. The other known indices like the Reserve Bank of India Equity Share Index, Nifty, Financial Express, All India Equity Index and Economic Times Ordinary Share Price Index will also be described in brief for a comparative study.

However, before examining these index numbers we will look into:

a. the need for having a summary measure,

b. the objectives sought to be achieved by constructing index numbers, and

c. the factors that influence the construction of index numbers.

Purpose of an Index

The security market indices are indicators of different things and are useful for different purposes. Following are the important uses of an index:

- Security market indices are the basic tools to help and analyze the movements of prices of various stocks listed in stock exchanges and are useful indicators of a country's economic health.
- The return on the index, which is known as market return, is helpful in evaluating the portfolio risk-return analysis. According to the modern portfolio theory's capital asset pricing model, the return on a stock depends on whether the stock's price follows prices in the market as a whole or not; the more closely the stock follows the market, the greater will be its expected return.
- Indices can be calculated industry-wise to know their trend pattern and also for comparative purposes across the industries and with the market indices.
- Generally, market indices are designed to serve as indicators of broad movements in the securities market and as sensitive barometers of the changes in trading patterns in the stock market.

- The growth in the secondary market can be measured through the movement of indices.
- The index can be used to compare a given share price behavior with its movements.
- The investors can make their investment decisions accordingly by estimating the realized rate of return on the index between two dates.
- Funds can be allocated more rationally between stocks with a knowledge of the relationship of prices of individual stocks with the movements in the market.

The Objectives sought to be Achieved by Constructing Index Numbers

An ideal index number of share prices must serve two purposes namely:

i. It must represent the changes in the values of all shares i.e., changes in the overall market performance, and

ii. It must reflect the price movement of typical shares.

Factors that Influence the Construction of Index Numbers

To ensure that an index number serves the objectives/purposes mentioned above, a careful attention must be given to the following factors that influence the construction of index numbers:

i. Selecting the shares for inclusion in the index-sampling,

ii. Determining the relative importance of each share included in the sample weighting, and

iii. Averaging the included shares into a single measure.

SELECTING STOCKS FOR INCLUSION

An index can be based on a sample of stocks or all of them. When the index is based on all listed shares, then the question of sampling does not arise. But when the index is based on a sample[5], the utility of the index will depend upon the degree to which one can infer movements in excluded shares on the basis of movements in the included shares.

So, an index based on a sample will be the desired measure only when: (a) the shares of a relatively few listed companies constitute a large proportion of the value of the shares of all listed companies; and (b) there is a tendency for all share prices to move together.

Determining the Relative Importance of the Share

STOCK MARKET INDICATOR SERIES

The stock indices can be organized by weighting the sample of stocks. The stock indicators can be of two types: price-weighted and volume-weighted series. Price-weighted average is arithmetic average of current prices. Dow Jones Industrial Average (DJIA) is the most popular price-weighted average.

Volume-weighted average is generated by deriving the initial total market value of all stocks used in the series (Market Value = Number of Shares Outstanding x Current Market Price). The initial figure is established as the base and is assigned an index value (the index may be 100, 50 or 10). Then a new market value is computed for all securities in the index, and the current market value is compared to the initial "base" value to determine the percentage of change, which in turn is applied to the beginning index value.

5 As we will see later in this chapter, all principal share price index numbers in India are based on a sample of shares unlike the New York Stock Exchange (NYSE) Index in the US, which is based on all stocks listed on Exchange.

$$\text{Index}_t = \frac{\sum P_t Q_t}{\sum P_b Q_b} \text{ x Beginning Index Value} \quad \text{...Eq.(1)}$$

Where,

Index_t = Index value on day 't'

P_t = Ending prices for stocks on day 't'

Q_t = Number of outstanding shares on day 't'

P_b = Ending price for stocks on base day

Q_b = Number of outstanding shares on base day.

With a value-weighted index, stock splits and other capital changes are automatically adjusted because a decrease in the stock price is offset by an increase in the number of shares outstanding. In a value-weighted index, the importance of individual stocks in the sample depends upon the market value of the stocks. Therefore, a specified percentage change in the value of a large company has a greater impact than a comparable percentage change for a small company. Price changes for the large market value stocks in a value-weighted index will dominate changes in the index value over time. The following illustration shows the calculation of a market value index and also demonstrates the impact of different values on a market value weighted stock index.

Illustration 1

Stock	Share Price (Rs.)	Number of Shares	Market Value (Rs.)
December 31, 2001			
A	10	1,000,000	1,00,00,000
B	15	6,000,000	9,00,00,000
C	20	5,000,000	10,00,00,000
Total			**200,000,000**
			Base Value equal to an Index of 100
December 31, 2002			
A	12	1,000,000	1,20,00,000
B	10	12,000,000[6]	12,00,00,000
C	20	5,500,000[7]	11,00,00,000
Total			**24,20,00,000**

$$\text{New Index Value} = \frac{\text{Current Market Value}}{\text{Base Value}} \text{ x Beginning Index Value}$$

$$= \frac{242,000,000}{200,000,000} \text{ x } 100 = 1.21 \text{ x } 100 = 121$$

Demonstration of the impact of different values on a market-value-weighted stock index:

Stock		December 31, 2000		December 31, 2001			
	Number of Shares	Price (Rs.)	Value (Rs.)	Price (Rs.)	Value (Rs.)	Price (Rs.)	Value (Rs.)
A	1,000,000	10	1,00,00,000	12	1,20,00,000	10	1,00,00,000
B	6,000,000	15	9,00,00,000	15	9,00,00,000	15	9,00,00,000
C	5,000,000	20	10,00,00,000	20	10,00,00,000	24	12,00,00,000
			20,00,00,000		20,20,00,000		22,00,00,000
Index Value			**100.00**		**101.00**		**110.00**

As shown in the table, if there is a 20% increase in the value of only Stock A, from Rs.10 million to Rs.12 million, the index value would increase from 100 to 101. In contrast, if only Stock C increases by 20%, the index value is changed from 100 to 110.

6 It is assumed that the stock was split in the ratio 2:1 during the year.

7 It is assumed that the company paid a stock dividend of 10% during the year.

METHODS OF AVERAGING

Two kinds of averages are used in constructing share price indices – arithmetic mean and the geometric mean. Between the two averages, the arithmetic mean is more widely used. However, before we evaluate these methods, it must be emphasized that the indices based on averages are not the same as the averages. The following table clarifies this point.

Table 6

Share	Base period price (Rs.)	Current period price (Rs.)
A	70	110
B	50	72
C	65	45
D	40	44
Average	Rs.56.25	Rs.67.75
Index Number	100	120.44

The index number in the above table is based on the arithmetic average. The difference between this average and the average we defined in equation (1) is that the former is an unweighted arithmetic average while the latter is a weighted arithmetic average. Instead of using the arithmetic average, we can use the geometric average to determine the index number. In the above example, the index number based on the geometric mean will be given by

$$\left(\frac{110}{70} \times \frac{72}{50} \times \frac{45}{65} \times \frac{44}{40}\right) \times 100 = 1.1457 \times 100 = 114.57$$

Note: The quantities such as 110/70 are known as price relatives.

Box 2: Computation of Index

So, we find that there is a variation in the index numbers based on the two methods. It is important to recognize this fact because the degree of divergence increases with the degree of variability in the component prices. An index based on the geometric mean will increase more slowly and decrease more rapidly than an index based on the arithmetic mean. So arithmetic mean has an upward bias, while geometric mean has a downward bias. The implication of this property is that an index based on arithmetic mean will outperform most of the components in the long run. The following table illustrates the relative movements in the index based on both these methods.

Table A

		Period			
Share	Base Price (Rs.)	1 (Rs.)	2 (Rs.)	3 (Rs.)	4 (Rs.)
A	50	60.00	90.00	70.00	65.00
B	50	75.00	140.00	50.00	40.00
C	50	65.00	87.00	60.00	50.00
D	50	55.00	75.00	55.00	45.00
Average:					
Arithmetic	50	63.75	98.00	58.75	50.00
Geometric	50	63.33	95.22	58.30	49.18
Index:					
Arithmetic	100	127.50	196.00	117.50	100.00
Geometric	100	126.66	190.44	116.60	98.36

The main purpose of an index is to measure the prevailing investor sentiment. The investor sentiment reflecting a human state of mind fluctuates frequently and so does an index.

How does one calculate and interpret an index? Generally, an index can be developed and compiled in the following manner:

- Select those scrips which fairly reflect the stock market movements. The number of scrips could depend on how broad-based the index has to be made.
- Select a base year when the stock markets were relatively stable. It should be close to the year in which the index is being constructed.
- Take the average price aggregates of all the selected scrips in the base year. This will be the base year value.
- Take the aggregate price value of the selected scrips, as on a particular day.
- Find the price relative of the current price aggregate as against the base year aggregate.

That will be the index for that particular day.

An illustration is given in Table B to further elucidate how an index is set-up and calculated.

Table B: Calculation of Hypothetical Index

Scrip Name	A	B	% Change
ABC	50	65	30.00
PQR	100	125	25.00
XYZ	75	70	–6.67
Total	**225**	**260**	**15.55**

Note:

A	–	Average price in the year 20x0
B	–	Price as on a day in the year 20x2
Total A	–	Average price aggregate in the base year
Total B	–	Price aggregate as on a particular day
INDEX	–	260/225 x 100 = 115.55 (Base 20 x 0 = 100)

From Table B it is clear that though individual scrips may have changed by 30, 25, 7 percent, the market as a whole has gained by 15.55 percent. However, in the above hypothetical example, each of the scrips is considered to have equal importance in the market. But, in reality, such examples are hard to find. The degree of influence that each scrip has on the market varies from one another. Thus, if weights are introduced in the index, depending upon the influence of the scrip in the market, a more reliable index figure can be calculated. Table C introduces market capitalization of the scrips as weights for the above example.

Table C: Calculation of Hypothetical Index

Scrip Name	M.Cap	Weights (W)	A	B	AW	BW (Rs. in crore)
ABC	125	0.625	50	65	31.250	40.625
PQR	50	0.250	100	125	25.000	1.250
XYZ	25	0.125	75	70	9.375	8.750
Total	175	1.000	225	260	65.625	80.625

Weighted Index = 80.625/65.625 = 122.86 (Base 20 x 0 = 100). Thus, when weights are introduced, the index changes dramatically. The weighted index shows that the market has risen by 22.86 percent from what it was in 20 x 0.

INTERNATIONAL STOCK INDICES

Morgan Stanley Capital International measures the International and National performance by publishing the following indices.

World Index – (consisting of 1500 stocks)

Europe Index – (consisting of 600 stocks)

Europe, Australia and Far East Index – (consisting of 1000 stocks)

These indices are of prime importance for fund managers for better asset allocation and performance measurement. All these indices do not cover the total capitalization of the respective region. Since 1987, The Financial Times has published the FT-Actuaries world index with the help of Goldman Sachs and WM company. Several national indices are provided along with the industrial and regional indices. The most important are World index, Europe index and Pacific index. The FT-Actuaries indices have a comprehensive coverage of 2400 stocks around the world, which covers 70% of each market's capitalization. Morgan Stanley Composite Index and FT-Actuaries indices are published daily and do not consider dividend. Other international indices are Salomon/Russel Global Equity Index, Union de Banque Suisses (UBS) and Dow Jones International Indices.

DOMESTIC STOCK INDICES

In any national market, domestic investors prefer the national indices for judging the movements of the national stock markets. Most of these indices are broad-based covering companies from several industries with proper market value weightage. In these indices, each company is assigned a weight proportional to its market capitalization.

Market value indices are true market portfolio indices as they provide returns commensurate with the market movement. But this is not applicable to the equal weightage indices like Dow Jones or the Japanese Nikkei. The Dow Jones Industrial Average contains 30 stocks with the weights assigned in proportion to their market price. Local indices are preferable to the international indices due to the following reasons:

1. Most of the local indices have been used for several years.
2. Domestic indices represent a comprehensive coverage of the national listed stocks.
3. Local indices are readily available with the daily stock price.

BSE – Sensex

The absence of an index of equity prices reflecting the general trend of the market at the end of the day's session was felt from a long time, by the share brokers and investors and also by newspapers who do not compile their own index numbers. With this point in view, the stock exchange of Mumbai compiled and published a sensitive index of equity prices from January 2, 1986 onwards. The index called "The Stock Exchange Sensitive Index for Equity Prices" cyclostyled quotations from "The Daily Official List" of the stock exchange.

- **Choice of Base Year**

  The financial year 1978-79 was chosen as the base year. Considerations for the choice were the price stability during that year and the proximity to the current period.

- **Method of Compilation**

  The method of compilation was the same as used by Standard & Poor, USA,[8] in the construction of their share price indices. The index for a day is

8 It is one of the best known indexes in the USA, published by Standard & Poor's Corporation – USA. This index measures the price index of 500 widely held equity shares, mostly of the New York Stock Exchange. It is considered to be more representative of stock market trends and often called S & P's 500 index. The S & P's 500 index has 400 industries, 40 public utilities, 20 transportation companies and 40 financial institutions.

calculated as the percentage of the aggregate market value of the equity shares of all the companies in the sample on that day to the average market value of the equity shares of the same companies during the base period. This method of compilation had the advantage that it had the necessary flexibility to adjust for arbitrary price changes caused by the issue of rights and bonus shares.

- **Weighting**

  The price of each component share in the index was weighted by the number of shares outstanding so that it would influence the index in proportion to its respective market importance. The current market value for any particular share was obtained by multiplying the price of the share by the number of shares outstanding.

  A drawback in using market capitalization as the weight in the index is that the companies influence the market by the sheer size of their business and the way they finance their projects.

- **Adjustments for Bonus Issues**

  When a company included in the compilation of the index issues bonus or subdivides or consolidates the existing equity shares, the new weighting factor will be the number of equity shares outstanding after the bonus issue, subdivision or consolidation has become effective. This new weighting factor will be used while computing the index from the day the change becomes effective.

- **Adjustments for Rights Issues**

  When a company included in the compilation, issues rights shares, the weighting factor for that share is increased by the number of additional shares actually issued. An offsetting or proportionate adjustment is then made to the Base Year Average.

- **Other Issues**

  Weighting factors are revised when new share issues are made by way of conversion of debentures, of loans into equity by financial institutions, mergers, etc. The Base Year Average is also suitably adjusted to offset the increase in the market value thus added. Similarly, when convertible/non-convertible bonds/debentures, preference shares etc., are issued as rights to equity shareholders, the Base Year Average is suitably adjusted on the basis of the ex-rights price of the equity share.

Box 3: All about Market Timing

Market Timing is a top down view of the market and its prospects. This is an approach that attempts to determine when to be in the market, when to be out of the market and when to short (bet on a price decline by borrowing stock and selling with the hope to buy it back at a cheaper price and repay at cheaper prices). Market timing includes the following four components.

Trends of interest rates: The future behavior of interest rates i.e., the tightening or easing bias of the Central Bank. Interest rates are critical to market values for three reasons. Stocks are basically the present value of future earnings. An investor invests his money in an expectation of certain rate of return. The higher the general level of risk-free rates, the greater the expected rate of return and the lower the present value of future returns. Additionally, higher rates of return available in fixed income instruments drain money from the stock market by reason of deteriorating supply and demand dynamics. Finally, many companies employ debt in their capital structure. Higher borrowing costs hurt earnings. Lower rates or the expectation of lower rates has the opposite effect.

Investor sentiments: This is also a contrarian indicator. The more bullish the investor sentiment, the more bearish it is for the market. Various proxies are used to determine investor sentiment, including investor surveys as well as ratios of put premiums to call premium, mutual fund cash, new issues of new stocks versus all stocks in the benchmark index, etc.

The valuation of the market as a whole: Various ratios, including Price earnings, Price to cash flow, Price to sales, and Price to book value are viewed against historical averages and ranges and subsequent market behavior. Additionally, the relationship between risk-free interest rates is reviewed. The lower the interest rates, the higher the P/E in most circumstances. Interest rates are critical because they determine the rate at which future cash flows are discounted. They determine the relative attractiveness of other fixed income investments and finally rates determine borrowing costs for companies.

The technical state of the market: The market can be considered extended and vulnerable if it is trading above its moving averages, is overbought using de-trending oscillators (stochastics, MACD, Wilder RSI, etc.), the Central bank is tightening liquidity and interest rates are rising, valuations are high by most measurements, and sentiment is bullish. The market is considered oversold and attractive if the opposite conditions exist.

Source: Portfolio Organizer, August 2001.

- **Base Changes**

  Base changes are in effect proportional adjustments in the Base Year Average Market Value to offset arbitrary price changes in market values upon which the index is based. The formula for changing the Base Year Average is as follows:

$$\text{New Base Year Average} = \text{Old Base Year Average} \times \frac{\text{New Market Value}}{\text{Old Market Value}}$$

  To illustrate, a company issues rights shares which increases the market value of the shares of that company by, say, Rs.100 crore. The existing Base Year Average, say, is Rs.963.93 crore and the aggregate market value of all the shares included in the index before the rights issue made is, say, Rs.2,294.72 crore. The New Base Year Average will then be:

$$963.93 \times \frac{(2,294.72 + 100.00)}{2,294.72} = 1,005.94$$

  This figure of Rs.1,005.94 crore will be used as the Base Year Average for calculating the index number from then onwards till the next base change becomes necessary.

Latest Changes in BSE Sensex

The composition of the SENSEX was again revised in March 2000. Over the last few years, Indian economy has made successful transition, first moved from manufacturing economy to a service economy and now it is heading towards knowledge-based economy. To reflect this, Infosys Technologies and NIIT were included in the SENSEX in November 1998 replacing Arvind Mills (Textiles) and Great Eastern Shipping to give due importance to the up-and-coming software sector. Further, Castrol and Novartis replaced SAIL and IPCL (Petrochemicals).

With increasing changes in Global Economy, it was felt that the BSE Sensitive Index needed to be reviewed. Thus, in March 2000, four scrips – IDBI, Tata Power, Tata Chem and Indian Hotels – were replaced by Zee Telefilms, Satyam

Computer, Dr. Reddy's Lab and Reliance Petroleum. In 2001, Novartis was replaced with Cipla Ltd. The replaced and replacing companies are shown below.

Table 7

Date	Outgoing Scrips	Replaced by
01.01.1986	Bombay Burmah	Voltas
	Asian Cables	Peico
	Crompton Greaves	Premier Auto.
	Scinda	G.E.Shipping
03.08.1992	Zenith Ltd.	Bharat Forge
19.08.1996	Ballarpur Inds.	Arvind Mills
	Bharat Forge	Bajaj Auto
	Bombay Dyeing	BHEL
	Ceat Tyres	BSES
	Century Text.	Colgate
	GSFC	Guj. Amb. Cement
	Hind. Motors	HPCL
	Indian Organic	ICICI
	Indian Rayon	IDBI
	Kirloskar Cummins	IPCL
	Mukand Iron	MTNL
	Phillips	Ranbaxy Lab.
	Premier Auto	State Bank of India
	Siemens	Steel Authority of India
	Voltas	Tata Chem
16.11.1998	Arvind Mills	Castrol
	G.E. Shipping	Infosys Technologies
	IPCL	NIIT Ltd.
	Steel Authority of India	Novartis
10.04.2000	IDBI	Dr. Reddy's Laboratories
	Indian Hotels	Reliance Petroleum
	Tata Chem	Satyam Computers
	Tata Power	Zee Telefilms
08.01.2001	Novartis	Cipla Ltd.
07.01.2002	NIIT Ltd.	HCL Technologies Ltd.
	Mahindra & Mahindra	Hero Honda Ltd.
31.05.2002	ICICI Bank Ltd.	ICICI Ltd.
10.10.2002	Reliance Petroleum Ltd	HDFC Ltd
11.10.2003	Castrol India Ltd	Bharti-Tele-Ventures Ltd
	Colgate Palomive (India) Ltd	HDFC Bank Ltd
	Glaxo Smithkline Pharma. Ltd.	ONGC Ltd
	HCL Technologies Ltd.	Tata Power Company Ltd.
	Nestle (India) Ltd.	Wipro Ltd.
19.05.2004	Larsen & Toubro Ltd.	Maruti Udyog Ltd.
27.09.2004	Mahanagar Telecom Ltd.	Larsen & Toubro Ltd

For latest revisions, the students are advised to log on to www.bseindia.com.

Box 4: The Sensex Shifted Over to the Freefloat Methodology

BSE has announced that the Sensex will be calculated on a freefloat methodology from September 1, 2003. This is a monumental structural change in most tracked index of the country. Let us explore the reasons and implications of this change.

What is Freefloat?

Freefloat is the part of the entire share capital that is floating freely in the market. By definition, freefloat is said to be comprised of all shares other than controlling and strategic holdings. So what are these controlling holdings? In essence, shares held by shareholders who 'control' the company or would exercise their voting rights in concert with the 'controlling' body are the ones that form the controlling stake. "Control" here means 'control' as defined in the Sebi's Takeover Regulations. According to these regulations, 'control' includes the right to appoint a majority of directors or to control the management and policy decisions by one or many shareholders acting in concert. A manner other than shareholding is if a person(s) has control over the management by way of an agreement.

Why the Freefloat Index?

The freefloat methodology for index construction is globally accepted as the best method. This is because, like in full market cap weights, closely held companies do not affect the index as much. The problem with full market cap is that they're a limited number of shares actually being traded, and the change in the prices based on their low volumes is applied to the entire share capital of the company. In the pricebased index, changes in the face value of a company's share has an undue affect on the index.

How is the Freefloat Determined?

The stock exchange directs listed companies to submit a pattern of their share holdings in a specific form. This forms the basis of classifying holdings into controlling or freefloat holdings. The controlling holdings contains shares held by promoters, persons acting in concert with the promoters, directors having control, Employees Welfare Trusts, shares allotted to employees under Employee Stock Options Program (ESOP), banks and financial institutions, and Central and State Governments. All other holdings come under the free-float holdings.

Free float Factors

The dynamic free-floats of 30 companies in the Sensex calls for a system that simplifies the process. The international practice of assigning a free-float factor to each company has been adopted by BSE. There are ten bands into which each company falls, based on their percentage of shares in free-float. Thereafter, these bands are assigned free-float factors. The free-float (as a %) is rounded off to the higher multiple of 10 to assign the stock one of the 10 free-float bands. If the float is 78%, the free-float factor will be 80% or 0.8. The banding structure ensures that the free-float factors don't change too frequently. This free-float factor is then multiplied with the full market cap of the company to arrive at the free-float capitalization. Finally, weights are assigned to each company by the percentage of its free-float cap to the total free-float cap of the Sensex.

Source: Portfolio Organizer, September, 2003

The objective of recasting the most familiar index in the country was to give fair representation to those sectors in the economy, which of late started playing a crucial role. The weightages given to different companies in the recasted Sensex is as given below.

SENSEX Constituents with their Free-Float Adjustment Factors: (Effective November 08, 2004

Table 8

Name	Free-float Adj. Factors	Name	Free-float Adj. Factors
Associated Cement Companys Ltd.	0.90	Infosys Technologies Ltd.	0.80
Bajaj Auto Ltd.	0.70	ITC Ltd.	0.70
Bharat Heavy Electricals Ltd.	0.35	Larsen & Toubro Limited	0.90
Bharti Tele Ventures Ltd.	0.20	Maruti Udyog Ltd.	0.30
Cipla Ltd.	0.60	ONGC Ltd.	0.15
Dr Reddy's Laboratories Ltd.	0.75	Ranbaxy Laboratories Ltd.	0.70
Grasim Industries Ltd.	0.80	Reliance Energy Ltd.	0.50
Gujarat Ambuja Cements Ltd.	0.75	Reliance Industries Ltd.	0.55
HDFC	0.85	Satyam Computer Services Ltd.	0.90
HDFC Bank Ltd.	0.75	State Bank of India	0.45
Hero Honda Motors Ltd.	0.50	Tata Iron & Steel Co. Ltd.	0.75
Hindalco Industries Ltd.	0.75	Tata Motors Ltd.	0.60
Hindustan Lever Ltd.	0.50	Tata Power Co. Ltd.	0.70
Hindustan Petroleum Corp Ltd.	0.50	Wipro Ltd.	0.20
ICICI Bank Ltd.	1.00	Zee Telefilms Ltd.	0.55

Source: www.bseindia.com

BSE 100 Index

This index was introduced by BSE in 1988-89 with 1983-84 as its base year. It was constructed with an objective of having a broad based index so as to have more smoother curve of the trend in the stock markets unlike the sensitive index which fluctuates widely. Thus, while the sensex can be used by the speculators, who need to have a daily or even momentary watch on the share prices, the Natex can be used by investors having a long-term investment perspective. However, even the Natex faces the same problem like the sensex, that is, inclusion of lesser market representative scrips.

METHOD OF COMPILATION

The methodology adopted for compiling BSE National Index is the same as the one used in compilation of the BSE Sensitive Index except that in this case where a scrip is actively quoted on more than one exchange, the average price of that scrip on these exchanges is used in compilation of the index. The coverage is, however, limited to the major stock exchanges of Mumbai, Calcutta, Delhi, Chennai and Ahmedabad.

The BSE National Index is being updated once in two minutes during market hours and displayed along with the BSE Sensitive Index through the PTI Stockscan Service. The day-to-day administration of the index is done by the Department of Research, Statistics and Data Processing of the exchange.

COVERAGE

The equity shares of 100 companies from both the Specified and Non-specified lists of the five major stock exchanges, viz., Mumbai, Calcutta, Delhi, Ahmedabad and Chennai, have been selected for the purpose of compiling the Bombay Stock Exchange National Index of Equity Prices with 1983-84 as the base year. The major criteria for selection have been market activity, due representation to various industrial groups and to the major stock exchanges. The 30 scrips comprising the BSE Sensitive Index are all included in the new BSE National Index.

Designation of the BSE National Index to the BSE 100 Index

As discussed above, the BSE National index is used to consider prices of some scrips from other stock exchanges or weighted average of some scrips that were popular on other exchanges to reflect national wide market sentiments. However, because of rapid advancements in information technology, there is now almost instantaneous availability of information across the country. This ensured that there is very little or no difference in prices of the index scrips. Therefore, the BSE administration decided, since October 1996, to calculate the index based on the prices of all scrips at BSE. It also redesignated the BSE 100 National Index as the 'BSE 100' index.

Table 9

List of Companies included in BSE 100 Index

A.C.C.	Indian Oil
ABB Ltd.	Indogulf Corporation
Aptech Ltd.	Infosys Technologies
Ashok Leyl	Ingersoll
Asian Paints	IPCL
Bajaj Auto	ITC Ltd.
Bank of Baroda	Knoll Pharmaceuticals
Bank of India	Larsen & Toubro
Bharat Electronics	Madras Cements
Bharat Forge	Mahindra & Mahindra
Bharat Petroleum	Mahanagar Tele
BHEL	Mirc Electronics
BPL Limited	Monsanto Industires
Britannia Industries	National Alu
BSES Ltd.	Nestle Ltd.
Cadbury (I)	Nicholas Pir
Cadila Healthcare	NIIT Ltd.
Castrol India	Nirma Ltd.
Cipla	Novartis (I)
Colgate Palmolive	Pentamedia G
Cummins India	Pfizer
Dabur India	Procter & Gamble
Dr. Reddy's Laboratories	Pun.Tractor
EIH Ltd.	Ranbaxy Laboratories
Escorts	Raymond Ltd.
Essel Packing	Rel. Petrol
G.E.Shipping	Reliance
Glaxo (I) Ltd.	Satyam Computers
Global Tele	Siemens
Grasim Industries	Silverline Technologies
Gujarat Ambuja Cement	Smithklin.Co
Gujarat Narmada	SSI Ltd.
HCL Infosys.	State Bank
HCLTechnologies	Steel Authority
HDFC Bank	Sterlite Industries

Hero Honda	Sterlite Opt
Him.Fut.Comm	Sun Pharmaceuticals
Hindustan Lever	Tata Chemicals
Hindustan Petroleum	Tata Engineering
Hindalco	Tata Power
Hindliver Ch	Tata Steel
Hoechst Mari	Tata Tea
Hous Dev Fin	Titan Industries
Hughes Soft.	TVS Suzuki
ICICI Bank	Videocon Int
ICICI Ltd.	Videsh Sanchar
IDBI	Visual.(I)(D)
India Cement	Wipro Ltd.
Indian Alum	Wockhardt Ltd.
Indian Hotel	Zee Telefilm

Source: www.bseindia.com

Choice of Base Year

The price stability during 1983-84 and the proximity to the current period are the main considerations for choosing it as the base year.

ADJUSTMENTS FOR BONUS ISSUES

(Same as that for BSE Sensitive Index)

ADJUSTMENTS FOR RIGHT ISSUES

(Same as that for BSE Sensitive Index)

OTHER ISSUES

(Same as that for BSE Sensitive Index)

BASE CHANGES

(Same as that for BSE Sensitive Index)

BSE-200 and DOLLEX

There has been a considerable growth in the number of companies registering with the Bombay Stock Exchange, which in turn has resulted in the manifold rise in market capitalization. The number of companies registered with BSE has increased from 992 to 5647 and their respective market capitalization increased from Rs.5,421 crore to Rs.6,19,872 crore during the period 1980 to 2003. Thus, in order to have a proper representation of market movements, it was required to have an index which has a larger number of companies. Thus, keeping these in view, two indices were constructed viz., BSE-200 and DOLLEX. Based upon the respective market capitalization and trading volumes, 200 companies were selected to construct the BSE-200 Index. The base year for this index was 1989-90. The index was constructed based upon the same methods as that of BSE Sensex.

In order to determine the increase in market value with respect to the base period in dollar terms, DOLLEX was constructed. Thus, it is nothing but the value of BSE-200 Index expressed in dollar terms. This was more useful to the foreign investors to analyze the market movements. Suitable changes were done in the calculation methodology to inculcate the dollar value both in the base period and the period to which calculations were made. Usually, current market value of rupee is divided by current rupee-dollar conversion rate and the base value is divided by a constant average rupee-dollar conversion rate in the base year.

BSE-500 and Sectoral Indices

On August 9, 1999, another new index was introduced in the market which was based on the data of 500 companies and designated as BSE-500 index. It was a broader index as it reflected movement of 85% of the total companies and 85% of total market capitalization. This index includes 20 major industries of the economy. The base date for this index was February 1, 1999 with a base value of 1000 points.

Close on the heels followed various sectoral indices such as BSE IT Sector Index, BSE FMCG Sector Index, BSE Capital Goods Sector Index, BSE Consumer Durable Index and BSE Healthcare Sector Index. These indices are calculated the same way as BSE Sensex.

IndoNext

A separate exchange for small, mid-cap companies was started from January 7, 2005. IndoNext was jointly promoted by the Bombay Stock Exchange (BSE) and the Federation of Indian Stock Exchanges (FISE). The launch of IndoNext created a national trading platform for mid-cap and small-cap companies. With its launch SMEs can now raise capital, list their shares on the stock exchange of their region and trade through BSE online Trading and BSE web trading system – BSEWEBX. The launch of IndoNext will allow trading of securities of companies having equity between Rs.3 crore and less than Rs.20 crore and also transfer of certain securities trading on BSE's B1 and B2 market to IndoNext. In the first phase, about 511 companies that are currently traded on the BSE B1 and B2 groups would be shifted to the BSE-IndoNext segment along with nine scrips that are listed on regional stock exchanges. All trades pertaining to this group will be done through the BSE's BOLT system under the 'S' group. All norms pertaining to trade, settlement, risk management, surveillance and monitoring applicable to BSE apply to scrips traded on IndoNext.

S&P CNX 50

The two different stock indices, NSE-50 of National Stock Exchange and CRISIL 500 of Credit Rating and Information Services of India Limited, will be now maintained by India Index Services and Products which is a joint venture between NSE and CRISIL. India Index Services and Products will, in turn, have a consulting and licensing agreement with Standard and Poor's. Under this agreement, the indices NSE-50 and CRISIL 500 will be now known as S&P CNX 50 and S&P CNX 500 respectively. The dollar equivalent of NSE-50 will be called S&P CNX defty. Also, we have CNX Mid Cap 200 and CNX Nifty Junior which will be maintained by India Index Services and Products for NSE and CRISIL.

Objectives of S&P CNX 50

The objectives of constructing this index are as follows:

- It should reflect the market trends accurately.
- It should act as a benchmark for fund managers to compare the return from the portfolio with the market returns.
- It should serve as a cornerstone for index-based derivatives.

The base period selected for this index is the closing prices on November 3, 1995. The base value is 1000.

The criteria for eligibility to be included into S&P CNX 50 are:

i. The market capitalization of Rs.500 crore, and

ii. High liquidity.

We define market capitalization of a company as the product of the market price of the share and the number of shares outstanding. Liquidity is measured in terms of trading frequency and impact cost. Impact cost is defined as the percentage difference between the executed price and the mean of the best buy and sell prices. It can be noticed that impact cost determines the liquidity of the company's stock. All the securities included in the index, necessarily satisfy the required execution on 85% of the trading days at an impact cost of less than 1.5%.

We may find quite a number of companies which satisfy these criteria, but the exchange officials have the discretion to make a final decision about the inclusion of the companies in the index.

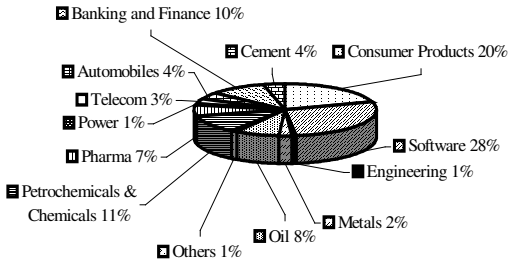
The index is computed by giving weights in proportion to the market capitalization of the companies on the lines of the internationally renowned index S & P 500. It takes into consideration the inclusion of new companies and omission of the existing ones in the index from time to time and adjusts for corporate actions like stock splits, rights etc., without affecting the index value. It is calculated as follows:

$$\text{Index Value} = \frac{(\text{Market Capitalization of Index Stocks})\ (\text{Initial Index Value})}{\text{Base Capitalization of Index}}$$

Since, an unbiased index ought to reflect various corporate events and actions from time to time, the base capitalization value has to be adjusted to a level it was before the announcement of such events. The adjustments are incorporated by calculating new base capitalization. It is given by

$$\text{New Base} = \text{Old Base Capitalization} + (\text{Changed Issue Size} \times \text{Issue Price}) \times \left(\frac{\text{Initial Index Value}}{\text{Previous Closing Price}}\right)$$

Figure 2: Composition of Nifty



S&P CNX Defty

The S&P CNX Defty closed at 772.95 on February 28, 2003, registering an increase of 16.00 points (2.11%) over its previous month close of 756.95 in January 2003. During the month under review, the Defty reached a high of 780.95 on February 24, 2003 and touched a low of 742.85 in January 2003.

Table 10: Performance of Various Indices as end January, 2003

(in percent)

	1 month	3 month	6 month	1 year
S&P CNX Nifty	–4.72%	9.51%	8.65%	–3.12%
S&P CNX 500	–3.07%	8.26%	6.01%	4.84%
S&P CNX Defty	–4.46%	10.84%	10.65%	–1.72%
CNX Nifty Junior	–2.56%	9.68%	–5.43%	2.10%
CNX MidCap 200	–3.41%	8.76%	1.06%	15.68%
CNX IT Index	–12.84%	5.87%	21.77%	–9.47%

Table 11: Stock Exchanges and Indices

Country	Exchange	Index (No. of Stocks)
United States	New York Stock Exchange (NYSE)	Dow Jones Industrial Average (30) Standard & Poors (500) NYSE Composite index (1500)
	NASDAQ	NASDAQ index (3000)
Japan	Tokyo Stock Exchange (TSE)	Nikkei Average (225) Topix (12300)
United Kingdom Exchange	London Stock Exchange	FTSE (100) Financial Times (30) Financial Times - Stock

Country	Exchange	Index (No. of Stocks)
		FT- All Share (750)
Hong Kong	Hong Kong Stock Exchange	Hang Seng (33)
Singapore	Singapore Stock Exchange	Straits Times (30)
Australia	Australian Stock Exchange	All Ordinaries Index
India	Bombay Stock Exchange	Sensex (30)
	National Stock Exchange (NSE)	Nifty (50)
France	Paris Stock Exchange	CAC (40)
Germany	Frankfurt Stock Exchange	Commerzbank (60)
		Fax Atekin (100)
Canada	Toronto Stock Exchange	TSE (100) (200)
South Africa	Johannesburg Stock Exchange	Composite Index JSE Actuaries Index
Switzerland	Zurich Stock Exchange	Swiss Market Index (21)
		Credit Sussie Index
Denmark	Copenhagen Stock Exchange	KFX Index

CRISIL 500

Crisil 500, as its name projects, comprises 500 scrips spread over 97 industries. It is constructed on the lines of world famous Standard and Poor's index and is a weighted average index. The base year is 1994 and the base value, 1000. Selection of the companies has been made on the basis of the following four parameters:

- Market capitalization of the company
- Industry representation
- Trading interests in the scrips
- Fundamentals of the company.

As already studied, CRISIL 500 will be known as S&P CNX 500 and will be maintained by India Index Services and Products Ltd. CRISIL wants this index to serve as a cornerstone for index-based derivatives.

Business Line-250 Index

The Business Line-250 Index is a portfolio of 250 stocks that has been designed comprehensively to capture and disseminate the underlying spirit of the Indian economy. The Business Line-250 is a portfolio of stocks from 41 industry groups, one diversified group and one miscellaneous group. It is broad-based and includes stock of companies in which the public has a significant stake.

Companies tracked by this index have:

a. a significant share in the markets in which they operate, and

b. a significant part of whose equity is held by individual and institutional investors.

The five distinguishing features of the Business Line-250 are:

– The Business Line-250 is weighted by market capitalization. A big price spurt in a stock that has small market capitalization will have only a small impact on the index.

– The Business Line-250 can be easily adjusted for dividends, buy-back of equity, offerings of equity and convertible debt and issue and exercise of warrants. It is, therefore, a full-fledged wealth index and not just a price index.

– The Business Line-250 is a composite of 43 groups of stocks and the performance of individual industry groups is captured by the composite.

– The Business Line-250 is designed to facilitate the easy deletion and addition of stocks. It is immunized against fossilization.

– The deletion of a stock is usually followed by the addition of a stock in the same industry. A cement stock will not be replaced by a sugar stock and vice versa.

OTCEI-Composite Index

The OTCEI index is a pure price index. The sum of the prices of all shares as of June, 1993 is in the denominator. The current prices are in the numerator. New scrips are added to both the numerator and the denominator. Adjustments for rights and bonus are also made. There is no element of market capitalization in the OTCEI index.

This is not intended for portfolio managers and traders. It is intended to reflect the mood [bullish or bearish] accurately for small investors. This index is similar to TOPIX in Japan.

The OTCEI carried out several simulations to study the variations in the index. A weighted index system was also simulated, before selecting the basis. With only 41 companies listed, and with more than 40 percent market capitalization accounted by 3 companies [Renewable Energy System, Maxwell Apparel, and Biochem Synergy], a weighting system at this stage would not achieve much. Hence, they opted for pure price index.

CNX Nifty Junior Index

This is another type of stock index existing in the Indian market. It came into existence from January 1, 1997. The selection of securities in this index is based on their value of market capitalization and liquidity in the market. The stock to be included in this index should have at least Rs.2 billion of market capitalization value. Their weight in the index is proportionate to the respective value of market capitalization. In addition to this, the security to be included in this index should be actively traded in the market, 85% of total trading days at a cost of less than 2.5%. The impact cost is the percentage mark-up lost while purchasing or selling a security with respect to its deal, i.e., average price of best buy and best sell or mathematically expressed as:

$$= \frac{(\text{best buy} + \text{best sell})}{2}$$

The impact cost is calculated as below:

Order Book

Buy		Sell	
Quantity	Price	Quantity	Price
1000	96	1000	97
2000	95	1500	98
1000	94	1000	99

To buy 1500 shares, Ideal Price $= \frac{97 + 96}{2} = 96.5$

Actual Buy Price $= \frac{1000 \text{ x } 97 + 500 \text{ x } 98}{1500} = 97.33$

Impact Cost $= \frac{97.33 - 96.5}{96.5} \text{ x } 100 = 0.86\%$ (for 1500 shares)

At present it stands for 7% of total market capitalization. This index has 1.08% impact cost for a portfolio of Rs.2.50 million. The derivatives can also be actively traded.

S&P CNX 500

Here, the stocks are included as per their respective market capitalization. It includes companies which lead in their respective industry sector. They should closely resemble the sentiments of the market in order to qualify for inclusion in this index. Few other important characteristics of the companies to be included in this index are as below:

1. Six month period of listing.
2. Part of share capital with public.

3. Sufficient liquidity in quantity of shares traded and frequency with which trading took place.
4. Three years of positive net worth.

At present, this index has 79 companies, which are divided into two groups. The first group reflects diversified companies and the second one includes miscellaneous companies. There is no rigidity in terms of number of industries to be included in this index. So is the case with number of industries to be included from a particular segment. It is done primarily because of the fact that the index should be able to reflect true sentiments of the market. The base value of the index is 1000 and the base year for the index is 1994.

The S&P CNX 500 reflects 72% of total market capitalization and 98% of total trading volume. It is one of the best indices that resembles the true market sentiments.

Other Indices

List of stock market indicators is long and gaining momentum day by day. Recently, many indices are introduced by many players in the market. Most prominent among them are:

Three debt indices:

a. Credit Capital's Debt Index,
b. I-Sec's Bond Index (i–BEX), and
c. J P Morgan India Treasury Bill Index.

Two GDR indices:

a. DSP's GDR Valuation Index
b. 22-Basket Skindia GDR Index.

Others being FE index, RBI index, ET index, etc. Salient features of some of them are given in Table 6.

Stock indices reflect market direction as well as day-to-day fluctuations. If one wants to know the market trend as a whole and as to which direction it is moving, there should be one common indicator or index to represent the mood.

There are many reasons as to why people are concerned about the movement of aggregate security prices.

The return on individual stocks is largely dependent on the aggregate market movements. Investors would like to see the increase in share prices of their portfolio attuned to the upward mobility of an index. Investors generally compare their holdings with movements of the indices and the returns associated with them and so on. Although the returns on individual share prices are a product of a large number of economic and political events, a significant portion of such events affects the prices of all securities. Many investors believe that the market tends to move on identifiable patterns.

- Investors believe that the size and direction of current moves can be related to historical movements and be used to determine the correct timing for buying or selling the securities.
- The prices of securities also depend upon various stock market indices.
- Each underlying index implies a separate portfolio strategy.

There are a variety of indications now available but none tells the whole story of the market. On a given day, the indices may differ from one another, but over a period of time all indices generally move together.

The index has established a place for itself amongst investors, chartists, technical analysts of the market, academicians, researchers, students of finance, the newspapers and all others concerned with the securities market. The index has also been widely accepted by all sections of people as a fair reflector of the trend of prices on the stock market. A layman who is not an active investor may not be interested in individual share price fluctuations, but if he wants to know the mood of the stock market, then the behavioral pattern of the index is his choice.

Table 12: Comparison of the Various Security Market Indices

	Bombay Stock Exchange Sensitive Index (Sensex)[1]	Bombay Stock Exchange National Index (Bseni)[2]	National Stock Exchange Index (Nifty)	Reserve Bank of India Index Number of Security Prices (Rbi)[3]	Financial Express Equity Index (fe)[4]	Economic Times Ordinary Share Price Index (et)[5]
Base Period	1978-79 = 100	1983-84 = 100	1993-94 = 100	1980-81 = 100	1979 = 100	1984-85 = 100
Stock exchanges covered	Bombay	Bombay, Delhi, Calcutta, Madras, Ahmedabad	Bombay	Bombay, Delhi, Calcutta, Madras, Ahmedaba	Bombay, Delhi, Calcutta, Madras, Ahmedabad	Bombay, Delhi, Calcutta, Madras, Bangalore, Pune, and Kanpur
Number of scrips	30	100	50	338	100	72
Method of compilation	The index for a day is calculated as the percentage of aggregate market value of the equity shares of all the companies in the sample on that day to the average market value of the equity shares of the same companies during the base period.	Same as sensex except that in case where a scrip is actively quoted on more than one exchange, the average price of that scrip on these exchanges is used in the compilation of the index.	Based on the major criterion of liquidity as measured by the market impact cost. A stock must trade in the total portfolio of 2 crore at an impact cost of less than 115% on 85% of the trading days.	The weekly average price of each sample scrip is obtained as the arithmetic average of daily closing price quotations in the week. Price relative for a scrip during a particular week is worked out as the ratio of the average price of the week to the base year average price of that scrip.	Price relatives for each of the scrips are worked out by dividing the closing quotation of the day by its corresponding average daily base price in 1979 and multiplying it by 100.	Simple arithmetic average of the price relatives of all the scrips price relatives for each day are obtained by dividing the daily quotations by the corresponding average prices of the base year.
Weighting system	The price of each component share in the index is weighted by the number of shares outstanding so that it will influence the index in proportion to its respective market importance.	Same as Sensex.		Weights are proportional to the aggregate average market value of share capital of all companies quoted on the respective stock exchanges as on 31.3.81.	The approximate volume of trading of the share.	No specific weights have been assigned. Care has been taken to give adequate representation to large stock exchanges, larger industry groups, the no. of scrips listed in each industry group, the no. of scrips listed for trading in each stock exchange and their paid-up capital.

	Bombay Stock Exchange Sensitive Index (Sensex)[1]	Bombay Stock Exchange National Index (Bseni)[2]	National Stock Exchange Index (Nifty)	Reserve Bank of India Index Number of Security Prices (Rbi)[3]	Financial Express Equity Index (fe)[4]	Economic Times Ordinary Share Price Index (et)[5]
Criteria for selection of scrips	Selection of scrips is on the basis of their market activities and adequate representation of the various industry groups.	Same as Sensex.		Selection of scrips is on the basis of i) the size of average market value of the share capital of the company during base year and ii) the activity of the scrip as indicated by no. of price changes during the base year.	100 briskly traded scrips have been chosen for compiling the index irrespective of which exchange they are quoted upon.	Those shares which are very actively traded on the basis of both the frequency of price changes and the magnitude of price fluctuations.
Dividend Adjustments	None	None		None	None	None
Bonus adjustments	The new weighting factor will be the no. of equity shares outstanding after the bonus issue has been effective.	Same as Sensex.		The correction factor is computed as the ratio of theoretical ex-bonus price to cum-bonus price to adjust the base year average.	In the proportion of new issues to the old issues for calculating further index numbers after taking into account the premium, if any.	The base year price is multiplied by no. of shares held and divided by the bonus issue.
Rights issue adjustments	The new weighting factor will be the no. of equity shares outstanding after the rights issue, and an offsetting or proportionate adjustments is made of the base year average.	Same as sensex	Same as sensex	Cum-right prices are divided by (1+p) where 'p' is the no. of rights shares issued per old share after making adjustments for cash payment.	In the proportion of new issue to the old issues for calculating further index numbers after taking into the premium if any.	It is adjusted by calculating an estimated ex-right price $E_r = \frac{c_r + r(f + p)/1 + p}{c_r}$ c_r = last cum-right price r = rights ratio f = face value of a share p = premium per share.

(1) 'The Stock Exchange Sensitive Index of Equity Prices: The Stock Exchange', July 1987. (2) '*Fortune India*' November 1988. (3) The Reserve Bank of India, July 1985. (4) '*The Financial Express*', February 11, 1981. (5) '*The Economic Times*', January 12, 1987.

Limitations of Various Indices

Though stock market indices are the basic tools to help and analyze the movements of price of the stock markets and is a useful indicator of a country's economic health, they have their own limitations also. The following points deal with those limitations:

1. Whenever a company issues rights in the form of CDs (to be converted at a later stage) or other instruments (warrants) entitling the holder to acquire one equity share of the company at a specified price at a notified future date, secured promissory notes (SPNs), etc., the equity capital increases only on conversion of debentures or the exercise of warrants/SPNs, option for equity shares but the market adjusts the ex-rights price of the share immediately (on the day the share starts trading ex-rights) on the basis of the anticipated increased equity capital and likely reduced earnings per share, etc. Hence, some modification is needed to adjust the equity capital suitably in advance. But the exact procedure by which this can be done is very difficult to state since the internal market mechanism which adjusts the ex-rights share price is almost impossible to know precisely.
2. Again, this is a common limitation of all the indices and so far, the increased equity capital is considered only after the debentures are converted into shares and are acquired for warrants/SPNs and the new shares are listed for trading on the stock exchange.
3. The coverage (in terms of number of scrips, number of stock exchanges used and the respective weights assigned) is different for all the indices and hence, each index may give only a partial picture of the movement of prices or the state of the market presented may be misleading.
4. The financial institutions like ICICI, IDBI, LIC, GIC, etc., sometimes convert the loans extended by them to companies into equity shares at a specified date. This causes sudden and significant changes in the market capitalization and hence, the weights assigned to those scrips change violently.

The stock market indicators covered here have been in use for many years and have satisfied the needs of millions of investors and stockbrokers. But the stock markets, by their very nature, are very dynamic and hence, the indices should be revised or adjusted periodically to reflect the changed conditions so that they continue to be relevant. Whenever prices of scrips listed on more than one stock exchange are used, most liquid prices (on any one stock exchange) should be used (rather than the present practice of using the arithmetic average of prices on all the exchanges, as the same scrip may not enjoy identical degree of liquidity on all exchanges). The limitations indicated may not be eliminated totally, but appropriate adjustments are certainly called for. The classification of industries into various groups for calculation of various industry indices is presently rather vague and presents problems in the case of diversified companies. This should be made uniform or the classification should be made in such a way that it reflects the major operations carried on by each company. Overall, one can say that the various stock market indicators devised have more or less served their purpose, despite their limitations but these can be made more effective and dynamic by introducing appropriate modifications of the existing ones to serve the investing public better.

MAJOR STOCK EXCHANGES

New York Stock Exchange (NYSE)

The origin of the New York Stock Exchange can be traced back to 1792, when 24 prominent brokers and merchants gathered in Wall Street to sign Brettonwood agreement for trading of securities on common commission basis. The first corporate stock traded was that of Bank of New York. In 1817, New York brokers established a formal organization named as the New York Stock and Exchange

Board. After the collapse of Ohio Life Insurance Company in 1857, the market value of exchange was crashed by 45%. In 1863, the New York Stock and Exchange Board was renamed as New York Stock Exchange. Membership in NYSE became exchangeable in 1868, as it enabled its members to sell their membership. On April 22, 1903, the NYSE moved to its current location at 18 Broad street. The NYSE remained closed for 4 1/2 months after the First World War broke out in 1914. After World War I, Wall Street replaced London as the world investment capital. October 24, 1929 was observed as black Thursday, when stock prices fell sharply and market crashed in huge volume. This crash was the beginning of the "Great Depression". The Dow index crashed in 1932 by 89% from its highest level. NYSE developed rapidly during 1950s and 1960s. Trading hours were extended from 10 a.m. until 4 p.m. In 1979, NYSE expanded into futures trading and it formed the New York Futures Exchange (NYFE). NYSE experienced tremendous growth during 1990s and Dow Jones Industrial Average crossed 3,000 level. In this period, exchange started two trading sessions which eventually assured 24-hour trading. In 1995, the three-day settlement period was started. In 1996, the Dow Jones industrial average reached 5,000 and average daily volume surpassed 350 million shares. The 1996-97 period witnessed heavy listing of non US companies. On October 28, 1997, DJIA soared by 337.17 points, which was its biggest single-day gain and following this volume crossed 1 billion figure. The Dow Jones Industrial Average (DJIA) crossed the 10,000 figure in 1999.

Dow Jones Industrial Average was first published on May 26, 1996 with 12 stocks by Charles H Dow. (The average came along 1929.) The industrial average expanded to 20 stocks, the number rose to the present figure of 30 in 1928. The 30 stocks now included in DJIA are widely held by individuals and institutional investors. These 30 stocks represent about a fifth of the $8 trillion-plus market value of all the US stocks and about a fourth of the value of stocks listed on the New York Stock Exchange. Today, all these stocks are regarded as good investment vehicles even by conservative investors. DJIA is considered as the main index for the movement of the New York Stock Exchange (NYSE). Other famous indices are S&P 500 and NYSE composite index.

NYSE trading process is a unique system. On the trading floor an auction takes place each day. Open bids and offers are provided by exchange members who act on behalf of their institution and investors buy and sell orders for each listed security by meeting directly on the trading floor. Prices are calculated on the basis of supply and demand. Stock buy and sell orders funnel through a single location, ensures that any common investor is exposed to a wide range of buyers and sellers. This process provides any common investor the best available price.

The NYSE registered as a securities exchange with the US Securities and Exchange Commission on October 1, 1934. The governing committee was the primary governing body until 1938, at which time, the exchange hired its first paid President and created a thirty-three member Board of Governors. The Board included exchange members, non-member partners from both New York and out-of-town firms, as well as public representatives.

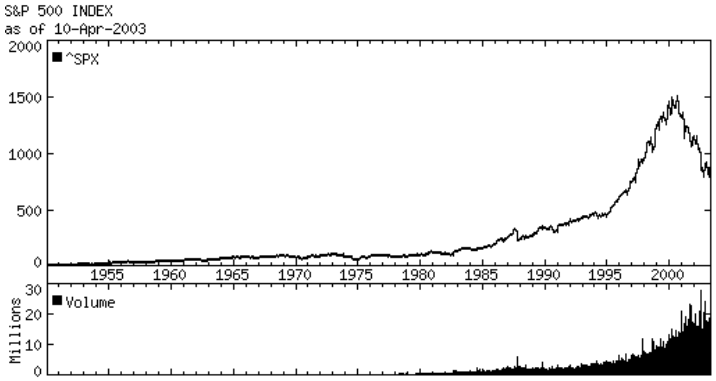
In 1971, the exchange was incorporated as a not-for-profit corporation. In 1972, the members voted to replace the Board of Governors with a twenty-five member Board of Directors, comprised of a Chairman, twelve representatives of the public and twelve representatives from the securities industry.

The New York Stock Exchange is the largest equities marketplace in the world. About 3265 companies worth more than $20 trillion in global market capitalization are traded on NYSE.

- As of December 2002, 465 non-US companies were listed.
- The total market capitalization of NYSE at the end of the year 2002 was $13.4 trillion.

Figure 3 shows the movement of the S&P 500 from 1950 to 2003.

Figure 3: S & P 500



NASDAQ

It is the world's first electronic stock market incorporated in 1971. With its bold initiatives, it came out with a lot of innovations and became a world market leader in stock trading. As the world's largest stock market in the United States, it has 4000 listed companies.

The primary index of NASDAQ is the NASDAQ composite. NASDAQ has an Exchange Traded Fund (ETF) called NASDAQ-100 tracking stock (NASDAQ symbol: QQQ). The other indices on NASDAQ are the NASDAQ Biotechnology Index, and the NASDAQ Financial-100 Index.

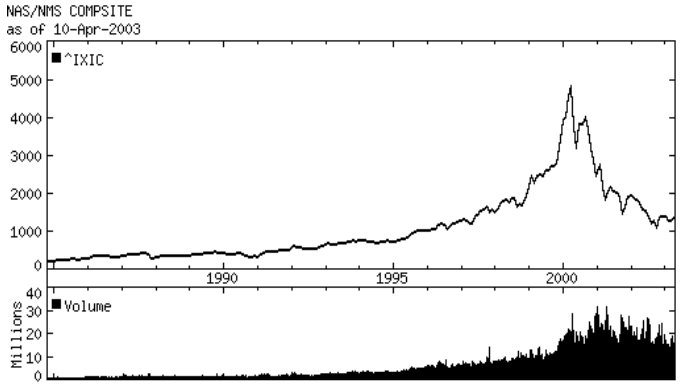
The NASDAQ is one of the most active exchanges in the world today. In 2001, NASDAQ handled 471.2 billion shares, with a peak volume of 3.2 billion shares and daily share volume of 1.9 billion shares. Its share volume topped other US markets on 247 of the 248 trading days in 2001, equating to 99.6%. In the last decade, the NASDAQ experienced a 1,041% growth in share volume.

The market capitalization has more than quadrupled over the last 10 years, from $508 billion in 1991 to $2.9 trillion in 2001, a 470% increase. Also, in 2001, the NASDAQ became the first US stock exchange ever to meet the ISO 9001 Quality Standards. NASDAQ has one of the lowest bid-ask spreads among the world bourses.

In early 2000, the NASDAQ composite peaked at above 4600 points, but shed 77.5% of its value in the next three years to reach 1350 in mid April.

Figure 4 shows the movement of the NASDAQ Composite Index from 1985 to 2003.

Figure 4: NASDAQ Composite Index



Frankfurt Stock Exchange

The roots of the Frankfurt Stock Exchange go back to the period of medieval fairs. As early as the middle of the ninth century, Emperor Ludwig, the German, granted the city of Frankfurt the preferential right to hold an annual autumn fair. Since the year 1330, when Emperor Ludwig expanded this privilege to include a spring fair as well, the city became an important center for commercial and monetary transactions. As a result of the trading that occurs during the fair, the goods manufactured against specific customer orders gradually developed into merchandise production for an open and nationwide sales market.

The industrial revolution in Germany brought to light the advantage of financing costly projects through share issues. The first share issue – a participating certificate of the Österreichische National Bank – was traded in Frankfurt back in 1820.

Following the collapse of the Nazi regime in 1945, the stock exchange remained initially closed for half a year. Nevertheless, it was already reopened in September 1945 as one of the first German stock exchanges.

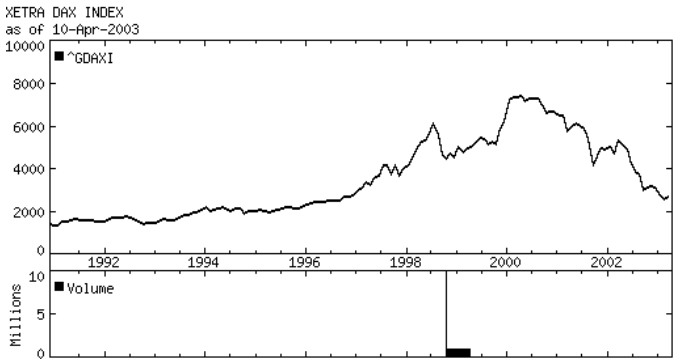
It was only following the currency reform of 1948 and the growing consolidation of the German economy that the Frankfurt Stock Exchange gradually recovered its old significance. Beginning in 1956, the purchase of foreign securities was again permitted in Germany. Frankfurt could accordingly return to its tradition of international business, again occupying the top position in Germany. The stock exchanges played an important role as capital intermediaries for the country's post-war reconstruction.

The Frankfurt Stock Exchange has continuously taken the current economic needs and developments of the country into account in recent decades. For example, the first central transaction via computer in Germany was already booked in Frankfurt in 1969. The Frankfurt Stock Exchange developed the DAX share index, which was launched in 1988 and is today one of the world's most important share indices. In 1993, the newly established Deutsche Börse AG assumed sponsorship of the public sector Frankfurt Stock Exchange. In order to create an appropriate trading environment – in particular for young, rapidly growing and future-oriented industries such as telecommunications, biotechnology, multimedia, and environmental technology – on March 10, 1997 the "Neuer Markt" was opened as a new trading segment on the Frankfurt Stock Exchange. In view of the great importance of international trading, in November 1997 the new Xetra® Electronic Trading System was introduced for German and cross-border securities trading in Frankfurt. With Xetra, market participants can deal in about 20,000 securities from anywhere in the world. In November 1998, Gruppe Deutsche Börse laid the cornerstone for a new stock exchange building. Since this summer, the 1,000 employees who had been working up until then at 13 different locations around Frankfurt have all moved to the new central headquarters.

Frankfurt is Germany's leading stock exchange. With a total volume of around ∈ 3,800 billion in 2001, the Frankfurt Stock Exchange has consolidated its position as the world's third largest securities trading center that is organized as a stock market.

Figure 5 shows the movement of the DAX Index from 1991 to 2003.

Figure 5: DAX Index



London Stock Exchange (LSE)

The origin of the London Stock Exchange goes back to the coffee houses of 17th century. London, where people willing to invest or raise money, bought and sold shares in Joint Stock Companies. The world's first Joint Stock Company – The Muscury Company was founded in London in 1553. As the number of joint stock companies grew, so did the number of brokers – acting as intermediaries for investors. In 1760, a group of 150 brokers formed a club at Jonathan's coffee house where they met to buy and sell shares. In 1773, the members of this club voted to change the name of Jonathan's coffee house to Stock Exchange. The Exchange developed rapidly playing a major role in financing the UK companies during the industrial revolution. By the 19th century, more than 20 Stock Exchanges were operating around the country. At first, these provincial exchanges operated independently from London, but the increasingly sophisticated market of the 20th century brought the need for amalgamation in 1973. This historic year also saw the female members admitted to the London market. The outbreak of the great war in 1914 threw Europe's market into disarray. The London market was the last to close at the end of July, 1914. During the 1960s, business continued to grow, with member firms expanding their staff – so the decision was taken to construct a new trading floor and a 26-storey office block on the site occupied by the market since 1801.

In October 1986, major changes were brought and after this ownership of member firms by an outside corporation was allowed. All firms became brokers/dealers allowed to operate in a dual capacity – either buying securities from or selling them to clients without the need to deal through a third party. Trading moved from being conducted face to face on a single market floor to being performed via computer and telephone from separate dealing rooms. In 1986, the Stock Exchange became a private limited company under the Companies Act, 1985. While the LSE is a private limited company with shareholders, its profit cannot be distributed to its shareholders. Instead, profits were used for financing developments by the exchange in 1991. The exchange replaced the governing council of the exchange with a Board of Directors.

In April 1997, settlement moved to CRESTCo., which operates the CREST electronic settlement system.

In June 1995, the Exchange launched Alternative Investment Market (AIM) to provide a market that is accessible to both investors and companies from a wide range of backgrounds – including start-ups and more established firms. The Stock Exchange Electronic Trading Service (SETS) was launched on October 20, 1997. The electronic order book was introduced to bring greater speed and efficiency to the London market, making London an even more attractive and competitive place

to do business. In July 1998, the LSE and Frankfurt's Deutsche Bourse decided to form a strategic alliance with the aim to harmonize the market for leading UK and German securities and developing a joint electronic trading platform. The first phase of the alliance went live at the start of January 1999, providing a common access package for both exchanges and a single point of liquidity for UK and German stocks.

This alliance will provide pan-European market for blue-chip shares and may reduce the costs and complexity of dealing in securities across Europe.

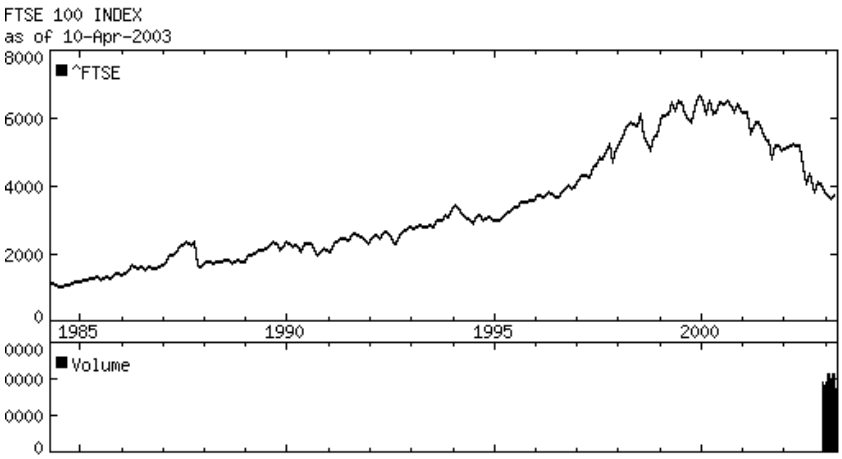
There are over 2,750 companies quoted on the Exchange, including over 500 from outside the UK. These companies are divided between the 'main market', the exchange's long-established market for the UK and international companies, and the Alternative Investment Market (AIM) set-up in 1995 for young and fast growing business. The listing requirements for AIM are slightly different to reflect the special characteristic of new and developing business. On September 16, 1999, the London Stock Exchange launched two depository receipts, Euro Convertible Bonds and Euro-denominated Euro Bonds. In February 2003, the total value of the UK and international trades was £242.2 billion representing 4.21 million trades. FTSE 100 reached record levels at 6,930 in 1999. However, in tune with the other stock markets, it receded to 3800 levels by April 2003. Equity turnover increased year by year throughout the 1990s. The London Stock Exchange plays a vital role in maintaining London's position as one of the world's biggest financial centers. LSE is the most famous stock exchange and recognized worldwide for international trading place for securities.

Companies from over 60 countries are listed on the London Stock Exchange. These companies can reach various investors and have the advantage of raising money in world's most heavily traded exchange. The London Stock Exchange provides companies the access to a well developed trading environment with services encompassing an advanced electronic order book for the most liquid assets. The London Stock Exchange provides speedy real time trade information to over 85000 installed terminals worldwide. LSE in collaboration with The Financial Times and the Institute and Faculty of Actuaries, developed the FTSE 100 in 1984 as a basis for derivatives and as a guide to the performance of the largest companies on the London market. Since then, a full range of FTSE Actuaries share indices have been developed for investors and analysts. FTSE international manages equity and bond indices and is jointly managed by London Stock Exchange and The Financial Times. There are several FTSE indices like FTSE 100, FTSE 200, FTSE 250 and FTSE 350 for different users.

The FTSE 100, which consists of the 100 largest UK companies, is calculated in real time and forms the basis for futures and traded options listed on the London International Financial Futures Exchange (LIFFE) and Option Exchange. FTSE 250 is a real time benchmark for medium sized UK companies, and consists of 250 mid-sized companies after those in the FTSE 100. FTSE 350 represents actively traded large companies and can be regarded as a combination of FTSE 100 and FTSE 250 indices. The FTSE small cap provides the average performance of around 550 smaller companies. The FTSE all-share is composite index for large, medium and small segments of listed companies. The FTSE fledgling index contains the companies that are too small to be included in the FTSE all-share index. Apart from all these indices, FTSE 350 higher-yield and FTSE 350 lower-yield indices are also published.

Figure 6 shows the movement of the FTSE 100 Index from 1984 to 2003.

Figure 6: FTSE 100 Index



Tokyo Stock Exchange

In the 1870s, a securities system was introduced in Japan and public bond negotiation began. This resulted in the request for public trading institution and Stock Exchange Ordinance was enacted in May. Based on this law, the "Tokyo Stock Exchange Co., Ltd." was established on May 15, 1878 and trading began in June. During the World War II, all the stock exchanges were unified and Japan Securities Exchange was established. On April 1, 1949, "Tokyo Stock Exchange" in the present form was founded. On July 1, 1969, TOPIX (Tokyo Stock Price Index) was inaugurated. During the year 1982, Computer-assisted Order Scrutiny and Execution System (CORES) was introduced. Foreign companies took TSE's membership on February 1, 1986. Trading in TOPIX options and futures started during 1988-89.

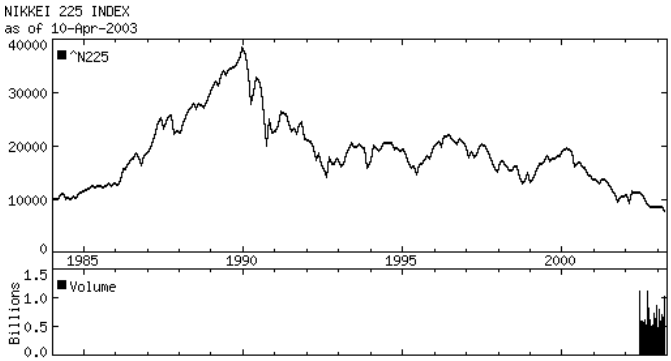
In 1991, first time depository system was started and trading was put in a better order. Trading in stock index futures and equity options started during 1997-1998. Tokyo Stock Exchange wide area network was introduced on June 1, 1999.

Tokyo Stock Exchange maintains market for stock and related instruments like futures and options. TSE's role as recognized and popular Stock Exchange has recently enhanced due to advances in international capital flow.

The Tokyo Stock Exchange functions as a self-regulated and a non-profit organization under the provisions of the Securities and Exchange law. The management of TSE was run by a self-regulated body of members involved with market. The major function of Tokyo Stock Exchange is to provide a market place for secondary market operations. The exchange provides real time trading on the Exchange floor and completes transactions carefully. The listing process and monitoring of securities is done by the Stock Exchange officials. TSE always maintains a higher standard for safety of investors and for protecting this it can suspend trading or can delist the security. In order to ensure investor protection and fair and transparent transactions, the TSE necessitates the accurate, swift and fair disclosure of company and security information. The TSE is a membership organization of securities companies. As a constituent of a prominent public exchange, members are expected to maintain the highest of standards.

Figure 7 shows the movement of the Nikkei-225 Index from 1984 to 2003.

Figure 7: Nikkei Index



Stock Exchange of Hong Kong

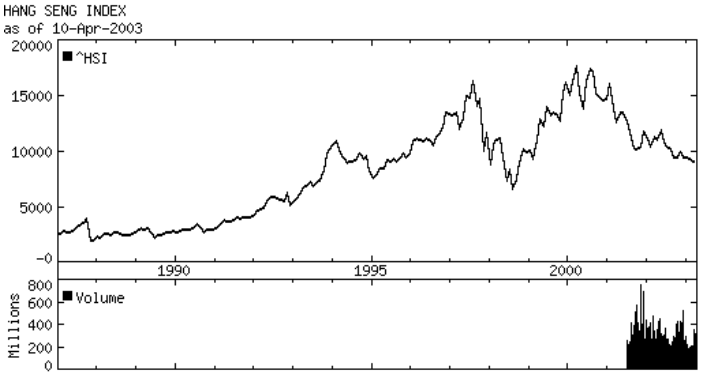
Securities trading in Hong Kong started in 1866 but the first formal stock market, the Association of Stock brokers in Hong Kong, was established in 1891. It was renamed as Hong Kong Stock Exchange in 1914. In 1921, a second exchange was incorporated – the Hong Kong Stockbrokers' Association. The two exchanges merged to form the Hong Kong Stock Exchange in 1997. The rapid growth of the Hong Kong economy led to the establishment of three other exchanges in late 1960s and early 1970s, including the Far East Exchange (1969), the Kaghan Stock Exchange (1971) and the Kowloon Stock Exchange (1972). Promoted by the 1973 market crash and the need to strengthen market surveillance, the Hong Kong government set-up a working party in 1977 to consider the unification of the four stock exchanges. As a result, the unified exchange – the Stock Exchange of Hong Kong was incorporated on July 7, 1980. The four exchanges ceased trading after the close of business on March 27, 1986. A new era began with the commencement of trading via a computerized system on the unified exchange on April 2, 1986. After the October crash in 1987, the exchange underwent a complete reform, including the establishment of a more widely representative council and strong participants to operate and develop the market effectively. During the past thirteen years, the exchange has developed from a largely domestic operation to a major international stock exchange. With market capitalization of almost US $457.29 billions ($635 billion) as at the end of December 2002, it ranks ninth in the world and second in Asia. The objectives of the exchange are to promote capital formation and securities trading in Hong Kong and China by providing a fair, transparent and efficient central securities market place.

The Exchange's development in the past three years was governed by its previous strategic plan, "The way forward", published in February 1995. In that strategic plan, the exchange set three strategic objectives: to upgrade its market facilities to meet internal standards, to expand its China dimension with a vision to become a major trading venue for China stocks, and strengthen itself as an institution. After three years of implementation, many strategies in the way forward have been completed and this contributed to the success of the exchange today as a leading international securities market in Asia and an important listing and trading venue for Chinese stocks. After the success of "The way forward", exchange has developed new strategies to accomplish its long-term vision. China offers the largest business potential for the Hong Kong securities market. To support its economic development, China has a deep long-term need for capital and financial services. Hong Kong can play a bigger role in channeling international funds to China via equity and debt financing. In turn, China based investors will become

important investors in Hong Kong listed securities. The Hong Kong domestic market will always be a major source of growth but the Asia-Pacific region can be a good growth driver for Hong Kong Stock Market. Several exchanges (e.g., Singapore, Kuala Lumpur and Taipei) are gearing up to challenge Hong Kong's regional prominence. These markets, along with several other Asian Exchanges, are investing heavily to seize domestic growth opportunities and capture an increasing share of the regional business and have already surpassed Hong Kong in some areas (e.g., trading infrastructure, clearing and settlement systems). Although at present, depressed to varying degrees, these exchanges still pose medium-term threats. In the longer term, stock exchanges in mainland China may also emerge as major exchanges in the region. The influx of mainland Chinese issuers and investors into Hong Kong boosted by the recently announced economic reforms has not only accelerated the market's growth but also affected the market's profile and potential status with international investors. Thus, Hong Kong faces two conflicting challenges, capturing the growth potential of mainland China while at the same time ensuring that the regulatory standards are maintained.

Figure 8 shows the movement of the Hang Seng Index from 1987 to 2003.

Figure 8: Hang Seng Index



Bombay Stock Exchange

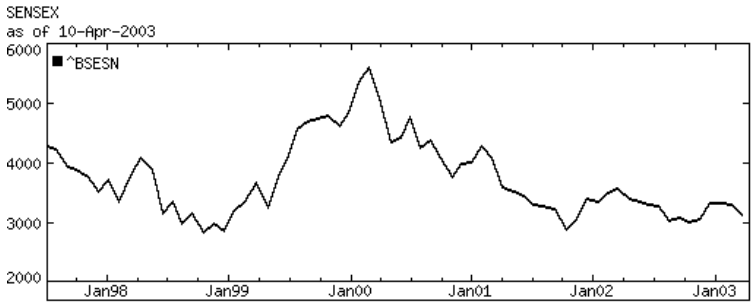
The roots of the Stock Exchange, Mumbai can be traced back to 1875, when the Share and Stockbrokers Association (non-profit organization) was established. BSE is the oldest stock exchange in Asia and the most important stock exchange in Indian capital market. After liberalization, the stock exchange, Mumbai has witnessed a huge increase in trading and economic deregulation that prompted the stock exchange to improve its operations on par with the international standards. The Board of Governors of BSE comprises 9 elected directors (one third of them retire every year by rotation), an executive director, three government nominees, a Reserve Bank of India nominee and five public representatives. A president, vice-president and an Honorary treasurer are annually elected from among the elected directors by the governing board following the election of directors. The executive director works as the chief executive officer and is responsible for day-to-day administration of the stock exchange.

In May 1995, the Bombay Stock Exchange took a major step when it started order-cum-quote driven electronic trading for all the listed securities. The BOLT, BSE Online Trading System increased market transparency, liquidity and elimination of mismatches. In addition, BOLT also provides flexibility in systems by handling growing volumes of trade and increases market activity. Since then, BSE is executing orders through computerized facility and orders are matched in less than one-tenth of a second. Trading hours have been increased from two hours

under the open-outcry system to six hours. Processing speed coupled with extended trading hours has ensured that most orders get executed on daily basis. Beginning with screen-based trading in May 1995, the exchange has started providing direct online facility since September 1997. The BOLT network, based on Very Small Aperture Terminal (VSAT) Technology, provides connectivity between members/Trader Work Stations (TWS) and its trading and settlement system. The expansion of BOLT network was started by the exchange on August 30, 1997, with the prior approval granted by SEBI. Now, the members of stock exchanges are free to install their trading terminals to cities where there are no stock exchanges. The BOLT network covers over 227 centers having VSATs (Very Small Aperture Terminals) and TWS (Trader Work Stations).

Figure 9 shows the movement of the Sensex from 1998 to 2003.

Figure 9: Sensex



National Stock Exchange (NSE)

While India has had a long history of securities trading, the markets have not always kept pace with the changing trends and requirements for this industry to reach its full potential. Particular issues of concern in the securities industry have been lack of transparency, lack of trading facilities which are fair and accessible to all, undercapitalized trading members, dated procedures and practices and long and uncertain settlement cycles. NSE emerged as an endeavor by some of the institutional investors within the country to address these issues, and to break the monopoly that was enjoyed by the BSE brokers. NSE incorporated in 1992 was given recognition as a stock exchange in April 1993 and started operation in June 1994.

Objectives of the NSE include:

- To establish a nationwide trading facility for equities, debt instruments and hybrids,
- To ensure equal access to investors all over the country through an appropriate communication network,
- To provide a fair, efficient and transparent securities market to investors using electronic trading systems,
- To enable shorter settlement cycles and book entry settlement system, and
- To meet the current international standards of securities markets.

The trading system of the NSE, known as NEAT (National Exchange for Automated Trading), is a fully automated screen-based trading system that enables members from across the country to trade simultaneously with enormous ease and efficiency. In one stroke, it has done away with the need for people to congregate on the floor of an exchange to trade. The National Stock Exchange has set-up facilities which serve as a model for the securities industry in terms of trading systems, practices and procedures. Though the impetus for its establishment came from policy-makers in the country, it has been set-up as a public limited company, owned by the leading institutional investors in the country.

NSE is different from many stock exchanges in India where membership on an exchange also meant ownership of the exchange. The ownership and management of the Exchange is completely separated from the right to trading members, to trade on the NSE. The Exchange is managed by a Board of Directors. Decisions relating to market operations are delegated by the Board to an Executive Committee which includes representatives from Trading Members, public and the management. Besides, the Exchange operates various committees to advise it on areas such as good market practices, settlement procedures, risk containment systems, etc. These committees are manned by Industry Professionals, Trading Members and Exchange staff. The day-to-day management of the Exchange is delegated to the Managing Director who is supported by a team of professional staff. The exchange floor is brought to the investors' doorstep.

Table 13: Milestone: National Stock Exchange

November 1996	:	'Best IT Usage' award by Computer Society of India.
December 1996	:	Commencement of trading/settlement in dematerialised securities.
December 1996	:	Dataquest award for 'Top IT User'.
December 1996	:	Launch of CNX Nifty Junior.
February 1997	:	Regional clearing facility goes live.
November 1997	:	'Best IT Usage' award by Computer Society of India.
May 1998	:	Promotion of joint venture, India Index Services & Products Limited (IISL).
May 1998	:	Launch of NSE's Web-site : www.nse.co.in.
June 1998	:	Launch of MIBID/MIBOR.
July 1998	:	Launch of 'NSE's Certification Programme in Financial Markets'.
August 1998	:	'CYBER CORPORATE OF THE YEAR 1998' award.
February 1999	:	Launch of 'Automated Lending and Borrowing Mechanism'.
April 1999	:	'CHIP Web Award' by CHIP magazine.
October 1999	:	Setting up of NSE.IT Ltd.
January 2000	:	Launch of NSE Research Initiative.
February 2000	:	Internet Trading in CM segment.
May 2000	:	Launch of DotEx International Ltd, e-trading joint venture, by NSE.IT Ltd. and i-flex Solutions Ltd.
June 2000	:	Commencement of Derivatives Trading (in Index Futures).
September 2000	:	Launch of Zero Coupon Yield Curve.
November 2000	:	Launch of DotEx Plaza by DotEx International Ltd.
December 2000	:	Launch of Wireless Application Protocol by NSE.IT Ltd.
May 2001	:	Internet Trading in F&O segment.
June 2001	:	Commencement of Trading in Index Options
July 2001	:	Commencement of Trading in Options on Individual Securities
November 2001	:	Commencement of Trading in Futures on Individual Securities
December 2001	:	Launch of finvarsity, e-learning portal, by NSE.IT Ltd.
December 2001	:	Launch of Nifty BeES – first Exchange Traded Fund in India.
January 2002	:	Launch of 'NSE-VAR' system for Government Securities
March 2002	:	Inauguration of NSE's Business Continuity Plan (BCP) site at Chennai
May 2002	:	NSE wins the Wharton-Infosys business Transformation Award in the organization-wide transformation category
October 2002	:	Launch of Government Securities Index
January 2003	:	Launch of Retail Debt of Government Securities
June 2003	:	Launch of Exchange Traded Interest Rate derivatives on Notional 91day T-bills and Notional 10 year bonds
August 2003	:	Launch of Futures and Options on CNX IT Index

Source : www.nseindia.com

Securities traded on NSE includes provides a trading platform for of all types of securities-equity and debt, corporate and government and derivatives. The Exchange provides products in 3 different segments: Wholesale Debt Market (WDM), Capital Market (CM) and in Futures & Options (F&O) segment and the products range from equities, fixed income securities (sovereign and nonsovereign), futures and options on indices, stocks and interest rate. The equity and the derivatives segment of the exchange accounted for 68.6% and 99.5% of the total trading volume in all the Stock exchanges respectively.

Table 14: Market segment: Selected Indicator

Segment	At end of March 2004			2003-04		1995-96 to 2003-04
	No. of members	No. of Securities/ Contracts Available*	Market Capitalisation (Rs. Crore)	Trading Value (Rs. crore)	Market Share (%)	Annual Compound Growth Rate (%)
CM	862	787	1,120,976	1,099,534	68.6	41.79
WDM	78	2,621	1,215,864	1,316,096	47.6[b]	80.14
F&O	589	4,477[c]	–	2,130,649[d]	99.5	–
Total	874[e]	7,885	2,336,840	4,546,279	89.8[f]	53.31

Source : www.nseindia.com

a. Excludes suspended securities.

b. Share in SGL.

c. Includes 3 futures, 3 CNX IT Futures, 102 index options, 176 CNX IT Options, 159 stock futures, 4,016 stock options and 18 interest rate futures contracts

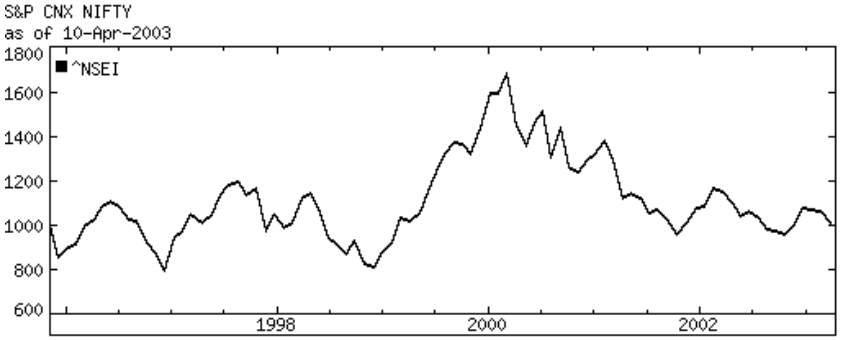
d. Includes notional turnover [(Strike Price + Premium) × Quantity] in case of index options and stock options.

e. Do not add up to total because of multiple membership.

f. Share in turnover on all exchanges

Presently, more than 2, 77,717 of securities are traded in this segment. It is of interest to note that on an average, 93% of the companies available for trading were traded every month during 2001-02. The increasing trades have resulted in growing volume which peaked at 5, 13,167 crore in 2001-02. The year 2003-04 witnessed a total trading value of Rs. 4,546,279 crore against Rs. 2,126,547 crore in the year 2002-2003. The CM and F&O segments of NSE accounted for 68.6% and 99.5% of total turnover in the country in equities and derivatives, respectively, while WDM segment accounted for 47.6% of total SGL turnover during 2003-04. The market capitalization of equity segment in December 2004 is 1,579,161. Figure 10 shows the movement of the S&P CNX Nifty from 1996 to 2003.

Figure 10: CNX Nifty



Over-the-Counter Market

The success of Over-the-Counter (OTC) market and its efficiency over the traditional stock exchanges led to the desire to replicate the OTC system in India. At the same time, liberalization of the economy in India allowed foreign investors to invest substantially in India. In order to mobilize resources, cheaper and faster sources of finance were found necessary. This would not only help the companies establish their operations, but also help the country by generating employment opportunities and boosting the economic growth. In order to have faster transactions, greater liquidity in the market and a transparency in transactions, the OTCEI was established. It was incorporated under Section 25 of the Companies Act, 1956. The promoters of OTCEI are UTI, ICICI, IDBI, IFCI, LIC, GIC, SBI Capital markets and Can Bank Financial Services. OTCEI was set-up to promote access of small and medium-sized companies to the capital markets. Companies with an issued capital ranging from Rs.30 lakh to less than Rs.3 crore are eligible to list their shares under OTCEI.

The OTCEI was the first exchange in India that offered transparency and screen-based trading. Some of the important characteristics of OTCEI are:

- A ringless trading mechanism
- Creation of liquidity
- Computerized and transparent trading
- Two way quotes, one for the sale and the other for purchase
- Exclusive list of companies
- Permit trading of equity and debentures.

The trades of all the dealers spread all over India are matched through a satellite communication network. The entire network of more than 50 centers dotted all over the country is through the OTCEI Automated Securities Integrated System (OASIS). There is no physical trading floor for trading in OTCEI, neither is there any physical delivery of shares. Therefore, OTCEI is capable of allowing nationwide listing and trading of shares. The listing requirements of OTCEI are different from that of the other stock exchanges. The method of public offer is different in OTCEI.

OTCEI provides the following benefits to the listed companies:

- A reasonable mode for closely held private companies to offer their shares to public.
- Listing for companies with market capitalization as low as Rs.3 crore.
- A single platform for the companies to be listed nationwide, removing the need for applying for listing in different exchanges.

OTCEI Trading Mechanism

Figure 11: OTC Market in Operation

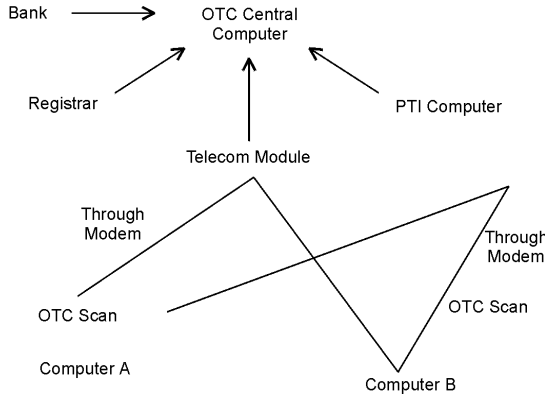
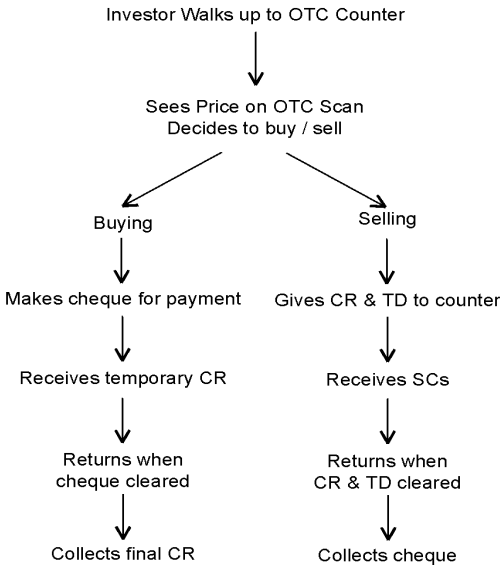


Figure 12: OTC Trading



ADVANTAGES OF OTCEI TO THE INVESTORS

OTCEI provides the following advantages to the investors:

- Investors need not go to the distant stock exchange but can trade through the counters of OTCEI set-up at several centers.
- OTCEI removes illiquidity by introducing new players namely compulsory market makers to help the small investors for sale of their securities.
- Investors will display security prices online and hence price blindness is removed.
- OTCEI helps to reduce the delay in settlements.
- OTCEI intends to provide the information relating to the companies to all its investors.

SECURITIES TRADED ON THE OTCEI

Securities traded are:

- The shares/debentures of the companies listed with OTCEI can be bought or sold at any OTCEI counters.
- Certain shares/debentures listed with other stock exchanges and units of UTI and mutual funds are permitted to be traded on OTCEI.

PLAYERS IN THE OTCEI MARKET

OTCEI has three types of players:

a. Members

b. Dealers

c. Sponsors.

The main activities of members and dealers are listed below –

- Buying and selling securities as per the order of their clients.
- Trading on their own account at the prices quoted by the market makers.
- Becoming voluntary market makers.

SPONSORS

Members can engage in sponsorship. Any company which wants to list its securities on OTCEI needs a sponsor who must be a member of OTCEI. The sponsor becomes the sole underwriter of the company.

REGISTRARS AND CUSTODIANS

There will be registered registrars and custodians with OTCEI and the listed companies can choose any one of these to look into the aspects of transfers, etc.

BANKS

OTCEI has a few affiliated banks to speed up the payment mechanism. Investors can transact through these affiliated banks for speedy payment.

DEALERS

Corporate bodies, partnership firms and individuals can be dealers by satisfying certain conditions laid down by OTCEI such as experience, network, infrastructure, etc.

The eligibility criteria for listing in OTCEI are as follows:

- Companies with an issued capital of Rs.30 lakh to less than Rs.3 crore should make a minimum public offer of 40% of their capital or Rs.20 lakh, in face value, whichever is higher.
- Companies with an issued capital of Rs.3 crore to Rs.25 crore should satisfy the listing requirements and guidelines as currently applicable on other exchanges.
- Venture capital companies/funds approved by the Department of Economic Affairs, Ministry of Finance or such other authority nominated by the Central Government, should make a minimum public offer of 20% of their issued capital in relaxation of Rule 19(2)(B) of the Securities Contracts (Regulation) Rules, 1957.
- Companies engaged in hire purchase/finance/leasing/amusement parks, etc., shall not be eligible for listing on the OTC Exchange.
- Companies covered under the MRTP/FERA may be listed on the OTC Exchange if they satisfy the listing guidelines as on the other recognized stock exchanges, such as minimum issued equity capital of Rs.300 lakh or such other limit as may be prescribed.
- A company which is listed on any other recognized stock exchanges in India would not simultaneously be eligible for listing on the OTC Exchange.
- The minimum number of centers for collection of application forms for issues of securities shall be four, one each from the Northern, Southern, Eastern and Western regions of the country, but may be increased by OTCEI depending on the size and the nature of the issue of securities made.
- Whenever securities are issued at a price above par, the premium must be approved by the Controller of Capital issues.

MEMBERSHIP OF OTCEI

The following can become members of OTCEI:

- Public financial institutions
- Scheduled banks
- Mutual funds
- Venture capital funds and venture capital companies
- NBFCs
- Banking subsidiaries.

They can become members of OTCEI by fulfilling the eligibility norms laid down by OTCEI such as network, approval of SEBI, infrastructure, standing and experience, etc.

INTEGRATION OF STOCK EXCHANGES[9]

Liberalization of trade and production induced the international economy towards a single market which allowed better and more efficient allocation of resources. Integration of stock market is an important area of development, that accompanied the globalization of securities markets in the manner in which markets are regulated.

One of the important results of globalization of securities market is the freedom of an investor of one market to buy and sell shares in other markets without restriction and issuance and trading of identical securities at the same price across the markets after foreign exchange adjustment; this process is termed as stock market integration. The main reason behind the integration of markets is to link a stock exchange electronically with other stock exchanges in the world so the broker of one stock exchange can execute order in the second stock exchange and offer the best rate to clients. This could help the market in terms of liquidity, depth and efficiency.

The concept of regionalization of stock exchange also arises here as only very few stock exchanges all over the world have the size and liquidity that matches the global exchanges.

A regional stock market means a group of stock exchanges located within a region which is free to issue and redeem capital via any stock exchange that is a member of the regional stock exchange. A member and investor of regional stock market can also benefit from liquidity, optimum turnover and price advantages, that bigger and wider markets can provide. However, before taking decision on regionalization, countries should cautiously analyze the cost and benefit associated with it. In addition, countries should ensure that stock exchanges are able to face the competition, and are able to try and specialize in different types of securities. The failed merger between London and Frankfurt exchanges is an example where London exchange specialized in blue chip companies whereas the Frankfurt exchange in high growth companies.

Factors that Must be Present Prior to Integration

The following factors must be considered prior to integration of the market:

- Advanced technology, telecommunication along with common language, legal system.
- The home country's stock exchange should be in a position to compete with the international stock exchange, in terms of risk management, listing rules, membership rules, trading and settlement mechanism etc.
- Integration of stock exchanges in the home country should take priority over regional integration.
- Harmonization of accounting policies.
- Prior to regional integration, governments should liberalize their economic laws, such as removal of trade barriers, capital account convertibility, etc.

Benefits of Stock Exchanges' Integration

The main benefit of integrating stock markets is the availability of broad market for trading i.e., investors can buy and sell shares in each market without restriction. Identical securities can be issued, redeemed and traded in all markets in the region.

The other advantages of integration are as follows:

- An efficient secondary market can facilitate mobilization of capital in primary markets. Integration of stock markets can provide more efficient, liquid, and transparent trading and settlement systems.

9 Source: World Stock Exchanges are integrating/consolidating/merging: what could be done by Arab Exchanges? Mrs. Hebalah El Serafie Dr. Shahira, and F. Abdel Shahid

- Integration can create the platform for large foreign portfolio investment flow which can result in better corporate governance by raising the level of information disclosure and reporting to match internationally acceptable standards.
- Integration can provide better hedging tools to companies that can improve the risk management system.
- It encourages the institutional investors in the home country.
- It can provide the best platform for privatization of large companies.
- Integration provides low transaction cost for investors. Examples include brokerage cost as a result of economies of scale due to efficient utilization of technology and sharing of costs among several markets.
- Regional integration can enhance market capitalization to the level of developed market and further increase the interest of foreign players in the region.

Barriers in Stock Exchanges Integration

There are various factors that act as barriers to integration of stock exchanges. These barriers may be in direct or indirect form. Some of the direct barriers are summarized below:

- Capital market segmentation can arise due to price differences in two different markets. It can provide huge pricing anomalies on exchanges, because it will prevent the laws of supply and demand from interacting fully across national frontiers.
- Investments abroad include stock return and foreign exchange return. Fluctuations in exchange rates can create barriers to integration of the exchanges.
- Capital account convertibility is another barrier; capital control can create arbitrage opportunity in the market.
- Different time zones, different trading systems and their clearing and settlement systems are also big barriers.
- Different accounting policies, regulatory systems, information systems and tax regimes are also obstacles to integration.
- Poor capital market development resulting in low turnover, liquidity and size are also barriers in some markets.
- Updation of technology also affects the consolidation process. For example, an electronic stock exchange will find it difficult to merge with one that has no electronic system.
- Some market barriers result from the market structure or dynamics that government action may not readily or perhaps appropriately change.

Stock Exchanges Integration/Alliances in Various Regions

In the recent past, the process of integration has started in terms of strategic alliances, mergers, launch takeovers, allowing remote membership, signing of cooperation and technological agreements. Some of the exchanges have changed their juridical forms and ownership structures, and some of them have even listed their shares. But the real integration can be made possible by deregulation and technological development, like trading and settlement procedure etc. Some of the instances of integration in Europe**,** United States, and the Asian market are discussed below:

Europe

Various stock exchanges in the past two decades have taken initiatives for integration. One such active exchange among them is the European exchange. It is among the first, which started alliances and mergers, because investors demanded reduction in their transaction cost and wanted a mix of stocks and derivatives under one roof. They started constituting new exchanges, even within the same country.

Consequently, various European exchanges took some bold steps in terms of harmonization of legislative measures. One of the main examples is formation of the single currency euro. The single currency will eliminate the main reason for fragmentation of listing among different national exchanges. Some exchanges started operations across boarders and functioned electronically as discussed below:

Euronext: Euronext is the most developed exchange in Europe and offers a range of integrated services including the listing of financial instruments, trading in securities and derivatives and clearing through its associate LCH. Clearing, netting and settlement is being-done through its subsidiaries CIK and Interbolsa and its partner Euroclear, as also market data dissemination and IT solutions and support.

Euronext is leading the way in integrating of Europe's financial markets. The company derives its strength from its roots in each of its local markets, its ability to generate synergies through the integration of the cash and derivatives markets it manages, and from its diversified revenue streams.

Growth has been central to the company's strategy: In 2002, Euronext acquired LIFFE, the London-based international derivatives market and merged with BVLP, the Portuguese exchange.

Eurex: Eurex is a leading exchange, which mostly deals in derivative products. It has links with two derivatives exchanges – Deutsche Börse AG and SWX Swiss Exchange. Its electronic trading platform provides access to a broad range of international benchmark products, with market participants connected from 700 locations worldwide. Trading volume at Eurex exceeded 1.07 billion contracts in 2004 and on 10th January, 2005 it became the US First Exchange to List 3-Year U.S. Treasury Note Derivatives.

Virt-x: Virt-x is designed to meet the requirements of contemporary investors in European blue chips. It is based on a highly efficient, flexible market model and world class technology providing the scope for significant reduction in cross border transaction costs at each stage of the trading, clearing and settlement processes. Its goal is to provide cross border trading at the equivalent of domestic cost. Virt-x has the support of a consortium of global investment banks and financial intermediaries and the Swiss financial community.

United States

The US stock exchange has a long history of consolidation. The number of stock exchanges came down to 5 by 1995 from 100 in the 19th century. The US, mainly has two stock exchanges operating presently. Apart from these, there are five other regional stock exchanges namely, Boston, Chicago, Cincinnati, Pacific and Philadelphia. NASDAQ is one of the growing OTC based stock market over the world. It's home to some 2,800 companies with a global market value of approximately $20 trillion. These companies include a cross-section of large, midsize and small capitalization companies. Non-US issuers play an increasingly important role on the Exchange. Nearly 460 non-US companies are valued at $7.1 trillion.

In 1975, with the motive of integrating the stock market, there developed an Integrated National Market System for US exchanges that linked all markets with communications and data processing facilities. In spite of large consolidation in the stock market , there were some hurdles due to different trading systems and poor governance among the stock market. Currently, the coalitions of large exchanges, like NYSE, AMEX, Chicago Mercantile Exchange, Chicago Board Options Trade are largely dependant upon the shifting of floor trading systems to screen-based systems. But the results have been quick: Electronic communication network started rising in 1997, as at the end of 2004, according to NSDAQ figure, 100 percent of the Exchange's investor orders were delivered electronically to the NYSE's central point of sale. The two largest ECNs operating in the US were Instinet and Island and accounted for most of NASDAQ's total number of

transactions but a later increase in the number of ECNs created competition and lead to major fragmentation of the market. These competitions finally ended with the consolidation of Instinet and Island, whereby the Island Holding Company became a wholly-owned subsidiary of the Instinet Group.

Asia

The Asian market has also seen consolidation due to increasing competition in the market. But the process has not been as fast as in the US and Europe. Impediments to the integration of the Asian stock exchanges include the following:

i. Lack of cooperation among countries.

ii. Competition.

iii. Limited foreign shareholdings or high ceilings on total foreign ownership of domestic shares.

iv. Non-existence of cross-listing instruments among exchanges except Singapore, which does not generally restrict acquisitions of shares by foreigners.

v. Limited membership of exchanges prohibited for foreign brokers.

vi. Ceilings on foreign investment generally apply to foreign financial institutions, so that a broker from one country in the region would be limited to establishing a subsidiary in a neighboring country.

vii. Same time-zones. The congruent trading times put the exchanges in direct competition with one another, making cooperation harder.

In spite of these barriers in the Asian stock market, a slow process of integration has initiated cooperation among the Asian countries. Most of the Asian countries have started making agreements of free trade zone; they have even started talking about common currency, relaxation of capital controls, starting with the Securities and Exchange Board of India (SEBI) entering into Memorandums of Understanding for securities markets with all SAARC countries.

Integration of Exchanges in the Indian Market

India has 23 stock exchanges but the activities are mainly focused on four stock exchanges – Mumbai, Delhi, Kolkata and Chennai that account for more than 90% of market capitalization. Of these stock exchanges, the Bombay Stock Exchange is the oldest with the highest number of members and trading companies. Being the single big stock market in India till 1993, the BSE indulged in malpractices like price manipulation, strikes, etc. The Securities and Exchange Board of India (SEBI) was formed under the Securities and Exchange Board of India Act, 1992, with the prime objective to protect the interests of the investors, promote the development of the securities market and to regulate it. In 1993, the National Stock Exchange of India Ltd (NSE) was established and encouraged competition in the Indian market and controlled malpractices of the Bombay Stock Exchange. NSE was established as a demutualized stock exchange.

Box 5: Mutual to Demutualized Exchanges

Most of the stock exchanges across the world are "not for profit" organizations and are owned by members organized as mutual associations. These members have ownership rights and decision-making power and try to control trading at the exchange. The owners of the exchanges are also the customers of the exchange. The profit gained at these exchanges is the gain of the enterprise in proportion to its ownership. Decision-making at these exchanges is on one member one vote basis, where committees that represent the member firms may influence the decisions. Moreover, ownership rights are not freely tradable or exchangeable. Trading at these exchanges was physical and also through verbal interaction. The rules and regulations governing the conduct of business transactions are framed and run by the traders themselves. Brokers represent the paid members of the association and become intermediaries for investors' transactions.

The transformation of a stock exchange into a "for-profit shareholder owned company" is referred to as demutualization. Though this is not the standard definition, the main difference between a traditional stock exchange and a demutualized exchange is that the latter is run on "for-profit" basis, where ownership and management are delinked. The process of demutualization can be defined as moving away from a member controlled exchange to become a public by traded company.

The transformation of a mutual member-based exchange to a demutualized exchange involves the transferability of ownership from members to non-members (shareholders). This involves the conversion of existing membership to share ownership. The members of the mutual-based exchange either have the option of selling their membership or retaining their hold on the demutualized exchange by converting their membership into share ownership. To avoid potential and hostile takeover by other exchanges and to prevent individuals and group holders with vested interests from having greater control on the demutualized exchange, regulators restrict the ownership holding of an individual or group of holders to below 5% or 10%.

Source: Portfolio Organizer, November, 2004

The NSE is the first fully automated electronic exchange in India, and also the first demutualized stock exchange, which set up facilities and employed rules that matched international standards of securities markets in terms of trading systems, practices and procedures. The quick settlement process made a marked difference. The NSE was the first exchange in the world to introduce a nation-wide VSAT based online driven-screen trading system. Thus, members of NSE are connected to its trading system from their workstations via satellites using VSATs, which allow participation from over 400 cities spread all over India. NSE can handle up to 1 million trades per day. It has also put in place NIBIS (NSE's Internet Based Information System) for on-line real-time dissemination of trading information over the Internet. In order to capitalize on in-house expertise in technology, NSE set up a separate company, NSE.IT, in October 1999. The NSE-network is the largest private area network in the country and the first extended C-Band VSAT network in the world. Currently more than 9000 users are trading on the real-time-online NSE application. At present NSE has become the market leader, accounting for more than 60% of turnover of all stock exchanges in India

The increasing volume of a single national stock is a big signal for the transformation of a large number of stock exchanges into one stock exchange. This leads to the increase in liquidity and price transparency in the market. In addition to the above, NSE introduced advantaged risk management systems that were common internationally. With increasing confidence and faster clearing and settlement, investors of other stock exchanges started shifting to NSE; thereby putting a question mark on the existence of other stock exchanges in the near future.

LISTING OF SECURITIES

Listing means admission of securities for trading on a stock exchange through a formal agreement between the stock exchange and the company. Members of the recognized stock exchanges in India can deal only in the securities listed on their exchange unless the governing board permits dealings in securities listed on any other recognized stock exchange in the country. The bye-laws of the stock exchanges prohibit listing.

This section dealing with the listing of securities in the Indian context covers the following aspects:

i. The obligation on the part of the companies to get their securities listed;

ii. Advantages of listing;

iii. Important listing requirements;

iv. Listing agreement;

v. Particulars of listing fees; and

vi. Delisting of securities.

Meaning of Listing

Listing means admission of securities to dealings on a recognized stock exchange of any incorporated company, Central and State Governments, quasi-governmental and other financial institutions/corporations, municipalities, electricity, housing boards, etc. The term 'Securities' has been defined under Section 2 of the Securities Contracts (Regulation) Act, 1956. It includes (a) shares, scrips, stocks, bonds, debentures, debenture stock or other marketable securities of a like nature in or of any incorporated company or any other body corporate; (b) government securities; (c) such other instruments as may be declared by the Central Government to be securities; and (d) rights or interest in securities. It would thus appear that only securities issued by the aforesaid categories of persons can be admitted to dealings in a recognized stock exchange.

Section 2(f) of the Securities Contracts (Regulation) Act, 1956 defines 'recognized stock exchange' as a stock exchange which is for the time being recognized by the Central Government under Section 4 of the said Act. Section 2(39) of the Companies Act, 1956 defines 'recognized stock exchange' as, in relation to any provision of this Act (the Companies Act, 1956) in which it occurs, a stock exchange, whether in or outside India which is notified by the Central Government in the Official Gazette as a recognized stock exchange for the purposes of that provision. Stock exchange means any body of individuals, whether incorporated or not, constituted for the purpose of assisting, regulating or controlling the business of buying, selling or dealing in securities.

Securities are bought and sold in recognized stock exchanges through members who are known as brokers. The price at which the securities are bought or sold on a recognized stock exchange is known as Official Quotation.

Is Listing Compulsory?

Section 73(1) of the Companies Act, 1956 makes it obligatory for companies intending to offer shares or debentures to the public for subscription by the issue of a prospectus, to make an application to one or more recognized stock exchanges seeking permission for the shares or debentures intending to be so offered to be dealt with in the stock exchange or each such stock exchange. Under Section 73(1A) of the Companies Act, 1956, where a prospectus states that an application has been made seeking permission for the shares or debentures offered and thereby to be dealt in one or more recognized stock exchanges, any allotment made on an application in pursuance of such prospectus shall, whenever made be void, if the permission has not been granted by the stock exchange or each stock exchange, as the case may be, before the expiry of ten weeks from the date of closing of the subscription list.

Thus, listing of securities in stock exchange(s) is compulsory.

Advantages of Listing

Listing of securities on the stock exchanges is advantageous to the company as well as to the investors as seen hereunder:

a. **To the Company**

   i. The company enjoys concessions under Direct Tax Laws – In such companies the public is substantially interested resulting in lower rate of income tax payable by them;

   ii. The company gains national and international importance by its share value quoted on the stock exchanges;

   iii. Financial institutions/bankers extend term loan facilities in the form of rupee currency and foreign currency loan;

iv. It helps the company to mobilize resources from the shareholders through 'Rights Issue' for programs of expansion and modernization without depending on the financial institutions in line with the government policies;

v. It ensures wide distribution of shareholding thus avoiding fears of easy takeover of the organization by others.

b. **To the Investors**

i. Since the securities are officially traded, liquidity of investment by the investors is well ensured;

ii. Rights entitlement in respect of further issues can be disposed of in the market;

iii. Listed securities are well preferred by bankers for extending loan facility;

iv. Official quotations of the securities on the stock exchanges corroborate the valuation taken by the investors for purposes of tax assessments under Income Tax Act, Wealth Tax Act, etc.;

v. Since securities are quoted, there is no secrecy of the price realization of securities sold by the investors;

vi. The rules of the stock exchange protect the interest of the investors in respect of their holdings;

vii. Listed companies are obligated to furnish unaudited financial results on a half-yearly basis within two months of the expiry of the period. The said details enable the investing public to appreciate the financial results of the company in between the financial year;

viii. Takeover offers concerning listed companies are to be announced to the public. This will enable the investing public to exercise its discretion on such matters.

Types of Listing

Listing of securities is of five types as follows:

Initial Listing

A company whose securities have not been listed earlier in a recognized stock exchange, if desirous of listing its securities, should follow procedures applicable to initial listing.

Listing of Public Issue of Shares and/or Debentures

A company whose shares are listed on a recognized stock exchange may issue shares and/or debentures to the public for subscription. In such cases the company under the Listing Agreement has to submit necessary application to the stock exchange(s) for listing of its securities. It may so happen that a green field company, i.e., a company shortly after incorporation may issue its shares and/or debentures to the public for subscription. In that event, it has to comply with the formalities applicable to initial listing.

Listing of Rights Issue of Shares and/or Debentures

Companies whose securities are already listed may issue shares and/or debentures by way of 'rights' to the existing shareholders. Under the listing agreement, such companies have to list shares and/or debentures allotted by way of rights to the shareholders with stock exchange(s).

Listing of Bonus Issue of Shares

Companies which issue bonus shares by capitalization of its reserves, pursuant to the listing agreement should enlist with the stock exchange(s). Bonus shares should issue by submitting necessary application form for official quotation of the bonus shares.

Listing of Shares Issued on Amalgamation, Mergers, etc.

Amalgamated companies which issue shares to the shareholders have to get the shares listed on the stock exchanges to enable the erstwhile shareholders with such shares.

Formalities Associated with Listing

The company executes a listing agreement with the stock exchange before formal trading can begin. Through these regulations the stock exchange aims to protect the interests of shareholders. The listing agreement requires the listing company to make certain disclosures and perform certain deeds. The information disclosures relate to annual reports, periodic statements of Profit and Loss, Balance Sheet, information pertaining to distribution of dividends, rights issues, bonus shares and other relevant information deemed essential for the shareholders. The company should also provide for prompt transfer, registration, subdivision and consolidation of shares.

SEBI has issued guidelines to the stock exchanges to amend the compliances that are necessary for a company to enlist its equity shares. These revised guidelines which were announced in April, 1996 are as follows:

i. The listing agreement should provide for payment of interest by companies to investors from the 30th day after the closure of a public issue. This has been reduced from the earlier requirement of 70 days. The interest payable by the company is 15 percent.

ii. Further, it has been prescribed as an initial and continuing listing requirement that, there should be at least 5 public shareholders for every Rs.1 lakh of fresh issue of capital and at least 10 shareholders for Rs.1 lakh in case of offer for sale.

The issuing company has to mention in the prospectus the names of all stock exchanges, where the securities are to be listed. However, if any of the stock exchanges within 10 weeks from the date of closing of the subscription list, have not granted permission for listing of such securities, the allotment will be void and the entire issue proceeds should be refunded forthwith.

The issuing company is also required to deposit percent of the issue price of the securities offered for subscription with the regional stock exchange. Fifty percent of this amount will be paid by cash (subject to a maximum of Rs.3 crore) and balance by way of bank guarantee. This deposit will be refunded after getting confirmation from the company duly supported by the certificate from the auditors of the company/practising company secretary that all allotment letters, share certificates and refund orders have been dispatched within the stipulated period.

From the point of view of the investors, the holder of equity capital is no doubt interested in the dividend but the main attraction for an individual to invest in a company is capital appreciation. Since the value of a company can be gauged from the equity capital, investors normally prefer exiting from the investment after their investments have shown the required rate of appreciation. To ensure no change in the share capital of the company, exit by a shareholder with a particular number of shares has to be matched by the investments of one or more other investor(s) in the share.

With the geographic spread of the investor community, there has got to be a common place where the present and prospective investors of all the companies in operation can effect the buy and sell of the security. This place of trading is called a stock exchange in technical terms. A company has to get itself listed so as to avail the benefits of secondary trading by its investors. Listing in other words mean admission of a security for the purpose of dealing on a recognized stock exchange. The security so listed could belong to anybody. Securities belonging to financial institutions, manufacturing concerns, central or state undertakings, municipalities, etc. Stock exchanges in India have separate listing departments which decide whether or not to allow a company to list at their exchange. The listing arrangements are made in accordance with the Securities Contracts (Regulation) Act, 1956/1957, Indian Companies Act, 1956, guidelines issued by the Securities and Exchange Board of India (SEBI) and the listing norms of the exchange where the company is going to be listed. Listing of a company has several benefits:

Listing provides liquidity to the security.

- It helps to mobilize savings for the overall development of the economy.
- A listed company has to adhere to several disclosure agreements. This ensures transparency and better corporate governance.
- Listing and subsequent trading allows the investors who had missed the opportunity or could not get allotment during the IPO stage to buy the shares of the company through the stock exchange.
- A listed company has to inform any significant developments pertaining to its business to the stock exchange. This helps in the process of information dissemination and draws attentions of the academicians, consultants, analysts, etc.

A company desirous of getting its security listed has to enter into an agreement with the stock exchange, known as the listing agreement. The listing agreement aims to protect the interest of the shareholder or whoever deals with the security. The agreement requires the company to do certain periodic disclosures with the exchange. These disclosures in turn are accessible to the members of the investment community. A listed company is bound to submit the annual statements of accounts to the exchange.

Listing Requirement at NSE

Listing on NSE provides qualifying companies with the broadest access to investors, the greatest market depth and liquidity, cost-effective access to capital, the highest visibility, the fairest pricing, and investor benefits. Securities listed on the Exchange are required to fulfill the eligibility criteria for listing. Various types of securities of a company are traded under a unique symbol and different series. For Eligibility Criteria for Listing, Listing Procedure, Listing Fees, Listing Agreement, and other regulation see annexure 1.

Listing Requirement at BSE

In BSE, companies are required to provide information to the exchange through a listing agreement. The listing agreement of BSE is given in the annexure II of the chapter.

TRADING PROCEDURE

In this chapter, we will study briefly about the trading and settlement procedure of stocks. An investor who wants to buy and sell the shares has to understand how the process works. After selection, he has to place the order with a broker, who communicates the same to the stock exchange. The order stays in the queue and gets executed when it logs on to the system within the buy limit that has been specified. You can also see the number of buyers and sellers who have placed the order at a particular rate (See table 15). The share buy or sell will be sent to the demat account of the buyer or seller by the broker.

Table 15: Securities Information Window, National Stock Exchange

As on 01-MAR-2005 11:11:16 Hours IST

Security Name	Symbol	Series	Market Type	Market Lot
Reliance Industries Ltd	RELIANCE	EQ	N	1
Face Value	ISIN Code	Ex Date	Purpose	
10.00	INE002A01018	20-MAY-04	DIVIDEND-52.5%	
No delivery start date	No delivery end date	52 week high price	52 week low price	
–	–	650.00	381.70	

Price & Turnover Information				
Prev. Close	Open	High	Low	Average Price
556.25	557.50	557.50	544.50	548.72
Last Price	Change from previous close	% Change from previous close	Total traded quantity	Turnover in Rs.lakhs
547.05	–9.20	–1.65	1745316	9576.9

Order Book			
Buy Qty	Buy Price	Sell Price	Sell Qty
99	547.05	547.20	463
1660	547.00	547.25	413
1	546.95	547.30	10
11	546.90	547.35	980
448	546.80	547.40	79
Total Buy Qty	104272	Total Sell Qty	250326

Other Information		
Security-wise Delivery Position – Rolling Settlement - 28FEB2005		
Quantity Traded	Deliverable Quantity (gross across client level)	% of Deliverable Quantity to Traded Quantity
7580763	2311130	30.49

Value at Risk (VaR) for				
Security VAR	Index VAR	VAR Margin	Adhoc Margin	Applicable Margin Rate
4.90	–		4.90	–

The upper screen of NSE provides information like the 52 weeks high and low price dividend and stock split. The second window provides information about the total quantities traded, turnover, day high and low price. Another information window provides details about the risk in securities in terms of VAR (Value at Risk) and the margin rate applicable to particular securities.

Dematerialization of Shares

Investors find it hard to deal with securities. Certificates may be lost in transit or stolen, mutilated or displaced. The amount of time it takes to process them at the clearing house every time an investor buys or sells shares can be lessened to a great extent if they are held in non-physical form such as the electronic form. To address these problems and to make the whole process more meaningful and efficient, the National Securities Depository Limited (NSDL) was established in November, 1996. It is sponsored by IDBI, the UTI and the NSE.

Depositories and depository participants will be regulated by "The Depositories Act, 1996", and guidelines issued by SEBI.

The various participants in this system are:

i. National Securities Depository Limited

ii. Depository Participants

iii. Registrars and Share Transfer Agents, and

iv. The Investors.

NATIONAL SECURITIES DEPOSITORY LIMITED

As the name suggests, it is an organization where the securities of the participating investors are held in an electronic form (fungible form). It functions as a bank. Any investor (the beneficial owner) who wants his shares dematerialized should open an account at the depository through a depository participant. The depository not only provides custodial services but also legally transfers the ownership of the securities. This essentially minimizes the tedious paper work involved in the ownership, trading and transfer of securities records. It also carries out settlement of off-market trades provided that the securities are held in electronic form. Investors can obtain the list of depository participants by writing to NSDL.

DEPOSITORY PARTICIPANTS (DPs)

They function as brokers in the stock exchange market. Depository participants are the conduits through which one can deal with the NSDL. They maintain the investors' securities account balances from time to time and intimate the investor about his status of holding. This also helps to sort out any discrepancy that arises in the due course of trading.

According to SEBI Guidelines, financial institutions, banks and stockbrokers can act as depository participants. As with banks, investors can open accounts with more than one depository participant.

PROCESS OF DEMATERIALIZATION

Now we look at the actual procedure as to how this system works and in the process can understand the role played by Registrars and Transfer Agents.

An investor who wants to hold his securities in the electronic form has to approach a depository participant and open an account at NSDL. If he wants to dematerialize the shares of say, Reliance Industries, he has to fill up a dematerialization form available with the DP and submit it along with the share certificates to be dematerialized after writing, "Surrendered for Dematerialization" on the face of each certificate.

The DP will then intimate the NSDL about the investor's intention through the system and then submit the share certificates to the Registrars and Transfer Agents. After confirming the genuineness of the certificates, the Registrar destroys them and sends the confirmation of dematerialization of shares to NSDL.

NSDL then makes appropriate entries and updates its system and informs the DP, which in turn updates its records and conveys the same to the investor.

It may be observed that there is a one way correspondence between the depository participant and the registrar. Also, the request from the DP and the confirmation of the same from the Registrar acts as a cross-check for NSDL. The whole process takes fifteen days.

This mechanism also provides for rematerialization of shares if the investor so desires. The procedure is similar to dematerialization. First, the investor sends a requisition to the DP who in turn intimates the same to NSDL. Then NSDL confirms the same with the Registrar. The Registrar then updates the accounts and provides for the printing of the share certificates with new range of certificate numbers and the same folio number if any dematerialization was done before and then confirms the same with NSDL. NSDL then updates its account and intimates the same to the DP. The Registrar dispatches the certificates to the investor who also receives an intimation from the DP.

Advantages of the Depository System

The advantages of the Depository System to the investors are:

1. Filling up transfer deeds and lodging the same with the company for transfer is not necessary;
2. There would not be any bad deliveries;
3. Exemption from paying stamp duty on transfer of shares;
4. Shares purchased in electronic form will be transferred to the investor's name within a day of completion of settlement;
5. Faster payments on sale of shares; and
6. No scope for forgery of share certificates.

Even if the shares are held in electronic form, the investors are eligible for all the benefits like dividend payments, bonus issues and rights, that arise from their holdings as the depository will provide the Registrar with details of the specific investors in that regard before the record/book closure date.

The securities held in electronic form can also be pledged/hypothecated whenever the need arises. Eventually, brokers may not prefer to trade in physical shares, as they will be free from worries of bad deliveries once the market starts dealing in electronic form.

Types of Orders

The following are various types of orders prevalent in the US markets:

- **Market Order:** The most common form of order is the market order, which means the order to buy or sell at the best current market price. Market orders provide immediate liquidity to the market. The investor who wants to buy the stock asks his broker to buy the stock at the lowest available price. Similarly, the seller asks his broker to sell the stock at the highest available price. In market order, the investor is unaware of the price at which the stock will be traded.

- **Limit Orders:** In limit orders, the investor specifies the limit at which he would like his stock to be traded. The buyer would specify the maximum limit at which the stock could be bought by the broker. Thus the broker has the choice to buy the stock at the specified limit or lower than that. Similarly, for the seller, the maximum limit is specified, below which the stock cannot be sold. The broker has the option to sell the stock at or above the specified price limit.
- **Day Order:** Day orders remain valid only during a specified day on which the order is placed. All market orders are taken only as day orders. The underlying assumption of this order is that the market, economic and industry conditions may change, thus investment should be specified for a particular day only.
- **Week Orders:** Week orders are valid for a particular trading week. For example, a trading week order placed on BSE, is valid from Monday to Friday. With the expiry of the trading week, the order also expires.
- **Month Orders:** Month orders are valid for a specified trading month. For example, a month order specified for June 2005 will be valid only in the month of June 2005 and will expire as the month ends.
- **Open Orders:** Open orders are also known as 'good till cancelled' orders. They are usually placed jointly with the limit orders. They are generally placed as monthly or quarterly orders. But there is a certain amount of risk associated with open orders as the investor may forget about the open order placed by him or market conditions may change so drastically that the order placed may not be desirable at all.
- **Stop Order:** Stop order is a type of limit order but with a variation. A stop order to sell becomes a market order when the market price goes below spot order price. Similarly, stop order to buy becomes a market order when the market price goes above the stop order price. Stop orders limit the loss and protect investor's profit.
- **Stop Limit Order:** Stop limit order helps to avoid the uncertainty associated with the stop orders. In case of stop limit order to sell, the investor can specify the minimum price he will accept and for stop order to buy, he specifies the maximum price that he is ready to pay for a stock.
- **Discretionary Orders:** In this type of order, the broker has the discretion to decide whether to buy or sell the security and also its price.

Types of Orders at BSE

There are different types of orders that can be routed through the BSEWEBX based on certain parameters of time, price and quantity.

- **Limit Order:** This is the price specified by the client while entering the order into the system. The client specifies a stated price to buy at or below, or to sell at or above that price. The order shall be executed only on satisfying these conditions.
- **Market Order:** It is an order to buy or sell securities at the current market price at that particular time.
- **Stop Loss Order:** This order allows the client to place an order, which gets activated only when the market price of the relevant security reaches or crosses a threshold price. Until then, the order does not enter the market. You can enter the threshold price.

Types of Order at NSE[10]

At the National Stock Exchange a Trading Member can enter various types of orders depending upon his/her requirements. These conditions are broadly classified into three categories: time related conditions, price-related conditions and quantity related conditions.

TIME CONDITIONS

DAY: A day order, as the name suggests, is an order which is valid for the day on which it is entered. If the order is not matched during the day, it gets cancelled automatically at the end of the trading day.

GTC: A Good Till Cancelled (GTC) order remains in the system until it is cancelled by the Trading Member. It will therefore be able to span trading days if it does not get matched. The maximum number of days a GTC order can remain in the system is notified by the Exchange from time to time.

GTD: A Good Till Days/Date (GTD) order allows the Trading Member to specify the days/date up to which the order should stay in the system. At the end of this period the order will get flushed from the system. Each day/date counted is a calendar day and inclusive of holidays and the day/date on which the order is placed. The maximum number of days a GTD order can remain in the system is notified by the Exchange from time to time.

IOC: An Immediate or Cancel (IOC) order allows a Trading Member to buy or sell a security as soon as the order is released into the market, failing which the order will be removed from the market. Partial match is possible for the order, and the unmatched portion of the order is cancelled immediately.

PRICE CONDITIONS

Limit Price/Order: An order that allows the price to be specified while entering the order into the system.

Market Price/Order: An order to buy or sell securities at the best price obtainable at the time of entering the order.

Stop Loss (SL) Price/Order: It allows the Trading Member to place an order which gets activated only when the market price of the relevant security reaches or crosses a threshold price. Until then the order does not enter the market.

A sell order in the Stop Loss book gets triggered when the last traded price in the normal market reaches or falls below the trigger price of the order. A buy order in the Stop Loss book gets triggered when the last traded price in the normal market reaches or exceeds the trigger price of the order.

For example, if for stop loss buy order, the trigger is 83.00, the limit price is 85.00 and the market (last traded) price is 80.00, then this order is released into the system once the market price reaches or exceeds 83.00. This order is added to the regular lot book with time of triggering the time stamp, as a limit order of 85.00

QUANTITY CONDITIONS

Disclosed Quantity (DQ): An order with a DQ condition allows the Trading Member to disclose only a part of the order quantity to the market. For example, an order of 1000 with a disclosed quantity condition of 200 will mean that 200 is displayed to the market at a time. After this is traded, another 200 is automatically released and so on till the full order is executed. The Exchange may set a minimum disclosed quantity criteria from time to time.

MF: Minimum Fill (MF) orders allow the Trading Member to specify the minimum quantity by which an order should be filled. For example, an order of 1000 units with minimum fill 200 will require that each trade be for at least 200 units. In other words there will be a maximum of 5 trades of 200 each or a single trade of 1000. The Exchange may lay down norms of MF from time to time.

10 www.nseindia.com

AON: All or None orders allow a Trading Member to impose the condition that only the full order should be matched against. This may be by way of multiple trades. If the full order is not matched it will stay in the books till matched or cancelled.

Note: Currently, AON and MF orders are not available on the system as per SEBI directives.

Trading

Introduction of automated trading systems has enabled market participants to login orders, execute deals and receive online market information. The competition from NSE has forced the regional stock exchanges including BSE to switch over to screen based trading. The NSE trading system is order driven while the OTCEI system is quote driven. In an order driven environment, the system captures all the orders and matches them with each other to execute the transaction. A quote driven system is based on the market making concept (dealer giving two way quotes) and the order logged in is matched against the best quote given by the market maker. BSE Online Trading (BOLT) is a mixture of both quote driven and order driven system as the system permits both jobbing and direct matching of orders.

Market Timings

Trading on the equities segment takes place on all days of the week (except Saturdays and Sundays and holidays declared by the Exchange in advance). The normal market timings of the equities segment on BSE and NSE are:

Normal Market Open : 09:55 hours
Normal Market Close : 15:30 hours

Trading Mechanism at BSE

BSE, had an open outcry trading system till the mid 1990s. Brokers used to assemble in the trading ring for buying and selling securities. The exchange switched over to a fully automated computerized mode of trading known as BOLT from March 14, 1995. BOLT refers to BSE On Line Trading system. After the adaptation of the BOLT system, the traders enter orders for purchase or sale of securities from Trader Work Stations (TWSs), instead of assembling in the trading ring. At present this system is order driven.

Trading on the BOLT System is conducted from Monday to Friday between 9:55 a.m. and 3:30 p.m. The scrips traded on BSE have been classified into 'A', 'B1', 'B2', 'F' and 'Z' groups. The number of scrips listed on the Exchange under 'A', 'B1', 'B2' and 'Z' groups, which represent the equity segment, as on March 31, 2003 was 198, 801, 562 and 2857 respectively.

Category of Shares at BSE

A Group: A group shares are known as specified shares. These companies have the best fundamentals and growth prospects. Many of them are blue chips. The trading interest in these shares is high. Previously exchanges used to offer the carry-forward facility, which enabled speculative trading of these shares. Because of the high trading volumes, the spreads are low and it is possible to easily enter and exit from these shares.

B1 Group: B1 group of Shares includes companies, which have less trading interest. These companies are usually middle-sized. Their financial performance is reasonable. Companies which show exceptional profit growth in the B1 group are often promoted to the A group. Conversely, poor performing A group shares are demoted to the B1 group.

B2 Group: Most of the companies in this group are small or show poor profits. The trading volumes in this group are very low even though the number of shares are very large. It is difficult to sell these shares since they have low liquidity.

Z Group: This is a new group of shares in the process of being created on the Bombay Stock Exchange (BSE). The shares put in this group are those which would otherwise have been delisted from the exchange. It is better to avoid investing in these shares since they have an uncertain future.

The shares in the Z group have the following deficiencies:

1. Non-compliance with listing norms.
2. Non-payment of listing fees.
3. Non-submission of quarterly results and annual reports.
4. Failure to redress investor complaints.
5. Non-fixation of book closure.

The 'F' group represents the debt market (fixed income securities) segment wherein 740 securities were listed as on March 31, 2003. The Exchange commenced trading in Govt. Securities for retail investors under "G" group w.e.f. January 16, 2003 and 85 Government Securities were traded on the Exchange under this group as on March 31, 2003.

The 'Z' group was introduced by the Exchange in July 1999 and covers the companies which have failed to comply with listing requirements. The Exchange also provides the market participants with on-line trading facility in "C" group which covers the odd lot securities in 'A', 'B1', 'B2' and 'Z' groups and rights renunciations in all the groups of scrips in the equity segment. The facility of trading in odd lots of securities not only offers an exit route to investors to dispose off their odd lots of securities but also provides them an opportunity to consolidate their securities into market lots.

The 'C' group facility can also be used by investors for selling up to 500 shares in physical form in respect of scrips of companies where trades are required to be compulsorily settled by all investors in the demat mode. This scheme of selling physical shares in compulsory demat scrips is called an Exit Route Scheme.

With effect from December 31, 2001, all securities listed in equity segment of the Exchange are traded in one market segment, viz., Compulsory Rolling Settlement Segment.

Trading Mechanism at NSE

NSE introduced for the first time in India, fully automated screen based trading. The National stock exchange uses a modern, fully computerized trading system designed to offer wide spread access to the investors across the length and breadth of the country. Its trading system, the 'National Exchange for Automated Trading' (NEAT), is an order driven, fully automated screen based trading system.

The Capital Market (Equities) segment of NSE facilitates trading in the following instruments:

A. Shares
   - Equity Shares
   - Preference Shares

B. Debentures
   - Partly Convertible Debentures
   - Fully Convertible Debentures
   - Non Convertible Debentures
   - Warrants / Coupons / Secured Premium Notes/ other Hybrids
   - Bonds

C. Units of Mutual Funds.

CLEARING AND SETTLEMENT PROCEDURE

Clearing and Settlement Procedure

As already discussed, the trades of all the members in all the securities in Compulsory Rolling Settlement (CRS) are now settled by payment of money and delivery of securities on T + n basis. All deliveries of securities are required to be

routed through the Clearing House, except for certain off-market transactions which, although required to be reported to the Exchange, may be settled directly between the members concerned.

Compulsory Rolling Settlement (CRS) Segment

The Bombay Stock Exchange introduced the compulsory rolling settlement to introduce the best international trading practices and achieve greater efficiency in the settlement procedure. Trades in all the equity shares listed on the Exchange in CRS Segment, were required to be settled on T+5 basis w.e.f. December 31, 2001. From April 1, 2002, SEBI directed the Stock Exchanges that all trades would be settled on T + 3 basis. Later SEBI, directed that all trades would be settled on t+2 basis with effect from April 1, 2003.

Under a rolling settlement environment, the trades done on a particular day are settled after a given number of business days rather than during an 'account period' of a week or fortnight. A T+2 settlement cycle means that the final settlement of transactions done on T, i.e., trade day by exchange of monies and securities between the buyers and sellers respectively, occurs on second business day after the trade day.

Clearing and Settlement Procedure at BSE

The Clearing House of BSE is the Bank of India Shareholding Ltd. (BOISL). This company was promoted jointly by Bank of India and BSE for handling the clearing and settlement operations of funds and securities on behalf of the Exchange. For this purpose, the Clearing & Settlement Dept. of the Exchange liaises with the Clearing House on a day to day basis.

The Information Systems Department (ISD) of the Exchange generates Delivery and Receive Orders for transactions done by the members in A, B1, B2 and F group scrips after netting purchase and sale transactions in each scrip whereas Delivery and Receive Orders for "C", "Z" group scrips and scrips on trade to trade basis are generated on gross basis, i.e., without netting of purchase and sell transactions in a scrip.

The Delivery Order provides information like scrip and quantity of securities to be delivered through the Clearing House. The Money Statement provides scrip wise/item wise details of payments/receipts for the settlement. The Delivery/Receive Orders and money statements can be downloaded by the members in their back offices.

The bank accounts of members maintained with the nine clearing banks, viz., Bank of India, HDFC Bank Ltd., Global Trust Bank Ltd., Standard Chartered Bank, Centurion Bank Ltd., UTI Bank Ltd., ICICI Bank Ltd., Indusind Bank Ltd., and Hongkong Shanghai Banking Corporation Ltd. are directly debited through computerized posting for their settlement and margin obligations and credited with receivables on account of pay-out dues and refund of margins.

The securities, as per the Delivery Orders issued by the Exchange, are required to be delivered by the members in the Clearing House on the day designated for securities pay-in, i.e., on T+2 day. In case of delivery of securities in demat form, the members are required to give out delivery instructions from their clearing member pool accounts/principal account. In case of delivery of securities in physical form, the members have to deliver the securities in special closed pouches (supplied by the Exchange) along with the relevant details (distinctive numbers, scrip code, quantity, and receiving member) on a floppy. The data submitted by the members on floppies is matched against the master file data on the Clearing House computer systems. If there are no discrepancies, then a scroll number is generated by the Clearing House and a scroll slip is issued. The members can then submit the securities at the receiving counter in the Clearing House.

Clearing and Settlement Procedure at NSE

NSCCL carries out clearing and settlement functions as per the settlement cycles of different sub-segments in the equities segment. Settlement is a two way process which involves legal transfer of title to funds and securities or other assets on the

settlement date. The clearing function of the clearing corporation is designed to workout what counterparties owe or what is due to them on the settlement date.

Clearing Function of NSE

Clearing is the process of determination of obligations, after which the obligations are discharged by settlement. NSCCL has two categories of clearing members: trading members and custodians. The trading members can pass on their obligation to the custodians if the custodians confirm the same to NSCCL. All such trades whose obligation the trading member proposes to pass on to the custodian are forwarded to the custodian by NSCCL for confirmation. The custodian is required to confirm these trades on T+1 days basis.

Once, the above activities are completed, NSCCL starts its clearing function. It uses the concept of multi-lateral netting for determining the obligations of counterparties. Accordingly, a clearing member would have either to pay-in or pay-out obligations for funds and securities separately. Those pay-in and pay-out obligations for funds and securities are determined latest by T + 1 day and are forwarded to the members so that they can settle their obligations on the settlement day (T+2). (See annexure III)

Risk Management System at NSE

A efficient clearing and settlement system requires a sound risk management system. NSE introduced for the first time in India, risk containment measures. NSCCL has put in place a comprehensive risk management system, which is constantly upgraded to pre-empt market failures. The Clearing Corporation ensures that trading member obligations are commensurate with their net worth.

Risk containment measures include the following:

- Capital adequacy requirements of members,
- Monitoring of member performance and track record,
- Stringent margin requirements,
- Position limits based on capital,
- Online monitoring of member positions,
- Automatic disablement from trading when limits are breached.

(Risk management system of NSE is given in annexure IV).

Margin Trading

To buy securities, an investor must have funds in his account and to sell securities he must have the share in his demat account. But sometimes investors may not have sufficient money to buy particular securities. In such a situation, he can take a loan from his broker up to a certain percentage as prescribed by the norms. In addition, if there is a fall in the share price to a certain level he has to pay the deficit amount. In other words, the investor has to maintain a margin throughout the period. If the margin falls by a level (normally prescribed by SEBI) the broker can liquidate the client's holdings. The "margin" here is the money actually borrowed from the broker, who uses the investor's stocks thus purchased as collateral for the funds advanced. Margins are thus collected to safeguard against any adverse price movement. Margins are quoted as a percentage of the value of the transaction. Let us understand the process by an example.

Suppose an investor wants to buy 100 Reliance industries shares, whose market price is Rs.500. This transaction requires Rs.50,000 but the investor has only Rs.30,000 as bank balance. He can approach a broker who will invest money on his behalf, taking interest for the same. Now he invests 50% of the amount (i.e., Rs.25,000) and the broker puts in the other half on his behalf and buys 100 Reliance shares in his name. Suppose maintenance margin is 40%, and if it falls below 30%, the broker has the right to sell the stock. Now the stock may fall to 410, then the loss is Rs.90 per share. In this case the loan from the broker is still 25,000 but the investor's own account equity will fall to Rs.16,000. Now his maintenance margin equals 39.02% (Equity Account/Market Value of Holding x 100 i.e., 16,000/41,000 x 100). In this case the broker can ask him for the balance to take the margin to the 40% mark. He has to deposit (41,000 X 40% – 16,000) or 400 to maintain the level of 40%.

Now, assume a market crash whereby the Reliance shares fall to 350. The margin loan still remains at what he originally took, i.e., Rs.25,000, but now his equity account falls to Rs.10,000. The maintenance margin has come down to only 28.57% (10,000/3,35,000 x 100). Thus, the investor can sell the shares and recover the balance amount.

Box 1: Important Rules of SEBI on Margin Trading

After banning the badla in 2001, Sebi introduced Margin Trading in order to increase liquidity in the market. After issuing the complete Margin Trading norms, the system will officially take off when exchanges and other markets intermediaries are ready for them. The partial norms for margin transactions indicated by Sebi are as follows:

- The initial margin can be up to 50% of the amount sought to be invested.
- The maintenance margin is 40% of the market value of the shares held at all times.
- If the margin falls below 30% of the market price of the shares, the broker can liquidate the clients' holdings.
- To start with, only corporate brokers with a minimum net worth of Rs.3 cr. are allowed to offer Margin Trading.
- Margin trading will be allowed only for buying BSE A Group Securities.
- Brokers can extend advances from their own resources or can borrow from banks, Non-banking Financial Companies (NBFCs) and other qualified lenders such as insurance companies.
- The total borrowing by the broker from the above institutions is capped to five times his or her net worth.
- The broker cannot use the funds of other clients or individuals to extend margin loans.
- Brokers have to disclose client-wise, scrip-wise, position-wise gross exposure limits to the exchanges.
- Brokers also have to maintain separate client-wise accounts of all the securities against which loans have been advanced and this should be made available to the client at any given point of time.

Source: Compiled by The ICFAI University Press Research Center

Exchange Traded Fund

An Exchange Traded Fund (ETF), is a type of investment company whose investment objective is to achieve the same return as a particular market index. An ETF is similar to an index fund in that it will primarily invest in the securities of companies that are included in a selected market index. An ETF will invest in either all of the securities or a representative sample of the securities included in the index. An ETF invests in a basket of stocks which blindly mimics a chosen market index (say, the S&P, CNX, Nifty, or the BSE Sensex). For convenience, the Net Asset Value (NAV) of the ETF is usually represented as a fraction of its underlying index. For instance, the Benchmark Nifty ETF has an NAV that is one-tenth of the prevailing Nifty value. Unlike regular open-end mutual funds, ETFs can be bought and sold throughout the trading day like any stock.

The total market in India for ETF is very small at less than Rs.300 crore. UTI has an ETF called SUNDERS, Prudential ICICI has SPICE, (India's first exchange traded fund) but the most focused player is a little known fund house called Benchmark Mutual Fund with several products on offer.

Box 2: Basket of Funds

In India, ETFs were first introduced by Benchmark, an asset management company on January 8, 2002. The first fund launched by the company was Nifty BeES (Benchmark Exchange Traded Scheme), which is the first ETF product in Asia, excluding Japan, and the third in the emerging markets. At present, five ETFs have been launched in India, of which, three are based on the 50-share S&P CNX Nifty index, one on 200-share CNX Nifty Junior, and one on the 30-share BSE Sensex.

Nifty BeES is traded on the capital market segment of NSE. It tracks the S&P CNX Nifty, by investing in all the 50 stocks of the index in proportion to the weightage of each stock. It is a no-load scheme and the minimum investment to be made is only one unit (1/10th of Nifty is presently Rs. 197). Another product launched by Benchmark and which tracks Nifty junior index, is Junior Nifty BeES traded on the capital market segment of NSE. Each unit is valued at 1/10th of the CNX Nifty junior index (at present it is 360), which comprises 50 most liquid stocks outside Nifty index. Since Nifty junior comprises those stocks, which are of high quality, high return, and high risk in nature, this type of ETF is suitable for aggressive investors.

Liquid BeES is the first money market ETF product in the world, launched by Benchmark. It was the best performing fund in 2003 in India. The scheme is listed and traded on NSE with T+2 rolling settlement. The fund invests in basket of call money, short-term government securities and money market instruments of short and medium maturities. This kind of a fund will facilitate in cashing on the money market returns. In case of Liquid BeES, the investor will earn interest on the money he has invested in the fund even after he has sold his shares and before the settlement is done unlike other funds where the money is locked for some period till the transaction is settled. This type of a fund needs less working capital for brokers and helps in efficient cash management by reinvesting the returns into the fund.

Adding to the innovative products launched by the company, Benchmark is also planning to come up with commodity ETF called, Gold BeES, which is again first of its kind in the world. India being the largest gold consuming country in the world, SEBI Chairman D.R. Mehta says, "Gold BeES will merely allow people to invest in gold in paper form. Most of the gold buying is done for ornamental purposes; however, there is a small class of investors, who would like to invest in gold. Gold BeES will target that market and offer convenience. We feel that Gold BeES has genuine appeal for such investors and it will provide value to such investors. The returns will be in line with gold prices."

The only ETF which tracks BSE Sensex is SPICE, managed by Prudential ICICI. It was launched on January 9, 2003 and is traded on the cash segment of BSE. The value of each unit is approximately 1/100th of Sensex (at present each unit is Rs.62). Though initially created out of IPO, SPICE units are now created and redeemed on daily basis and are traded in both primary and secondary markets. The other ETF launched by UTI Asset Management Company is SUNDER (July 2003), which tracks S&P CNX Nifty. It is an open-ended exchange traded fund and each unit is valued at one-tenth of the Nifty index. The objective of the fund is to provide investment returns at low cost to the investors.

The ETF market has been steadily growing in India. Mehta feels, "India has seen introduction of the four more ETFs after the launch of the first ETF. In terms of total corpus ETF also has grown significantly. We believe that it is just the beginning." The total corpus of ETF is close to Rs. 850 cr. Nifty BeES, presently, has a customer base of 1000-plus, covering 110 towns with a total corpus of Rs. 10 cr. The best performer among all is Nifty Junior. It had appreciated by nearly 73% in six months, till September 2003.

Source: Chartered Financial Analyst, March, 2004

Circuit Breakers

Circuit breakers help tackle the problem of volatility in stock. In simple words, if a stock registers a high limit in a day or low limit in a day, a circuit breaker is applied. At this level trading on that particular level is either stopped for a number of hours or for a day. SEBI rule says that, there will be two circuit breakers – one for a particular stock and the other for the whole market. The market circuit breaker is applicable when a market index moves by a prescribed limit. For example, after the parliamentary election, when the BJP lost the election, the sensex and nifty fell by more than 20% in a single day.

The index-based market-wide circuit breaker is applied at three stages:

When the index moves up or down by 10 percent

When the index moves up or down by 15 percent

When the index moves up or down by 20 percent.

Table 16

Movement in either index	Time	Trading halted for
10%	Before 1:00 pm	1 hour
	At or after 1:00 pm before 2:30 pm	0.5 hours
	At or after 2:30 pm	No halt in trading
15%	Before 1:00 pm	2 hour
	At or after 1:00 pm before 2:00 pm	1 hours
	At or after 2:00 pm	Halt for remainder of the day
20%	Anytime during the trading hours	Halt for remainder of the day

Source: www.ey.com

As discussed earlier the circuit breaker is applicable to individual stocks, and this is known as price filter or price bands. But the reader should remember that the circuit breaker is not applicable to the 30 stocks included in the Sensex or the 50 included in the Nifty. For other stocks different price bands are applicable at NSE or BSE.

Box 7: Black Monday

On May 17, 2004, the Sensex opened at 5020.89 points, about 50 points lower than it's previous close. At 9:56 a.m. a minute after opening, it fell to 4927, and by 9:59 a.m. it touched 4792 registering a fall of 135 points in 3 minutes. At 10:17 a.m., the Sensex fell to 4516, 553 points or a full 10% below its previous close. The market-wide circuit breaker was applied, and all trading was stopped for an hour. The market was to reopen at 11:15 a.m.

At 11:15 a.m., the unrelenting selling pressure continued. In the next three minutes and forty seconds, the Sensex fell to its intraday low of 4247 points, a full 822 points below the previous day's close. The circuit breakers were hit once again at 11:20 a.m., and the stock exchanges suspended trading for two hours.

At this point, Dr. Manmohan Singh addressed the media in which he assured the stock markets that the new government was committed to the development of the financial markets. He also warned of strict action against those found guilty of market manipulation. The RBI announced that it was ready to provide additional liquidity to banks in order to ensure that settlements in the market took place smoothly. There was also some talk of 'select' financial institutions picking up stocks in the remainder of the day.

When trading resumed, the Sensex recovered its strength, and gained in a zigzag manner, before closing the day at 4505.16 points. Black Monday saw 564.71 points or 11.25% of the Sensex the second highest of all time. The intra day fall of 822 points was the highest in the history of the index.

Source: http://www.thehindubusinessline.com, 18th May 2004

Buy Back

The much awaited proposal for buy-back of shares was cleared by the Union Cabinet on 26th October, 1998. The prudential norms for buy-back of shares in case of listed shares have been evolved by SEBI, while for unlisted shares they have been evolved by the Department of Company Affairs.

The buy-back of shares will be permitted only for restructuring the equity and not for treasury operations. The cabinet also ruled against evaluating the buy-back proposal on a case to case basis, but allowed for such provisions which call for stringent punishment including provisions for imprisonment in case of any violations.

Any company which wants to buy-back its shares, should do so only after the shareholders have given their mandate in that direction through a special resolution following an approval from the Board of Directors.

However, the government did not come up with any specific measures regarding the applicability of buy-back of shares provision for Fera companies. These companies by using the buy-back route, may buy the shares from the public and extinguish them, resulting in an increase in the promoter's stake. This obviates the need for seeking FIPB/RBI approval for enhancing the promoter's stake.

Insider Trading

Insider trading refers to transactions in securities of some company insider. SEBI defines insider trading as any trading by a person who is or was connected with the company or is deemed to have been connected with the company and who is reasonably expected to have access, by virtue of such connection, to unpublished price-sensitive information in respect of securities of the company, or who has received or has had access to such unpublished price-sensitive information. Insider trading is illegal in India. SEBI has strict rules in place that dictates when company insiders may execute transactions in their company's securities. More information about insider trading is discussed in chapter, "Efficient market hypothesis."

Box 8: Insider Trading Issues in the GTB Imbroglio

In the investigation report pertaining to market manipulations by stockbroker Ketan Parekh, Sebi has said that there was proof of the GTB scrip being ramped up before the formal merger announcement made on January 24, 2001. The report, hard-hitting in its tone, says there is evidence of Parekh using his front companies to misuse banking channels and their accounts in GTB to carry out operations in the stock market. The report has also established that Parekh, who holds at least 5% of GTB stock, carried out manipulative operations in the bank scrip using the FII broking house, Credit Suisse First Boston (CSFB). It maintains that there was a case of insider trading in the stock. In the wake of the present crisis, Sebi has asked stock exchanges to disclose the buyers and sellers of GTB shares both before and after the RBI slapped a moratorium on the failed private bank in order to investigate the insider-trading indulged in GTB stocks.

Some of the contentious issues regarding insider trading in the present case are**:**

The bank management claimed that it had no clue about the impending moratorium. But it was common knowledge among the inner circle of the bank's management, ever since the New Bridge proposal was rejected, that the RBI intended to take drastic measures to salvage the bank's position. That explains why the promoters sold a major chunk of their stake in the GTB in the weeks preceding the announcement of the moratorium.

The auditor report for 2002-03 was qualified. It was made on the assumption of a going concern basis. Given the precarious position of the bank's finances, the going concern assumption was a flawed one. In the existing circumstances, the auditor should have given an adverse report, but failed in his primary duty of giving an accurate report to the shareholders of the company. Although the management knew very well that the bank was going to be doomed, the auditor's report failed to forewarn small shareholders about the risk to their investments in the GTB.

Source: Portfolio Organizer, Sept 2004

Fraudulent and Unfair Trade Practices

SEBI is vested with powers to take action against these practices relating to securities market manipulation and misleading statements to induce sale/purchase of securities. Rules regarding unfair trade practice are given in appendix IV.

Exchange Memberships

A broker is a person who borrows and sells securities for his clients. SEBI has issued guidelines for a taking membership. A broker can apply to the SEBI for registration through a stock exchange. SEBI may grant a certificate to a stockbroker [as per SEBI (Stock Brokers and Sub-Brokers) Rules, 1992] subject to the fulfillment of conditions as:

a. He holds the membership of any stock exchange;
b. He shall abide by the rules, regulations and bye-laws of the stock exchange or stock exchanges of which he is a member;
c. In case of any change in the status and constitution, he shall obtain prior permission of SEBI to continue to buy, sell or deal in securities in any stock exchange;
d. He shall pay the amount of fees for registration in the prescribed manner; and
e. He shall take adequate steps for redressal of grievances of the investors within one month of the date of the receipt of the complaint and keep SEBI informed about the number, nature and other particulars of the complaints.

While considering the application of an entity for grant of registration as a stock broker, SEBI shall take into account the eligibility to be admitted as a member of a stock exchange, like infrastructure, past experience, etc.

There are generally four categories of memberships:

- **Specialist:** Specialists are also known as exchange market makers.
- **Commission broker:** Commission brokers buy or sell on behalf of the customers of the firm. They are employees of the brokerage firms. When a customer contacts his brokerage firm to place an order, the brokerage firm in turn contacts its commission broker to execute the order.
- **Floor broker:** Floor brokers are not employees of brokerage firms, but act independently as brokers for other members like commission brokers. In case the commission broker is not able to handle any order, he may ask one of the floor brokers to execute it.
- **Registered competitive market makers:** Registered competitive market makers buy and sell on their own account. Thus they save commission on their own trading. These market makers provide liquidity to the market.

Eligibility Criteria for Trading Membership

The eligibility criteria and deposits/fees payable for trading membership at NSE are summarized below:

Table 17

Particulars	WDM Segment	CM and F&O Segments	CM and WDM Segments	CM, WDM and F&O Segments
Constitution	Corporates /Institutions	Individuals/Firms/ Corporates	Corporates/Institutions	Corporates/ Institutions
Paid-up capital	Rs.30 lakh	Rs.30 lakh	Rs.30 lakh	Rs.30 lakh
Net Worth	Rs.200 lakh	Rs.100 lakh*	Rs.200 lakh	Rs.200 lakh*
Interest Free Security Deposit (IFSD)	Rs.150 lakh	Rs.125 lakh	Rs.250 lakh	Rs.275 lakh*
Collateral Security Deposit (CSD)	–	Rs.25 lakh	Rs.25 lakh	Rs.25 lakh

Particulars	WDM Segment	CM and F&O Segments	CM and WDM Segments	CM, WDM and F&O Segments
Annual Subscription	Rs.1 lakh	Rs. 1 lakh	Rs. 2 lakh	Rs. 2 lakh
Education	At least two directors should be graduates.	Proprietor/two partners/two directors should be graduates. Dealers should also have passed SEBI approved certification test for derivatives and NCFM Capital Market (Basic or Dealers) Module.	At least two directors should be graduates. Dealers should also have passed NCFM Capital Market (Basic or Dealers) Module.	At least two directors should be graduates. Dealers should also have passed SEBI approved certification test for derivatives and NCFM Capital Market (Basic or Dealers) Module.
Experience Track Record	Two year's experience in securities market The Applicant/Partners/Directors should not be defaulters on any stock exchange. They must not be debarred by SEBI for being associated with capital market as intermediaries. They must be engaged solely in the business of securities and must not be engaged in any fund-based activity.			

Source: www. nseindia.org

* No additional net worth is required for self-clearing members in the F&O segment. However, a net worth of Rs.300 lakh is required for members clearing for self as well as for other TMs.

Additional Rs.25 lakh is required for clearing membership on the F&O segment. In addition, a member clearing for others is required to bring in IFSD of Rs.2 lakh and CSD of Rs.8 lakh per trading member he undertakes to clear in the F&O segment.

Capital Adequacy Norms for Stockbrokers

The members of the stock exchange shall maintain a minimum deposit with the exchange. The minimum deposit is specified by the exchange as directed by the SEBI. This requirement is irrespective of the volume of business of an individual broker. The security deposit kept by the members in the exchanges shall form part of the base minimum capital.

The capital adequacy norms to be followed by members at NSE are presented below:

Table 18: Capital Adequacy Norms for Membership on NSE

(Rs. in lakh)

	Members of			Professional Clearing Members of (PCM)	
Requirement	CM and F & O Segment	CM and WDM Segment	CM, WDM and F & O Segment	CM Segment	CM and F & O Segment
Net Worth	100	200	200	300	300
Interest Free	125	250	275	25	34
Security Deposit Collateral Security Deposit	25	25	25	25	50

Note: A PCM is required to bring in interest free security deposit of Rs.6 lakh and collateral security deposit of Rs.17.5 lakh (Rs.9 lakh and Rs.25 lakh respectively for corporate members) per trading member in the CM segment.

Source: www.nseindia.com

Sub-Brokers

A person who intermediates between investors and stockbrokers is named as the sub-broker. He acts on behalf of a stockbroker as an agent or otherwise assists the investors in buying, selling or dealing in securities through such stockbroker. Every sub-broker who is allowed to buy, sell or deal in securities, must hold a certificate of registration granted by SEBI. A sub-broker may take the form of a sole proprietorship, a partnership firm or a company. Stockbrokers of the recognized stock exchanges are permitted to transact with sub-brokers.

Sub-brokers are required to obtain certificate of registration from SEBI in accordance with SEBI (Stock Brokers & Sub-brokers) Rules and Regulations, 1992, without which they are not permitted to buy, sell or deal in securities. SEBI may grant a certificate to a sub-broker, subject to the prescribed conditions. Some important conditions are as follows:

- The sub-broker of a TM of the Exchange has to comply with all the requirements under SEBI (stockbrokers and sub-brokers) Regulation, 1992 and the requirements of the Exchange as may be laid down from time to time.
- Ensuring that the sub-brokers function in accordance with the Scheme, Rules, Byelaws, Regulations, etc. of the Exchange/NSCCL and the SEBI Regulations, etc.
- The corporate entities applying for sub-brokership shall have a minimum paid-up capital of Rs.5 lakh and shall identify a dominant shareholder who holds a minimum of 51% shares either singly or with the unconditional support of his/her spouse.

The sub-broker shall enter in to an agreement with the client before placing an order. The agreement should include provisions specified by the exchange in this behalf. The sub-broker shall charge his brokerage at the rate which could here not exceed the rate prescribed by SEBI.

SUMMARY

- The last one-decade overall growth and development of the world equity markets was phenomenal. During this period, several countries liberalized their economy and also made the necessary changes for the rapid growth of the secondary market.
- The 1990-96 period witnessed huge growth in the international issuance particularly in Europe, Africa, the Middle East, Asia-Pacific and Japan. European IPO market registered miraculous increase of the US $35 billion in 1996. During the last three decades the dominance of the US market capitalization over the total world market capitalization has decreased from 60% to 35%.
- The last two decades witnessed opening up of stock exchanges in several countries. Several countries opened their stock market for foreign institutional investors. In Asia, countries like India, Indonesia, Malaysia, Thailand, Korea and Taiwan experienced the most vibrant growth.
- Stock Exchanges can be categorized as Public, Private and bankers bourses. Trading procedures in different stock markets vary because of diverse operational set-up and legal procedures. In some stock markets, transactions are to be settled essentially in cash. However, some stock exchanges such as London, Paris and Rio de Janeiro follow forward settlements.

- The microstructure layer of the equity markets consists of identification of trading process such as price driven versus order driven systems. Good information system and transparency is an important issue that decides the popularity of any security market.
- Stock indices are the convenient indicators to measure the pulse of secondary market. An ideal stock index should represent the changes in the overall stock price and it should indicate the price changes of a typical share. A stock index is generally based on a sample of stock. For example, BSE consists of 30 stocks.
- Among the most famous and popular stock exchanges, New York Stock Exchange, London Stock Exchange and Tokyo Stock Exchange accounts are the most prominent. The huge amount of average daily trading in these exchanges reflects their importance in the world equity markets.

Annexure I

SEBI Guidelines for Book Building*

11.1 An issuer company proposing to issue capital through book building shall comply with the following:

A 75% Book Building Process

11.2 In an issue of securities to the public through a prospectus the option for 75% book building shall be available to the issuer company subject to the following:

i. The option of book-building shall be available to all body corporate which are otherwise eligible to make an issue of capital to the public.

ii. a. The book-building facility shall be available as an alternative to, and to the extent of the percentage of the issue which can be reserved for firm allotment, as per these Guidelines.

b. The issuer company shall have an option of either reserving the securities for firm allotment or issuing the securities through book-building process.

iii. The issue of securities through book-building process shall be separately identified / indicated as 'placement portion category', in the prospectus.

iv. a. The securities available to the public shall be separately identified as 'net offer to the public'.

b. The requirement of minimum 25% of the securities to be offered to the public shall also be applicable.

v. In case the book-building option is availed of, underwriting shall be mandatory to the extent of the net offer to the public.

vi. The draft prospectus containing all the information except the information regarding the price at which the securities are offered shall be filed with the Board.

vii. One of the lead merchant banker to the issue shall be nominated by the issuer company as a Book Runner and his name shall be mentioned in the prospectus.

viii. a. The copy of the draft prospectus filed with the Board may be circulated by the Book Runner to the institutional buyers who are eligible for firm allotment and to the intermediaries eligible to act as underwriters inviting offers for subscribing to the securities.

b. The draft prospectus to be circulated shall indicate the price band within which the securities are being offered for subscription.

ix. The Book Runner on receipt of the offers shall maintain a record of the names and number of securities ordered and the price at which the institutional buyer or underwriter is willing to subscribe to securities under the placement portion.

x. The underwriter(s) shall maintain a record of the orders received by him for subscribing to the issue out of the placement portion.

* Source: www.sebi.gov.in

xi. a. The underwriter(s) shall aggregate the offers so received for subscribing to the issue and intimate to the Book Runner the aggregate amount of the orders received by him.

b. The institutional investor shall also forward its orders, if any, to the book runner.

xii. On receipt of the information, the Book Runner and the issuer company shall determine the price at which the securities shall be offered to the public.

xiii. The issue price for the placement portion and offer to the public shall be the same.

xiv. On determination of the price of the underwriter shall enter into an underwriting agreement with the issuer indicating the number of securities as well as the price at which the underwriter shall subscribe to the securities.

Provided that the Book Runner shall have an option of requiring the underwriters to the net offer to the public to pay in advance all monies required to be paid in respect of their underwriting commitment.

xv. On determination of the issue price within two day, thereafter the prospectus shall be filed with the Registrar of Company.

xvi. The issuer company shall open two different accounts for collection of application moneys, one for the private placement portion and the other for the public subscription.

xvii. One day prior to the opening of the issue to the public, Book Runner shall collect from the institutional buyers and the underwriters the application forms along with the application moneys to the extent of the securities proposed to be allotted to them / subscribed by them.

xviii. a. Allotments for the private placement portion shall be made on the second day from the closure of the issue.

b. However, to ensure that the securities allotted under placement portion and public portion are pari passu in all respects, the issuer company may have one date of allotment which shall be the deemed date of allotment for the issue of securities through book building process.

xix. In case the Book Runner has exercised the option of requiring the underwriter to the net offer to the public to pay in advance all moneys required to be paid in respect of their underwriting commitment by the eleventh day of the closure of the issue the shares allotted as per the private placement category shall be eligible to be listed.

xx. a. Allotment of securities under the pubic category shall be made as per the Guidelines.

b. Allotment of securities under the public category shall be eligible to be listed.

xxi. a. In case of undersubscription in the net offer to the public spillover to the extent of under subscription shall be permitted from the placement portion to the net offer to the public portion subject to the condition that preference shall be given to the individual investors.

b. In case of under subscription in the placement portion spillover shall be permitted from the net offer to the public to the placement portion.

xxii. The issuer company may pay interest on the application moneys till the date of allotment or the deemed date of allotment provided that payment of interest is uniformly given to all the applicants.

xxiii. a. The Book Runner and other intermediaries associated with the book building process shall maintain records of the book building process.

b. The Board shall have the right to inspect such records.

B (Offer to Public Through Book Building Process)

11.3 (An issuer company may, subject to the requirements specified in this chapter, make an issue of securities to the public through a prospectus in the following manner: -

a. 100% of the net offer to the public through book building process, or

b. 75% of the net offer to the public through book building process and 25% at the price determined through book building.)

11.3.1 i. (Deleted)

ii. Reservation or firm allotment to the extent of percentage specified in these Guidelines shall not be made to categories other than the categories mentioned in sub-clause (iii) below.

iii Book Building shall be for the portion other than the promoters contribution and the allocation made to;

a. 'permanent employees of the issuer company and in the case of a new company the permanent employees of the promoting companies';

b. 'shareholders of the promoting companies in the case of a new company and shareholders of group companies in the case of an existing company' either on a 'competitive basis' or on a 'firm allotment basis'.

c. (persons who, on the date of filing of the draft offer document with the Board, have business association, as depositors, bondholders and subscribers to services, with the issuer making an initial public offering, provided that allotment to such persons shall not exceed 5% of the issue size.

Provided further that no reservation shall be made for the issue management team, syndicate members, their promoters, directors and employees and for the group/associate companies of issue management team and syndicate members and their promoters, directors and employees.)

iv. The issuer company shall appoint an eligible Merchant Banker(s) as book runner(s) and their name(s) shall be mentioned in the draft prospectus.

v. (The Lead Merchant Banker shall act as the Lead Book Runner.)

v(a) (In case the issuer company appoints more than one (merchant banker), the names of all such (merchant bankers) who have submitted the due diligence certificate to SEBI, may be mentioned on the front cover page of the prospectus. A disclosure to the effect that " the investors may contact any of such (merchant bankers), for any complaint pertaining to the issue" shall be made in the prospectus, after the "risk factors)

v(b) (The lead book runner/issuer may designate, in any manner, the other Merchant Banker(s), subject to the following :

1. the inter-se allocation of responsibilities amongst the merchant bankers shall be disclosed in the prospectus on the page giving the details of the issue management team;

2. a co-ordinator shall be appointed amongst the lead book runners, for the purpose of co-ordination with SEBI.

the names of only those merchant bankers who have signed the inter-se allocation of responsibilities shall be mentioned in the offer document on the page where the details of the issue management team is given.)

vi. The primary responsibility of building the book shall be that of the Lead Book Runner.

vii. The Book Runner(s) may appoint those intermediaries who are registered with the Board and who are permitted to carry on activity as an 'Underwriter' as syndicate members.

viii. The draft prospectus containing all the disclosures as laid down in Chapter VI except that of price and the number of securities to be offered to the public shall be filed by the Lead Merchant Banker with the Board.

Provided that the total size of the issue shall be mentioned in the draft prospectus.

viiia. (The red herring prospectus shall disclose, only the floor price of the securities offered through it and shall not mention the maximum price or the indicative price band.)

ix. a. In case of appointment of more than one Lead Merchant Banker or Book Runner for book building, the rights, obligations and responsibilities of each should be delineated.

b. In case of an under subscription in an issue, the shortfall shall have to be made good by the Book Runner(s) to the issue and the same shall be incorporated in the interse allocation of responsibility given in **Schedule II**.

x. a. The Board within 21 days of the receipt of the draft prospectus may suggest modifications to it.

b. The Lead Merchant Banker shall be responsible for ensuring that the modifications/final observations made by the Board are incorporated in the prospectus.

xi. a. The issuer company shall after receiving the final observations if any on the offer document from the Board make an advertisement in an English National daily with wide circulation, one Hindi National newspaper and a Regional language newspaper with wide circulation at the place where the registered office of the Issuer company is situated.

b. The advertisement so issued shall contain the salient features of the final offer document as specified in Form 2A of the Companies Act circulated along with the application form.

xii. (Deleted)

xiii. The pre-issue obligations and disclosure requirements as specified in Chapter V and VI respectively of these Guidelines, shall be applicable to issue of securities through book building unless stated otherwise in this Chapter.

xiv. The Book Runner(s) and the issuer company shall determine the issue price based on the bids received through the 'syndicate members'.

xiva (Retail individual investors may bid at "cut off" price instead of their writing the specific bid prices in the bid forms)

xv. On determination of the price, the number of securities to be offered shall be determined (issue size divided by the price which has been determined).

xvi. Once the final price (cut-off price) is determined all those bidders whose bids have been found to be successful (i.e. at and above the final price or cut-off price) shall become entitle for allotment of securities.

xvii. No incentive, whether in cash or kind, shall be paid to the investors who have become entitled for allotment of securities.

xvii a. (The margin collected from categories other than Qualified Institutional Buyers shall be uniform across the book runner(s)/syndicate members, for each such category)

xvii b (Bids for securities beyond the investment limit prescribed under relevant laws shall not be accepted by the syndicate members from any category of investors.)

xviii. On determination of the entitlement under sub-clause (xvi), the information regarding the same (i.e. the number of securities which the investor becomes entitled) shall be intimated immediately to the investors.

xviii. a. (Renumbered)

xix. The final prospectus containing all disclosures as per these Guidelines including the price and the number of securities proposed to be issued shall be filed with the Registrar of Companies.

xx. Arrangement shall be made by the issuer for collection of the applications by appointing mandatory collection centres as per these Guidelines.

xx. a. (The online, real time graphical display of demand and bid prices at the bidding terminals, shall be made. The book running lead manager shall ensure the availability of adequate infrastructure for data entry of the bids on a real time basis.)

xxi. The investors who had not participated in the bidding process or have not received intimation of entitlement of securities may also make an application.

11.3.2 Additional Disclosures

Apart from meeting the disclosure requirements as specified in these Guidelines, the following disclosures shall be suitably made:

i. The particulars of syndicate members along with the details of registrars, bankers to the issue, etc.

ii. The following statement shall be given under the 'basis for issue price':-

"The issue price has been determined by the Issuer in consultation with the Book Runner(s), on the basis of assessment of market demand for the offered securities by way of Book-building."

iii. The following accounting ratios shall be given under the basis for issue price for each of the accounting periods for which the financial information is given:

1. EPS, pre-issue, for the last three years (as adjusted for changes in capital).
2. P/E, pre-issue and comparison thereof with industry P/E

where available (giving the source from which industry P/E has been taken).

3. Average return on net-worth in the last three years.
4. Net-Asset value per share based on last balance sheet.
5. The accounting ratios disclosed in the offer document shall be

calculated after giving effect to the consequent increase of capital on account of compulsory conversions outstanding, as well as on the assumption that the options outstanding, if any, to subscribe for additional capital shall be exercised.

11.3.3 Underwriting

i. (In case the issuer company is making an issue of securities –

a. under sub clause(a) of clause 11.3, 100% of the net offer to the public;

b. under sub clause (b) of clause 11.3, the book built portion - 75% of the net offer to the public,

shall be compulsorily underwritten by the syndicate members/book runner(s).

Provided that nothing contained in sub-clause (i) shall apply to 60% of the net offer to the public, mandatorily to be allotted to the Qualified Institutional Buyers under proviso to clause 2.2.2 or clause 2.3.2 of these guidelines, in case the company is making an issue of securities under clause 2.2.2 or clause 2.3.2).

ii. a. The 'syndicate members' shall enter into an underwriting agreement with the Book Runner(s) indicating the number of securities which they would subscribe at the predetermined price.

b. The Book Runner(s) shall in turn enter into an underwriting agreement with the Issuer company.

iii. In the event of the syndicate members not fulfilling their underwriting obligations the Book Runner(s) shall be responsible for bringing in the amount devolved.

iv. (Deleted)

11.3.4 Procedure for bidding:

The method and process of bidding shall be subject to the following:

i. Bid shall be open for atleast 5 days.

ii. The advertisement mentioned at clause 11.3.1 (xi) shall also contain the following:

a. the date of opening and closing of the bidding(not less than 5 days).

b. the names and addresses of the syndicate members as well as the bidding terminals for accepting the bids.

c. the method and process of bidding.

iii. Bidding shall be permitted only if an electronically linked transparent facility is used.

iv. The 'syndicate members' shall be present at the bidding centres so that at least one electronically linked computer terminal at all the bidding centres is available for the purpose of bidding.

v. a. (The number of bidding centres, in case 75% of the net offer to the public is offered through the book building, process shall not be less than the number of mandatory collection centres as specified in these regulations. In case 100% of the net offer to the public is made through book building process, the bidding centres shall be at all the places, where the recognised stock exchanges are situated.)

b. The same norms as applicable for collection centres shall be applicable for the bidding centres also.

vi. Individual as well as (qualified institutional buyers) shall place their bids only through the 'syndicate members' who shall have the right to vet the bids.

vii. The investors shall have the right to revise their bids.

viii. Bidding Form

a. There shall be a standard bidding form to ensure uniformity in bidding and accuracy.

b. The bidding form shall contain information about the investor, the price and the number of securities that the investor wishes to bid.

c. The bidding form before being issued to the bidder shall be serially numbered at the bidding centres and date and time stamped.

d. The serial number may be system generated or stamped with an automatic numbering machine.

e. The bidding form shall be issued in duplicate signed by the investor and countersigned by the syndicate member, with one form for the investor and the other for the syndicate member(s)/Book Runner(s).

ix. At the end of each day of the bidding period the demand shall be shown graphically on the terminals for information of the syndicate members as well as the investors.

11.3.5 Allocation / Allotment Procedure

i. (In case an issuer company makes an issue of 100% of the net offer to public through 100% book building process -

a. not less than 25% of the net offer to the public shall be available for allocation to retail individual investors i.e. investors applying for upto 1000 securities;

b. not less than 15% of the net offer to the public shall be available for allocation to non institutional investors i.e. investors applying for more than 1000 securities;

c. not more than 60% of the net offer to the public shall be available for allocation to Qualified Institutional Buyers.)

ii. (In case an issuer company makes an issue of 75% of the net offer to public through book building process and 25% at the price determined through book building -

a. in the book built portion, not less than 15% of the net offer to the public, shall be available for allocation to non institutional investors and not more than 60% of the net offer to the public shall be available for allocation to Qualified Institutional Buyers.

b. the balance 25% of the net offer to the public, offered at a price determined through book building, shall be available only to retail individual investors who have either not participated or have not received any allocation, in the book built portion."

Provided that, 60% of the issue size shall be allotted to the Qualified Institutional Buyers, in case the issuer company is making a public issue under Clause 2.2.2 or clause 2.3.2 of these guidelines.)

iii. Allotment to (retail individual investors and non institutional investors.), shall be made on the basis of the proportionate allotment system as specified in **Schedule XVIII**.

iv. (In case of under subscription in any category, the undersubscribed portion may be allocated to the bidders in the other categories.

Provided that, the unsubscribed portion in the "Qualified Institutional Buyer" category, shall not be available for subscription to other categories, in case the issuer company has made an issue of securities under clause 2.2.2 or clause 2.3.2 of these guidelines.)

v. a. (The allocation to the Qualified Institutional Buyers) shall be determined by the Book Runner(s) based on prior commitment, investor quality, price aggression, earliness of bids, etc.

b. (Deleted)

vi. Allotment shall be made not later than 15 days from the closure of the issue failing which interest at the rate of 15% shall be paid to the investors.

vii. **Schedule XX** may be referred to for Clarificatory Examples for issue size and allocation has been specified in **Schedule XX**.

viii. Model Time Frame for Book Building is specified in **Schedule XXI.**

ix. (In case the issuer company has made an issue of 75% of the net offer to public through book building process and 25% at the price determined through book building -

a. the offer of 25% of the net offer to the public, made at a price determined through book building, shall open within 15 days from the date of closure of bidding ;

b. the offer for subscription to the public, shall remain open for a period of atleast 3 working days after completing all the requirements of advertisement and despatch of issue material to all the stock exchanges ;

c. during the time when the offer is open, the investors who have received an intimation of entitlement of securities under sub clause (xviii) of clause 11.3.1, shall submit the application forms along with the application moneys ;

d. the other retail individual investors who had not participated in the bidding process or have not received intimation of entitlement of securities under sub clause (xviii) of clause 11.3.1 may also make an application.)

11.3.6 Maintenance of Books and Records

i. A final book of demand showing the result of the allocation process shall be maintained by the book runner/s.

ii. The Book Runner/s and other intermediaries in the book building process associated shall maintain records of the book building prices.

The Board shall have the right to inspect the records, books and documents relating to the Book building process and such person shall extend full co-operation.

Annexure II

Listing of Securities (NSE)*

Eligibility Criteria for Listing

IPOs by Knowledge Based Companies

Knowledge based companies are companies in the field of Information Technology, Internet Commerce, Telecommunication, Pharmaceuticals, etc. The qualifications for listing Initial Public Offerings (IPOs) by knowledge based companies are as below:

1. **Paid-up Capital:** The paid-up equity capital* of the applicant shall not be less than Rs.5 crores and the capitalization** of the applicant's equity shall not be less than Rs.50 crores.

   * For this purpose, the existing paid-up equity capital and the proposed issue for which listing is sought shall be taken into account.

   ** For this purpose, capitalisation will be the product of the issue price and the post-issue number of equity shares.

2. **Conditions Precedent to Listing:** The issuer shall have adhered to conditions precedent to listing as emerging from *inter alia*, Securities Contracts (Regulations) Act, 1956 Companies Act 1956, Securities and Exchange Board of India Act 1992, any rules and/or regulations framed under foregoing statutes, as also any circular, clarifications, guidelines issued by the appropriate authority under foregoing statutes.

3. At least, a 3 year track record of either:

   – the applicant seeking the listing; or

   – the promoting company, incorporated in or outside India.

   For this purpose, the applicant or the promoting company shall submit the audited balance sheet of 3 trailing financial years of the company to NSE.

4. The Project/Activity plan of the applicant must have been appraised by a financial institution u/s 4A of the Companies Act, 1956 or a state finance corporation or a scheduled commercial bank with a paid-up capital exceeding Rs.50 crores or a Category I Merchant Banker with a net worth of at least Rs.10 crores.

   Provided that, this Clause 4 shall not be applicable to listing of securities issued by Government Companies, Public Sector Undertakings, Financial Institutions, Nationalised Banks, Statutory Corporations and Banking Companies who are otherwise bound to adhere to all the relevant statutes, guidelines, circulars, clarifications, etc. that may be issued by various regulatory authorities from time to time and in case of an Offer for Sale.

5. The revenue from the core activity undertaken (knowledge based) as stated in the prospectus shall not be less than 75% of the total income during the two immediately preceding years. The Listing Advisory Committee (LAC) of the Exchange shall approve and recommend the listing.

6. Applicant desirous of listing its securities should meet the following criteria:

   – No Disciplinary action has been taken by other stock exchanges and regulatory authorities in the past three years. The promoting company (if any) has not been in default in payment of listing fees to any stock exchange in the last three years or has not been delisted or suspended in the past and has not been proceeded against by SEBI or other regulatory authorities in connection with investor related issues or otherwise.

   – Redressal mechanism of investor grievance.

     i. promoting company's (if any) track record in redressal of investor grievances

     ii. promoting company's arrangements envisaged are in place for servicing its investor

     iii. promoting company's general approach and philosophy to the issue of investor service and protection.

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* Source: www.nseindia.com

– **Distribution of shareholding:** The promoting company's (if any) shareholding pattern on March 31 of last three calendar years separately showing promoters and other groups' shareholding pattern should be as per the regulatory requirements.

Details of litigation: The promoting company's (if any) litigation record, the nature of litigation, status of litigation during the preceding three years period need to be clarified to the exchange.

IPOs by Companies

Qualifications for listing Initial Public Offerings (IPO) are as below:

1. **Paid-up Capital:** The paid-up equity capital* of the applicant shall not be less than Rs.10 crores and the capitalization* of the applicant's equity shall not be less than Rs.25 crores.

   * For this purpose, the post-issue paid-up equity capital for which listing is sought shall be taken into account.

   ** For this purpose, capitalisation will be the product of the issue price and the post-issue number of equity shares.

2. **Conditions Precedent to Listing:** The issuer shall have adhered to conditions precedent to listing as emerging inter-alia from Securities Contracts (Regulations) Act 1956, Companies Act 1956, Securities and Exchange Board of India Act 1992, any rules and/or regulations framed under foregoing statutes, as also any circular, clarifications, guidelines issued by the appropriate authority under foregoing statutes.

3. At least, a 3 year track record of either:

   – the applicant seeking the listing; or

   – the promoting company, incorporated in or outside India.

   For this purpose, the applicant or the promoting company shall submit audited balance sheet of three preceding financial years of the company to the NSE.

4. The Project/ Activity plan of the applicant must have been appraised by a financial institution u/s 4 A of the Companies Act, 1956 or a state finance corporation or a scheduled commercial bank with a paid-up capital exceeding Rs.50 crores or a category I Merchant Banker with a net worth of at least Rs.10 crores, or a venture capital fund with a net worth of atleast Rs.50 crores.

   Provided that this clause 4 shall not be applicable to listing of securities issued by Government Companies, Public Sector Undertakings, Financial Institutions, Nationalised Banks, Statutory Corporations, Banking Companies and subsidiaries of scheduled commercial bank who are otherwise bound to adhere to all the relevant statutes, guidelines, circulars, clarifications, etc. that may be issued by various regulatory authorities from time to time and in case of an Offer for Sale.

5. The applicant desirous of listing its securities should satisfy the exchange on the following:

   – No disciplinary action has been taken by other stock exchanges and regulatory authorities in the past three years. The promoting company (if any) has not been in default in payment of listing fees to any stock exchange in the last three years or has not been delisted or suspended in the past, and has not been proceeded against by SEBI or other regulatory authorities in connection with investor related issues or otherwise.

   – Redressal mechanism of investor grievance

     i. promoting company's (if any) track record in redressal of investor grievances,

     ii. promoting company's arrangements envisaged are in place for servicing its investor,

     iii. promoting company's general approach and philosophy to the issue of investor service and protection.

   – **Distribution of Shareholding:** The promoting company's (if any) shareholding pattern on March 31 of last three calendar years separately showing promoters and other groups' shareholding pattern should be as per the regulatory requirements.

   – **Details of Litigation:** The promoting company's (if any) litigation record, the nature of litigation, status of litigation during the preceding three years period need to be clarified to the exchange.

   – The preceding three years period need to be clarified to the exchange.

Securities of Existing Companies

Qualifications for listing securities of existing companies are:

1. **Paid-up Capital & Market Capitalisation:** The paid-up equity capital* of the applicant shall not be less than Rs.10 crores and the market capitalization** of the applicant's equity shall not be less than Rs.25 crores.

   or

   The paid-up equity capital* of the applicant shall not be less than Rs.25 crores

   or

   The market capitalization** of the applicant's equity shall not be less than Rs.50 crores.

   or

   The applicant company shall have a net worth of not less than Rs.50 crore in each of the three preceding financial years. The company shall submit a certificate from the statutory auditors in respect of net worth.

   * For this purpose, the existing paid up equity capital as well as the paid up equity capital after the proposed issue for which listing is sought shall be taken into account.

   ** The average of the weekly high and low of the closing prices of the shares as quoted on the National Stock Exchange during the last twelve months preceding the date of submission of application by the company and if the shares are not traded on the National Stock Exchange such average price on any of the recognised Stock Exchanges where those shares are frequently traded should be taken into account while determining market capitalisation after making necessary adjustments for Rights/Bonus Issues. Unless the market capitalisation is more than Rs.25 crores the securities of the company should be traded for at least 25% of the trading days during the last twelve months preceding the date of submission of application by the company on at least one of the Stock Exchanges where it is traded.

   Provided that the requirement of Rs.25 crores market capitalisation under this clause 1(a) shall not be applicable to listing of securities issued by Government Companies, Public Sector Undertakings, Financial Institutions, Nationalised Banks, Statutory Corporations and Banking Companies who are otherwise bound to adhere to all the relevant statutes, guidelines, circulars, clarifications, etc. that may be issued by various regulatory authorities from time to time.

   However, as a one time exception, securities of companies which entered the capital market with public offering and have not completed a period of 12 months during the relevant period (June 1, 1998 to May 31, 1999), may be granted permission to list provided the companies qualify for listing under the earlier norms (i.e., market capitalisation based on average price of six months preceding the date of application).

2. **Conditions Precedent to Listing:** The applicant shall have adhered to conditions precedent to listing as emerging from *inter alia*, Securities Contracts (Regulations) Act 1956, Companies Act 1956, Securities and Exchange Board of India Act 1992, any rules and/or regulations framed under foregoing statutes, as also any circular, clarifications, guidelines issued by the appropriate authority under foregoing status.

3. At least, a 3 year track record of either:

   – the applicant seeking the listing; or

   – the promoting company, incorporated in or outside India.

   For this purpose, the applicant or the promoting company shall submit audited balance sheet of three preceding financial years of the company to NSE and also provide a certificate to the Exchange in respect of the following:

   – The company has not been referred to the Board for Industrial and Financial Reconstruction BIFR).

   – The net worth of the company has not been wiped out by the accumulated losses resulting in a negative net worth.

   – The company has not received any winding up petition accepted by a court.

4. The applicant should have been listed on any other recognised stock exchange for at least last three years.

   or

   The project/activity plan must have been appraised by a financial institution u/s 4A of the Companies Act, 1956, or a state finance corporation, or a scheduled commercial bank with a paid-up capital exceeding Rs.50 crores, or a category I Merchant Banker with a net worth of at least Rs.10 crores, or a venture capital fund with a net worth of at least Rs.50 crores.

5. The applicant has paid dividend in at least two out of the last three financial years immediately preceding the year in which listing application has been made.

   or

   The networth*** of the applicant is at least Rs.50 crores

   *** Networth means:

   Paid-up equity capital

   + Reserves excluding revaluation reserve

   – Miscellaneous expenses not written off

   – Negative balance in profit and loss account to the extent not set off Clauses 4&5 shall not be applicable to listing of securities issued by Government Companies, Public Sector Undertakings, Financial Institutions, Nationalised Banks, Statutory Corporations, Banking Companies and subsidiaries of scheduled commercial bank who are otherwise bound to adhere to all the relevant statutes, guidelines, circulars, clarifications, etc. that may be issued by various regulatory authorities from time to time and in case of an Offer for Sale.

6. The applicant desirous of listing its securities should satisfy the exchange on the following:

   – a. No disciplinary action has been taken by other stock exchanges and regulatory authorities in the past three years. The promoting company (if any) has not been in default in payment of listing fees to any stock exchange in the last three years or has not been delisted or suspended in the past and has not been proceeded against by SEBI or other regulatory authorities in connection with investor related issues or otherwise.

   – Redressal mechanism of investor grievance

     i. promoting company's (if any) track record in redressal of investor grievances

     ii. promoting company's arrangements envisaged are in place for servicing its investor,

     iii. promoting company's general approach and philosophy to the issue of investor service and protection.

   – **Distribution of shareholding:** The promoting company's (if any) shareholding pattern on March 31 of last three calendar years separately showing promoters and other groups' shareholding pattern should be as per the regulatory requirements.

   – **Details of Litigation:** The promoting company's (if any) litigation record, the nature of litigation, status of litigation during the preceding three years period need to be clarified to the exchange.

Annexure III
Listing of Securities (BSE)*

Listing means admission of the securities to dealings on a recognized Stock Exchange. The securities may be of any public limited company, Central or State Government, quas-governmental and other financial institutions/corporations, municipalities, etc.

The objectives of listing are mainly to :

- provide liquidity to securities;
- mobilize savings for economic development;
- protect interest of investors by ensuring full disclosures.

The Exchange has a separate Listing Department to grant approval for listing of securities of companies in accordance with the provisions of the Securities Contracts (Regulation) Act, 1956, Securities Contracts (Regulation) Rules, 1957, Companies Act, 1956, Guidelines issued by SEBI and Rules, Bye-laws and Regulations of the Exchange.

A company intending to have its securities listed on the Exchange has to comply with the listing requirements prescribed by the Exchange. Some of the requirements are as under:

I Minimum Listing Requirements for new companies,

II Minimum Listing Requirements for companies listed on other stock exchanges,

III Minimum Requirements for companies delisted by this Exchange seeking relisting of this Exchange,

IV Permission to use the name of the Exchange in an Issuer Company's prospectus

V Submission of Letter of Application

VI Allotment of Securities

VII Trading Permission

VIII Requirement of 1% Security

IX Payment of Listing Fees

X Compliance with Listing Agreement

XI "Z" Group

XII Cash Management Services (CMS) – Collection of Listing Fees

[I] Minimum Listing Requirements for new companies

(A) Minimum Capital

1. New companies can be listed on the Exchange, if their issued and subscribed equity capital after the public issue is Rs.10 crores. In addition to this the issuer company should have a post issue net worth (equity capital + free reserves excluding revaluation reserve) of Rs.20 crores.
2. For new companies in high technology (i.e., information technology, internet, e-commerce, telecommunication, media including advertisement, entertainment, etc.,) the following criteria will be applicable regarding threshold limit:
   i. The total income/sales from the main activity, which should be in the field of information technology, internet, e-commerce, telecommunication, media including advertisement, entertainment, etc. should not be less than 75% of the total income during the two immediately preceding years as certified by the Auditors of the company.
   ii. The minimum post-issue paid-up equity capital should be Rs.5 crores.
   iii. The minimum market capitalisation should be Rs.50 crores. (The capitalisation will be calculated by multiplying the post-issue subscribed number of equity shares with the issue price).
   iv. Post-issue net worth (equity capital + free reserves excluding revaluation reserve) of Rs.20 Crores.

* Source: www.bseindia.com

(B) Minimum Public Offer:

As per Rule 19(2)(b) of the Securities Contracts (Regulation) Rules, 1957, securities of a company can be listed on a Stock Exchange only when at least 25% of each class or kind of securities is offered to the public for subscription.

In case of IPOs by unlisted companies in the IT & entertainment sector, at least 10% of the securities issued by the company may be offered to the public subject to the following:

- Minimum 20 lakh securities are offered to the public (excluding reservation, firm allotment and promoters contribution).
- The size of the offer to the public is minimum 50 crores.

For this purpose, the term "offered to the public" means only the portion offered to the public and does not include reservations of securities on firm or competitive basis.

SEBI may, however, relax this condition on the basis of recommendations of stock exchange(s), only in respect of a Government company defined under Section 617 of the Companies Act, 1956.

[II] Minimum Listing Requirements for companies listed on other stock exchanges

The Governing Board of the Exchange at its meeting held on 6th August, 2002 amended the direct listing norms for companies listed on other Stock Exchange(s) and seeking listing at BSE. These norms are applicable with immediate effect.

1. The company should have minimum issued and paid-up equity capital of Rs.3 crores.
2. The company should have profit making track record for the last three years. The revenues/profits arising out of extra ordinary items or income from any source of non-recurring nature should be excluded while calculating distributable profits.
3. Minimum net worth of Rs.20 crores (net worth includes equity capital and free reserves excluding revaluation reserves).
4. Minimum market capitalisation of the listed capital should be at least two times of the paid-up capital.
5. The company should have a dividend paying track record for the last 3 consecutive years and the minimum dividend should be at least 10%.
6. Minimum 25% of the company's issued capital should be with Non-Promoters shareholders as per Clause 35 of the Listing Agreement. Out of the above Non-Promoter holdings no single shareholder should hold more than 0.5% of the paid-up capital of the company individually or jointly with others except in case of Banks/Financial Institutions/Foreign Institutional Investors/Overseas Corporate Bodies and Non-Resident Indians.
7. The company should have at least two years listing record with any of the Regional Stock Exchange.
8. The company should sign an agreement with CDSL & NSDL for demat trading.

[III] Minimum Requirements for companies delisted by this Exchange seeking relisting of this Exchange

The companies delisted by this Exchange and seeking relisting are required to make a fresh public offer and comply with the prevailing SEBI's and BSE's guidelines regarding initial public offerings.

[IV] Permission to use the name of the Exchange in an Issuer Company's prospectus

The Exchange follows a procedure in terms of which companies desiring to list their securities offered through public issues are required to obtain its prior permission to use the name of the Exchange in their prospectus or offer for sale documents before filing the same with the concerned office of the Registrar of Companies. The Exchange has formed a "Listing Committee" to analyse draft prospectus/offer documents of the companies in respect of their forthcoming public issues of securities and decide upon the matter of granting them permission to use the name of "The Stock Exchange, Mumbai" in their prospectus/offer documents. The committee evaluates the promoters, company, project and several other factors before taking decision in this regard.

[V] Submission of Letter of Application

As per Section 73 of the Companies Act, 1956, a company seeking listing of its securities on the Exchange is required to submit a Letter of Application to all the Stock Exchanges where it proposes to have its securities listed before filing the prospectus with the Registrar of Companies.

[VI] Allotment of Securities

As per Listing Agreement, a company is required to complete allotment of securities offered to the public within 30 days of the date of closure of the subscription list and approach the Regional Stock Exchange, i.e. Stock Exchange nearest to its Registered Office for approval of the basis of allotment.

In case of Book Building issue, allotment shall be made not later than 15 days from the closure of the issue failing which interest at the rate of 15% shall be paid to the investors.

[VII] Trading Permission

As per Securities and Exchange Board of India Guidelines, the issuer company should complete the formalities for trading at all the Stock Exchanges where the securities are to be listed within 7 working days of finalisation of Basis of Allotment.

A company should scrupulously adhere to the time limit for allotment of all securities and dispatch of Allotment Letters/Share Certificates and Refund Orders and for obtaining the listing permissions of all the Exchanges whose names are stated in its prospectus or offer documents. In the event of listing permission to a company being denied by any Stock Exchange where it had applied for listing of its securities, it cannot proceed with the allotment of shares. However, the company may file an appeal before the Securities and Exchange Board of India under Section 22 of the Securities Contracts (Regulation) Act, 1956.

[VIII] Requirement of 1% Security

The companies making public/rights issues are required to deposit 1% of issue amount with the Regional Stock Exchange before the issue opens. This amount is liable to be forfeited in the event of the company not resolving the complaints of investors regarding delay in sending refund orders/share certificates, non-payment of commission to underwriters, brokers, etc.

[IX] Payment of Listing Fees

All companies listed on the Exchange have to pay Annual Listing Fees by the 30th April of every financial year to the Exchange as per the Schedule of Listing Fees prescribed from time to time.

The schedule of listing fees for the year 2004-2005, prescribed by the Governing Board of the Exchange and approved by the Securities and Exchange Board of India is given hereunder:

SCHEDULE OF LISTING FEES FOR THE YEAR 2004-2005		
Sr. No.	Particulars	Amount (Rs.)
1	Initial Listing Fees	20,000
2	Annual Listing Fees	
	(i) Companies with paid-up capital* up to Rs.5 crores	10,000
	(ii) Above Rs.5 crores and up to Rs.10 crores	15,000
	(iii) Above Rs.10 crores and up to Rs.20 crores	30,000
3	Companies which have a paid-up capital* of more than Rs.20 crores will pay additional fee of Rs.750/- for every increase of Rs.1 crores or part thereof.	
4	In case of debenture capital (not convertible into equity shares) of companies, the fees will be charged @ 25% of the fees payable as per the above mentioned scales.	
*includes equity shares, preference shares, fully convertible debentures, partly convertible debenture capital and any other security which will be converted into equity shares.		

[X] Compliance with Listing Agreement

The companies desirous of getting their securities listed are required to enter into an agreement with the Exchange called the Listing Agreement and they are required to make certain disclosures and perform certain acts. As such, the agreement is of great importance and is executed under the common seal of a company. Under the Listing Agreement, a company undertakes, amongst other things, to provide facilities for prompt transfer, registration, sub-division and consolidation of securities; to give proper notice of closure of transfer books and record dates, to forward copies of unabridged Annual Reports and Balance Sheets to the shareholders, to file Distribution Schedule with the Exchange annually; to furnish financial results on a quarterly basis; intimate promptly to the Exchange the happenings which are likely to materially affect the financial performance of the Company and its stock prices, to comply with the conditions of Corporate Governance, etc.

The Listing Department of the Exchange monitors the compliance of the companies with the provisions of the Listing Agreement, especially with regard to timely payment of annual listing fees, submission of quarterly results, requirement of minimum number of shareholders, etc. and takes penal action against the defaulting companies.

[XI] "Z" Group

The Exchange has introduced a new category called "Z Group" from July 1999 for companies who have not complied with and are in breach of provisions of the Listing Agreement. The number of companies placed under this group as at the end of February, 2005 was 50.

The number of companies listed at the Exchange as at the end of May 2001 was 5,874. This is the highest number among the Stock Exchanges in the country and in the world.

New Direct Listing Norms: The Governing Board of the Exchange at its meeting held on 6th August, 2002 amended the direct listing norms for companies listed on other Stock Exchange(s) and seeking listing at BSE. These norms are applicable with immediate effect.

1. The company should have minimum issued and paid-up equity capital of Rs.3 crores.
2. The company should have profit making track record for the last three years. The revenues/profits arising out of extraordinary items or income from any source of non-recurring nature should be excluded while calculating distributable profits.
3. Minimum net worth of Rs.20 crores (net worth includes equity capital and free reserves excluding revaluation reserves).
4. Minimum market capitalisation of the listed capital should be at least two times of the paid-up capital.
5. The company should have a dividend paying track record for the last 3 consecutive years and the minimum dividend should be at least 10%.
6. Minimum 25% of the company's issued capital should be with Non-Promoters shareholders as per Clause 35 of the Listing Agreement. Out of above Non-Promoter holding no single shareholder should hold more than 0.5% of the paid-up capital of the company individually or jointly with others except in case of Banks/Financial Institutions/Foreign Institutional Investors/Overseas Corporate Bodies and Non-Resident Indians.
7. The company should have at least two years listing record with any of the Regional Stock Exchange.
8. The company should sign an agreement with CDSL & NSDL for demat trading.

[XII] Cash Management Services (CMS) – Collection of Listing Fees

As a further step towards simplifying the system of payment of listing fees, the Exchange has entered into an arrangement with HDFC Bank for collection of listing fees, from 141 locations, situated all over India. Details of the HDFC Bank branches, are available website www.bseindia.com as well as on the HDFC Bank website www.hdfcbank.com. The above facility is being provided free of cost to the companies.

Companies intending to utilise the above facility for payment of listing fee would be required to furnish the information, in the Cash Management Cash Deposit Slip. These slips would be available at all the HDFC Bank centres.

Annexure IV

Clearing and Settlement Function at NSE[11]

Clearing

Clearing is the process of determination of obligations, after which the obligations are discharged by settlement.

NSCCL has two categories of clearing members: trading members and custodians. The trading members can pass on the obligation to the custodian if the custodian confirms the same to NSCCL. All the trades whose obligations the trading member proposes to pass on to the custodian are forwarded to the custodian by NSCCL for their confirmation. The custodian is required to confirm these trades on T + 1 days basis.

Once, the above activities are completed, NSCCL starts its function of clearing. It uses the concept of multi-lateral netting for determining the obligations of counterparties. Accordingly, a clearing member would have either pay-in or pay-out obligations for funds and securities separately. Thus, members pay-in and pay-out obligations for funds and securities are determined latest by T + 1 day and are forwarded to them so that they can settle their obligations on the settlement day (T+2).

Cleared and Non-cleared Deals

NSCCL carries out the clearing and settlement of trades executed in the following sub-segments of the equities segment:

1. All trades executed in the Book entry/Rolling segment.
2. All trades executed in the Limited Physical Market segment.

NSCCL does not undertake clearing and settlement of deals executed in the Trade for Trade sub-segment of the Equities (Capital Market) Segment of the Exchange. Primary responsibility of settling these deals rests directly with the members and the Exchange only monitors the settlement. The parties are required to report settlement of these deals to the Exchange.

Clearing Mechanism

Trades in rolling segment are cleared and settled on a netted basis. Trading and settlement periods are specified by the Exchange/Clearing Corporation from time to time. Deals executed during a particular trading period are netted at the end of that trading period and settlement obligations for that settlement period are computed. A multilateral netting procedure is adopted to determine the net settlement obligations.

In a rolling settlement, each trading day is considered as a trading period and trades executed during the day are netted to obtain the net obligations for the day.

Trade-for-trade deals and Limited Physical Market deals are settled on a trade for trade basis and settlement obligations arise out of every deal.

Securities Settlement

The securities obligations of members are downloaded to members/custodians by NSCCL after the trading period is over. The members/custodians deliver the securities to the Clearing House on the pay-in day in case of physical settlement and make available the required securities in the pool accounts with the depository participants in case of dematerialised securities. Members are required to open accounts with depository participants of both the depositores, NSDL and CDSL.

Delivering members are required to deliver all documents to the Clearing House (in case of physical settlement) during its regular business hours from 10 a.m. to 5 p.m. but not later than 10:00 a.m on the pay-in day. Receiving members are allotted specific time slots on pay-out day to collect the documents from the Clearing House.

11 Nseindia.com/clearing and settlement.

In case of dematerialised settlement, the delivering member should have clear balances of securities in his delivery account within his CM clearing account with the depository on or before 10:00 a.m. on the pay-in day. The depository would debit the delivering members' account on or after 10:00 a.m. The depository would credit the receiving members' receipt account within his CM clearing account with the depository on or after 2:30 p.m. on the pay-out day.

Pursuant to SEBI directive (vide its circular SMDRP/Policy/Cir-05/2001 dated February 1, 2001) NSCCL has introduced a settlement system for direct delivery of securities to the investors accounts with effect from April 2, 2001.

Funds Settlement

NSCCL offers settlement of funds through 10 clearing banks namely Canara Bank, HDFC Bank, IndusInd Bank, ICICI Bank, UTI Bank, Bank of India, IDBI Bank, Hongkong & Shanghai Banking Corporation Ltd., Kotak Mahindra Bank and Standard Chartered Bank.

Every Clearing Member is required to maintain and operate a clearing account with any one of the empanelled clearing banks at the designated clearing bank branches. The clearing account is to be used exclusively for clearing & settlement operations.

Shortages Handling

On the securities pay-in day, NSCCL identifies short deliveries and the respective clearing member is debited by an amount equivalent to the securities not delivered by him and valued at a valuation price. This is called a valuation debit. A valuation debit is also conducted for bad delivery by clearing members.

NSCCL conducts a buy-in auction for security shortages on the day after the pay-out day through the NSE trading system. If the buy-in auction price is more than the valuation price, the member is required to make good the difference.

Annexure V

Risk Management System at NSE*

Margins

Categorization of stocks for imposition of margins

- The Stocks which have traded at least 80% of the days for the previous 18 months shall constitute the Group I and Group II.
- Out of the scrips identified above, the scrips having mean impact cost of less than or equal to 1% shall be categorized under Group I and the scrips where the impact cost is more than 1, shall be categorized under Group II.
- The remaining stocks shall be classified into Group III.
- The impact cost shall be calculated at 15th of each month on a rolling basis considering the order book snapshots of the previous six months. On the basis of the impact cost so calculated, the scrips shall move from one group to another group from the 1st of the next month.

Daily margins payable by members consists of the following:

1. Value at Risk Margin
2. Mark-to-Market Margin

Daily margin, comprising of the sum of VaR margin and mark-to-market margin is payable.

Value at Risk Margin

VaR margin is applicable to all securities in rolling settlement. All securities are classified into three groups for the purpose of VaR margin.

For the securities listed in Group I Scrip wise daily volatility is calculated using the exponentially weighted moving average methodology that is used in the index futures market and the scrip wise daily VaR would be 3.5 times the volatility so calculated.

For the securities listed in Group II the VaR margin shall be higher of scrip VaR (3.5 sigma) or three times the index VaR, and it shall be scaled up by root 3.

For the securities listed in Group III, the VaR margin would be equal to five times the index VaR and scaled up by root 3.

VaR margin rate for a security constitutes the following:

1. Value at Risk (VaR) based margin, which is arrived at, based on the methods stated above. The index VaR, for the purpose, would be the higher of the daily Index VaR based on S&P CNX NIFTY or BSE SENSEX. The index VaR would be subject to a minimum of 5%.
2. Additional VAR Margin : 6% as specified by SEBI.
3. Security specific Margin : NSCCL may stipulate security specific margins for the securities from time to time.

The VaR based margin would be rounded off to the next higher integer (For example, if the VaR based Margin rate is 10.01, it would be rounded off to 11.00) and capped at 100%.

The VaR margin rate computed as mentioned above will be charged on the net outstanding position (buy value-sell value) of the respective clients on the respective securities across all open settlements. The net position at a client level for a member are arrived at and thereafter, it is grossed across all the clients for a member to compute gross exposure for margin calculation.

For example, in case of a member, if client A has a buy position of 1000 in a security and client B has a sell position of 1000 in the same security, the net position of the member in the security would be taken as 2000. The buy position of client A and sell position of client B in the same security would not be netted. It would be summed up to arrive at the member's exposure for the purpose of margin calculation.

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* Source: www.nseindia.com

VaR Margin Rate & Security Category

Mark-to-Market Margin

Mark-to-market margin is computed on the basis of mark-to-market loss of a member. Mark-to-market loss is the notional loss which the member would incur in case the cumulative net outstanding position of the member in all securities, at the end of the relevant day were closed out at the closing price of the securities as announced at the end of the day by the NSE. Mark to market margin is calculated by marking each transaction in a scrip to the closing price of the scrip at the end of trading. In case the security has not been traded on a particular day, the latest available closing price at the NSE is considered as the closing price.

In the event of the net outstanding position of a member in any security being nil, the difference between the buy and sell values would be considered as notional loss for the purpose of calculating the mark-to-market margin payable.

MTM profit/loss across different securities within the same settlement is set off to determine the MTM loss for a settlement. Such MTM losses for settlements are computed at client level.

VaR Margin Rate, Security Category and Impact Cost

The data for VAR margin rates and security category are made available in the specified format as DAT files.

Margin Payment & Payout

Payment of Margin

The daily margin for rolling settlements is payable on T+1 day. The margin is collected together for all settlements for all clients. Members are responsible to compute margin payable and to make suitable margin payments on the due date. Members are required to deposit the margin money due in cash, bank guarantee or FDRs, rounded off to the next higher multiple of Rs.10,000.

Pay-out of Margin

The margins deposited in cash on a given day may, if NSCCL chooses not to exercise its lien, be returned to the member on the subsequent day after adjustment for margin, additional base capital and any other funds dues. NSCCL may, at its discretion retain part or whole of the amount releasable cash margin, with respect to any member as a risk containment measure.

Upfront Margins Collection

Members are required to ensure collection of upfront margin from their clients at rates mentioned below and deposit the same in a separate clients account, in respect of trades in Normal market which would result in a margin of Rs.50,000 or more, after applying the margin percentages as given below:

Groups (Securities Covered)	Upfront Margin Rate
Group I	15%
Group II	30%
Group III	45%

Failure to Pay Margins

Non-payment of either the whole or part of the margin amount due will be treated as a violation of the Bye Laws of the Clearing Corporation and will attract penal charges @ 0.09% per day of the amount not paid throughout the period of non-payment.

In case a member has a margin shortage of Rs.10 lakh or above for more than 10 occasions in the past 4 weeks, the gross exposure multiple of the member will be reduced to one level lower at the time of re-activation of their trading terminals as given under:

Slab	Multiple
Full Exposure	8.50 times
1st Level	7.00 times
2nd Level	5.00 times
3rd Level	3.00 times
4th Level	2.00 times

If there is no margin shortage for the next 1 week of Rs.10 lakhs or more, the exposure limits shall be restored to the previous levels.

In addition, NSCCL may, within such time as it may deem fit, advise the Exchange to withdraw any or all of the membership rights of the member including the withdrawal of trading facilities without any notice.

In the event of withdrawal of trading facilities, the outstanding positions of the member may be closed out, to the extent possible, forthwith or any time thereafter by NSCCL, at its discretion by placing at the Exchange, counter orders in respect of the outstanding position of the member, without any notice to the member, and such action shall be final and binding on the member.

Margins based on Turnover & Exposure Limits (Initial Margins)

Intra-day Turnover Limit

Members are subject to intra-day trading limits. Gross turnover (buy + sell) intra-day of the member should not exceed twenty five (25) times the base capital (cash deposit and other deposits in the form of securities or bank guarantees with NSCCL and NSE).

A members violating the intra-day gross turnover limit at any time on any trading day are not be permitted to trade forthwith

Members's trading facility is restored from the next trading day with a reduced intra-day turnover limit of 20 times the base capital till deposits in the form of additional deposits (additional base capital) is deposited with NSCCL.

Members are given a maximum of 15 days time from the date of the violation to bring in the additional capital. Upon members failing to deposit the additional capital within the stipulated time, the reduced turnover limit of 20 times the base capital would be applicable for a period of one month from the last date for providing the margin deposits.

Upon the member violating the reduced intra-day turnover limit, the above mentioned provisions apply and the intra-day turnover limit will be further reduced to 15 times. Upon subsequent violations, the intra-day turnover limit will be further reduced from 15 times to 10 times and then from 10 times to 5 times the base capital. Members are not permitted to trade if any subsequent violation occurs till the required additional deposit is brought in.

Gross Exposure Limits

Members are also subject to gross exposure limits. Gross exposure for a member, across all securities in rolling settlements, is computed as absolute (buy value – sell value), i.e. ignoring +ve and –ve signs, across all open settlements. Open settlements would be all those settlements for which trading has commenced and for which settlement pay-in is not yet completed. The total gross exposure for a member on any given day would be the sum total of the gross exposure computed across all the securities in which a member has an open position.
Gross exposure limit would be:

Total Base Capital	Gross Exposure Limit
up to Rs.1 crore	8.5 times the total base capital
> Rs.1 crore	8.5 crore + 10 times the total base capital in excess of Rs.1 crore or any such lower limits as applicable to the members.

The total base capital being the base minimum capital (cash deposit and security deposit) and additional deposits, not used towards margins, in the nature of securities, bank guarantee, FDR, or cash with NSCCL and NSE.

Security-wise Differential Exposure Limits

In case of securities that are traded in the Rolling settlement (Type 'N' and security series 'EQ'), the GE multiple for each security is as under:

Groups (Securities Covered)	Covered Multiple
Group I	1.25 times
Group II	2 times
Group III	8.5 times

All new securities to be traded on the Exchange shall be subject to exposure multiple of 8.5 times.

It is clarified that while computing the gross exposure at any time for a particular trading day, for the purpose of the above limits, members are required to add the net outstanding positions of the previous settlement period to the cumulative net outstanding positions as of that particular trading day until the securities pay-in day for the previous settlement period.

Members exceeding the gross exposure limit are not permitted to trade with immediate effect and are not permitted to do so until the cumulative gross exposure is reduced to below the gross exposure limits (as defined above or any such lower limits as applicable to the members) or they increase their limit by providing additional base capital.

Members who desire to reduce their gross exposure may submit their order entry requirements as per the prescribed format.

If members desire to increase their limits, additional deposits by way of cash, bank guarantee or Fixed Deposit Receipt (FDR) have to be submitted to NSCCL. Additional deposits by way of securities in electronic form ('demat securities') may be deposited as per procedures.

The additional deposits of the member is used first for adjustment against gross exposure of the member. After such adjustments, the surplus additional deposits, if any, excluding deposits in the form of securities, is utilized for meeting margin requirements.

Violation Charges

A penalty of Rs.5,000 is levied for each violation of gross exposure limit and Intra Day Turnover limits, which shall be paid by next day. The penalty is debited to the clearing account of the member. Non-payment of penalty in time will attract penal interest of 15 basis points per day till the date of payment.

In case of second and subsequent violation during the day the penalty will be in multiples of Rs.5000 for each such instances. (For example, in case of second violation for the day the penalty levied will be Rs.10,000, Rs.15,000 for third instances and so on).

In respect of violation of stipulated limits on more than one occasion on the same day, each violation would be treated as a separate instance for purpose of calculation of penalty.

The penalty as indicated above, would be charged to the members irrespective of whether they bring in additional capital subsequently.

Additional Base Capital

Members may provide additional margin/collateral deposit (additional base capital) to NSCCL, over and above their minimum deposit requirements (base capital), towards margins and/or exposure/turnover limits.

Members may submit such deposits in any one form or combination of the following forms:

1. Cash
2. Fixed Deposit Receipts (FDRs) issued by approved banks and deposited with approved Custodians or NSCCL
3. Bank Guarantee in favor of NSCCL from approved banks in the specified format. If a bank guarantee is submitted by a bank, whose net worth is above Rs.500 crores, then the same is considered as cash component and all other bank guarantees will be considered as non-cash component as per past procedures.

List of the Banks, whose net worth is more than 500 crores.

4. Approved securities in demat form deposited with approved custodians.
5. Government Securities: The procedure for acceptance and list of securities is as specified in circular. The haircut for the Government Securities shall be 10%.
6. Units of the schemes of liquid mutual funds or government securities mutual funds. The haircuts for units of liquid funds or government securities mutual funds shall be 10% of Net Asset Value (NAV). Units of all Mutual Funds schemes except Liquid Mutual Funds and Government Securities Mutual Funds (in demat) shall be eligible security for the purpose of non-cash component of additional capital and margin subject to a haircut equivalent to the VaR of the unit's NAV plus any exit load charged by the mutual fund.

All Additional Base Capital (ABC) given in the form of cash/FDR/BG's from approved Banks whose net worth is above 500 crores, (hereinafter referred to as 'Cash Component') should be at least 50% of the total ABC and Cash Margins in respect of every trading member. In case where non-cash component is more than 50% of the total additional base capital, the excess non-cash component is ignored for the purpose of exposure limits requirements and/or margins requirements.

Exemption for Institutional Deals

While computing margins, institutional deals are excluded. Deals executed on behalf of the following entities are considered as institutional deals:

1. Financial Institutions
2. SEBI registered FIIs
3. Banks
4. SEBI registered Mutual Funds.

Deals are identified by the use of the participant code in the trades reported on the NSE.

Deals entered into on behalf of custodial participants i.e. carrying custodial participant code are considered as institutional deals unless not confirmed by the respective custodians in which case the deals shall attract margins.

Non-Custodial Institutional Deals are identified by the use of the participant code 'NCIT'. The 'NCIT' deals will be exempted for margin purposes (However, VaR based margin which is charged on institutional trades on the net outstanding sale position, in securities shall be applicable in this case also) and the settlement obligation will remain with TM clearing member. Non-Custodial Institutional deals, which are not marked as 'NCIT' at the time of order entry, will not be exempted.

All TM clearing members are required to provide details of the contract notes for all Non-Custodial Institutional Trades through a file upload as per the procedure.

Exemption upon Delivery of Securities

If a member delivers securities prior to the securities pay-in day, then the margin payable by the member will be recomputed after considering the above pay-in of securities. The margin benefit on account of early payin (EPI) of securities shall be given to the extent of the net delivery position across all clients of the member. The EPI would be allocated to clients having net deliverable position, on a random basis, till such time that the system is developed to provide the EPI benefit on a client basis. However, members are required to ensure to pass on appropriate early pay-in benefit of margin/exposure to the relevant client, until the above system is in place.

The value of the advance pay-in made is reduced from the cumulative net outstanding sale position of the member for the purpose of gross exposure limits.

Members may note that early pay-in of securities only up to the working day prior to the scheduled settlement pay-in day shall be considered for the purpose of early pay in benefits. In case any member makes early pay-in on the scheduled day of pay-in for the settlement, no benefit will accrue to the member. Such early pay-in shall not be adjusted against the settlement pay-in obligation and it would be treated as short delivery. Members are therefore alerted to ensure that no early pay-in is made on the scheduled day of settlement pay-in.

Pay-in of Funds/Securities Prior to Scheduled Pay-in Day

The relevant authority may require members to pay-in funds and securities prior to the scheduled pay-in day for funds and securities. The relevant authority would determine from time to time, the members who would be required to pay-in funds and securities prior to the pay-in day. The relevant authority would also determine securities and funds which would be required to be paid in and the date by which such pay-in shall be made by the respective member.

The value of such prior pay-in of funds and securities will not be reduced from the cumulative net position of the member for the purpose of gross exposure reduction. There will be no margin exemption available for such pay-in of funds and securities.

Chapter V

Sources of Financial Information

After reading this chapter, you will be conversant with:

- Sources of Economic Data
- Sources of Market Data
- Sources of Company Data
- Sources of International Economic Data

Introduction

Barring a few such as government securities, bank and post office deposits, most investments are risky. An investment decision, therefore, calls for carefully evaluating available alternatives; assessing the reward and risk associated with each of these alternatives and selecting such of the alternatives that are believed to best serve the investment objectives at hand. Despite the fact that luck and experience play their role in making the correct choice, the objective and intelligent investment decisions are always based on sound information.

As the prospect for better rewards on an investment depends upon what the future holds, a primary task of an investor, an investment manager, an investment broker or counsellor is to look ahead. This looking ahead involves making projections about prospective rewards and risks of investments in the near as well as distant future.

The investment results in general and the results of security investments in particular are influenced by a whole gamut of events, public policy changes, market conditions, policies and performance of companies, and so on. So, data has to be gathered on economic and market events, national and international events, public and corporate policies, and performance facts.

Since the gathering of primary data is both time consuming and costly, the investing public has to resort to the sources of secondary information. Further, to facilitate quick analysis and decision-making, it would be useful to collect data from such sources that have already done a good deal of data analysis and condensed them into a capsule form.

Various agencies publish various types of data. There are a number of trade journals, periodicals, official documents, advisory reports published by the investment brokers and counsellors that can be valuable sources of information for investment decision-making. The finance newspapers and magazines of course carry a lot of investment and finance data on a regular basis. Most of the national newspapers invariably carry a financial page. The delay in the publication of latest information by agencies, in particular public agencies, is, however, quite common. The updating service, the reliable and well-researched economic and financial forecasts are generally lacking in India. So, an Indian investor would have to walk an extra mile to gather the most recent data and put in an extra effort to generate meaningful projections.

Some of the important sources of investment information are briefly described below:

SOURCES OF ECONOMIC DATA

Economic and Industry Data

1. Two important publications of the Central Statistical Organization provide monthly Abstract of Statistics and Monthly Statistics of the production of Selected Industries in India. The former contains information on selected economic indicators such as national income, agricultural production, industrial production, money supply, wholesale prices, imports, exports, etc. The latter provides industry-wise production data, plan outlays, industry trends, etc., together, they provide a good deal of economic and industry data useful for gauging the economy's well-being, trends in direction of the economy and business trends and cycles.
2. The Economic Survey, The Explanatory Memorandum on the Budget of the Central Government, and the Finance Budget of the Government of India provide data analysis of current economic scene, the effects of fiscal and monetary policies in the past, government revenues, expenditures and deficit financing, proposed fiscal and monetary measures to be adopted in the forthcoming year, policy revisions concerning imports, exports, investments, industry, agriculture, etc.

3. The Weekly Statistical Supplement, Monthly Bulletin, Report on Currency and Finance, and the Annual Report of the Reserve Bank of India (RBI) are an invaluable source of macrodata. In these publications, the RBI provides considerable data in a concise form, among others, money supply, prices, exchange rates, money market rates, balance of payment situation, bank credit, liquidity position of the banking system, and the strategy and review of many monetary tools employed by the RBI. Thus, these sources shed considerable light on the financing and investment climate prevailing in the country.
4. The Center for Monitoring Indian Economy (CMIE), and the Commerce Research Bureau (CRB) are two non-government agencies that collect, classify, and present main economic data in a capsule form. These agencies, besides compilation, review the data, analyze trends, and discuss current policy developments in their publications.

The Economic Intelligence Service of the Center for Monitoring Indian Economy publishes a Monthly Review of Indian Economy, Index Numbers of Wholesale prices. Economic Indicators, and Economic Outlook (yearly) provide data on money and prices, outlook in various economic fields, and a review of economic events, trends in corporate finance, investments, etc.

The Economic Monitoring Service of the Commerce Research Bureau brings out a Weekly Report on Prices, Banking Money and World Currency Developments, a Monthly Review of the Indian Economy, and a monthly document on Investment Climate in India. Its annual publications include Basic Statistics on Indian Economy, Basic Statistics on State Economics of India, Companies Inviting Deposits and the rates they offer, Selected Statistics of Eighty Countries of the World, Foreign Trade Statistics of India, and position papers on major Indian industries besides many special documents and reports such as a Pre-Budget Review, Industrial Policy and Investment Incentives, CII reports, etc.

SOURCES OF MARKET DATA

A number of sources provide stock market data ranging from price quotations to review of stock market trends in India. Important sources of market information include:

i. **Stock Exchanges' Daily Official List:** It provides daily price quotations and various characteristics (i.e. redemption, tax status, dividend announcement, gross dividend per share, date of closure of register of members, etc.) of the quoted securities – central and state government securities, corporate bonds, preference shares, equity shares.

ii. **Official Year Book/Directory of the Stock Exchange:** These publications review stock market trends, new issues made during the year, official policy in regard to capital issues, brokerage, stamp duty, etc. besides providing a wealth of information on the working of companies.

iii. **RBI's Weekly Statistical Supplement, Monthly Bulletin, and Report on Currency and Finance:** As noted before, these publications are a valuable source of economic and industry data. Besides that they give All-India, regional, and industry-wise index numbers of security prices, running and redemption yield on various types of securities.

iv. The Economic Times, Financial Express, Business Standard, Fortune India, Investments Today, Economic Scene, Commerce and Business India are some of the newspapers and periodicals that carry, on a regular basis, a wealth of stock market information, market quotations, reviews of stock market trends, and very incisive and thought provoking articles on current developments affecting stock market's future movements and other matters of interest to the investor.

v. The Reports and Newsletters of investment brokerage and counselling firms are other important sources of market data. They provide, among others, stock market reviews, trends, prices and yields for gilt-edged and corporate securities and a detailed analysis of securities in which they are specialized.

SOURCES OF COMPANY DATA

The fundamental analysis and valuation of stocks calls for gathering and examination of the company's specific data. Further, a considerable insight in respect of prospective return and risk of a security can be gained from going through the announcements and future plans often publicized by the companies. So, the company data, historic and futuristic, is of interest to the investors.

i. Company's annual reports and prospectuses are the main sources of company data, the former being an annual feature of a public company and the latter being published while making public issue. The annual report contains the chairman's speech, balance sheet and profit and loss account with explanatory notes, and a review of the working of the company over the last 5 to 10 years. The chairman's speech outlines the events that occurred in the previous year having a bearing on the company's performance and how the company responded to those events. It also outlines what the company proposes to do in the next year. Some companies include in their annual reports also a statement of changes in financial position and a forecast of earnings for the next couple of years besides presenting the trends in earnings per share, dividend per share, and their share prices vis-à-vis the market and industry indices. In the prospectuses, companies present a review of their working, the composition of their management team, and their future investment plans for which the capital is sought from the public.

ii. Stock Exchange Official Directory is another important source. It covers all the companies whose shares are listed on the stock exchange and gives for each company, its brief history, progress, and balance sheet and profit and loss accounts for a period of ten years. Moreover, important financial ratios, their trend over the last ten years, and yearly high and low prices quoted for the company's shares are presented as well in the directory.

iii. Kothari's Economic and Investment Guide of India, a yearly publication of the Kothari and Sons, is yet another important source of company data. This guide contains a lot of data on individual companies, their progress and management besides a good write-up on industry scene.

iv. In their regular feature columns such as investors' guide, company profiles reports, company news and comments, and business notes, etc. The Economic Times, Financial Express, Business Standard, Commerce and Business India, and India Today present reports, comments, reviews of the working of individual companies, changes in company policy and management, future plans and prospects of the companies.

v. Some government sources provide company or company related information, 'The Company News and Notes', a monthly publication of the Department of Company Affairs, Government of India, carries circulars and notifications in respect of changes and/or interpretation of the provisions of the Companies Act. The Office of the Registrar of Companies supplies on request, for a minimal charge, a company's annual report, list of members, prospectuses, product-by-product information in respect of licensed capacity, installed capacity, actual production, exports, imports, exchange earnings, etc. The Director General, Technical Development and the Licensing Committee of the Ministry of Commerce supply excellent supplementary data relating to capacity, expansion plans and export performance of the companies.

SOURCES OF INTERNATIONAL ECONOMIC DATA

In today's interdependent world, the international economic, political, market, business and technological developments have a considerable bearing on the conditions and prospects prevailing in a country's economy, the market, and for the business firms. The oil crisis of 1970's, the international financial (debt) crisis, and the growing protectionist attitude of the western countries whose effects are felt worldover are the good examples of this impact.

To evaluate the investment worth of securities of companies engaged in joint ventures with foreign collaborators, export oriented companies, and of those that have diversified their direct investments beyond the national borders (i.e. multinational companies), it is important to collect and examine the international economic market, and business data. Furthermore, information relating to the international money, capital, and currency exchange, market data is important for international portfolio investment if and when such investment is allowed by the RBI. For example, an Indian stock broker or investment counsellor intending to attract non-residents of Indian origin clientele, who are allowed to make portfolio investments in India need to compile this type of data so that he can offer a good advice on the portfolio investment choices.

Some important sources of international data include the following:

i. International Financial Statistics, a monthly publication of the International Monetary Fund (IMF) provides each country's yearly, quarterly and monthly data on major economic indicators such as GNP, money supply, consumer price index, stock market indices, currency exchange rate expressed in the US dollars, and balance of payment condition. The IMF also brings out occasionally supplementary documents on prices, production, balance of payments, exchange rates, etc. covering a long historical period.

ii. Moody's and Standard and Poor's Industrial, Banking and Finance, Transportation, Utility and International Manuals cover extensively the individual company profiles of both the US and international companies. For each company, the historical background, the management team and a lot of financial information are provided in these manuals. The International Manual provides the above information, for a large segment of well-known foreign companies, the information being presented on a country-wise basis.

iii. Capital International Perspective, a Geneva publication, reports on the various national stock market indices, world capital market, international interest rates, and capital flows.

iv. The Financial Times of London, The Economist, a UK weekly, The Wall Street Journal, a US daily, Baron's National Business and Financial Weekly of the USA, International Business Week, Fortune International and the Far Eastern Economic Review are some of the international newspapers and periodicals that contain a lot of information on current international developments of interest to business executives and the investors.

New Ways to Serve the Customers

With the revolution in the electronic industry, different ways to provide the information are sweeping the market. Various financial packages are competing in the market for their position. These packages provide the information about the various facets of the economy, industry and companies in the user friendly manner. Some of the financial packages are introduced herein brief.

CIMM

CIMM is a data-base, introduced by the well-known research organization called Center for Monitoring the Indian Economy (CMIE). It provides company's specific information, both qualitative and quantitative, under the different heads. It also provides industry specific data in a very lucid fashion. Stock market information is also given by this package and updated on a monthly basis. This package also gives the flexibility to give queries and select the companies on the basis of specific needs of users.

CLINE-OLE

This package is designed and marketed by Capital Market, a well-known organization in the field of finance. This package also provides the information on companies, industry and economy. International information is also provided by this package.

VANS

This is a unique product introduced by the Vans Information Services Ltd., a Mumbai based company. This is basically a package which provides the information of various articles and news in the different magazines and newspapers. The whole package is so designed that the access to information can be had on the basis of certain keywords also.

Various other similar products are available in the market, competing to provide the information about the various sectors to the market. Some information companies are busy in providing the tailor-made information products to their clients.

SUMMARY

- The investments are influenced by a whole gamut of events, public policy changes, market conditions, policies and performance of companies, and so on. So, data have to be gathered on economic and market events, national and international events, public and corporate policies, and performance facts.
- The gathering of primary data is both time consuming and costly, the investing public has to resort to the sources of secondary information. Further, to be useful tool collect data from such sources that have already one good deal of data analysis and condensed them into a capsule form.
- Various agencies publish various types of data. There are a number of trade journals, periodicals, official documents, advisory reports published by the investment brokers and counselors that can be valuable sources of information for investment decision-making.
- Sources of economic and industry data, market data and company data include economic survey, final budget of the Government of India, the RBI monthly bulleting, the RBI's report on currency and finance, CMIE reports, etc.
- Most of the times, only financial information of the issuer is not sufficient. The investors are interested in knowing the performance of the economy in general, industry and the specific company.

Chapter VI

Fundamental Analysis

After reading this chapter, you will be conversant with:

- Objectives and Beliefs of Fundamental Analysis
- Framework for Fundamental Analysis
- Concept of Intrinsic Value
- Economic Forecasting Methods
- Industry Analysis
- Key Characteristics in an Industry Analysis
- Industry Life Cycle
- Business Cycle Analysis
- Structural Analysis
- Company Analysis

OBJECTIVES AND BELIEFS OF FUNDAMENTAL ANALYSIS

Security analysis is the first step undertaken in the process of investment decisions. The task involves determining prospective benefits from investment in a security, the conditions subject to which they may be received, and the likelihood of such conditions.

In a sense, the task involves forecasting future conditions, the prospective benefits from holding a security given these conditions, and arriving at 'what ought to be' the price for the security, given these benefits and adjusting for the inherent time and risk. Security valuation is the end objective of security analysis in this sense.

Fundamental analysis is an approach to determine this 'what ought to be price'. Its objective is to identify the underpriced and overpriced securities in the market place so that the investment decisions – buying and selling – can be made.

(A security is said to be underpriced if its current market price is below the 'what ought to be price' otherwise known as 'intrinsic' or 'true' value. Conversely, it is an overpriced security if its current market price is above its intrinsic value.)

The fundamental analysts believe that due to temporary market disequilibrium, the current market price may be at variance with its intrinsic value, but in the long run the market price would get back to its intrinsic value. As Graham, *et al*[1] have pointed out that the fundamental analysts do not invest this value with an aura of permanence. Instead, they believe that the intrinsic value is likely to change from year to year as the factors determining this value take on different values. But in most cases of securities, the intrinsic value changes less drastically than changes in market price. So, an investor usually has an opportunity to profit from a wide discrepancy between the current market price and the intrinsic value. By buying an underpriced security, and selling an overpriced security, an investor would be able to make profits.

It may be noted that the end objective of fundamental analysis is not to make speculative profits which call for frequent entering in and exiting from the market and/or switching from one security of portfolio to another. Rather, it is to avoid the risk of loss from buying an overpriced stock and selling an underpriced stock. The fundamentalists view investments as long-term decisions, in fact, for such a long period that the holding of a security or portfolio can be considered permanent.

The fundamentalists may buy a security if the current market price matches its intrinsic value, that is, when it is a fair price. By buying a fair priced security, a person earns the normal rate of return on his investment. Buying an underpriced stock enables one to earn some abnormal return (relative to risk) on his investment. This is known as beating the market. The fundamentalists are a cadre of participants in the market who believe that the stock market can be beaten.

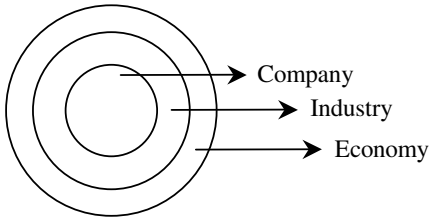
FRAMEWORK FOR FUNDAMENTAL ANALYSIS

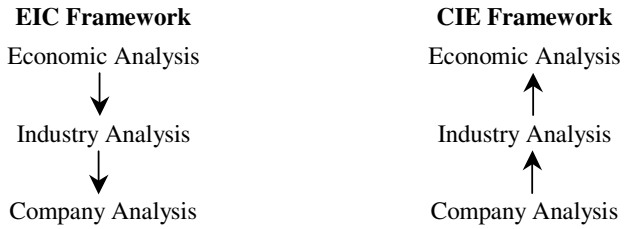
Fundamental Analysis is based on the premise that a security has an intrinsic value at any given time. This value is a function of underlying economic values – specifically, expected returns and risk. By assessing these fundamental determinants of intrinsic value of a security, it is possible to determine an estimate of its intrinsic value. This estimated intrinsic value can then be compared to the current market price of the security. A basic assumption of fundamental analysis is that market price and intrinsic value can differ from time to time, but eventually investors will recognize the discrepancy and act to bring the two values together. Those investors who can perform good fundamental analysis and spot discrepancies should be able to realize profits by taking a suitable decision before the disparity is eliminated by the market.

1 Graham B D Dodd, and S Cottle, Security Analysis 4th ed. McGraw-Hill, New York, 1962.

The proper order in which to proceed in fundamental analysis is, first to analyze the overall economy and securities markets. Second, analyze the industry within which a particular company operates. Finally, analysis of the company should be considered. The above analysis involves making careful estimates of the expected stream of benefits and the required rate of return (this depends on the risk) for a common stock. The intrinsic value can then be obtained through the present value analysis – that is, the dividend discount model. An alternative method of valuation is the P/E ratio or earnings multiplier approach.

Figure 1:Framework for Fundamental Analysis





Professionals, do follow both the approaches for investment and disinvestment decision making. Strategic considerations in economic, industry and company analysis are elaborated and are following in the next few pages.

Economic Analysis

- A study of economic trends as indicated by the rate of growth in gross national product, employment, aggregate corporate profits, personal disposable income, balance of payment position, inflation, government spending, money supply, etc.
- A study of economic policies of the government including plan priorities, monetary policies, Exim policy, fiscal policy, industrial policy, regulation and control of prices, wages, and production.
- An analysis of the relationship between economic trends and economic policies and the stability of such relationships.
- A study of world economic trends and their impact on Indian economy.

Industry Analysis

- Implications of projected growth in gross national product for various industries.
- Implications of plan priorities and plan expenditures for various industries.
- Vulnerability of an industry under government regulation, and control of prices and production.
- Implications of industrial and fiscal policies of the government for an industry.
- Input-output analysis of an industry's sales.
- Degree of dependence on scarce non-renewable or imported raw materials and energy intensity.

- Vulnerability of industry to business cycle.
- Linkage between the sectors vulnerable to business cycle and the industry.
- Life cycle position of industry.
- Price and income elasticity of the end-products of the industry.
- An analysis of competitive conditions as reflected in any barriers to entry.

Company Analysis

- A trend analysis of company's market share.
- An analysis of cost structure and break even analysis.
- An analysis of turnover of assets, operating and production efficiencies through ratio analysis.
- Leverage and coverage ratio analysis.
- Funds flow analysis.
- Profitability analysis.
- A trend analysis of book value per share.
- An analysis of growth in dividend per share and retention policy.
- Estimation of dividend yield.
- Estimation of price-to-earnings multiple.
- An assessment of the quality of assets.
- An assessment of the quality of management.

CONCEPT OF INTRINSIC VALUE

John Burr Williams, offers perhaps one of the earlier but narrow definitions of a stock's intrinsic value[2]. He calls it as the investment value and says that the investment value of a security is the present value of all future cash payments to be paid on the security. The cash payments to the investor may be in the form of dividends, interest, liquidation proceeds, or repayment of the principal amount.

A general definition of intrinsic value is given by Graham and Dodd. They define the intrinsic value of a security as "that value which is justified by the facts, e.g. assets, earnings, dividends, definite prospects, including the factor of management (of the company)". This rather aptly covers the work of a fundamental analyst. His primary focus is, however, on earnings and dividends, the earnings being the payment stream received by the company and the dividends being the payment stream from the company's earnings stream received by the shareholder.

The intrinsic value of a stock is estimated by discounting the company's prospective earnings stream or the shareholder's prospective dividend stream. As the prospective earnings of a company and the prospective dividends to its shareholders depend very much on the economic and industrial environment, relative importance of the company within its industry, company's financial strength, its policies, quality of assets and management, the fundamental analysts seek to establish quantitative relationships between economic, industrial, and company indicators with a view to forecast earnings and dividends. For this purpose, an economic analysis, industrial analysis, and company analysis are undertaken. The quality of assets (technology) and the quality of management are, of course, the factors about which a qualitative assessment is made.

It should be noted that in practice, a fundamental analyst calculates a range of intrinsic values rather than a single value. A stock is said to be mispriced (overpriced or underpriced) if its current price falls outside this range.

2 John Burr Williams, The Theory of Investment Value, Harvard University Press, 1938.

What does Intrinsic Value Imply?

The traditional rule in investments specifies a relationship between the intrinsic value of an asset and its current market price. Specifically, if intrinsic value exceeds current market price, the asset is undervalued and should be purchased or held if already owned. If intrinsic value is less than the current market price, the asset is overvalued and it should be sold if held, or possibly sell it short.

A problem with intrinsic value is that it is derived from a present value process involving estimates of uncertain (future) benefits and use of (varying) discount rates by different investors. Therefore, the same asset may have many intrinsic values – it depends on who, and how many, are doing the valuing. This is why, for a particular asset on a particular day, some investors are willing to buy and some to sell. The market price of an asset at any point in time is, in this sense, the consensus intrinsic value of that asset for the market.

As mentioned earlier, the preferred order for fundamental security analysis is (1) the economy and market, (2) the industry and (3) the company. It is very important to assess the state of the economy and the outlook for primary variables such as corporate profits. If a recession is likely, or underway, stock prices will be heavily affected at certain times during the contraction. Conversely, if a strong economic expansion is underway, stock prices will be affected heavily, again at particular times during the expansion. Thus, the status of economic activity has a major impact on overall stock prices. It is, therefore, very important for investors to assess the state of the economy and its implications for the stock market.

In turn, the stock market impacts on each individual investor. Investors cannot very well go against market trends – if the market goes up (or down) strongly, the majority of stocks are carried along. Company analysis is likely to be of limited benefit in a period when there is a severe depression in stock market. Conversely, many investors would do well regardless of their specific company analysis because the market is up.

In a well known study in the year 1966, Benjamin King analyzed the relationship between market returns and individual stock returns. King found that for the period 1927-1960, roughly half of the variance for an average stock was explained by the overall market. The impact was observed to be in the range 20-45 percent in a recent study conducted by this author for Indian securities.

This impact is much higher for well diversified portfolios. For instance, the percentage of the variability in return of Mastershare NAV and Canshare NAV explained by the market (BSE National Index as proxy for the market) was observed to be as high as 84 and 72.6 respectively. Thus, the impact of the market factor on security returns is quite powerful. Another indication of the overall market impact is on earnings of a particular company. Available evidence for developed economies suggests that from one-fourth to one- half of the variability in a company's annual earnings is attributable to the overall economy. Thus, economy/market analysis is considered extremely important.

After completing an analysis of the economy and the overall market, an investor can decide if it is favorable to invest in common stocks. If so, the next step should be industry analysis. King also identified the industry factor as the second component (after overall market movements) affecting the variability in stock returns. In the Indian context, the industry factor is observed to be extremely powerful in influencing the fortunes of individual companies. In a controlled economy like India, changes in government policies generally affect all companies in a given industry. We will discuss some examples later.

After an analysis of economy market and industries, the next step is to concentrate on specific companies. The bottom line in financial statements, i.e. earnings per share is considered to have a powerful impact on the price of the share. While a number of factors are important in analyzing a company, investors tend to focus on earnings and dividends that are paid out of them.

Market Analysis

We have discussed the importance of market analysis. Ultimately, investors must make intelligent judgments about the current state of the market and possible changes in the future. A logical starting point in assessing the market is to understand the economic factors that determine stock prices. Understanding the current and future state of the economy is the first step in understanding what is happening and what is likely to happen to the market. The state of the market is measured by the security market indicators.

What determines stock prices? As discussed earlier, the two determinants of stock prices are – the expected stream of benefits (earnings or dividends) and the required rate of return (or its counterpart, the P/E ratio). Although these are the ultimate determinants, a more comprehensive model is desirable when attempting to understand the stock market.

The positive impact of a change in expected real corporate earnings on stock prices has been noticed in the Indian scenario. However, the variables that have led to a change in expected real corporate earnings have been more qualitative in nature – the various liberalization and deregulation measures, gradual elimination of administrative and bureaucratic controls in the industrial and financial sector and the like.

In the absence of proper qualification of all the variables, empirical testing of the model would be inadequate and misleading. Moreover, the process of interest rates affecting stock prices is not testable as the interest rates are not allowed to be fully determined by market forces. However, with a gradual phasing out of administered interest rates, one may witness the kind of interaction indicated by the model.

We cite some of the major factors that influence corporate earnings and hence, stock prices in the Indian context.

Economic Policies: This is a major variable affecting the stock market, especially in the context of a highly regulated environment like India. While some policy changes affect specific industries, (this will be discussed in the section on industry analysis) some have a general positive or negative impact on the entire market. The recent move towards economic liberalization has noticeably affected the market sentiments. Changes in credit policy announced by the Reserve Bank of India are seen to affect corporate performance. Similarly, changes in interest rate structure, import and export policies have a direct bearing on the corporate profits and hence, on the stock market.

Fiscal Policies: Presentation of national budget is a major event in the stock market circles. While changes in tax structure introduced in the budget may affect specific industries, or even specific companies, some provisions affect the entire corporate sector.

Monsoons: The agricultural sector being a dominant sector in India, the arrival of monsoon is also a major event. The rainfall pattern affects the fortunes of the corporate sector indirectly in several ways. A good monsoon leading to a good harvest results in greater purchasing power with the rural households. This leads to greater demand for the output of the corporate sector. On the other hand, the agricultural produce, such as, cotton, sugarcane, etc. are inputs for many industries. A good monsoon naturally results in a downward pressure on prices of such inputs. The final outcome is spurt in corporate profits.

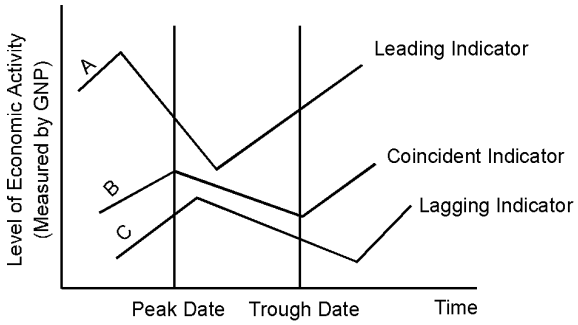
ECONOMIC FORECASTING METHODS

An understanding of economic forces that affect stock prices facilitates forecasting likely changes in the market by using data on the economic variables. What follows is a brief evaluation of some of the important economic forecasting techniques like: (a) Lead Indicator Approach, (b) Diffusion Indices, (c) Econometric Model Building and (d) GNP Model Building.

Lead Indicator Approach

The lead indicator approach attempts to forecast the general economic conditions by identifying economic indicators that turn ahead of the change in the general level of economic activity. Economic indicators are nothing but time series which tend to turn up or down in advance of or concurrent with, or after the economic upturn or downturn. From figure 2, we find that indicator A turns ahead of the peak and trough of the business cycle whereas indicators B and C turn in unison with or after the peak and trough of the cycle.

Figure 2



Source: ICFAI Research Team.

So, to forecast the change in the economic conditions, we will be obviously interested in leading indicators because they provide advance signals of the turning points in the economic activity.

While identifying a lead indicator for the purposes of forecasting, the analyst must ensure that the lead indicator fulfills the following criteria as closely as possible: (1) It should move smoothly from one period to another as it rises or falls and should turn sharply at its peaks and troughs. If a series zigzags during its upward or downward swings, it becomes difficult to know whether the 'zig' is a genuine turning point or a temporary reversal of trend. (2) An ideal lead indicator should always lead turning points of general business activity by the same number of months with no 'false' leads. (False leads are predictions of business turning points which do not materialize). (3) It should lead by enough time to permit the user to make necessary alterations in his plans, but do not lead by a long time interval that will make him disbelieve the indicator. (4) The indicator should fit logically with the business cycle theory. The more logical it appears that a particular series will turn ahead of economic conditions, the more assured the user can be that its historical lead relationship will continue in the future.

Some of the leading economic indicators are the utilization of manufacturing capacity, residential construction, corporate profits, and of course the general level of stock prices. Since the movement in the general level of stock prices is what we are ultimately interested in forecasting, we should look for that leading indicator which would act as a lead to the leading indicator under consideration.

The lead indicator approach is most valuable in suggesting the direction of change in economic activity. But it does not convey any information on the magnitude and duration of the change. The other important limitation of this approach is that the signals provided by the different lead indicators can be mixed. In other words, some of the leading series might signal a turn while the others might not, resulting in a serious problem of interpreting the same for the purpose of arriving at a forecast.

This limitation can of course be resolved by shortlisting only such lead indicator(s) that satisfy the criteria mentioned above. The diffusion index approach discussed in the next section partly attempts to resolve the problem of mixed signals.

Diffusion Indices

A diffusion index (as the name implies) is a measure of how widespread (diffused) a phenomenon is. We can set up a diffusion index for leading indicators by counting the number of indicators that rise during a particular period and expressing it as a proportion of the total number of lead indicators and more desirably in a percentage form. If five out of, say, ten leading indicators rise during a particular month, the diffusion index for that month will be 50 percent. If, in the next month, seven rise (not necessarily including all the five which rose in the previous month), the index for that month will be 70 percent. The user must interpret the diffusion index relative to the levels of the index in the past. Certainly a rise from 50% to 70% in the index is a stronger confirmation of a period of economic advance.

Econometric Model Building Approach

As far as short-term economic forecasting is concerned, an approach based on econometric methods has the advantage of providing a magnitude and direction to the dependent variable (unlike the lead indicator approach), say GNP. However, the user must understand that a precise estimate of the dependent variable (forecast value for GNP) obtained from the econometric model need not be an accurate one, because accuracy of the forecast will ultimately depend upon the quality of data input, the validity of the assumptions underlying the model, and above all upon the model builder's understanding of the underlying economic theory.

Further, as stated in the Indian context it must be noted that, an econometric model for forecasting GNP in a planned economy may not have much of a practical relevance because the planning priorities may change significantly, besides the likely changes in government regulation, fiscal policy, and the control mechanisms of money, credit, prices and wages. Econometric models can be meaningful for future projections if and only if the estimated co-efficients (like the intercept 'a' and slope 'b' in a linear regression model) are found to be acceptable in respect of their stability over time.

GNP Model Building Approach

The GNP model building approach forecasts GNP in the short run by estimating the magnitudes of the various components constituting GNP. If GNP is defined as C + I + G + X – M where C, I, G, X and M stand for their standard definitions, then forecast for GNP under this approach is determined by estimating the likely values of C, I, G, X and M. To estimate these components, the forecaster relies extensively on the budget estimates of the Central and State Governments, the socio-economic surveys carried out by the Government and private agencies, and the field data collected for this purpose.

Once the forecaster estimates these major components, he adds them together to come up with his estimate of the GNP. He tests the forecast for internal consistency because of the interrelatedness of the GNP accounts. For example, a given level of consumption implies a certain level of savings, which affects business investments which in turn affects production activities, and thus affects income and savings.

While these circular effects take place, other factors like interest rates and inflation will also be affected. So, the forecaster must ensure that his estimates for the different components take care of such interlinkage. Apart from testing the forecast for internal consistency, the forecaster also examines it for external consistency by comparing it with forecasts obtained under other methods like the econometric model building approach.

The major advantage of this approach is its versatility. Since the GNP forecast is adjusted for all anticipated changes and tested for internal consistency, it is likely to be a reliable one. But the approach is data demanding and calls for a vast deal of judgment and ingenuity.

The approach has been succinctly described by Lewis and Turner as 'an effort to build a view of the short run business outlook that is comprehensive, that is as quantitatively precise as the state of our knowledge permits, that is internally consistent, that draws upon rather than sidesteps all the pertinent insights of modern aggregative economics but, at the same time, does not make a fetish of the theoretical rigor. Instead, the technique seeks to exploit any and all evidences of business prospects that may come to hand. It is particularly distinguished from pure econometric model building by its heavy use of data concerning the advance plans and commitments of certain spending groups, and it retains a sizeable place for judgment and free-hand adjustments'.

Economic Forecasting in India

The state-of-the-art of business/economic forecasting in India suggests that economic forecasting is yet to acquire a professional stature in the country. Though some projections on major macroeconomic variables are made by the government and private bodies like Planning Commission, Center for Monitoring Indian Economy (CMIE) and the Commerce Research Bureau (CRB), there appears to be no agency like the National Bureau of Economic Research (NBER) in the US that has done extensive research in forecasting business cycles. Some of the economic forecasting tools like the econometric model building approach may have limited relevance in the Indian context, but other approaches like the lead indicator approach can serve as valuable tools in forecasting economic conditions.

INDUSTRY ANALYSIS

The second step in the fundamental analysis of common stocks is industry analysis. Convinced that the economy and the market are attractive from the standpoint of investing in common stocks, the investor should proceed to consider those industries that promise the most opportunities in the coming years.

The significance of industry analysis can be established by considering the performance of other industries too in a similar fashion. The analysis indicates the value to investors in selecting certain industries while avoiding others. The analysis also establishes the need for investors to continue analyzing industries by showing the inconsistency of industry performance over consecutive yearly periods.

Industry analysis usually involves several steps. As a first step, industries are analyzed in terms of their stage in the life cycle. The idea is to assess the general health and current position of the industry. This may be followed by an assessment of the position of the industry in relation to the business cycle and macroeconomic conditions; an analysis of the competitive structure prevailing in the industry and a study of the impact of changes in government policy on the industry.

KEY CHARACTERISTICS IN AN INDUSTRY ANALYSIS

The most important of the characteristics that are to be evaluated in an Industry Analysis can be enumerated as given below:

1. Past sales and earnings performance.
2. Permanence of the industry.
3. The attitude of the government towards the industry.
4. Labor conditions within the industry.
5. The competitive conditions as reflected by the existence of the entry barriers and
6. The stock prices of the firms in the industry relative to their earnings.

Past Sales and Earnings Performance

For an analyst, the past sales and earnings performance of the firm form a crucial input in forecasting future trends. This is not to say that the firm is going to repeat the same performance again. Rather, the analyst is more interested in examining the contribution of the various factors in the past so that the relevance of these factors individually and relatively can be properly evaluated under present conditions.

In any firm, sales and the earnings play an important role. These variables will exhibit a degree of consistency only when the firm has weathered a variety of economic conditions. The analyst from the observation of these variables will be able to judge the stability of the performance in terms of sales and earnings as well as the growth rates. Another crucial factor is that of the relationship between the sales and the fixed costs. The more the fixed costs, the higher will be the break even point and higher will be the sales volume to be achieved.

Permanence

By permanence, we understand the products and the technology of a particular industry not becoming obsolete in a short span of time. If the industry is not permanent, then investing in that industry altogether becomes a losing proportion. In some of the cases a product with additional features manufactured by employing superior technology makes the existing product totally irrelevant or at least results in the manufacturing process becoming a commercially enviable proposition.

In this age of rapid technological developments, this factor plays a crucial role in Industry Analysis. The Government's role is also an important factor affecting the permanence of the industry.

The Attitude of the Government towards the Industry

It is imperative for an Analyst that he should be well aware of the various Government policies and regulations with reference to an industry in which he is going to invest. The government policies like deregulating an industry by allowing foreign investment, imposing high tariffs on imports and restrictive legislation have a bearing on their performance. Some of the legal restrictions result in the profits being very low for a particular industry. Thus an analyst, for that matter, an investor should be thorough with various government regulations and their implications and should be able to predict, at least broadly, the changes likely to take place in the regulations in the near future.

Labor Conditions

This is an important factor to be considered in industries which are labor intensive. An analyst should examine the various provisions of the labor laws and also go into the possible reasons that may halt the production process and its fallout on the profits of the industry. In case of a prolonged strike, a labor intensive firm will not only lose its customers and goodwill but also may not be able to cover its fixed costs in certain cases.

Competitive Conditions

While analyzing this situation, the three general types of barriers that an analyst should concentrate on, are

1. Existence of product differentiation
2. Absolute cost advantages and
3. Advantages rising from economies of scale.

The existence of the first barrier assures that a new entrant will not be able to charge as much as the existing firms. Also he has to spend large amounts of money on advertising to capture an acceptable share of the market as this situation is usually found in cases where the customers exhibit a high degree of brand loyalty. By absolute cost advantages, we understand that the existing firms are capable of producing and distributing the products at lower costs than the new entrants irrespective of the volume produced. As a result, they enjoy wider profit margins. This may be due to the fact that the existing firms may have exclusive patents, own the resources or superior management skills that are not available to the new entrants.

Economies of scale are usually realized when the production levels are quite high. A new entrant in this case also has to garner a significant market share so that he can avail the benefits from economies of scale. If he fails to do so, he will be able to compete with the prices offered by the existing players.

An analyst or a prospective investor should consider investment in an industry which is well protected.

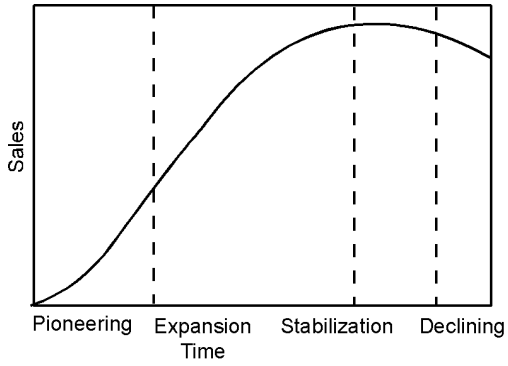
Industry Share Prices Relative to its Earnings

In addition to the various factors we have been looking at, the analyst also has to look at the present share prices. In this case an underpriced share would be the best bet. Also he should examine the fact that the share prices are not high due to the overzealous nature of the investors to acquire the shares of the firms in a new industry. Usually the shares of these companies experience high fluctuations depending on the crowd behavior.

INDUSTRY LIFE CYCLE

Many observers believe that industries evolve through four stages – the pioneering stage, the expansion stage, the stabilization stage and the declining stage. There is an obvious parallel in this idea to human development. The concept of an industry life cycle could apply to industries or product lines within industries. The industry life cycle concept is depicted in figure 3 and each stage is discussed in the following section.

Figure 3



Pioneering Stage

In this stage, rapid growth in demand occurs. Although a number of companies within a growing industry will fail at this stage because they will not survive the competitive pressures, most experience rapid growth in sales and earnings, possibly at an increasing rate. The opportunities available may attract a number of companies, as well as venture capital. Considerable jockeying for position occurs as the companies battle each other for survival, with the weaker firms failing and dropping out. Investor risk in an unproven company is high, but so are expected returns if the company succeeds. At the pioneering stage of an industry it can be difficult for security analysts to identify the likely survivors, just when the ability to identify the future strong performers is most valuable. By the time it becomes apparent who the real winners are, their prices may have been bid up considerably beyond what they were in the earlier stages of development.

Expansion Stage

In this second stage of an industry's life cycle the survivors from the pioneering stage are identifiable. They continue to grow and prosper, but the rate of growth is more moderate than before. At the expansion stage of the cycle, industries are improving their product and perhaps lowering their prices.

They are more stable and solid, and at this stage they often attract considerable investment funds. Investors are more willing to invest in these industries now that their potential has been demonstrated and the risk of failure has decreased.

"Financial policies become firmly established at this stage. The capital base is widened and strengthened dividends often become payable, further enhancing the attractiveness of these companies to a number of investors.

Stabilization Stage

Finally, industries evolve into the stabilization stage (sometimes referred to as the maturity stage), at which the growth begins to moderate. Sales may still be increasing, but at a much slower rate than before. Products become more standardized and less innovative, the market place is full of competitors, and costs are stable rather than decreasing through efficiency moves and so on. Industries at this stage continue to move along, but without significant growth.

Stagnation may occur for considerable period of time, or intermittently.

This three-part classification of industry evolvement is helpful to investors in assessing the growth potential of different companies in an industry. Based on the stage of the industry, they can better assess the potential of companies within that industry. However, there are limitations to this type of analysis. First, it is only a generalization, and investors must be careful not to attempt to categorize every industry, or all companies within a particular industry, into neat categories that may not apply. Second, even the general framework may not apply to some industries that are not categorized by many small companies struggling for survival. Finally, the bottom line in security analysis is stock prices, a function of the expected stream of the benefits and risk involved. The industrial life cycle tends to focus on sales and share of the market and investment in the industry. Although all of these factors are important to investor, they are not the final items of interest. Given these qualifications to industry life cycle analysis, what are the implications to investors?

The pioneering stage may offer the highest potential returns, but also offers the greatest risk. Several companies in a particular industry will fail, or do poorly. Such risk may be appropriate for some investors, but many will wish to avoid the risk inherent in this stage.

The maturity stage is to be avoided by investors interested primarily in capital gains. Companies at this stage may have relatively high dividend pay-outs because their growth prospects are fewer. These companies often offer stability in earnings and dividend growth.

Declining Stage

In this stage of the industrial life cycle – decline is indicated on either a relative or absolute basis. Clearly, investors should seek to spot industries in this stage and avoid them.

It is the second stage i.e. expansion, that is probably of most interest to investors. Industries that have survived the pioneering stage often offer good opportunities as the demand for their products and services is growing more rapidly than the economy as a whole. Growth is rapid, but orderly, an appealing characteristic to investors.

BUSINESS CYCLE ANALYSIS

A second way to analyze industries is by their operating ability in relation to the economy as a whole. That is, some industries perform poorly during a recession whereas others are able to weather it reasonably well. Some industries move closely with the business cycle, outperforming the average industry in good times and underperforming it in bad times. Investors, in analyzing industries, should be aware of these relationships.

Most investors have heard of, and are usually seeking, growth companies. In growth industries, earnings are expected to be significantly above the average of all industries and such growth may occur regardless of setbacks in the economy. Clearly, one of the primary goals of fundamental security analysis is to identify the growth industries of the near and far future.

At the opposite end of the scale are the defensive industries, which are least affected by recessions and economic adversity. Food has long been considered one such an industry. Public utilities might also be considered a defensive industry.

Cyclical industries are most volatile – they do unusually well when the economy prospers and are likely to be hurt more when the economy falters. Durable goods are a good example of the products involved in cyclical industries. Autos, refrigerators, and stereos, for example, may be avidly sought when times are good, but such purchases may be postponed during bad times because consumers can often make do with the old units.

These three classifications of industries according to economic conditions do not constitute an exhaustive set. Additional classifications are possible and logical. For example, some industries are interest-sensitive, that is, particularly sensitive to expectations about changes in interest rates. The financial services industry, the banking industry, and the real estate industry are obvious examples of interest-sensitive industries. Another is the building industry.

What are the implications of these classifications to investors? To predict performance of an industry over shorter periods of time, investors should carefully analyze the stage of the business cycle and the likely movements in interest rates. If the economy is heading into a recession, cyclical industries are likely to be affected more than other industries, whereas defensive industries are the least likely to be affected. With such guidelines, investors may make better buy or sell decisions. Similarly, an expected rise in interest rates will have negative implications for the savings and loan industry and the home-building industry, whereas an expected rise in interest rates will have opposite effects.

These statements reinforce the importance of market analysis. Not only do investors need to know the state of the economy and market before deciding to invest, but such knowledge is valuable in selecting, or avoiding particular industries.

STRUCTURAL ANALYSIS

The nature of the competitive conditions existing in an industry can provide useful information in assessing its future. The intensity of competition in an industry determines that industry's profitability. Professor Micheal Porter in his famous book on 'Competitive Strategy' has undertaken a detailed analysis of the forces that shape the competitive structure in an industry. The following sections are based on excerpts from this book.

Competition in an industry continually works to drive down the rate of return on invested capital towards the competitive floor rate of return, or the return that would be earned by the economist's 'perfectly competitive' industry. This competitive floor, or 'free market' return, is approximated by the yield on long-term government securities adjusted upward by the risk of capital loss. Investors will not tolerate returns below this rate in the long run because of their alternative of investing in other industries, and firms habitually earning less than this return will eventually go out of business. The presence of rates of return higher than the adjusted free market return serves to stimulate the inflow of capital into an industry either through new entry or through additional investment by existing competitors. The strength of the competitive forces in an industry determines the degree to which this inflow of investment occurs and derives the return to the free market level, and thus the ability of firms to sustain above average returns.

The five competitive forces – entry, threat of substitution, bargaining power of buyers, bargaining power of suppliers, and rivalry among current competitors – reflect the fact that competition in an industry goes well beyond the established

players. Customers, suppliers, substitutes, and potential entrants are all 'competitors' to firms in the industry and may be more or less prominent depending on a particular circumstance. Competition in this broader sense might be termed extended rivalry. Of course different forces take on prominence, in shaping competition in each industry.

Threat of Entry

New entrants to an industry bring new capacity, the desire to gain market share, and often substantial resources. Prices can be bid down or incumbent costs inflated as a result, reducing profitability. Companies diversifying through acquisition into the industry from other markets often use their resources to cause a shake-up. This acquisition into an industry with intent to build market position should probably be viewed as entry even though no entirely new entity is created.

The threat of entry into an industry depends on the barriers to entry that are present, coupled with the reaction from existing competitors that the entrant can expect. If barriers are high and/or the newcomer can expect share retaliation from entrenched competitors, the threat of entry is low.

There are six major sources of barriers to entry.

ECONOMIES OF SCALE

Economies of scale refer to decline in unit cost of a product (or operation or function that goes into producing a product) as the absolute volume per period increases. Economies of scale deter entry by forcing the entrant to come in at large scale and risk strong reaction from existing firms or come in at a small scale and accept a cost disadvantage, both undesirable options. Scale economies can be present in nearly every function of a business, including manufacturing, purchasing, research and development, marketing, service network, sales force utilization, and distribution.

Scale economies may relate to an entire functional area, as in the case of a sales force, or they may stem from particular operations or activities that are part of a functional area. For example, in the manufacture of television sets, economies of scale are large in color tube production and they are less significant in cabinet making and set assembly. It is important to examine each component of costs separately for its particular relationship between unit cost and scale.

Units of multibusiness firms may be able to reap economies similar to those of scale if they are able to share operations or functions subject to economies of scale with other businesses in the company. For example, the multibusiness company may manufacture small electric motors, which are then used in producing industrial fans, hairdryers, and cooling systems for electronic equipment. If economies of scale in motor manufacturing extend beyond the number of motors needed in any one market, the multibusiness firm diversified in this way will reap economies in motor manufacturing that exceed those available if it only manufactured motors for use in, say, hairdryers. Thus related diversification around common operations or functions can remove volume constraints imposed by the size of a given industry[3]. The prospective entrant is forced to be diversified or face cost disadvantage. Potentially shareable activities or functions subject to economies of scale can include sales forces, distribution systems, purchasing, and so on.

The benefits of sharing are particularly potent if there are joint costs. Joint costs occur when a firm producing product A (or an operation or function that is part of producing A) must inherently have the capacity to produce product B. An example is air passenger services and air cargo, where because of technological constraints only

3 For this entry barrier to be significant it is crucial that the shared operation or function be subject to economies of scale which extend beyond the size of any one market. If this is not the case, cost savings of sharing can be illusory. A company may see its costs decline as overhead is spread, but this depends solely on the presence of excess capacity in the operation or function. These economies are short run economies, and once capacity is fully utilized and expanded the true cost of the shared operation will become apparent.

so much space in the aircraft can be filled with passengers, leaving available cargo space and pay load capacity. Many of the costs must be borne to put the plane into the air and there is capacity for freight regardless of the quantity of passengers the plane is carrying. Thus the firm that competes in both passenger and freight may have a substantial advantage over the firm competing in only one market.

A common situation of joint costs occurs when business unit can share intangible assets such as brand names and know-how. The cost of creating an intangible asset need only be borne once; the asset may then be freely applied to other business, subject only to any costs of adapting or modifying it. Thus situations in which intangible assets are shared can lead to substantial economies.

A type of economies of scale entry barrier occurs, when there are economies in vertical integration, that is, operating in successive stages of production or distribution. Here the entrant must enter the market, integrated or face a cost disadvantage, as well as possible foreclosure of inputs or markets for its product if well-established competitors are already in. Foreclosure in such situations stems from the fact that most customers purchase from in-house units, or most suppliers 'sell' their inputs in-house. The independent firm faces a difficult time in getting comparable prices and may become 'squeezed' if integrated competitors offer different terms to it than to their captive units. The requirement to enter the market in an integrated fashion may heighten the risks of retaliation and also elevate other entry barriers discussed below.

PRODUCT DIFFERENTIATION

Product differentiation means that established firms have brand identification and customer loyalties, which stem from past advertising, customer service, product difference, or simply being first into the industry. Differentiation creates a barrier to entry by forcing entrants to spend heavily to overcome existing customer loyalties. This effort usually involves start-up losses and often takes an extended period of time. Such investments in building a brand name are particularly risky since they have no salvage value if entry fails.

CAPITAL REQUIREMENTS

The need to invest large financial resources in order to compete creates a barrier to entry, particularly if the capital is required for risky or unrecoverable upfront advertizing or research and development (R&D). Capital may be necessary not only for production facilities but also for things like customer credit, inventories, or covering start-up losses. Even if capital is available on the capital market, entry represents a risky use of that capital which should be reflected in risk premiums charged to the prospective entrant; these constitute advantages for going firm.

SWITCHING COSTS

A barrier to entry is created by the presence of switching costs, that is, one-time costs facing the buyer of switching from one supplier's product to another's. Switching costs may include employee retraining costs, cost of new ancillary equipment, cost and time in testing or qualifying a new source, a need for technical help as a result of reliance on seller engineering aid, product redesign, or even psychic costs of severing a relationship. If these switching costs are high, then new entrants must offer a major improvement in cost or performance in order for the buyer to switch from an incumbent.

ACCESS TO DISTRIBUTION CHANNELS

A barrier to entry can be created by the new entrant's need to secure distribution for its product; to the extent the logical distribution channels accept its product through price breaks, co-operative advertising allowances, and the like, there will be a reduction in the profits. The manufacturer of a new food product, for example, must persuade the retailer to give its space on the fiercely competitive supermarket shelf via promises of promotions, intense selling efforts to the retailer, or some other means.

The more limited the wholesale or retail channels for a product are and the more existing competitors have these tied up, obviously, the tougher the entry into the industry will be. Existing competitors may have ties with channels based on long relationships, high-quality service, or even exclusive relationships in which the

channel is solely identified with a particular manufacturer. Sometimes this barrier to entry is so high that to surmount it a new firm must create an entirely new distribution channel.

Cost Disadvantage Independent of Scale

Established firms may have cost advantages not replicable by potential entrants, no matter what their size and attained economies of scale. The most critical advantages are factors such as the following:

- **Proprietary product technology:** Product know-how or design characteristics that are kept proprietary through patents or secrecy.
- **Favorable access to raw materials:** Established firms may have locked up the most favorable sources and/or tied-up foreseeable needs early at prices reflecting a lower demand for them than the existing one.
- **Favorable locations:** Established firms may have cornered favorable locations before market forces bid up prices to capture their full value.
- **Government subsidies:** Preferential government subsidies may give established firms lasting advantages in some business.
- **Learning or experience curve:** In some businesses, there is an observed tendency for unit costs to decline as the firm gains more cumulative experience in producing a product. Costs decline because workers improve their methods and become more efficient (the classic learning curve), layout improves, specialized equipment and processes are developed, better performance is coaxed from equipment, product design changes make manufacturing easier, techniques for measurement and control of operations improve, and so on. Experience is just a name for certain kinds of technological changes and may apply not only to production but also to distribution, logistics, and other functions. As is the case with scale economies, cost declines with experience relate not to the entire firm but arise from the individual operations or functions that make up the firm. Experience can lower costs in marketing, distribution, and other areas as well as in production or operation within production, and each component of costs must be examined for the effects of experience.

Cost declines with experience seem to be the most significant in businesses involving a high labor content performing intricate tasks and/or complex assembly operations (aircraft manufacture, ship building). They are nearly always the most significant in the early and growth phase of a product's development, and later reach diminishing proportional improvements. Often economies of scale are cited among the reasons that costs decline with experience. Economies of scale are dependent on volume per period and not on cumulative volume, and are very different analytically from experience, although the two often occur together and can be hard to separate.

If costs decline with experience in an industry, and if the experience can be kept proprietary by established firms, then this effect leads to an entry barrier. Newly started firms, with no experience, will have inherently higher costs than established firms and must bear heavy start-up losses from below or near-cost pricing in order to gain the experience to achieve cost parity with established firms (if they ever can). Established firms, particularly the market share leader who is accumulating experience the fastest, will have higher cash flow because of their lower costs to invest in new equipment and techniques. However, it is important to recognize that pursuing experience curve cost declines (and scale economies) may require substantial upfront capital investment for equipment and start-up losses. If costs continue to decline with volume even as cumulative volume gets very large, new entrants may never catch up.

The decline in cost from experience can be augmented if there are diversified firms in the industry whose share operations or functions subject to such a decline with other units in the company, or where there are related activities in the company from which incomplete though useful experience can be obtained. When an activity like the fabrication of raw material is shared by several business units,

experience obviously accumulates faster than it would if the activity were used solely to meet the needs in one industry. Or when the corporate entity has related activities within the firm, sister units can receive the benefits of their experience at little or no cost since such experience is an intangible asset. This sort of shared learning accentuates the entry barrier provided by the experience curve, provided the other conditions for its significance are met.

Government Policy

The last major source of entry barriers is government policy. Government can limit or even foreclose entry into industries with such controls as licensing requirements and limits on access to raw materials. More subtle government restrictions on entry can stem from control such as air and water pollution standards and products safety and efficacy regulations. Government policy in such areas certainly has direct social benefits, but it often has secondary consequences for entry which are unrecognized.

Expected Retaliation

The potential entrant's expectations about the reaction of existing competitors also will influence the threat of entry. If existing competitors are expected to respond forcefully to make the entrant's stay in the industry an unpleasant one, then entry may well be deterred. The following are the conditions that signal the strong likelihood of retaliation to entry and hence deter it:

- A history of vigorous retaliation to entrants;
- Established firms with substantial resources to fight back, including excess cash and unused borrowing capacity, adequate excess productive capacity to meet all likely future needs, or great leverage with distribution channels or customers;
- Established firms with great commitment to the industry and highly illiquid assets employed in it;
- Slow industry growth, which limits the ability of the industry to absorb a new firm without depressing the sales and financial performance of established firms.

Intensity of Rivalry among Existing Competitors

Rivalry among existing competitors takes the familiar form of jockeying for position – using tactics like price competition, advertising battles, product introductions, and increased customer service or warranties. Rivalry occurs because one or more competitors either feels the pressure or sees the opportunity to improve positions. In most industries, competitive moves by one firm have noticeable effects on its competitors and thus may incite retaliation or efforts to counter the move; that is, firms are mutually dependent. This pattern of action and reaction may or may not leave the initiating firm and the industry as a whole better off. If moves and countermoves escalate, then all firms in the industry may suffer and be worse off than before.

Some forms of competition, notably price competition, are highly unstable and quite likely to leave the entire industry worse off from the standpoint of profitability. Price cuts are quickly and easily matched by rivals, and once matched they lower revenues for all firms unless industry price elasticity of demand is high enough. Advertizing battles, on the other hand, may well expand demand or enhance the level of product differentiation in the industry for the benefit of all firms.

Rivalry in some industries is characterized by such phrases as 'warlike', 'bitter', or 'cut-throat' whereas in other industries it is termed 'polite' or 'gentlemanly'. Intense rivalry is the result of a number of interacting structural factors.

NUMEROUS OR EQUALLY BALANCED COMPETITORS

When firms are numerous, the likelihood of mavericks is great and some firms may habitually believe they can make moves without being noticed. Even where there are relatively few firms, who are relatively balanced in terms of size and perceived resources, it creates instability because they may be prone to fight with each other and have the resources dominated by one or a few firms. On the other

hand, one cannot underemphasize the relative strength of the firms and the leader or leaders can impose discipline as well as play a co-ordinative role in the industry through devices like price leadership.

In many industries foreign competitors, either exporting into the industry or participating directly through foreign investment, play an important role in industry competition.

Slow Industry Growth

Slow industry growth turns competition into a market share game for firms seeking expansion. Market share competition is a great deal more volatile than is the situation in which rapid industry growth insures that firms can improve results just by keeping up with the industry, and where all their financial and managerial resources may be consumed by expanding with the industry.

High Fixed or Storage Costs

High fixed costs create strong pressures for all firms to fill capacity which often leads to rapidly escalating price cutting when excess capacity is present. Many basic materials like paper and aluminum suffer from this problem, for example. The significant characteristic of costs is fixed costs relative to value added, and not fixed costs as a proportion of total costs. Firms purchasing a high proportion of costs in outside inputs (low value added) may feel enormous pressures to fill capacity to break even, despite the fact that the absolute proportion of fixed costs is low.

A situation related to high fixed costs is one in which the product, once produced, is very difficult or costly to store. Here firms will also be vulnerable to temptations to shade prices in order to insure sales. This sort of pressure keeps profits low in industries like fishing and the manufacture of certain hazardous chemicals and some service businesses.

Lack of Differentiation or Switching Costs

Where the product or service is perceived as a commodity or near commodity, choice by the buyer is largely based on price and service, and pressures for intense price and service competition result. These forms of competition are particularly volatile, as has been discussed. Product differentiation, on the other hand, creates layers of insulation against competitive warfare because buyers have preferences and loyalties to particular sellers. Switching costs, described earlier, have the same effect.

Capacity Augment in Large Increments

Where economies of scale dictate that capacity must be added in large increments, capacity additions can be chronically disruptive to the industry supply/demand balance, particularly where there is a risk of bunching capacity additions. The industry may face recurring periods of overcapacity and price cutting.

DIVERSE COMPETITORS

Competitors diverse in strategies, origins, personalities and relationships to their parent companies have differing goals and differing strategies for how to compete and may continually run head into each other in the process. They may have a hard time reading each other's intentions accurately and aggreeing on a set of 'rules of the game' for the industry. Strategic choice right for one competitor will be wrong for others.

Foreign competitors often add a great deal of diversity to industries because of their differing circumstances and often differing goals. Owner-managers of small manufacturing or service firms may as well be satisfied with a subnormal rate of return on their invested capital to maintain the independence of self-ownership, whereas such outlook and philosophy is unacceptable and may appear irrational in case of large publicly held companies.

In such an industry, the posture of the small firms may limit the profitability of the larger concern. Similarly, firms viewing a market as an outlet for excess capacity (e.g. in the case of dumping) will adopt policies contrary to those of firms viewing the market as a primary one. Finally, difference in the relationship of competing business units to their corporate parents is an important source of diversity in an

industry as well. For example, a business unit that is part of a vertical chain of businesses in its corporate organization may well adopt different and perhaps contradictory goals than a free-standing firm competing in the same industry.

High Strategic Stakes

Rivalry in an industry becomes even more volatile if a number of firms have high stakes in achieving success there. For example, a diversified firm may place great importance on achieving success in a particular industry in order to further its overall corporate strategy. Or a foreign firm may perceive a strong need to establish a solid position in the market in order to build global prestige or technological credibility. In such situations, the goals of these firms may not only be diverse but even more destabilizing because they are expansionary and involve potential willingness to sacrifice profitability.

Shifting Rivalry

The factors that determine the intensity of competitive rivalry can or do change. A very common example is the change in industry growth brought about by industry maturity. As an industry matures, its growth rate declines, resulting in intensified rivalry, declining profits, and (often) a shake out.

Another common change in rivalry occurs when an acquisition introduces a very different personality to an industry. Also, technological innovation can boost the level of fixed cost in the production process and rise the volatility of rivalry.

Although a company must live with many of the factors that determine the intensity of industry rivalry because they are built into industry economics – it may have some latitude in improving matters through strategic shifts. For example, it may try to raise buyer's switching costs by providing engineering assistance to customers to design its product into operations or to make them dependent for technical advice. Or the firm can try to raise product differentiation through new kinds of services, marketing innovations, or product changes. Focussing selling efforts on the fastest growing segments of the industry or on market areas with the lowest fixed costs can reduce the impact of industry rivalry. Also, if it is feasible a company can try to avoid confronting competitors with high exit barriers and can thus sidestep involvement in bitter price-cutting, or it can lower its own exit barriers.

Exit Barriers

Exit barriers are economic, strategic, and emotional factors that keep companies competing in businesses even though they may be earning low or even negative returns on investment. The major source of exit barriers are the following:

- **Specialized assets:** Assets highly specialized to a particular business or location have low liquidation values or high costs of transfer or conversion.
- **Fixed costs of exit:** These include labor agreements, resettlement costs, maintaining capabilities for spare parts, and so on.
- **Strategic interrelationships:** Interrelationships between the business unit and others in the company in terms of image, marketing ability, access to financial markets, shared facilities, and so on. They cause the firm to attach high strategic importance of being in the business.
- **Emotional barriers:** Management's unwillingness to make economically justified exit decisions is caused by identification with the particular business, loyalty to employees, fear for one's own career, price, and other reasons.
- **Government and social restrictions:** These involve government denial or discouragement of exit out of concern for job, loss and regional economic effects.

When exit barriers are high, excess capacity does not leave the industry, and companies that lose the competitive battle do not give up. Rather, they grimly hang on and because of their weakness, have to resort to extreme tactics. The profitability of the entire industry can be persistently low as a result.

Although exit barriers and entry barriers are conceptually different, their joint level is an important aspect of the analysis of an industry. Often exit and entry barriers are related. Substantial economies of scale in production, for example are usually associated with specialized assets, as is the presence of proprietary technology.

Taking the simplified case in which exit and entry barriers can be either high or low:

		Exit Barriers	
Entry Barriers		Low	High
	Low	Low, stable returns	Low, risky returns
	High	High, stable returns	High, risky returns

The best case from the viewpoint of industry profits is one in which entry barriers are high but exit barriers are low. Here entry will be deterred, and unsuccessful competitors will leave the industry. When both entry and exit barriers are high, profit potential is high but is usually accompanied by more risk. Although entry is deterred, unsuccessful firms will stay and fight in the industry.

The case of low entry and exit barriers is merely unexciting, but the worst case is one in which entry barriers are low and exit barriers are high. Here entry is easy and will be attracted by upturns in economic conditions or other temporary windfalls. However, capacity will not leave the industry when results deteriorate. As a result capacity stacks up in the industry and profitability is usually chronically poor. An industry might be in this unfortunate position for example, if suppliers or lenders will readily finance entry, but once in, the firm faces substantial fixed financing costs.

Pressure from Substitute Products

All firms in an industry are competing, in a broad sense, with industries producing substitute products. Substitutes limit the potential returns of an industry by placing a ceiling on the prices firms in the industry can profitably charge. The more attractive the price performance alternative offered by substitutes, the firmer the lid on industry profits.

Identifying substitute products is a matter of searching for other products that can perform the same function as the product of the industry. Sometimes doing so can be a subtle task, and one which leads the analyst into businesses seemingly far removed from the industry. Securities brokers, for example, are being increasingly confronted with such substitutes as real estate, insurance, money market funds, and other ways for the individual to invest capital accentuated in importance by the poor performance of the equity markets.

Position vis-a-vis substitute products may well be a matter of collective industry actions. For example, although advertising by one firm may not be enough to bolster the industry's position against a substitute, heavy and sustained advertising by all industry participants may well improve the industry's collective position. Similar arguments apply to collective response in areas like product quality improvement, marketing efforts, providing greater product availability, and so on.

Substitute products that deserve the most attention are those that are (1) subject to trends improving their price performance trade off with the industry's product, or (2) produced by industries earning high profits. In the latter case, substitutes often come rapidly into play if some development increases competition in their industries and causes price reduction or performance improvement.

Bargaining Power of Buyers

Buyers compete with the industry by forcing down prices, bargaining for higher quality or more services, and playing competitors against each other – all at the expense of industry profitability. The power of each of the industry's important buyer groups depends on a number of characteristic of its market situation and on the relative importance of its purchases from the industry compared with its overall business. A buyer group is powerful if the following circumstances hold true:

If they are concentrated or makes purchases in large volumes relative to sales of the supplier. If a large portion of sales is purchased by a given buyer this raises the importance of the buyer's business. Large volume buyers are particularly potent forces if heavy fixed costs characterize the industry – and raise the stakes to keep capacity filled.

The products it purchases from the industry represent a significant fraction of the buyer's costs or purchases. Here buyers are prone to expend the resources necessary to shop for a favorable price and purchase selectively. When the product sold by the industry in question is a small fraction of buyer's costs, buyers are usually much less price sensitive.

The products it purchases from the industry are standard or undifferentiated. Buyers, sure that they can always find alternative suppliers, may play one company against another.

It faces few switching costs. Switching costs, defined earlier, lock the buyer to particular sellers. Conversely, the buyer's power is enhanced if the seller faces switching costs.

It earns low profits. Low profits create great incentives to lower purchasing costs. Highly profitable buyers, however, are generally less price sensitive (that is, of course, if the item does not represent a large fraction of their costs) and may take a longer run view toward preserving the health of their suppliers.

Buyers pose a credible threat of backward integration. If buyers either are partially integrated or pose a credible threat of backward integration, they are in a position to demand bargaining concessions. They engage in the practice of tapered integration, that is producing some of their needs for a given component in house and purchasing the rest from outside suppliers. Not only is their threat of further integration particularly credible, but also partial manufacture in-house gives them a detailed knowledge of costs which is a great aid in negotiation. Buyer power can be partially naturalized when firms in the industry offer a threat of forward integration into the buyers' industry.

The industry's product is unimportant to the quality of the buyer's products or services. When the quality of the buyers' products is very much affected by the industry's product, buyers are generally less price sensitive.

The buyer has full information. Where the buyer has full information about demand, actual market prices, and even supplier costs, this usually yields the buyer greater bargaining leverage than when information is poor. With full information, the buyer is in a greater position to ensure that it receives the most favorable prices offered to others and can counter supplier's claims that their viability is threatened.

Most of these sources of buyer power can be attributed to consumers as well as to industrial and commercial buyers; only a modification of the frame of reference is necessary. For example, consumers tend to be more price sensitive if they are purchasing products that are undifferentiated, expensive relative to their incomes, or of a sort where quality is not particularly important to them.

The buyer's power of wholesalers and retailers is determined by the same rules, with one important addition. Retailers can gain significant bargaining power over manufacturers when they can *influence consumers' purchasing decisions*, as they do in audio components, jewelry, appliances, sporting goods, and other products. Wholesalers can gain bargaining power, similarly, if they can influence the purchase decisions of the retailers or other firms to which they sell.

Bargaining Power of Suppliers

Suppliers can exert bargaining power over participants in an industry by threatening to raise prices or reduce the quality of purchased goods and services. Powerful suppliers can thereby squeeze profitability out of an industry unable to recover cost increases in its own prices.

The conditions making suppliers powerful tend to mirror those making buyers powerful. A supplier group is powerful if the following apply:

- It is dominated by a few companies and is more concentrated than the industry it sells to. Suppliers selling to more fragmented buyers will usually be able to exert considerable influence in prices, quality, and terms.
- It is not obliged to contend with other substitute products for sale to the industry. The power of even large, powerful suppliers can be checked if they compete with substitutes.

The industry is not an important customer of the supplier group. When suppliers sell to a number of industries and a particular industry does not represent a significant fraction of sales, suppliers are much more prone to exert power. If the industry is an important customer, suppliers' fortunes will be closely tied to the industry and they will want to protect it through reasonable pricing and assistance in activities like R&D and lobbying.

The supplier's product is an important input to the buyer's business. Such an input is important to the success of the buyers' manufacturing process or product quality. This raises the supplier power. This is particularly true where the input is not storable, thus enabling the buyer to build up stocks of inventory.

The supplier group's products are differentiated or it has built up switching costs. Differentiation or switching costs facing the buyer cut off their options to play one supplier against another. If the supplier faces switching costs the effect is the reverse.

The supplier group poses a credible threat of forward integration. This provides a check against the industry's ability to improve the terms on which it purchases.

We usually think of suppliers as other firms, but labor must be recognized as a supplier as well, and one that exerts great power in many industries. There is substantial empirical evidence that scarce, highly skilled employees and/or tightly unionized labor can bargain away a significant fraction of potential profits in an industry. The principles in determining the potential power of labor as a supplier are similar to those just discussed. The key additions in assessing the power of labor are its degree of organization, and whether supply of scarce varieties of labor can expand. Where the labor force is tightly organized or the supply of scarce labor is contained from growing, the power of labor can be high.

Government as a Force in Industry Competition

Government has been discussed primarily in terms of its possible impact on entry barriers, but in the 1970s and 1980s government at all levels must be recognized as potentially influencing many if not all aspects of industry structure both directly and indirectly. In many industries, government is a buyer or supplier and can influence industry competition by the policies it adopts.

Many times government's role as a supplier or buyer is determined more by political factors than by economic circumstances, and this is probably a fact of life. Government regulations can also set limits on the behavior of firms as suppliers or buyers.

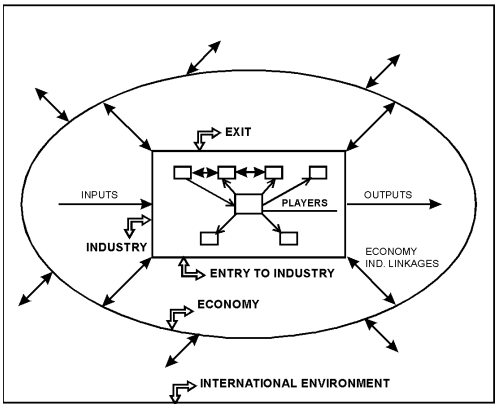
Government can also affect the position of an industry with substitutes through regulations, subsidies or other means. Government can also affect rivalry among competitors by influencing industry growth, the cost structure through regulations and so on.

Thus no structural analysis is complete without a diagnosis of how present and future government policy, at all levels, will affect structural conditions.

Following figure helps in summarizing the industry analysis process.

Figure 4

INDUSTRY ANALYSIS



Strategic considerations in industry analysis can be summarized in the following points.

Inputs

- What are inputs?
- Who the supplier is?
- Demand-supply position.
- Dependency on foreign countries.
- Alternative inputs.
- Organized or unorganized markets.

Outputs

- What is it?
- Who uses it?
- Customer Analysis → Sex, Age, Religion, Demographic Conditions
- Organized or unorganized markets.
- Demand supply position.

Exit Barriers

- Switching Cost.

Players

- Who are the players?
- Their niches.
- Their SWOT.
- Their competitive positioning.
- Their market shares.
- Their future plans & strategies → New Products (Product Portfolio change), New Markets (Market Portfolio change), Diversification or disinvestment plant, etc.

Economy Industry Linkages

- Government's attitude towards Industry → Promotional
  → Regulatory
  → Restrictive
- Government's policies & how they effect Industry.

Entry Barriers

Artificial	Natural
– Control over raw material.	– Labor intensive.
– Licencing policy of Government.	– Capital intensive.
– Control over Tech.	– Learning curve.
– Control over Market through strong brand equity.	– Economies of scale.

Other Factors

- Export orientation of industry (exp. Potential)
- Import substitution potential of industry
- Industry life cycle stage.

COMPANY ANALYSIS

Significance of Company Analysis

The industry analysis enables us to shortlist industries for the purpose of equity investment. The next step is to identify the superior performers in this industry. Even though an industry might be doing well, some companies in the industry can be in doldrums as revealed by the following example.

The two wheeler industry has stabilized in the recent past and Bajaj Auto is doing extremely well. But there are many companies like Chamundi Mopeds, and A.P. Scooters which are in deep trouble.

To identify those companies that are doing relatively well in the industry, we have to make a penetrating analysis of the financial and non-financial strengths and weaknesses of the company. This lesson provides a discussion on the important financial and non-financial parameters that have to be examined in this context.

Financial Indicators

Financial statements are a primary internal source of information for evaluating the investment prospects of various companies.

Analyzing Financial Statements: Ratio Analysis

Ratios are among the best known and widely used tools of financial analysis. Ratios allow one to make intra-firm and inter-firm comparisons. A ratio expresses the mathematical relationship between one quantity and another. The ratio of 200 to 100 is expressed as 2:1 or 2.

While the computation of ratio simply involves the division of one variable by another, the interpretation of a ratio is very complicated as there are many factors which one has to consider which influence variables involved in the ratio. In addition the investor needs to be alert to the fact that the ratios can be manipulated.

Since ratios are future oriented, the analyst must be able to adjust the factors present in a relationship to their probable shape and size in future. Thus, in the final analysis, the usefulness of ratios is wholly dependent on their intelligent and skillful interpretation.

A great many ratios can be developed from the multitude of items included in the enterprise's financial statements.

Investors or analysts are primarily interested in the profitability and the leverage position of the company. For this purpose, they examine the following ratios.

Profitability Ratios

$$\text{Return on Investment} = \frac{\text{Earnings Before Interest and Taxes}}{\text{Total Asssets}}$$

$$\text{Net Profit Margin} = \frac{\text{Profit After Tax}}{\text{Net Sales}}$$

$$\text{Return on Equity} = \frac{\text{Profit After Tax} - \text{Preference Dividends}}{\text{Paid-up Equity Capital} + \text{Reserves}}$$

$$\text{Earnings Per Share} = \frac{\text{Profit After Tax} - \text{Preference Dividends}}{\text{Number of Outstanding Equity Shares}}$$

$$\text{Dividend Cover} = \frac{\text{Earnings Per Share}}{\text{Dividends Per Share}}$$

Besides these ratios, the equity investors contemplating investment through the secondary market consider the following market-related measures.

$$\text{Earnings-Price Ratio} = \frac{\text{Earnings Per Share}}{\text{Market Price Per Share}}$$

$$\text{Market Yield} = \frac{\text{Dividend} + \text{Price Change}}{\text{Initial Price}}$$

In practice the market price per share is calculated as the simple average of the opening and closing prices or the high and low prices during the period under consideration. Other things being equal, investors prefer companies with a consistent track record of profitability, to companies, which experience sharp fluctuations in their profitability. A company with an erratic profitability record is perceived to have a higher degree of business risk.

Leverage Ratios

Leverage ratios help in assessing the financial risk of a firm. The typical ratios that are examined in this context are:

$$\text{Debt-Equity Ratio} = \frac{\text{Total Debt (i.e. Long-term} + \text{Short-term)}}{\text{Equity (Equity+Preference)}}$$

$$\text{Interest Coverage Ratio} = \frac{\text{Earnings Before Interest and Taxes}}{\text{Interest}}$$

A company with a high debt-equity ratio (say more than 2:1) and a low interest coverage ratio (say less than 2) is perceived to have a high degree of financial risk. Obviously, the equity investors will demand a high rate of return on their investment to compensate for a high degree of business and financial risks.

The other ratios that are calculated are liquidity ratios like current ratio and quick ratio and asset-turnover ratios like total assets turnover ratio, fixed assets turnover ratio, accounts receivable turnover ratio, inventory turnover ratio and average collection period.

Box 1: Is Cash Earnings Per Share a Better Indication?

Earnings per share, or EPS as it is popularly known, has been a favorite measure for investment analysis. But of late, the Cash Earnings Per Share (CEPS) is seen as an improvement. CEPS is arrived at by adding back the depreciation provision to the Profit After Tax (PAT) thus,

$$\text{CEPS} = \frac{\text{PAT} + \text{Depreciation}}{\text{No. of Shares}}$$

Why are CEPS considered more efficient investment signals? Depreciation policies differ widely among companies and even within a company from one year to another and hence makes comparisons difficult. Another advantage is that they give a better idea of the cash available for use within a company, since depreciation is a non-cash charge. A third factor for preference is that EPS discriminates against growing companies which have been building their gross block of assets compared with companies which are growing slowly and therefore are not investing in fixed assets. If a company's profit figure is low due to high depreciation it does not indicate less efficiency.

ROE Analysis

The measure of Return On Equity (ROE) can be analyzed in terms of profitability, turnover and leverage as follows:

ROE = Net profit margin x Total assets turnover ratio x Total assets to net worth

= (PAT/NS) x (NS/TA) x (TA/NW)

PAT/NS can also be expressed as the product of pre-tax margin and post-tax retention ratio

$$\left(\text{i.e. } 1 - \frac{\text{TAXES}}{\text{PBT}} \text{ or } \frac{\text{PAT}}{\text{PBT}}\right)$$

$$\text{Then ROE} = \frac{\text{PBT}}{\text{NS}} \text{x} \frac{\text{PAT}}{\text{PBT}} \text{x} \frac{\text{NS}}{\text{TA}} \text{x} \frac{\text{TA}}{\text{NW}}$$

PAT/NS provides a measure of profitability, NS/TA indicates the efficiency with which the total assets are employed, and TA/NW serves as a measure of leverage. A trend analysis of PAT/NS, and TA/NW provides an idea of the business and financial risks assumed by the company.

The higher the post tax margin and total assets turnover ratio the more profitable the firm. But interpretation of high turnover ratio is rather complex. An extremely high turnover ratio may indicate that the firm is up against the capacity limits of its plant and equipment and therefore provides a warning signal that the firm may have to expand its capacity.

Non-Financial Parameters

The important non-financial parameters to be examined by an investor are as follows:

BUSINESS OF THE COMPANY

The investor should know whether the company is a well-established one, whether it has a good product range and whether its lines of business have considerable potential to grow.

TOP MANAGEMENT

The quality of top management team, particularly, the competence and the commitment of the chief executive officer matters a lot in shaping the destiny of the company.

PRODUCT RANGE

Progressive companies like ITC and Hindustan Lever create competition for their existing products by launching new products with regular frequency. Hence, investors must examine whether the company under review belongs to this group or not.

DIVERSIFICATION

An issue related to that of product range is diversification. To reduce the degree of business risk and improve profitability, many companies resort to diversification. Hence this issue is to be carefully examined by the investor.

FOREIGN COLLABORATION

Where a company has entered into technical collaboration with a foreign company, the investor must find out more about the nature of the collaboration agreement.

AVAILABILITY OF COST OF INPUTS

If the company depends upon imported raw materials, it is important for the investors to assess the raw material position, because any shortage of the raw material and/or escalation in the cost of raw material will adversely affect the profitability.

RESEARCH AND DEVELOPMENT

Progressive companies spend substantial sums of money on R&D to upgrade their existing products, introduce new products, adapt foreign technology to suit the local conditions, achieve import substitution, etc.

GOVERNMENTAL REGULATIONS

The investor must assess the implications of governmental regulations such as MRTP Act, FERA, etc., for the company under review.

PATTERN OF SHAREHOLDING AND LISTING

The pattern of shareholding has a baring on the floating stock available in the market and the trading volume of these issues will have an effect on the company, hence it will be analyzed by the investor before taking any investment decision.

SUMMARY

- The intrinsic value of a share is estimated by discounting the company's prospective earnings stream or the shareholders' prospective dividend stream. This depends very much on the economic and industrial environment, the particular company's market share, its own financial strength, its policies, quality of asset management, etc.
- The fundamental analysis framework mainly deals with (a) Economic Analysis, (b) Industry Analysis and (c) Company Analysis.
- The industry life cycle helps to understand the characteristics of pioneering stage, expansion stage, stabilization stage and declining stage of an industry. It is the second stage namely expansion stage which is probably most important to investors. The growth is rapid but orderly, which is an appealing characteristic to investors.
- The business cycle analysis helps the investors to predict performance of an industry over shorter periods of time.
- The structural analysis helps to analyze the competitive conditions existing in an industry and this provides useful information in assessing its future.
- The industry analysis enables the investors to shortlist the industries for the purpose of equity investment.
- Under the company analysis, an investor can study the performance of the particular firm with regard to profitability ratios, leverage ratios and ROE Analysis and decide about choosing to invest.
- Many a time, companies resort to changing of their accounting policies for various reasons. The next chapter focuses on the impact of changes in accounting policies.

Case Study

Aluminum Industry

PROFITABILITY HINGES ON RE-EVALUATING FUTURE STRATEGY

The Variables dictating the trends in the aluminium industry have changed dramatically in the last three years. In a mature and cyclical commodity industry such as aluminium, these three years have been the most dynamic and instructive phase in almost a decade. In this period players such as Alcan, Alcoa and Pechiney responded to some key factors influencing the industry. Delivering the keynote address at the Metal Bulletin's International Aluminium Conference in September 1999, Mr Jacques Bougie, the then President and Chief Executive Officer of Alcan Aluminium, outlined the key influences as: Declining aluminium prices and eroding margins, Pressures to improve returns on investment, Maturing of terminal markets such as the London Metals Exchange (LME), Technological changes - particularly on the upstream side, Intense competition from other materials such as steel and plastics, and The need to respond to the changing demands of global customers. The influence of these factors set the stage for a three-phased change in the industry in 1999-2001. Phase I: Consolidation in 1999 The decline in aluminium prices at the LME to a five-year low of $1,140 in March 1999 proved to be the last straw for an already strained industry. It finally triggered the much-needed "consolidation". In August 1999, Alcan Aluminium, the industry's second-largest player, announced a merger with Pechiney SA, France, and the aluminium business of Alusuisse-Lonza Group of Switzerland in a $9.2-billion all-stock buyout. However, in a swift response to the APA (Alcan-Pechiney-Algroup) combine, Alcoa, US, acquired Reynolds Metals Company, the third largest aluminium player, in a $5.6-billion cash and stock deal. The two mega mergers were dictated by the rationale of cost savings, price stability, global focus and creation/preservation of shareholder value. The combined entities were expected to be substantially stronger financially, operationally and technically than their peers. These mergers were also likely to force other aluminium majors - such as Billiton, Norsk Hydro, Kaiser Aluminium, and Billiton - into the consolidation act. Phase II: Retarding the 'urge to merge' The mergers of Alcoa-Reynolds and the APA combine went before the anti-trust authorities for review. The Alcoa-Reynolds deal was okayed by the European Commission (EC) in mid-2000 as Alcoa acceded to all the divestment demands. The EC demanded that Reynolds sacrifice its alumina assets and the Alcoa its Longview smelter. However, vis-à-vis the other merger, the EC asked the combine to sell the equity stake in downstream aluminium namely - Aluminium Norf, the rolling mill held by Alcan Aluminium in Germany. Alcan's unwillingness to do this, led to the collapse of the APA in 2000. Ultimately, only the Alcan-Algroup merger went through, with Pechiney dropping out of the deal. Basically, Pechiney's exit clearly exposed a weak link in the consolidation chain. With strong technological thrust and focus on speciality aluminium products, Pechiney was expected to complement the Alcan and Algroup's product profile and contribute significantly to APA's value-creation. Hence, the combine's breakdown achieved the objectives of the consolidation only to a limited extent. The EC's tough review may discourage mergers of this 'scale' and 'size'. This is largely because the anti-trust authorities were concerned not by the size or the market share of individual players, but by the effect the merger might have on the global aluminium market. If mergers are examined along these lines it will be an onerous task for companies to put through mergers of the APA/Alcoa-Reynolds kind. Phase III: Back to fundamentals There has been a distinct slowdown in mergers and acquisitions since late 2000 and early 2001, mainly because of the toughness of the anti-trust authorities. This stance is probably correct from the consumers' viewpoint. But from the producers'

standpoint, these developments have triggered volatility in international price trends again. The international prices, which witnessed a steady uptrend in 2000, eased up following a slowdown in demand from the US and Japan in mid-2001. Aluminium prices then began to steadily decline, from $1,539 a tonne in May to $1,377 in August. In July, Alcan announced its second quarter earnings for 2001 and predicted that the world consumption was likely to drop by 1.9 percent in 2001 to 27.99 million tonnes from 28.53 million tonnes in 2000.

Citing weak economic conditions, Alcan also reported lower post-tax earnings in the second quarter ended June. And then came the terrorist attacks on New York and Washington on September 11, which may end up changing the global demand-supply equation and consumption patterns of the industry altogether. Alcoa closed third quarter in September with an 8 percent decline in post-tax earnings, ending its record run of growth in post-tax earnings. In response to these weak earnings announcements by aluminium majors and lowered consumption outlook, aluminium prices, towards the end of October, started slipping to March 1999 lows. But the US progress in the war against Afghanistan helped prices recover in November and early December from the October's low of $1,282. However, the aluminium industry is not out of the woods yet. In a crisis of this kind, every industry participant goes back to the fundamentals and re-evaluates strategy from the basics. The players are grappling with a complex mosaic of variables in evolving the industry's future strategy. Challenges facing long-term planners Global demand and cost patterns: After September 11, Alcoa forecast a drop in the West's demand (the key constituent) by almost 5 percent in 2001. This can be attributed mainly to the deteriorating economic environment, and cuts in capacity that were still insufficient to offset the slowdown in demand.

In 2002, Alcoa estimates that the aluminium demand will rise by 3 percent, but with higher supplies, the global demand-supply equation may be in balance. In this backdrop, if the 2002 price levels remain at $1,300-1,400, producers can maintain margins only by massive cost-cutting. But the challenge is in reducing costs consistently and innovatively. Slowing pace of consolidation: After APA's collapse, it became obvious that such mergers were unlikely to win easy approval from anti-trust authorities. In a slight dilution of their tough stand, Europe's anti-trust authorities have since, late-2000 indicated that they will evaluate mergers/acquisitions not only in the context of the overall aluminium market, but also with regard to other materials. However, this is unlikely to lead to major acquisitions in the aluminium market. For instance, as late as the third quarter of 2001, Pechiney was reluctant to bid for VAW, the aluminium subsidiary of German power utility E.ON, because of fears of overlapping business interests. Although small acquisitions will continue, the absence of large mergers will keep aluminium prices volatile, and curtail the scope for significant value creation. Upstream vs downstream disintegration: Aluminium has so far remained a vertically-integrated industry, with the same producers operating in upstream and downstream aluminium. In an address to the International Aluminium Forum in May, Mr. Richard Evans, Executive Vice-President, Alcan Inc, raised an interesting question: Are upstream and downstream aluminium fundamentally different lines of businesses? He felt the factors of success for these two segments were different and reiterated that the successful entrants in upstream aluminium were from the mining and energy fields, while in downstream aluminium, the success factors depended on customer needs and a combination of lead times, prices, product attributes and customer perceptions. As the industry matures, it is likely that the upstream-downstream distinction will actually emerge. And companies equipped to make this transition will succeed in the long run. Technological changes: As the industry is likely to face greater pressure on prices and margins, its challenge lies in developing and employing new and efficient refining and smelting technologies.

As environmental consciousness grows and energy efficiency becomes paramount, "super-smelters", with capacities of up to 5 lakh tonnes and capable of producing at lower cost per unit of output, will become the industry norm. At the same time, aluminium majors are also working on other technology initiatives - such as the Pechiney AP50 Smelting System that may be commercially operational in the next few years. Alcoa's inert anode technology is at an advanced experimental stage.

These technological breakthroughs will continue to challenge the need for aluminium majors to create greenfield capacities at competitive cost. Create new end-user segments: For an industry excessively focussed on the auto and container segments, the biggest challenge will be to create new end-user segments. Although the auto industry will continue to be one of the biggest users of aluminium in the next five years, unless alternative end-uses can be created, the industry could be foreclosing on long-term growth opportunities. The other challenge will be the downstream players' ability to engineer/customise solutions to customer requirements. Unless the integrated/standalone downstream producers work on this, their viability may be called into question.

Chapter VII

Impact of Changes in Accounting Policies

After reading this chapter, you will be conversant with:

- Changes in Accounting Policies
- Depreciation
- Valuation of Fixed Assets
- Foreign Exchange Transactions
- Amortization of Preliminary and other Expenses
- R&D Expenditure
- Valuation of Inventory
- Treatment of Gratuity
- Lease Accounting

Introduction

The financial statements of a company which reflect both the performance of the company during a particular period as well as the worth of the company as on a particular date are of great significance to an investor. Most investors look at the price of a security as the present value of the future cash flows, which they expect to receive, where the discount rate is appropriately adjusted for the risk associated with the cash flow stream. The reported earnings and the earnings forecast help investors estimate the future dividend stream. It can be reasonably expected that with a growth in income, the dividends are also expected to grow. On the other hand, a sudden fall in income rates can forewarn a cut in dividends too. Studies in the stock market have also shown that earnings are important determinants of stock prices and that changes in stock prices are highly correlated with changes in earnings.

The return on equity which is calculated based on the information provided by the financial statements is also an important factor in determining stock prices. It can be shown on the basis of the constant growth model, that stock prices are a positive function of return on equity, book value, pay-out ratio and the growth rate and a negative function of the risk adjusted discount rate. Thus, everything else held constant, the higher the return on equity the higher the stock price.

The cash flow is also used by many investors in addition to earnings and dividends. For example, the analysis of stock prices based on the 'value line' drawn on price charts is based on cash flow. The value line which represents the stock's intrinsic value drawn on the price chart is equal to cash flow per share multiplied by some appropriate number. Sometimes, an analysis of the cash flow may provide insights into the company's profitability which earnings may not reveal.

It is, therefore, evident that the financial statements play a major role in security evaluation. The questions now arise as to the validity of the 'profit' figures as reported in the financial statements. Although the Companies Act requires that the profit and loss account and the balance sheet should reflect a 'true and fair view' of the profit/loss for a particular period and the net worth of the company as of that date, the concept of 'true and fair' has not been defined anywhere. Being situation specific no certain definition of 'true and fair position' is possible either.

A number of areas require estimates to be made. Varying judgments on the nature, timing and the form of transaction can lead to different accounting treatments. Above all, the different accounting policies followed by the companies and changes in such accounting policies can distort the profit figures and asset values to a great extent.

Within a certain broad legal framework, it is quite possible to report profits which suit the specific organizational needs, thanks to the accounting jugglery. In order to follow a conservative system of profit-reporting, the following practices can be adopted:

- Do not take into account any income until it is/can be realized without doubt.
- Take into account all expenses, which have arisen or which are likely to arise or which are under dispute.
- Make full provisions for obsolete stores and unusable spares, tools, designs, etc.
- Estimate all contingent liabilities like gratuity, and make adequate provisions for them.
- Charge depreciation fully at the maximum rates prescribed in law.

The list can no doubt be extended. In the final analysis, the profit is what you wish to report, at least, in the short run.

CHANGES IN ACCOUNTING POLICIES

The divergent accounting policies followed by companies and changes in such policies are major factors which lead maneuverability to accounts. The following are some areas where divergent accounting policies are followed. The list is, however, not exhaustive.

- Depreciation
- Valuation of fixed assets
- Conversion or translation of foreign currency items
- Valuation of inventories
- Amortization of preliminary expenses and other miscellaneous expenditure
- Lease accounting
- Treatment of gratuity liability
- Treatment of Research and Development expenditure.

The repercussions of changes in accounting policies in some of the more important areas are examined below, with illustrations.

DEPRECIATION

Depreciation offers a range of tools by which the profit figure can be tampered with. To begin with, depreciation is to be arrived at in such a manner that the cost is written-off over the useful life of the asset. But 'the useful life' is determined by the company with an eye on profits.

Again, Section 350 of the Companies Act allows two methods of depreciation – the straight line method and the written down value method. Nothing prevents a company from changing its method of depreciation. This lends a helping hand to the company management which would like to raise or lower the actual profit figure.

The depreciation calculated under the written down value method is higher than that calculated under the straight-line method in the initial years of the life of the asset, and is considerably lower under WDV method than under straight-line method in the later years. Thus, a company can change the method of depreciation from straight-line method to WDV method in the later years and show a higher profit figure and vice versa. A number of companies which run the machines on extra shifts do not provide extra depreciation leading to excess profits. For instance, the auditors of DCW Home Products Limited have commented that "the company has not provided extra shift depreciation amounting to Rs.32,78,371 during the year, resulting in the loss for the year being lower by the same amount".

Illustration 1

The annual report of the "ABC Tea and Industries" for 2002-03 contains the following note no. 11 under the notes forming part of the accounts.

During the year the basis for providing depreciation in respect of the fixed assets at the pharmaceutical division has been changed from the written down value method to the straight-line method. Consequently, Rs.65.52 lakh being the resultant excess amount of depreciation provided for in earlier years has been written back in the current year. However, due to this change, depreciation with the consequential impact on the profit and net fixed assets is higher by Rs.4.08 lakh.

The Profit and Loss account of the Company for the year ended 2002-03 is reproduced below:

Profit and Loss of Dhunseri Tea Company for the Year ended 31.3.03.

(Rs. in lakh)

	Year ended 31.3.02	Year ended 31.3.03
Income		
Sales	2,026.45	143.04
Decrease/Increase in Stock	64.54	65.86
Other Income	184.54	64.42
	2,275.53	1,567.32
Expenditure		
Materials	387.06	240.79
Excise duty and Cess	95.43	74.12
Expenses	1,103.93	765.52
Interest	91.39	61.20
Depreciation	63.90	47.30
	1,741.71	1,188.93
Profit before Taxation	533.82	378.39

The writing back of excess depreciation of Rs.65.52 lakh due to the change in the method of provision of depreciation has been included under 'Other Income'. This has to be deducted from the current income (net of higher depreciation in the current year on account of the change) to arrive at a more realistic figure of the profit. The profit before tax, after the aforesaid adjustment would be only Rs.472.38 lakh and the change in PBT over the previous year would be only 24 percent as against the increase of 41 percent before adjustments.

VALUATION OF FIXED ASSETS

Capitalization of Interest

One area which was prone to controversies was the capitalization of interest on loans for acquiring fixed assets. The AS-10 "Accounting for fixed assets" requires that interest charges on loans obtained for acquiring capital assets up to the date of putting the asset to use should be capitalized. However, this was only recommendatory up to 31.3.91 (made mandatory with effect from 1.4.91) and the International Accounting Standard in this regard does not insist on such capitalization. Hence divergent policies were used in this regard, making comparability of performances by different companies difficult. The controversy appears to have been put to rest with the AS-10 becoming mandatory with effect from 1.4.91.

When interest charges are capitalized, the interest expense against profits becomes reduced leading to increased profits; the asset cost goes up with consequent higher depreciation. It is also to be noted that the Accounting Standard only provides for capitalization of interest up to the date of commencement of operations of the asset, whereas some companies tend to capitalize the interest beyond this point also. When such deviations are found, it is the auditor's duty to point it out in his report. The impact of change in the policy followed in this regard is shown in the following illustrations.

Illustration 2

An extent from the auditor's report of Kirloskar Cummins Ltd. runs as follows: "Financing costs relating to borrowed funds attributable to the acquisition of fixed assets for the period up to the date when the assets are ready for use, have not been capitalized. This is not in accordance with AS-10 issued by the Institute of Chartered Accountants of India which is mandatory for accounting years beginning on or after 1.4.91. Consequently, the profit after tax for the year and the reserves and surplus are lower by Rs.13.53 million and the net block of fixed assets is lower by Rs.22.06 million".

The Company reported an EBIT of Rs.203 million and with the profit being adjusted for the interest charge not capitalized, the earnings before tax rise to Rs.216.53 million.

Again, in the case of TISCO, the company was writing-off the interest charges on loans used for capital expenditure up to financial year 1990-91. However, in 1991-92, such interest charges were capitalized. Therefore, the profits were higher in that year by Rs.46.51 crore after the consequential higher depreciation due to such capitalization of Rs.0.12 crore than what it would have been had the previous basis been followed. Although such treatment is in conformity with AS-10 the difference in profits on account of the change in policy should be adjusted to enable comparability with previous years.

FOREIGN EXCHANGE TRANSACTIONS

Treatment of differences arising out of foreign exchange transactions is also an avenue which offers scope for manipulation of accounts. Gains or losses arising out of fluctuations in exchange rates between the transaction dates and the settlement dates are treated differently by companies. The AS-11 on "Accounting for effects of changes in foreign exchange rates requires that gains or losses on settlement of the transactions within the same accounting period should be recognized in the Profit and Loss statement of the period except in the case of exchange differences relating to amounts incurred for the acquisition of fixed assets, which would be adjusted in the carrying amount of the related excess."

Where a company does not capitalize the differences arising out of exchange fluctuation relating to loans for fixed assets or does not charge the differences arising out of other transactions to the profit and loss account of the relevant periods, there is a distortion in the report figures.

Illustration 3

Here is an extract from the Auditor's report of M/s. Praga Tools Ltd. "Capitalization of foreign exchange fluctuations as per the Accounting Policy no. 7 of the company amounts to Rs.162.66 lakh. Consequently, current year's loss is reduced by Rs.19.94 lakh".

The company had, up to the financial year 1990-91, charged off to revenue, the differences arising out of fluctuations in the commercial rate of exchange between the dates of draw down and the dates of effecting actual payments. Such differences arising for the year 1991-92 in respect of foreign currency loans/deferred payments for imported capital equipment have been capitalized resulting in reduction of losses by Rs.19.94 lakh than it would have been had the earlier policy was followed.

Although the change in the company's accounting policy in this regard is in conformity with the Accounting Standard-11, the change in policy does affect the current year's earnings power and consequently defeats comparison with earlier years unless the profits/losses are reworked making adjustments for such changes.

AMORTIZATION OF PRELIMINARY AND OTHER EXPENSES

The amortization of preliminary expenses and other miscellaneous expenditure of capital nature offers ample scope for increasing or decreasing the profits. There is no legal rule prescribed for the write-off of such expenditure. Although the income tax rules may provide for the write-off of such expenditure within a period of time this is relevant only for computation of taxable income and nothing prevents the company from writing-off heavy amounts in years of rich harvest and nothing at all during the lean years. Alternatively, heavy expenses incurred during the period may be camouflaged and treated as 'deferred revenue expenditure' and written-off over a number of years. Patent rights which were previously written-off might be capitalized resulting in higher profit figures.

RESEARCH AND DEVELOPMENT EXPENDITURE

Research and Development expenses are incurred by almost all companies who wish to stay ahead in their fields. But it is the accounting treatment of such expenditure that raises a number of questions. Research and Development expenditure can be basically classified into:

a. Pure and applied research which can be regarded as a part of a continuing operation required to maintain a company's business and its competitive position.

b. Development research, the end result of which is a new and developed product with enduring benefits.

The Accounting Standard no. 8 on Accounting for Research and Development requires that expenditure on pure research be written-off to the profit and loss accounts of the relevant periods and development research expenses can be deferred and amortized on a systematic basis either by reference to the sale and use of the product or process or by reference to a reasonable time period. However, the classification of research as pure and developmental and the basis and time period of write-off of the deferred research costs are left to the discretion of the company management. Thus, there is enough ground for them to amortize the expenditure when profits are low and/or alter the periods and the amount of write-off as they deem fit.

VALUATION OF INVENTORY

Inventory valuation plays a key role in determining profits as any change in the inventory value directly affects the profit figure and the financial position of a company as at a particular date. Three methods of valuation are recognized, normally, for valuing inventory viz., FIFO, LIFO and 'average cost' methods of valuation. As such, the companies may switch over from one method of valuation to another, which would have repercussions on the profits. For instance, under inflationary circumstances, a company may switch over from the LIFO method to FIFO method and increase its profits. Not only can the companies change the method of valuation, but also their policy regarding the costs that are inventoriable. The changes in inventory value due to such policy changes not only affect profit figures, but also the current assets figure and hence the funds flow evaluation too.

TREATMENT OF GRATUITY

Several companies account for retirement gratuity only on cash basis even though the other incomes and expenditures are accounted for on accrual basis. This is so in spite of the fact that companies are required to provide for gratuity liability on the basis of actuarial valuation. Such non-provision of gratuity leads to higher profits. Some companies may even switch over from the accrual basis of accounting for gratuity to cash basis during lean years to save on the provision for gratuity, thereby showing higher profit figures.

For instance, an extract from the Auditor's Report of Greaves Cotton and Co. Ltd. runs as follows: "No provision has been made for gratuity liability in respect of employees of Heavy Engineering Unit, Madras, estimated on actuarial valuation of Rs.7,77,307, with consequential effect of profits." Thus while comparing profits, the required provision for gratuity liability would have to be adjusted.

REVENUE RECOGNITION

The point of time at which revenue can be recognized in accounts is a totally subjective decision and refers to the particular situation and nature of revenue. The important factor underlying the decision is only (a reasonable certainty) regarding receipt of such revenue. It is, therefore, no wonder that a change in the policy of revenue recognition in relation to any particular item can lead to a substantial change in profits.

For instance, the Hindustan Gas & Industries Ltd., which accounted for premium of EXIM scrips only on actual sale of such scrips up to the year 1990-91 changed its policy and accounted for such premium on accrual basis for the year 1991-92 thereby increasing their profits by Rs.9,88,890.

Another case in point is M/s Stanrose Ltd. who took account the estimated import duty benefit aggregating to Rs.294.72 lakh in respect of duty-free imports of raw materials yet to be made in respect of exports effected during the year and earlier years. The auditors, however, mentioned this in their report.

LEASE ACCOUNTING

Lease accounting is another area where manipulations are resorted to. A lease can be either a financial lease or an operating lease. The generally accepted accounting principles related to lease accounting require the lessee acquiring the use of a financial lease to capitalize the asset and create a corresponding liability equal to the fair value of the leased property or the present value of the minimum lease payments. The rentals paid by the lessee must be apportioned between the finance charge and the reduction of the outstanding liability and the annual finance charges must be debited to the revenue account over the lease period. In the case of an operating lease, the annual rentals must be charged off as operating expense to the revenue account.

In India, the prevalent lease accounting practices are, however, not in conformity with the aforesaid principles. Irrespective of the nature of a lease, the lessee is not obliged to disclose the value of the leased asset in the balance sheet and the rentals are charged off to the profit and loss account according to the terms of payment contained in the lease agreement. The lease, therefore, enjoys the benefit of "off-balance sheet financing" which is often labeled as a dubious advantage of leasing.

The analyst should also guard himself against other ways of maneuvering profits. Changing the method of bonus payment from accrual to cash basis, thereby not providing for the bonus due to be paid, is one such method. Writing back of excess provision made in the earlier years is an excellent way of adding to the other income. An evidence of such writing back can be seen from our earlier example on depreciation where the Dhunseri Tea & Industries has included the excess depreciation of earlier years of Rs.65.52 lakh under other income.

The entire scenario as regards transparency in accounts has undergone a sea change with the Accounting Standards issued by the Institute of Chartered Accountants of India being made mandatory. The following Accounting Standards have been made mandatory in respect of accounts for periods commencing on or after 1.4.1991.

AS-1 Disclosure of accounting policies.

AS-7 Accounting for construction contracts.

AS-8 Accounting for Research and Development.

AS-9 Revenue recognition.

AS-10 Accounting for fixed assets.

AS-11 Accounting for the effects of changes in Foreign Exchange Rates.

AS-4 on contingencies and events occurring after Balance Sheet date and AS-5 on prior period and extra-ordinary items and changes in accounting policies were earlier made mandatory.

The Accounting Standard-1 (AS – 1) on 'Disclosure Accounting Policies' is of special importance to the analysts because it provides *inter alia* that any changes in accounting policies must be disclosed with their effect on profits quantified if it is ascertainable.

The Accounting Standard-2 (AS – 2): Valuation of inventories and AS-3: Changes in financial position are recommendatory in nature.

In addition to the above standards the following Accounting Standards have been made mandatory.

AS-13: Accounting for Investments.

AS-14: Accounting for Amalgamations.

AS-15: Accounting for Retirement benefits in the Financial Statements of Employer.

AS-16: Borrowing Costs.

AS-17: Segment Reporting.

AS-18: Related Party Disclosures.

AS-19: Leases.

AS-20: Earnings Per Share.

AS-21: Consolidated Financial Statements.

AS-22: Accounting for Taxes on Income.

AS-23: Accounting for Investments in Associates in Consolidated Financial Statements.

Box 1: Instances of changes in Accounting Policies

Tat Robins Fraser (TRF) reported a net profit of Rs.72 lakh for 1989-90 by changing the method of valuation of closing inventory of unfinished contracts, using estimated future overhead rates. This change resulted in increasing the profits by Rs.325 lakh. In other words, TRF actually made a loss of Rs.253 lakh, for this highly controversial change in accounting method. Having done that, TRF proceeded to pay a dividend of 16 percent to its shareholders.

Orkay Silk Mills puffed up its bottom line for 1989-90 by following unconventional accounting policies. A small profit of Rs.103 lakh was reported by under-providing depreciation (Rs.434 lakh), by overstating closing inventories (Rs.42 lakh) and by not providing for excise and customs liabilities (Rs.2,064 lakh).

The significance of the Accounting Standards being made 'mandatory' is that, if there are deviations from the provisions of these standards, the auditor's duties require him to qualify his report by mentioning such deviation along with the quantum of the effect of such deviations where it is ascertainable. This again means that the Directors are required to give explanations to the auditor's qualifications as required by Section 217(3) of the Companies Act.

Therefore, a perusal of the notes to accounts, auditor's report and the Director's report is likely to bring into light any deviations from accepted practices of accounting or any changes in accounting policies which have a bearing on profits. This facilitates the analyst to make necessary adjustments to the reported incomes to effect meaningful comparisons.

If the Companies Act is also amended suitably, the companies would be under a statutory obligation to stick to accepted accounting practices and also to increase the transparency of their accounts, much to the advantage of the analyst of the financial statements.

SUMMARY

- Most of the investors look at the prices of a security as the present value of the future cash flows which are influenced by the reported earnings. The reported earnings can be manipulated by bringing certain changes in the accounting policies. Some such areas in which the accounting policies can be changed are: Depreciation, Valuation of Assets, Conversion or translation of foreign currency items, valuation of inventories, amortization of preliminary expenses and other miscellaneous expenditure, lease accounting treatment of gratuity liability and treatment of R & D expenditure.
- All the chapter until now focused on the general aspects. The next chapter deals in depth about the equity stock valuation models.

Chapter VIII

Equity Valuation Models

After reading this chapter, you will be conversant with:

- Valuation Methods
  - Dividend Discount Models
- Measures of Relative Value
  - Price/Earnings Ratio
  - Price/Book Value Ratio
  - Price/Sales Ratio
- Free Cash Flow Model to Equity Model
- Quantitative Analysis – Value Added Concept
  - Economic Value Added
  - Market Value Added
- Evaluation of Security Analysis
- Minority Interests and Discounts

Introduction

The basic model for valuing equity is the dividend discount model. There are many variants of this model. According to these models, the intrinsic value of a security is equal to the present value of the expected dividends on the stock. We discuss here the variants of the basic model which make different assumptions about the future growth rates.

VALUATION METHODS

Dividend Capitalization Models

For an equity share, the payments are in the form of dividends declared by the company. As the equity share is a perpetual security i.e. with no maturity date, the dividend payments are made in perpetuity. So, the intrinsic value of a share is represented by the equation,

$$V = \frac{D_1}{(1+k_e)} + \frac{D_2}{(1+k_e)^2} + ... + \frac{D_\alpha}{(1+k_e)^\alpha}$$

$$= \sum_{t=1}^{\alpha} \frac{D_t}{(1+k_e)^t} \quad \text{..... Eq. (1)}$$

where ,

D_t = dividend payment at time t

k_e = equity capitalization rate and

V = present value

With the progress of time the dividend payments may increase, i.e. $D_1 < D_2 < D_3 < D_4 <....$ Given this phenomenon, equation (2) can be rewritten as follows:

$$V = \frac{D_1}{(1+k_e)} + \frac{D_1(1+g)}{(1+k_e)^2} + \frac{D_1(1+g)^2}{(1+k_e)^3} + \frac{D_1(1+g)^\alpha}{(1+k_e)^\alpha} = \frac{D_1}{k_e + g} \quad \text{..... Eq. (2)}$$

Equation (3) assumes a constant growth rate in dividends and hence is called the Constant Growth Dividend Capitalization Model. This equation can also be modified to reflect the possibility of supernormal growth in the initial years followed by a normal growth rate. (This model popularly known as the H model is discussed in the annexure to this lesson.)

From equation (3), it is clear that for valuation of stock, the analyst has to estimate the expected dividend in year 1, the growth rate(s) in dividend, and the appropriate capitalization rate. Since the dividend payments are not known in advance, both dividend in year 1 and the dividend growth rate (g) have to be forecasted.

Equation (3) can also be modified to include the earnings per share. Assuming a constant pay-out ratio, equation (3) can be rewritten as:

$$V = \frac{(1-b)\,E_1}{k_e - g} = \frac{D_1}{k_e - g}$$

where,

E_1 = earnings per share in year 1 and

b = constant retention ratio

Forecasting EPS

The approaches that are commonly followed for estimating the EPS are (a) the Market Share to Profit Margin Approach and (b) the Financial Statement Analysis Approach.

Under the first approach, a forecast of the EPS (assuming no outstanding preference shares) is arrived at as follows:

$$EPS = \frac{S_i \times M_c \times f_c}{N_c} \quad \ldots\ldots \text{Eq. (3)}$$

where,

S_i = estimated industry sales

M_c = estimated market share of the company

f_c = estimated net profit margin of the company, and

N_c = number of outstanding shares.

This industry sales is estimated based on one of the analytical methods (discussed in chapter VI). An estimate of the company's market share is made on the basis of historical market shares with due allowance for any significant step, the company might take or is likely to take in the near future to improve its market share. The estimate of the market share may be equal to the current market share or an average of the market share over the last 3-5 years plus or minus an adjustment factor.

The net profit margin is estimated based on the current net profit margin or the average of the net profit margins over the last 3-5 years adjusted for any anticipated changes in the variables affecting the net profit margin (the variables that affect the net profit margin are the production efficiency, operating efficiency, financial leverage, and the corporate tax rate).

Under the second approach, a forecast of the EPS is obtained by estimating the value for the variables that are included in the EPS-EBIT relationship. The relationship between these two parameters is given by :

$$EPS = \frac{(EBIT - iD)(1 - T) - dP}{N}$$

$$= \frac{[r(A) - iD](1 - T) - dP}{N}$$

$$= \frac{[r(NW + P + D) - iD](1 - T) - dP}{N}$$

$$= \frac{NW\left[r\left(1 + \frac{P}{NW}\right) + \frac{D}{NW}(r - i)(1 - T) - dP\right]}{N} \quad \ldots\ldots \text{Eq. (4)}$$

where,

EBIT = earnings before interest and taxes

NW = net worth

P = preference capital

D = debt capital

d = preferred dividend rate

i = interest rate

A = total assets (total capital employed)

r = return on total assets (ROI)

T = corporate tax rate

N = number of outstanding equity shares

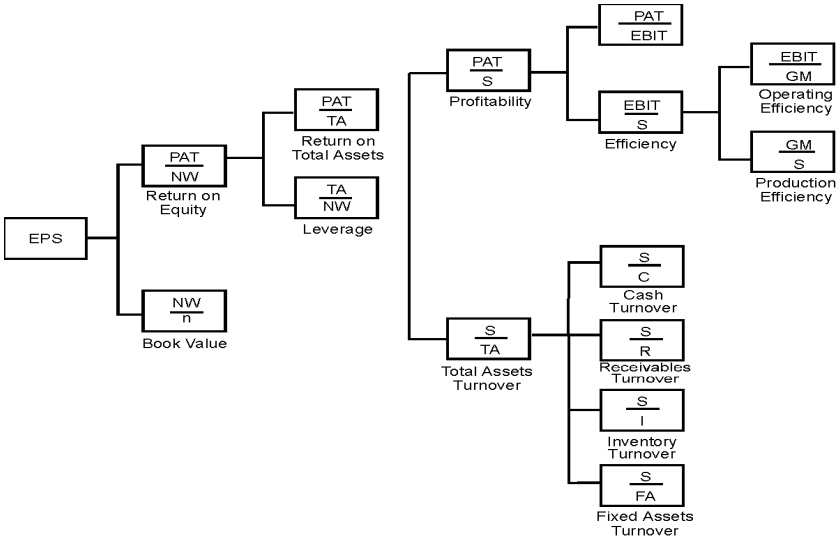
Equation (5) suggests that the EPS is a function of

1. Book value of equity share (NW/N)
2. Debt to net worth ratio (D/NW)
3. Preference capital to net worth ratio (P/NW)
4. Rate of return on capital employed (r) and its spread over the interest rate (r–i)
5. The corporate tax rate, and
6. The preferred dividend rate.

The EPS is directly proportional to the first four factors and inversely proportional to the last two factors.

The first four factors can be estimated by adjusting the historical value of these factors for the anticipated changes. From equation (5), it is evident that the EPS is a function of the profitability, efficiency, leverage and coverage, asset utilization and book value of equity. Figure 1 shows the functional relationships between these factors. So, a more refined way of forecasting EPS can be to estimate the value of these determining factors and combine them according to the functional relationship indicated in figure 1.

Figure 1



Source: Samuel S. Stewart, Jr. "Corporate Forecasting in Financial Analysts" Handbook (Homewood III: Dow Jones Inc. 1975), 1, 912

The explanation of the symbols used in figure 8.1 are given below:

EPS = earnings per share
PAT = profit after tax
NW = net worth

n = number of outstanding equity shares

TA = total assets

S = sales

GM = gross margin
C = cash
R = receivables
I = inventory

FA = fixed assets.

ESTIMATING THE CAPITALIZATION RATE

The estimation of capitalization rate for the equity stock of a company must take into consideration the business risk and financial risk (of which default risk is a part) besides the interest rate, purchasing power, and market risks borne by the shareholders. Business risk arises out of the fluctuations in the earnings of a company – the wider the fluctuations, the greater is the business risk. Financial risk stems from the use of leverage – the use of external debt relative to net worth. Other things being equal, the higher the debt to net worth ratio, the greater is the financial risk.

Estimation of risk premium for an equity stock is a difficult task. One approach can be, to classify the equity stocks of companies into some homogeneous risk classes and estimate the risk premium (the premium for a particular risk class will be the difference between the average rate of return[1] on the stocks in that class and the risk-free rate). For example, the equity stocks can be classified industry-wise and a mean risk premium can be calculated for each class using the time-series data. However, this classification does not take into account the heterogeneity among companies with respect to size, capital structure, etc.

So, a further classification within each industrial class is warranted for fine tuning the estimation of risk premium on equity stocks. Based on this classification, the capitalization rate for an equity stock can be obtained as the sum total of the risk-free rate and the appropriate risk premium. Alternatively, the capitalization rate for an equity stock can also be determined from the Constant Growth Dividend Capitalization Model. Under this approach, the equity capitalization rate (k_e) will be as follows:

$$k_e = \frac{D_1}{P_0} + g \qquad \ldots\ldots \text{Eq. (5)}$$

So, the capitalization rate is obtained as the sum total of the dividend yield and long-term growth rate of dividends.

An estimate of 'g' is usually obtained by determining the compound growth rate of dividends over a long historical period. However, this procedure will not make any sense in the case of companies with a nil or erratic record of dividends. In such cases the compound growth rate in earnings per share is used as a surrogate.

To determine $\frac{D_1}{P_o}$ (the dividend yield), a common approach that is followed is to determine the average dividend yield over a reasonable length of time in the past. Some analysts, however, attempt to obtain a more refined estimate by developing a dividend yield regression model which considers the key factors determining dividend yield and provides their relative significance in terms of regression coefficients. One such model (Weaver & Hall) developed by a firm of stockbrokers in the USA is given below:

$$\log dz = a + b \log y + c \log x + d \log w + e \log v + f \log u \qquad \ldots\ldots \text{Eq. (6)}$$

where,

dz = mean dividend yield
y = mean dividend, pay-out ratio
x = forecasted short-term earnings growth rate
w = forecasted long-term dividend growth rate
v = historical earnings variability
u = historical earnings growth rate.

It is possible to develop a similar model for the Indian equity stocks and use it as the basis for dividend yield estimation.

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1 The rate of return referred to here is the one-period rate of return defined as $\frac{D_t + (P_t - P_{t-1})}{P_{t-1}} \times 100$

where, D_t = dividend per share in year t
P_t = market price at the end of year t
and P_{t-1} = market price at the end of year t – 1

Different Models of Valuation of Stock

There are several dividend discount models based on different assumptions for calculating the value of a stock. Some of them are:

- Gordon model
- Two-stage dividend discount model
- H-model
- Three-stage dividend discount model.

GORDON MODEL

This model assumes a constant growth rate over a long-term. According to this model, the value of a stock is given by,

$$\text{Value of a stock} = \frac{DPS_1}{r - g} \qquad \ldots\text{Eq.(7)}$$

Where, DPS_1 = Dividend per share during next year

r = Required rate of return on stock

g = Growth rate in dividends for an infinite period.

Illustration 1

XYZ Ltd. had earnings per share of Rs.10.16 last year and paid-out 52% of its earnings as dividends. Its earnings and dividends had grown at 4% per year in the last 4 years and are expected to grow at the same rate in the long-term. The required rate of return on the stock of XYZ Ltd. is 12%. Compute the value of the stock using Gordon's Model.

EPS = Rs.10.16

DPS = 0.52(EPS) = 0.52(10.16) = Rs.5.28

Expected growth rate in earnings and dividends = 4%

$$\text{Value of the equity} = \frac{5.28(1.04)}{(0.12 - 0.04)} = 68.64$$

Value of the stock of XYZ Ltd. is Rs.68.64.

Limitations of Gordon Model

- **The use of** this **model is restricted to firms that are growing at a stable growth rate:** This same growth rate is assumed for the firm's earnings also. In the long-term, there may be situations when the dividends grow at a rate higher than the earnings in which case the dividends will exceed earnings. Thus, if the firm is in a steady state, then the analysts should be able to substitute the expected growth rate of earnings in the dividend growth rate.
- **The second limitation of the model is that if the growth rate is equal to the required rate of return, then the value of the stock approaches infinity:** If the growth rate is higher than the required rate of return, then the value of the stock becomes negative. A firm cannot grow in the long-term at a rate significantly greater than the growth rate in the economy. Thus the stable growth rate cannot be larger than the nominal (real) growth rate in the economy in which the firm operates, when the valuation is performed in nominal (real) terms. The sensitivity of the model to changes in growth rate implies that the stable growth rate cannot be 1% or 2% more than the growth rate in the economy. When the deviation becomes larger, it is better to go in for a two-stage model or a three-stage model. Even when one assumes a stable growth rate, it cannot be stable over a long time.

TWO-STAGE DIVIDEND DISCOUNT MODEL

This model assumes two stages of growth, the first phase in which the growth rate is high and the second phase which represents steady state in which the growth

rate is assumed to be stable and is expected to continue for a long-term. The initial supernormal growth is assumed to last for a fixed time say n years, after which a stable growth is assumed forever.

According to this model, value of the stock is given by,

Value of the stock = PV of dividends during supernormal growth + PV of terminal price

$$\text{Value of the stock} = \frac{DPS}{(1+r)^t} + \frac{P_n}{(1+r)^n} \quad \text{...Eq.(8)}$$

Where, $P_n = \frac{DPS_{n+1}}{r - g_n}$

DPS_t = Expected dividend per share in year 't'

r = Required rate of return

P_n = Price at the end of year n

g = Extraordinary growth rate for the first n years

g_n = Growth rate forever after year n.

This formula can be restated as,

$$P_o = \frac{DPS_0 (1+g) \left(1 - \frac{(1+g)^n}{(1+r)^n}\right)}{r-g} + \frac{DPS_{n+1}}{(r - g_n)(1+r)^n} \quad \text{...Eq.(9)}$$

Illustration 2

Assume that the firm discussed in the previous illustration has two stages of growth. (1) High-growth period (2) Stable-growth period. The length of high-growth period is 4 years. The growth rate after 4 years is expected to be 3%. Find out the value of the stock of XYZ Ltd. taking the other data as given in the above illustration. Pay-out ratio in the stable growth period is 60%.

$$P_0 = \frac{DPS_0 (1+g) \left(1 - \frac{(1+g)^n}{(1+r)^n}\right)}{r-g} + \frac{DPS_{n+1}}{(r-g_n)(1+r)^n}$$

Current EPS = Rs.10.16

Growth rate in high-growth period = 4%

Length of high-growth period = 4 years

Pay-out ratio during high-growth period = 52%

Return on equity = 12%

Expected growth rate in the stable phase = 3%

$$\text{Terminal price} = \frac{DPS_{n+1}}{r - g_n} = \frac{(0.60)\ (10.16)\ (1.04)^4\ (1.03)}{(0.12 - 0.03)} = 81.62$$

$$P_0 = \frac{(0.52)\ (10.16)\ (1.04) \left(1 - \frac{(1.04)^4}{(1.12)^4}\right)}{(0.12 - 0.04)} + \frac{81.62}{(1.12)^4} = 17.61 + 51.87 = 69.48$$

Limitations of the Two-Stage Dividend Discount Model

- **Defining the length of the supernormal growth period:** It is difficult to specify the **supernormal** growth period with precision since the growth rate is expected to reduce to a stable level after this period, and the investment increases as this period becomes longer. Though the supernormal growth

period can be related to product life cycle and projects opportunities, it is not easy to convert these qualitative terms into quantitative terms.

- **The change of high supernormal growth to a lower stable growth rate at the end of the supernormal growth period:** It is unrealistic to assume such a sudden change in the growth rate. There should be a gradual change over a time period rather than a sudden change of growth.
- **The terminal price calculated in this model is derived from Gordon model and hence it suffers from the limitations of the Gordon model:** The terminal value is sensitive to the assumptions about the stable growth, the underestimation or overestimation of which will lead to significant errors in the value calculated.

Uses of the Model

It is most suitable to firms that register high growth and they also expect to maintain this growth rate for a certain period of time after the growth rate tends to decline.

It is also suitable for firms with modest growth rates in the initial phase.

Determinants of the value of growth: The factors which influence the value of growth are:

- *Growth rate during extraordinary growth period:* The higher the growth rate during supernormal growth period, the higher the estimated value of growth.
- *Length of the extraordinary growth period:* The longer the supernormal growth period, the greater the value of growth.
- *Profitability of projects:* The profitability of projects is a determinant of supernormal growth rate and the stable growth rate. When the projects become more profitable, both the growth rates increase, and the resulting value from supernormal growth will be greater.
- *Riskiness of the stock or equity:* Depending on the risk associated with the equity investment, the discount factor to be used is determined. The higher the risk, the higher the discount rate and lower the supernormal growth.

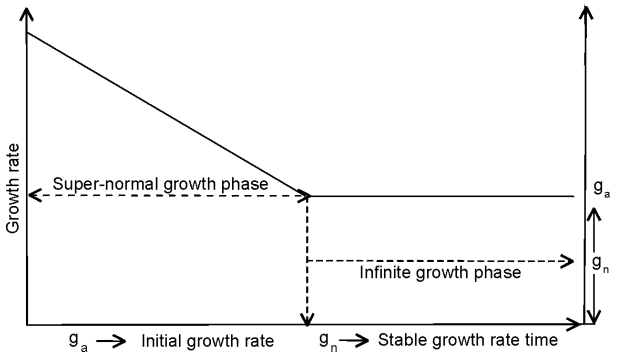
H-MODEL

This model is similar to the two-stage model except that a gradual change in the growth rate is assumed rather than a sudden change. This is explained in Figure 1.

Assumptions under H-Model

- The growth rate of earnings starts at a high initial rate and declines over the supernormal growth period linearly.
- Dividend pay-out is constant over a time period and not affected by the shifting growth rates.

Figure 2



Value of the Stock

The value of the stock P_o as per this model is given by,

$$P_0 = \underbrace{\frac{DPS_0\ (1+g)}{r-g_n}}_{\text{Stable Growth}} + \underbrace{\frac{DPS_0 H\ (g_a - g_n)}{r-g_n}}_{\text{Supernormal Growth}} \qquad \text{...Eq.(10)}$$

Where,

P_0 = Present value of the share

DPS_t = Dividend per Share in year t

r = Required rate of return on equity

g_a = Initial growth rate

g_n = Growth rate at the end of 2H years which extends to an infinite period.

Limitations of the Model

The decline in the growth rate is assumed to follow a strict structure based upon the initial growth rate, the stable growth rate and the length of the supernormal growth period. Large deviations from this assumption affect the value significantly. When growth rate declines, pay-out ratio has to increase, but the assumption of constant pay-out ratio violates this rule.

Best Use

This model is best suited to those firms which have a high growth rate in the beginning and a gradual decline in the growth rate over a time period.

Illustration 3

Vinay Enterprises was expected to have earnings per share of Rs.2 last year and to pay-out dividends of Re.1 in the same year. The earnings had grown at the rate of 18% a year for the previous 5 years, but the growth was expected to decline at the rate of 2% a year over the next 6 years to a stable growth of 6%. The decline in growth can be attributed to the following factors.

- Declining profitability due to increased competition
- Lower profitability in the industry
- Substantial growth in the size of the firm.

The required rate of return on equity of the firm is 13%.

Current EPS	= Rs.2
Current DPS	= Re.1
Current growth rate	= 18%
Length of transition period	= 5 years
Stable growth rate	= 6%
Required rate of return on equity	= 13%

Value of the stock during growth phase $= \dfrac{\text{EPS (pay-out ratio)}\ (1+g_n)}{r-g_n}$

$$= \frac{2\ (0.5)\ (1.06)}{(0.13-0.06)} = 15.14$$

Value of the stock during extraordinary growth phase

$$= \frac{DPS_0 \text{ x H x } (g_a - g_n)}{(r-g_n)} = \frac{1\ \left(\frac{6}{2}\right)\ (0.18-0.06)}{(0.13-0.06)} = 5.14$$

Value of the stock = 15.14 + 5.14 = Rs.20.28

THREE-STAGE DIVIDEND DISCOUNT MODEL

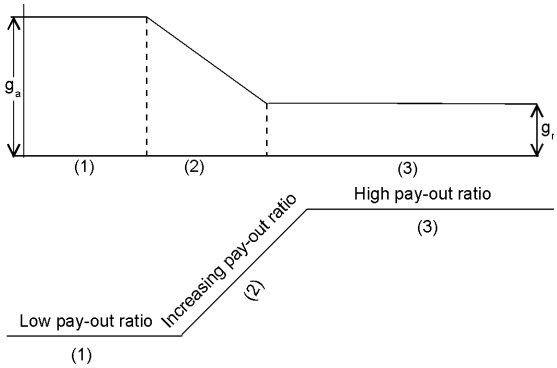
It is a combination of two-stage model and H-model. This model assumes three stages of growth:

1. An initial period of high-growth
2. An intermediate period during which the growth declines
3. A final stable-growth phase.

The main feature of this model that distinguishes it from the other models is the absence of any restriction on the pay-out ratio.

The assumptions of this model can be depicted in the following figure.

Figure 3: Dividend Pay-outs



(1) High Stable Growth

(2) Declining Growth

(3) Infinite Stable Growth.

Value of the stock as per this model is given by,

$$P_0 = \underbrace{\sum_{t=1}^{n_1} \frac{EPS_0 (1+g_a)^t \pi_a}{(1+r)^t}}_{\text{High Growth Phase}} + \underbrace{\sum_{t=n_1+1}^{t=n} \frac{DPS_t}{(1+r)^t}}_{\text{Transition}} + \underbrace{\frac{EPS_n (1+g_n)(\pi_n)}{(r-g_n)(1+r)^n}}_{\text{Stable Growth Phase}} \qquad \text{Eq.(11)}$$

Where, EPS_t = Earnings Per Share in year t

DPS_t = Dividends Per Share in year t

g_a, g_n = Growth rates in high growth phase and stable growth phase respectively

π_a π_n = Pay-out ratio in high growth phase and stable growth phase respectively.

r = Required rate of return on equity.

Illustration 4

Consider the same data as given in Illustration 3. But let us assume that Vinay Enterprises has three stages of growth. A high-growth phase with 18% growth rate for 5 years, a transition period of 5 years after which the firm reaches stable-growth phase with the growth rate of 6%. Earnings per share after the growth stabilized will be Rs.2.5 and the pay-out ratio will be 60%. The required rate of return after the growth rate stabilized is 12%.

$$P_0 = \sum_{t=1}^{n_1} \frac{EPS_o (1+g_a)^t (\text{pay-out ratio}_1)}{(1+r)^t} + \frac{EPS_n (1+g_n)(\text{pay-out ratio}_2)}{(r-g_n)(1+r)^n}$$

$$= \frac{2(0.5)\ (1.18)}{(1.13)} + \frac{2(0.5)\ (1.18)^2}{(1.13)^2} + \frac{2(0.5)\ (1.18)^3}{(1.13)^3}$$

$$+ \frac{2(0.5)\ (1.18)^4}{(1.13)^4} + \frac{2(0.5)\ (1.18)^5}{(1.13)^5} + \frac{2(0.5)\ (1.18)^6}{(1.13)^6}$$

$$+ \frac{(1.18)^7}{(1.12)^7} + \frac{(1.18)^8}{(1.12)^8} + \frac{(1.18)^9}{(1.12)^9} + \frac{(1.18)^{10}}{(1.12)^{10}} + \frac{2.5\ (1.06)\ (0.06)}{(0.12 - 0.06)\ (1.12)^{10}}$$

$$= 5.704 + 7.62 + 0.05 = 13.374$$

Uses

This model is best suited to firms that are growing at different rates and in addition have varying pay-out policies. It is also suitable to firms which have an extraordinary growth period followed by a declining growth period and a stable growth to continue forever.

ANALYSIS OF GROWTH COMPANIES[2]

Investments in certain stocks virtually make investors wealthy. High rates of return from these stocks indicate that the proper valuation of true growth companies can be extremely rewarding. There are many instances where the stock price of a growth company overcompensated for the firm's expected growth and the subsequent returns to the stockholder were below expectations. Therefore, the common stock of a growth company is not always a growth stock.

Growth Company

When a company is able to tap good opportunities to invest in profitable projects, then it is termed a growth company. Profitable projects are those that can generate sufficient returns above the cost of capital. This condition is not applicable always, as any company, when faced with competition, is expected to be operating at a level where its marginal revenue equals marginal cost. This implies that the returns are just sufficient to meet the cost of capital. When the returns earned do not match the risks assumed, then the existing participants may leave the industry whereas more players are expected to enter when the returns are commensurate with the risks involved. With more players, there will be an increase in supply which will lead to a decrease in prices till the rates of return earned are consistent with the risks assumed in a state of equilibrium.

When firms are engaged in ventures involving sufficient investment of corporate capital, they are exposed to some risks arising out of these investments. The required rate of return is determined by a firm based on the risks involved in comparison to the risks of other firms. According to the CAPM, the difference in the required rate of return is a function of the difference in the stock's systematic risk. This required rate of return is termed as the firm's cost of equity. When the rates of return earned are greater than the required rate of return (which would occur only when the market is in equilibrium), then the excess return is nothing but profits.

Cost of capital being one of the costs of production, under perfect competition, marginal revenues should equal marginal costs (which includes cost of capital). In such a situation, excess returns may not always be possible. But we have observed several instances of excess profits. These excess profits might not have been possible only out of temporary disequilibrium but also because of non-competitive environment. Some of the non-competitive factors such as patents, copyrights, etc., provide a firm or person with monopoly rights to a process or a manuscript for a specified period. This period offers protection for these firms against competition. In addition, other possibilities for the firms earning abnormal profits could be that they may be adopting some strategies suggested by Porter, creating barriers to entry, etc.

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2 This section is drawn from "Investment Analysis and Portfolio Management" by Frank K Reilly and Keith C Brown, 6th Edition, *The Dryden Press*.

Thus under perfect competition, it is not possible for firms to remain a true growth company for a very long time earning abnormal profits. But, in reality, we rarely find a situation of perfect competition, and hence some growth companies do exist at least for a short period of time making use of the disequilibrium condition in the market.

Growth Companies and Growth Stocks

A growth stock is one that is supposed to earn above normal returns at some point of time in future. This has two implications: (i) undervalued stocks can be growth stocks irrespective of the nature of the company; (ii) overvalued stocks of growth companies could be speculative stocks as they may have a high probability of below-normal returns. In this section, some models are presented which would help in classifying a stock as a growth stock or a speculative stock or a correctly valued stock.

Companies and the Dividend Discount Model

A true growth firm cannot sustain its growth for an infinite period of time in a competitive environment. In reality, even in a non-competitive economy, a true growth firm does not exist for a long period of time because patents and copyrights cannot be held for long, and unusual management practices may be copied and competitors may enter the industry. Consequently, the constant growth dividend discount model cannot be applied for the valuation of growth companies, and some special valuation models that allow for the infinite periods of abnormal growth and for the possibility of different rates of growth need to be developed.

ALTERNATIVE GROWTH MODELS

For simplification purposes, the general assumption underlying all these models is that the company is an all-equity firm.

No-Growth Firm: A no-growth company is assumed to have a specified portfolio of investments that generate a constant stream of earnings (E) equal to 'r' times the value of assets. Depreciation is deducted from the earnings to maintain the assets at their original value. Therefore,

$$E = r \times \text{Assets} \qquad \text{...Eq.(12)}$$

It is also assumed that all earnings of the firm are paid out in dividends; if 'b' is the rate of retention, b = 0. Hence,

$$E = r \times \text{Assets} = \text{Dividends}$$

Because of the above assumptions, the value of the firm is the discounted value of the perpetual stream of earnings (E). Let the discount rate be 'k'. An additional assumption made is that r = k, i.e., the firm's rate of return on assets equals its required rate of return. The value of the firm is,

$$V = \frac{(1-b)E}{k} = E/k \text{ (since } b = 0) \qquad \text{...Eq.(13)}$$

As there is no change in the assets, there is also no change in the earnings in the case of no growth companies. As a result, the value of a firm never changes, and investors continue to receive a return of 'k' on their investment.

$$k = E/V$$

LONG RUN GROWTH MODELS

The difference here is that it assumes that some of the earnings are reinvested. Initially, we assume that a firm would retain a constant amount of earnings, which in turn, would be reinvested in assets that would earn a rate of return above the required rate.

These models postulate that the market value (V) of an all-equity firm is the capitalized value of three component forms of returns discounted at the rate 'k'.

- E = the level of (constant) net earnings expected from existing assets, without further net investments.
- G = the growth component that equals the present value of capital gains from reinvested funds. The return on reinvested funds is equal to 'r', which equals 'mk' (m is the relative rate of return operator). If 'm' = 1, then r = k. If m > 1, then r > k. If m < 1, the investments are generating returns (r) below the cost of capital (r < k).
- R = the reinvestment of net earnings (E), and is equal to 'bE', where 'b' is a percent of retention between zero (no investment) and unity (total reinvestment; no dividends).

SIMPLE GROWTH MODEL

According to this model, a firm has growth investment opportunities that provide rates of return equal to 'r', where 'r' is greater than 'k'. It may also be assumed that the firm may be able to invest 'R' rupees a year at these rates and that R = bE. It can be noted that R is a constant amount because 'E' is the constant earnings at the beginning of the period.

The capital gain component (G) is computed as follows: Investment of 'bE' rupees grows to bEr at the end of one year, which is again invested to get bEr^2 at the end of the second year, and this is repeated every year. Each of these earnings streams will have a present value, as of the year it begins. The present value of a constant perpetual stream (discounted at a rate consistent with the risk involved) is equal to bEr/k. Assuming the firm does this every year, it has a series of investments, each of which has a present value of bEr/k. The present value of all these series is (bEr/k)/k, which equals bEr/k^2. But since r = mk, this becomes,

$$\frac{bEmk}{k^2} = \frac{bEm}{k} \qquad \text{...Eq.(14)}$$

(Gross Present Value of Growth Investments)

To derive these flows, the firm must invest bE dollars each year. The present value of all these annual investments is equal to bE/k. Therefore, the net present value of growth investments is equal to,

$$\frac{bEm}{k} - \frac{bE}{k} \qquad \text{...Eq.(15)}$$

(Present Value of Growth Investments)

'm' indicates the relationship between 'r' and 'k'. Combining the growth component with the capitalized value of the constant earnings stream indicates that the value of the firm is:

$$V = \frac{E}{k} + \frac{bEm}{k} - \frac{bE}{k} \qquad \text{...Eq.(16)}$$

This equation indicates that the value of the firm is equal to the constant earnings stream plus a growth component equal to the net present value of re-investment in growth projects. By combining the first and third terms above,

$$V = \frac{E(1-b)}{k} + \frac{bEm}{k} \qquad \text{...Eq.(17)}$$

Since E (1 – b) is the dividend (D), this model becomes,

$$V = \frac{D}{k} + \frac{bEm}{k} \qquad \text{...Eq.(18)}$$

(Present Value of Constant Dividend plus the Present Value of Growth Investments)

It can be stated in terms of earnings by rearranging equation (11).

$$V = \frac{E}{k} + \frac{bE(m-1)}{k} \quad \text{...Eq.(19)}$$

(Present Value of Constant Earnings plus Present Value of Excess Earnings from Growth Investments)

EXPANSION MODEL

According to this model, it is assumed that a firm retains earnings to invest but receives a rate of return on its investments that is equal to its cost of capital (m = 1, so r = k). This would make the net present value of growth investments zero. Therefore, equation (11) would become,

$$V = \frac{E}{k} \quad \text{...Eq.(20)}$$

and equation (12) would become,

$$V = \frac{E(1-b)}{k} + \frac{bE}{k} = \frac{E}{k} \quad \text{...Eq.(21)}$$

Equation (13) is still valid, but the present value of the growth investment component would be smaller because 'm' would be equal to 1. The absence of the last term in equation (14) implies that if a firm retains earnings and reinvests them, it is not necessarily beneficial unless the reinvestment rate is above the required rate (r > k). Otherwise, the investor in a tax-free world would prefer to receive all the earnings as dividends.

NEGATIVE GROWTH MODEL

A firm may retain some portion of its profits for reinvestment in its projects which may generate a rate of return below its cost of capital (r < k or m < 1). Recall the present value of growth investment is given by,

$$\frac{bEm}{k} - \frac{bE}{k} + \frac{E}{k}$$

When m < 1, this present value becomes negative. This negative value will make the value of the firm as,

$$V = \frac{-bE}{k} - \frac{bEm}{k} + \frac{E}{k}$$

It will be less than the value of a no-growth firm or an expansion firm. When m < 1 in equation (14), we get the same result. This implies that funds are invested in non-profitable projects. But such unprofitable investments cannot be easily spotted out as the firm uses its retained earnings to purchase more assets. These new assets will earn a positive rate of return, which would increase the earnings of the firm but in a low proportion, and not in the proportion in which it should increase. This is the reason for the decline in the value of the firm, particularly when these earnings are discounted at the firm's cost of capital which is greater than the rate of return on the investment. Therefore, the gross present value of the growth investments is equal to,

$$V = \frac{bEm}{k}$$

Thus, we identify three factors which influence the size of this capital gain term viz.,

1. The amount of capital invested in growth investments (b)
2. The relative rate of return earned in the funds retained (m)
3. The time horizon of these growth investments.

DYNAMIC TRUE GROWTH MODEL

Firms which invest a fixed proportion of current earnings in projects which generate rate of return greater than the firm's cost of capital should adopt this model. One should note the difference between simple growth model and dynamic true growth model. In the former, the amount of investment is fixed but in the latter the proportion of earnings used for investment is fixed, which implies the investments increase as earnings increase. Hence, the firm's earnings and dividends grow at a constant rate equal to 'br'. When m>1 and m = r/k, then the growth rate of earnings and dividends is bmk. Hence, the value of the firm as per dynamic growth model is given by,

$$V = \frac{D_1}{k - g} \qquad \text{...Eq.(22)}$$

Where, $g = br$ and $D_1 = D_0 (1+g)$.

When this model is applied to true growth companies, earnings and dividends grow at a constant rate and the firms invest larger and larger amounts in projects that generate returns greater than 'k'. If the growth rate (g) is greater than 'k', the model indicates that the firm should have an infinite value.

In practice, a combination of these models can be used. A firm may choose its own way of investment but the quantum of investment in growth projects and period of investment are more important in valuing and classifying these companies.

MEASURES OF RELATIVE VALUE

The three widely used measures of relative value are:

1. Price/Earnings ratio (P/E ratio)
2. Price/Book Value ratio (P/BV ratio)
3. Price/Sales ratio (P/Sales ratio).

Price/Earnings Ratio

HOW TO CALCULATE P/E RATIOS

We can relate the dividend discount model discussed in the previous section to arrive at price-earnings multiple. P/E ratio for a stable firm which is growing at a rate comparable to the normal growth rate in the economy in which it operates is given by,

$$\frac{P_0}{EPS_1} = P/E_1 \; \frac{\text{Pay-out ratio}}{r - g_n} \qquad \text{...Eq.(23)}$$

Where, $P_0 = \dfrac{DPS_1}{r - g_n}$

DPS_1 = Expected dividends per share next year

r = Required rate of return on equity

g_n = Growth rate in dividends (forever)

EPS_1 = Expected earnings per share next year.

The P/E ratio is an increasing function of the pay-out ratio and the growth rate and a decreasing function of the riskiness of the firm.

Illustration 5

ABC Ltd. has an EPS of Rs.2.75 last year and it paid out 50% of its earnings as dividends that year. The growth rate in earnings and dividends in the long-term is expected to be 5%. The required rate of return on equity for ABC Ltd. is 12%. Calculate its P/E ratio.

Current dividend pay-out ratio = 50%

Expected growth rate in earnings and dividends = 5%

$$\text{P/E ratio} = \frac{\text{Pay-out ratio}}{r - g_n} = \frac{0.5\ (1.05)}{0.12 - 0.05} = \frac{0.5\ (1.05)}{0.07} = 7.5$$

P/E RATIO FOR A HIGH GROWTH FIRM

When the growth rate and pay-out ratios are known, the two-stage dividend discount model can be written as follows:

$$P_0 = \frac{EPS_0\ (\text{Pay-out ratio})\ (1+g)\ \left(1 - \frac{(1+g)^n}{(1+r)^n}\right)}{r - g} + \frac{EPS_0\ (\text{Pay-out ratio})_n\ (1+g)^n\ (1+g_n)}{(r - g_n)\ (1+r)^n} \quad \text{...Eq.(24)}$$

Where,

EPS_0	=	Earnings per share in year '0'
g	=	Growth rate in the first n years
r	=	Required rate of return on equity
Pay-out ratio_n	=	Pay-out ratio after n years
g_n	=	Growth rate after n years (Stabilized growth rate).

The above equation can be rewritten as,

$$\frac{P_0}{EPS_0} = \frac{(\text{Pay-out ratio})\ (1+g)\ \left(1 - \frac{(1+g)^n}{(1+r)^n}\right)}{r - g} + \frac{(\text{Pay-out ratio})_n\ (1+g)^n\ (1+g_n)}{(r - g_n)\ (1+r)^n} \quad \text{...Eq.(25)}$$

The inputs required to calculate the P/E ratio for a high growth firm using the above model are pay-out ratio, discount rate 'r' and the expected growth rate in earnings.

Illustration 6

Assume that you have the following information about a firm.

Earnings per share	= Rs.7.5
Growth rate in the first five years	= 5%
Growth rate after five years	= 10%
Pay-out ratio for the first five years	= 20%
Pay-out ratio after five years	= 50%
Required rate of return on equity	= 12%

$$\text{P/E} = \frac{7.5\ (0.2)\ (1.05)\ \left(1 - \frac{(1.05)^5}{(1.12)^5}\right)}{0.07} + \frac{7.5\ (0.5)\ (1.05)^5\ (1.1)}{(0.02)\ (1.12)^5} = 155.57$$

Forecast of P/E ratio

Under the P/E multiplier approach for stock valuation, the two inputs that are required to determine the intrinsic value of the stock are the estimates of EPS and P/E multiple.

One way to estimate the P/E multiple is to calculate the normalized earnings over the last few years, determine the P/E ratios for these years using the normalized EPS and take the average of the P/Es. But, in practice, P/E ratio is often estimated on the basis of a subjective evaluation of the various factors that have a bearing on the P/E multiple like the projected earnings, dividends, company performance,

variability in its performance, fluctuations in the share price, corporate policies, and management ability. The analysts usually estimate an average P/E multiple for stocks with similar characteristics along the aforesaid dimensions.

Like the dividend yield estimation, it is however possible to obtain a better estimate of P/E multiple by developing a regression model. One such model by Whitbeck and Kisor is given below:

$$P/E = a + bEG + cDP - dSD$$

where,

- a = P/E ratio when it is assumed to be unaffected by growth in equity, dividend payment and variability of earnings growth.
- P/E = price-earnings ratio
- EG = growth rate in earnings (in percentage)
- DP = dividend pay-out (in percentage), and
- SD = standard deviation of growth rate in earnings (in percentage).

Whitbeck and Kisor obtained estimates of earnings growth rates, dividend pay-outs and the variation of growth rates from a group of security analysts. For this data, they employed multiple regression analysis to get the above relation and the values of the constants were found to be a = 8.2, b = 1.50, c = 0.067 and d = 0.20. This analysis was conducted in 1962.

INVESTMENT STRATEGIES THAT COMPARE P/E TO THE EXPECTED GROWTH RATE

P/E ratios are compared with the expected growth rates by the portfolio managers to identify the undervalued and overvalued stocks. If P/E ratio is less than the expected growth rate, then the stock is undervalued and if P/E ratio is more than the expected growth rate, then the stock is overvalued. But this may not hold good always and it may be consistent only with a fairly valued or an overvalued firm if interest rates are high or if a firm has high risk. When firms are ranked on the basis of the ratio of P/E to expected growth, the ranking will provide a measure of relative value if (i) the length of the high growth period is the same for all firms, and (ii) all firms considered are of equivalent risk.

If the above assumptions are not satisfied, then P/E ratio and expected growth rate cannot be compared to arrive at a conclusion about the valuation of stock. This is because, a high risk firm will have a lower P/E ratio than another firm which has the same expected growth rate but a lower risk. Similarly, P/E ratio of a high growth firm which is expected to grow at the same rate for a longer period is greater than the firm with the same growth rate but is sustainable only for a short period.

Box 1: PEG – The Shining Armor

The PEG ratio is developed by Peter Lynch and popularized by Motley Fool, who also named it the "Fool Ratio." Peter Lynch, the former star manager of Fidelity's Magellan Fund puts it aptly in his book 'One up on Wall Street' that "In a fully and fairly valued situation, a growth stock price-to-earnings ratio should equal the percentage of the growth rate of its company's earnings per share." Therefore, the PE ratio of a company will be equal to its profit growth rate. And the PEG ratio of a stock should be equal to one, as PEs come into line with the growth rate in net profits.

If the PEG ratio is greater than one, it indicates that the stock is possibly overvalued or that the market expects future EPS growth to be greater than what is currently prevailing. Growth stocks typically have a PEG ratio greater than one because investors are willing to pay more for a stock that is expected to grow rapidly (also known as "growth at any price"). It can also be interpreted that the earnings forecasts have been lowered while the stock price remains relatively stable for other reasons. Traditional wisdom held that a stock should sell for a P/E equal to its growth rate (i.e., a PEG of 1.0). However, that thinking changed when technology companies started selling for higher PEGs than the industries.

If the PEG ratio is less than one, it is a sign of a possibly undervalued stock or that the market does not expect the company to achieve the earnings growth that is reflected in the market estimates. Value stocks usually have a PEG ratio less than one because the stock's earnings expectations have risen and the market has not yet recognized the growth potential. On the other hand, it could also indicate that earnings expectations have fallen faster than the new forecasts. Overpriced stocks have higher PEs and underpriced stocks have lower PEs than their respective growth rates.

PEG is considered particularly helpful in valuing small and mid-cap growth stocks, which typically pay no dividend. For valuing larger stocks, the company's dividend yield should be added to its projected five-year earnings growth rate because larger and more established firms are valued by investors for their current pay-out as well as for their future prospects of price appreciation. PEG ratios are considered less useful in assessing cyclical stocks and those in industries such as banking, oil or real estate, where assets are a more important indicator of value.

During the tech boom, the PE and PEG ratio were used to justify the high valuations. Though the expectations were belied, this ratio can still add glitter to one's portfolio if used judiciously. The following table shows the expected PEG ratios of some of the top rung software stocks in India.

Company	PEG March 31, 2003
Infosys Technologies Ltd.	1.37
NIIT	–0.40
Hughes Software Systems Ltd.	–1.55
Digital Globalsoft Ltd.	0.66
Mascot Systems Ltd.	1.67
Satyam Computer Services Ltd.	1.89
Visualsoft Technologies Ltd.	–0.91
Wipro Ltd.	1.81

Source: www.icicidirect.com

Limitations of PEG

Certain financial magazines challenged the rule of thumb of PEG that the stocks, which are having a PEG of less than 1, are good picks. However, does the financial theory support the PEG ratio? Not really. Consider the example of Aventis Pharma and Cipla stocks. Suppose if an investor perceives that Cipla is less risky than Aventis, and therefore gets satisfied with lower returns from investments in the Cipla stock. This means that he would be willing to pay more for every Re.1 of Cipla's EPS. In other words, lower the risk of a stock, higher its PE ratio. However, the flip side is that higher the risk, lower the PE ratio. Since Aventis is expected to be more risky by the investor, its PE ratio will be lower than that of Cipla. Suppose the PE ratio for Cipla is 10, and that of Aventis is 5 and the expected growth rate for Cipla and Aventis is 20% and 15% respectively, the PEG ratio for Cipla will be 0.5, while that for Aventis will be just 0.33. Therefore, an investor may choose Aventis based on the PEG ratio even though his perception for Cipla is better. Hence based on stock picks just on the PEG ratio may be wrong, as the ratio is biased towards stocks that have low PE ratio. The PEG ratio is not perfect. Even if a stock has a very low PEG, it does not mean that the stock will definitely go up. However, it is generally more likely that a stock with a low PEG is a good investment.

PEG ratio is generally construed to capture the growth component of valuation. This is generally true where the growth rates of the two businesses are similar. In such cases incorporating the growth rate into a comparative valuation is largely an exercise in redundancy. In other words, where growth rates are the same, taking the PE ratio and using the same divisor for each ratio does little to alter the assessment leaving aside the aspect of providing different numbers to compare. The important aspect of growth in the valuation metric is its impact in terms of compounding revenue or income over time.

Incorporating the growth rate into a new formula to derive a new ratio does not result in accuracy of the growth component of value. It simply provides a new and different benchmark to assess a business. Moreover, when a forward-looking data point is combined with a backward looking data point, one can derive another static or backward looking data point. The PEG is typically utilized to compare two companies in the same sector. When two businesses with differing growth dynamics and different industries are compared, PEG fails to capture the growth component of value.

Where the underlying growth rates of two businesses are substantially different, PEG would not be a good valuation tool. It is necessary to assess the PEG in the context of growth rates and margins in order to truly know the relative differences between two prospective investments. If the growth and margin dynamics are reasonably similar, the PEG is likely to be a safe tool to use for benchmarking. PEG does not account for differences in growth rates simply because it incorporates growth into an artificially created formula. Just as the P/E can be misapplied and misunderstood, the PEG is susceptible to the same issues as well.

Source: "Is the Primacy of the PE in Ruins?" by K Bhramaramba, Portfolio Organizer, November 2002.

PROBLEMS WITH P/E RATIOS

- P/E ratios are not meaningful when EPS is negative.
- P/E ratios may have wide variations over a time period depending on the variability of earnings.

Price/Book Value Ratios

The relationship between the price and the book value has often helped the investors to identify the undervalued and overvalued portfolios and stocks.

ESTIMATION OF PRICE TO BOOK VALUE RATIO

The book value of an equity is calculated as the difference between the book value of assets and book value of liabilities. According to the accounting convention followed, the assets are valued at historical cost minus depreciation. So, book value of assets declines over time. The book value of liabilities is their value at their issue.

The price to book value ratio for a stable growth firm is calculated from the price of the stock determined as per the Gordon model.

As per the Gordon model,

$$P_0 = \frac{DPS_1}{r - g_n}$$

Where,

P_0 = Value of the stock

DPS_1 = Expected dividends per share next year

r = Required rate of return on equity

g_n = Perpetual growth rate in dividend

$DPS_1 = EPS_0 \text{ (pay-out ratio) } (1 + g_n)$

$$\text{Then } P_0 = \frac{EPS_0 \text{ (Pay-out ratio) } (1 + g_n)}{r - g_n}$$

EPS_0 can be defined as,

EPS_0 = Return on Equity x Book Value of Equity = RoE x BV_0

$$\therefore P_0 = \frac{RoE \times BV_0 \times \text{(Pay-out ratio) } (1 + g_n)}{r - g_n} \quad \text{...Eq.(26)}$$

$$\frac{P_0}{BV_0} = \frac{RoE \times \text{(Pay-out ratio) } \times (1 + g_n)}{r - g_n}$$

If RoE is calculated based on the expected earnings in the next time period, then the above equation can be rewritten as,

$$\frac{P_0}{BV_0} = \frac{P}{BV} = \frac{RoE \text{ x (Pay-out ratio)}}{r - g_n}$$

P/BV is directly proportional to RoE and pay-out ratio and inversely proportional to the riskiness of the firm.

If g = (1 – Pay-out ratio) RoE, then

$$1 - \text{Pay-out ratio} = \frac{g}{RoE}$$

$$\text{Pay-out ratio} = 1 - \frac{g}{RoE} \qquad \text{...Eq.(27)}$$

$$\frac{P}{BV} = \frac{RoE\left(1 - \frac{g_n}{RoE}\right)}{r - g_n} = \frac{RoE - g_n}{r - g_n}$$

Thus, value of P/BV ratio is nothing but the differential between the RoE and the required rate of return. The advantage of this representation of P/BV ratio is that it can be estimated even for firms which do not pay dividends.

P/BV RATIO FOR A HIGH GROWTH FIRM

According to the two-stage dividend discount model, value of equity is given by,

$$P_0 = \frac{EPS_o \text{ x Pay-out ratio } (1+g)\left(1 - \frac{(1+g)^n}{(1+r)^n}\right)}{r - g} + \frac{EPS_o \text{ x Pay-out ratio}_n \ (1+g)^n \ (1-g_n)}{(r - g_n)\ (1+r)^n} \qquad \text{...Eq.(28)}$$

Where,

g = Growth rate in the first n years

Pay-out ratio = Pay-out ratio in the first n years

Pay-out ratio_n = Pay-out ratio after n years i.e., after reaching the stability

g_n = Perpetual growth rate after n years.

If EPS_o = BV_o x RoE, then

$$\frac{P_o}{BV_o} = RoE \text{ x } \left[\frac{\text{Pay-out ratio x } (1+g) \text{ x } \left(1 - \frac{(1+g)^n}{(1+r)^n}\right)}{r - g}\right] + \left[\frac{\text{Pay-out ratio}_n \text{ x } (1-g)^n \text{ x } (1+g_n)}{(r - g_n)\ (1+r)^n}\right] \qquad \text{...Eq.(29)}$$

This formula is also applicable to firms which do not pay dividends.

Illustration 7

XYZ Ltd. is a firm which has a stable growth of 6%. It pays out 50% of its earnings as dividends. The RoE of XYZ in the beginning of the year was 15%. The required rate of return is 12%. Calculate its P/BV ratio.

Solution

$$\text{P/BV ratio} = \frac{\text{RoE x Pay-out ratio x } (1+g_n)}{r - g_n} = \frac{0.15 \text{ x } 0.5 \text{ } (1.06)}{0.12 - 0.06} = 1.325$$

Illustration 8

Calculate the P/BV ratio of a firm which has the following characteristics:

Growth rate in the first five years	= 17%
Growth rate after 5 years	= 9%
Required rate of return	= 15%
Pay-out ratio in the first 5 years	= 25%
Pay-out ratio after five years	= 52%

Solution

$$\frac{P}{BV} = \text{RoE x} \left[\frac{\text{Pay-out ratio x } (1+g) \text{ x } \left(1 - \frac{(1+g)^n}{(1+r)^n} \right)}{r - g} \right]$$

$$+ \left[\frac{\text{Pay-out ratio}_n \text{ x } (1-g)^n \text{ x } (1+g_n)}{(r - g_n) \ (1+r)^n} \right]$$

$$= 0.18 \text{ x } \frac{(0.25)\ (1.17) \left(1 - \frac{(1.17)^5}{(1.15)^5} \right)}{0.15 - 0.17} + \frac{0.52 \text{ x } (0.83)^5 (1.09)}{(0.15\text{-}0.09)\ (1.15)^5}$$

$$= 0.18[-0.026 + 1.833] = 0.18(1.807) = 0.325$$

DETERMINANTS OF P/BV RATIO

When RoE goes down, the growth rate or the pay-out ratio or both go down. RoE indirectly affects the P/BV ratio.

P/BV ratio is affected by the required rate of return. When the required rate of return is high, P/BV ratio goes down.

INVESTMENT STRATEGIES BASED ON P/BV RATIO

A low value P/BV ratio indicates that the firm has a price which is below the book value. Such a firm is more likely to go out of business. So, investors are advised to make careful decisions about investing in these firms. The excess returns which are offered by such a firm should match with the additional risk it is exposed to by making such an investment decision.

ADVANTAGES OF USING PRICE/BOOK VALUE RATIO

- Book value serves as a reliable intuitive measure of value compared to the market price.
- P/BV ratios of different firms can be compared to identify undervalued or overvalued stocks.
- P/BV ratios can be calculated even for firms with negative earnings.

DISADVANTAGES OF P/BV RATIO

- Book values are influenced by the method of depreciation used. When different firms use different methods, then P/BV ratio comparison across firms may not be meaningful.
- If the firms do not have significant fixed assets, the book value may not be meaningful.
- If a firm has continuous negative earnings, then the book value of equity can become negative leading to a negative P/BV ratio.

Price/Sales Ratio (P/S Ratio)

P/S ratio can be estimated using earnings growth rate, pay-out ratio and risk. For a firm which has a stable growth rate, the value of equity as per Gordon model is given by,

$$P_o = \frac{DPS_1}{r - g_n}$$

P_o = Price of the stock

DPS_1 = Expected dividends per share next year

r = Required rate of return

g_n = Perpetual stable growth rate.

Substituting $DPS_1 = EPS_o (1 + g_n)$ (Pay-out ratio)

we get,

$$P_o = \frac{EPS_o \text{ (Pay-out ratio) } (1+g_n)}{r - g_n}$$

When net profit margin is defined as,

$$NPM = \frac{EPS_o}{\text{Sales per share}}$$

$$P_o = \frac{NPM \text{ x Sales per share x Pay-out ratio x } (1+g_n)}{r - g_n} \quad \text{...Eq.(30)}$$

If the NPM is based upon expected earnings, then

$$\frac{P_o}{\text{Sales}} = \frac{NPM \text{ x Pay-out ratio}}{r - g_n} \quad \text{...Eq.(31)}$$

Thus, P/S ratio is directly proportional to NPM and pay-out ratio and is inversely proportional to the required rate of return.

Box 2: P/E Ratio Alone is not Enough

Valuing a company with inconsistent schedule of earning, or worse, with no earning at all requires a delicate balancing act on part of the analysts. At these instances, traditional methods of valuations befall to helplessness. That's where the price/sales ratio comes in. Just like its more popular alternative the P/E ratio, PSR (Price-to-Sales Ratio) is useful to value any company. Price-to-Sales Ratio for a company can be calculated by dividing the market capitalization of a company by its total revenue for the last four quarters. As compared to PE ratio, Price-to-Sales Ratio is a more reliable measure because, unlike earnings, revenue for a company is difficult to manipulate. Besides earnings is a complex figure which may include inflows from non-recurring events also. Therefore, analysts look to both the PE ratio and PS ratio of companies before taking any investment decision. PS ratio is useful while valuing companies even with no earnings at all. PS ratio comes handy to value companies in today's dynamic set-up where mergers and divestitures are a part of the daily routine. For example, need for economy of scale has driven companies in telecom sector for sometime. Owing to write-offs related to merger, several such companies report negative earnings soon after the process. Such write-offs present a minuscule PE estimate for the company. However, strategically and fundamentally, the company may well be on its way to a bright future. This can be verified by analyzing the Price-to-Sales Ratio, which may be growing immediately after the merger, thus presenting a more realistic presentation of the prospect of the company.

Like any other ratio, a high or low PS ratio connotes different interpretations for an analyst. High or low PS ratio depends on the profit margin of the company. Thus, PS ratio for a steel manufacturer may vary from the PS ratio for a chip maker.

Price-to-Sales Ratio may also vary consequent to the capital structure of the company. A company with a lot of debt component in its balance sheet may have to allocate more resources for servicing the interest burden, and thus might see erosion in its profits. Another problem with PSR is that sales figure does not contain any information about the debt burden of the company. Thus, it may so happen that some companies may have no profits but only huge debt and could be on the verge of bankruptcy. Due to all these, it is advisable to compare both the PE ratio and PS ratio for the company on a historical basis for a reliable analysis.
Mathematically, relationship between these two ratios can be established as:

Price-to-Sales Ratio = Price-to-Earnings Ratio x (Profit Margin)

Source: ICFAI Research Team.

Illustration 9

A firm has the following characteristics. Calculate its P/S ratio.

The growth rate is stable and it is 5%

Dividend pay-out ratio = 30%

Net profit margin = 5%

Required rate of return = 12%

$$\text{P/S ratio} = \frac{0.05 \text{ x } 0.3 \text{ x } 1.05}{0.12 - 0.05} = 0.225$$

P/S Ratio for a High Growth Firm

Based on the two-stage dividend discount model, we can derive the P/S ratio for a high growth firm.

$$P_o = \frac{EPS_o \text{ x Pay-out ratio } (1+g) \text{ x} \left(1 - \frac{(1+g)^n}{(1+r)^n}\right)}{r-g} + \frac{EPS_o \text{ x Pay-out ratio}_n (1+g)^n \text{ x } (1+g_n)}{(r-g_n)(1+r)^n}$$

Where,

g, g_n = Growth rate in the first n years, growth rate after n years.

Pay-out ratio = Pay-out ratio in the first n years, and

Pay-out ratio_n = Pay-out ratio after n years respectively.

Substituting EPS_o = Sales_o x NPM

$$\frac{P_o}{\text{Sales}} = \text{P/S} = \text{NPM x} \left[\frac{\text{Pay-out ratio x } (1+g) \text{ x} \left(1 - \frac{(1+g)^n}{(1+r)^n}\right)}{(r-g)} + \frac{\text{Pay-out ratio x } (1+g)^n \text{ x } (1+g_n)}{(r-g_n)(1+r)^n}\right] \quad \text{...Eq.(32)}$$

Illustration 10

Calculate the P/S ratio for a firm which has the following characteristics:

Growth rate for the first five years = 15%

Growth rate after five years = 4%

Pay-out ratio in the first five years = 30%

Pay-out ratio after five years = 52%

Required rate of return = 12%

Net profit margin = 6%

$$P/S = \frac{0.06 \times 0.3 \times 1.15 \times \left(1 - \frac{(1.15)^5}{(1.12)^5}\right)}{0.12 - 0.15} + \frac{(0.06)(0.52) \times (1.15)^5 \times 1.04}{(0.12 - 0.04)(1.12)^5} = 0.42$$

DETERMINANTS OF P/S RATIO

When firms have high profit margins, they have high P/S ratio. When there is a drop in profit margin, it has dual effects– (i) It has a direct effect on P/S ratio which gets reduced, and (ii) It lowers the growth rate, which in turn affects the P/S ratio.

Profit margin can also be defined in terms of growth rate and retention ratio as follows:

Expected growth rate = Retention ratio x RoE

$$= \text{Retention ratio} \times \frac{\text{Net profit}}{\text{Sales}} \times \left[\frac{\text{Sales}}{\text{BV of equity}}\right]$$

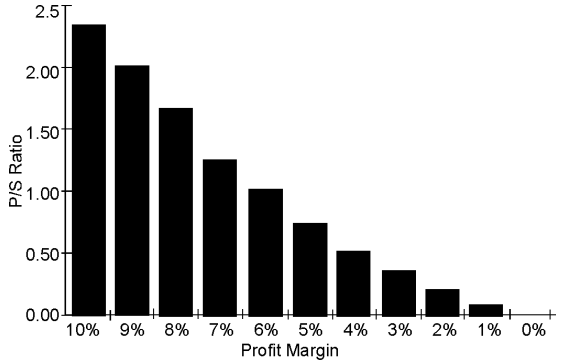
$$= \text{Retention ratio} \times \text{NPM} \times \frac{\text{Sales}}{\text{BV of equity}}$$

$$\text{Profit margin} = \text{Expected growth rate} \times \frac{\text{BV of equity}}{\text{Sales}} \times \frac{1}{\text{Retention ratio}}$$

Thus, it is clear that when NPM is reduced, the expected growth rate will decline if the sales do not increase proportionately.

The relationship between NPM and P/S ratio is clearly indicated in Figure 3.

Figure 4



In Figure 3, P/S ratio is expressed as a function of profit margin, keeping the sales/BV of equity constant.

ADVANTAGES OF USING P/S RATIO

- P/S ratio can never be negative unlike P/E and P/BV ratios.
- P/E ratio is not influenced by accounting methods used for depreciation, inventory, etc.
- P/S ratios are not so volatile as P/E ratios. This is because earnings are more sensitive than revenues to economic variations.
- P/S ratio is a useful tool to examine the effects of changes in pricing policy and other corporate decisions.

DISADVANTAGES OF USING P/S RATIO

Revenues are considered more stable than earnings but when a firm faces problems in cost control the revenues may not be affected while the earnings and value may drop suddenly. This disadvantage may fail to capture the differences across the firms in cost and profit margins and hence may cause misleading valuations.

INVESTMENT STRATEGIES USING P/S RATIOS

Firms with low profit margins and high P/S ratios are overvalued and those with high profit margins and low P/S ratios are undervalued. Investors should be able to identify them correctly and make investment decisions.

Figure 4: Identifying Undervalued and Overvalued Securities

		P/S	
		Low	High
NPM	Low	Correctly valued	Overvalued
	High	Undervalued	Correctly valued

FREE CASH FLOW TO EQUITY MODEL (FCFE)

The models discussed here are akin to those we had discussed in the dividend discount model, with one significant change – FCFE replaces dividends in the models.

Constant Growth FCFE Model

The value of equity under this method is defined as a function of the expected FCFE in the next period, constant growth rate and the required rate of return.

$$P_o = \frac{FCFE_1}{K_e - g} \qquad \text{...Eq.(33)}$$

which is similar to equation no.(2)

Where,

P_o = Value of stock today

$FCFE_1$ = Expected FCFE for the next year

K_e = Cost of equity or required rate of return

g = Constant growth rate in FCFE for the firm.

Thus, computation of FCFE and the cost of equity becomes essential to find the value of equity.

It is a very common practice of the firms to avail debt to meet the capital expenditure and working capital needs. Then if the target debt ratio B and the principal repayments are made from new debt issues, then

FCFE = Net Income – (1 – b) (Capital Expenditure – Depreciation) – (1 – b) (Change in Working Capital)

It may be noted that (1 – b) represents the margin invested by the firm in meeting the capital expenditure and working capital.

Let us try to understand the components of equation better through an example.

A firm had an EPS of Rs.40.65 and paid dividends of Rs.13 last year. The capital expenditure per share was Rs.109 and depreciation was Rs.91.12 per share.

The working capital increased by Rs.4.48 per share. The growth rate of the firm is 6% in the long run.

The firm had a debt ratio of 11.71% only (since EPS was quite high, the management opted for a limited debt from outside). The stock's β is 0.89. The risk-free rate of return is 6.42% and market return is 9.92%. Calculate the value of stock.

To calculate FCFE:

FCFE = Net Income – (1 – b) (Capital Expenditure – Depreciation) – (1 – b) (Change in Working Capital)

= 40.65 – (1 – 0.1171) (109.00 – 91.12) – (1 – 0.1171) (4.48) = 20.91

Cost of equity = $R_f + \beta (R_m - R_f)$ = 6.42 + 0.89 (9.92 – 6.42) = 9.54%

g = 6%

$$\therefore P_o = \frac{20.91 \times 1.06}{(0.0954 - 0.06)} = 626.12.$$

Valuation with Variable Growth in Free Cash Flows

Consider a firm with supernormal growth in the initial period followed by a constant normal growth in the long-term.

Then, P_o = Present value of FCFE stream up to nth year + PV of terminal price

$$= \sum_{t=1}^{n} \frac{FCFE_t}{(t + K_e)^t} + \frac{FCFE}{(K_e - g_n)} \times \frac{1}{(1 + K_e)^n} \quad \text{...Eq.(34)}$$

Where,

$FCFE_t$ = Free cash flow to equity in year t

$\frac{FCFE_{n+1}}{(K_e - g_n)}$ = Price at the end of the supernormal growth period t

K_e = Required rate of return

n = Supernormal growth period.

Illustration 11

The following data pertains to a promising firm in 'Communication Technology'. Its Current EPS = Rs.4.00; Capital expenditure per share = Rs.3.70 and depreciation = Rs.1.70 per share. The increase in working capital = Rs.1.00 per share. The debt ratio of the firm = 20%; the risk-free rate = 7%; β = 1.3 and R_m = 10%. If the supernormal growth rate = 22% during the next 5 years and thereafter at 10% throughout, calculate the value per share.

Required rate of return = $R_f + \beta (R_m - R_f)$ = 7% + 1.3 (10 – 7) = 10.9%

The growth rate in FCFE from 6th year onwards is 10%.

∴ The FCFE in the year 6 = 4.71 x 1.10

	Year 1	Year 2	Year 3	Year 4	Year 5
EPS	4.88	5.95	7.26	8.86	10.8
(Capital expenditure – Depreciation) (1 – B)	1.95	2.38	2.91	3.55	4.33
(Change in Working Capital) (1 – B)	0.80	0.98	1.19	1.45	1.77
FCFE	2.13	2.59	3.16	3.86	4.71
Present value discounted at required rate of return	1.92	2.10	2.32	2.55	2.81 = 11.70

The PV of terminal value = $\frac{1}{(1.109)^5} \text{ x } \frac{4.71 \text{ x } 1.10}{(0.109\text{-}0.10)} = \frac{575.66}{(1.109)^5} = 343.17$

The value of stock or the Value per share = 11.70 + 343.17 = 354.87.

The Three-Stage Future Cash Flow to Equity Model

This model is an extension of earlier two-stage model. In this model, it is assumed that the company expects initially an increasing growth rate up to a certain period called high growth period. Thereafter, the growth rate shows a downward trend during the second phase called transition period and the last phase is called infinite stable growth rate period. Thus, in this case, the present value of all the FCFE of the three periods are summed up to obtain,

$$P_0 = \sum_{t=1}^{t=n_1} \frac{FCFE_t}{(1+r)^t} + \sum_{t=n_{1+1}}^{t=n_2} \frac{FCFE}{(1+r)^t} \text{ x } \frac{P_{n_2}}{(1+r)^n} \quad \text{...Eq.(35)}$$

Where,

P_o = Present value of stock

$FCFE_t$ = Future Cash Flow to Equity in year t

K_e = Discount rate or cost of equity

P_{n_2} = Price of the stock at the end of declining growth period

$$P_{n_2} = \frac{FCFE_{n_2+1}}{(r - g_n)}$$

n_1 = End of the high growth period

n_2 = End of declining period or transition.

Here again the assumptions are as per constant growth model. In this case, the capital expenditure is expected to be more than the depreciation during the increasing growth phase. And the difference between capital expenses and depreciation gradually comes closer to zero during declining phase of growth. It approximates to zero during the constant growth phase. The beta of the firm also gradually converges to 1.0 from a positive value during the initial growth phase.

QUANTITATIVE ANALYSIS – VALUE ADDED CONCEPT

When the corporate finance managers aim at raising new capital for their business expansion, the investors choose a particular firm on their behalf on the basis of how their investments would fetch them returns. There are several methods to value the stocks of the firms. The value added methods differ from the conventional methods which focus on translating the operating performance into a useful single figure that will serve as a measure of enhancement in shareholder value.

One such value added measure is the economic value added, popularly referred to as EVA. In this approach, capital means only the operating assets of the firm. This assumption is made to avoid any discrepancies arising out of accounting distortions.

According to Modigliani and Miller, the finance managers tend to maximize the shareholders' wealth by maximizing the net present value of all the available projects. This net present value is nothing but the discounted value of the cash flow generating capabilities of a firm during its life. The task is to measure these cash flow generating capabilities. When the cash flows are measured for a particular period, it may not produce the true result because a negative cash flow could deplete the value. To overcome this drawback, corporate finance managers

should look at the free cash flows over a considerably long period as is usually done by the market. The market assumes that these negative cash flows are only for a short period of time and the reinvestment of cash flows will give rise to significant positive cash flows thus enhancing the shareholder's wealth.

Economic Value Added

There are two methods of calculating EVA:

1. Residual income method
2. Refined earnings method.

RESIDUAL INCOME METHOD

This method can also be called the spread method because it involves computation of the spread between two returns of same risk level.

Steps involved in arriving at EVA:

1. Calculate the current returns.
2. Subtract (1) from the returns available in an equal-risk category.
3. Multiply the result obtained in (2) by the amount to be invested.

EVA number should be positive. Any negative value of EVA is not a good sign for an investor to choose an investment. EVA of a firm can be calculated by,

1. Computing the net profit after tax, which it generates in a given period.
2. Dividing the result of (1) by the total capital invested.
3. Subtract the weighted average cost of capital (WACC) from (2).
4. Multiply the result of (3) by the total capital of the firm.

The above steps can be mathematically stated as follows:

$$\text{EVA} = \left(\frac{\text{NOPLAT}}{\text{Total Capital}} - \text{WACC} \right) \text{ (Total Capital)}$$

= (Spread over WACC) (Total Capital)

= Excess return generated over cost of capital

Where,

$$\text{WACC} = \left(\frac{\text{Book Value of Debt}}{\text{Total Book Value}} \right) \text{(Cost of Debt) (1 – Tax Rate)} + \left(\frac{\text{Book Value of Equity}}{\text{Total Book Value}} \right) \text{(Cost of Equity)}$$

Note: Cost of equity is calculated based on the CAPM model.

NOPLAT = Net Operating Profits Less Adjusted Taxes

From the foregoing discussion, it is clear that profitability is captured in the first component of the equation and the growth is captured in the second component. But a firm should not try to add value to the shareholder's wealth by just making an attempt to increase profitability. Because if low earning projects are not omitted for the calculation of profits, the return on capital employed will increase but EVA will be destroyed especially if those projects despite earning a low value were yielding a return higher than the cost of capital. This is because, these projects were adding value to the firm.

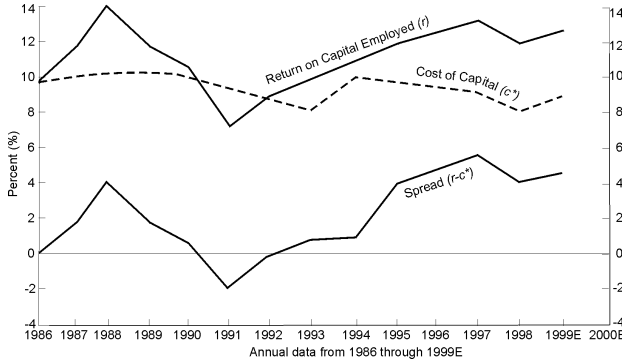
REFINED EARNINGS METHOD

According to this method, EVA is calculated as follows:

EVA= (Sales – Operating expenses) – (WACC) (Net assets)

In this method, WACC is multiplied by the net asset to arrive at the capital charge. Then this capital charge and other expenses are subtracted from the revenues received to arrive at the EVA. If this EVA is a positive figure, then the firm is said to have earned high quality profits. This method focuses on the factors that create growth in a company. It also helps the management and analysts to recognize that true growth can be created by increasing the firm's return on capital or by reducing WACC.

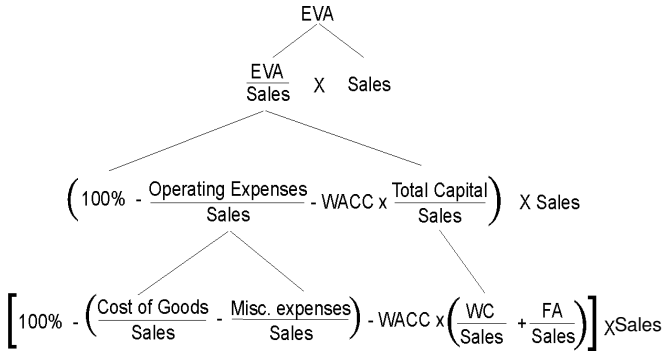
Figure 5



EVA ANALYSIS

Traditional earnings analysis sometimes may not clearly provide an intuitive conclusion about the choice of the firm to make investments for an investor. But a firm's performance can be measured through EVA analysis by breaking EVA into its components as given in figure 6:

Figure 6



Though Economic Value Added (EVA) is conceived as a popular measure, there is little evidence that suggests companies with a high value of EVA performed well above the market. Moreover, the portfolios built using other measures of corporate valuation are seen to outperform those built based on EVA.

Market Value Added (MVA)

MVA serves as a measure of a firm's external performance. This reflects the view of the market on the firm's performance in terms of market value of debt and market value of equity compared to the capital invested in the firm. This can be expressed mathematically as follows:

MVA (Market Value Added) = (Market Value of Firm) – Capital – Market Value of Debt – Market Value of Equity

To analyze a firm's performance, it is required to look for positive changes over time i.e., the percentage change each year. Comparison of changes in MVA each year with those of the aggregate stock and bond markets is required, since the market values will be affected by the changes in interest rates and other macroeconomic factors.

MVA can also be computed by discounting the EVA of each year by the weighted average cost of capital. The relationship between EVA and MVA can be expressed as follows:

$$MVA=\frac{EVA}{(1+WACC)^1}+\frac{EVA}{(1+WACC)^2}+...+\frac{EVA}{(1+WACC)^n} \quad ...Eq.(36)$$

Where, WACC = Weighted Average Cost of Capital

n = Estimated life of the firm.

ADVANTAGES OF EVA

- EVA is primarily used for evaluating the performance of management.
- It serves as a proxy for measuring a firm's stock performance.
- EVA can be applied to capital budgeting like NPV.

Box 3: Measures of Fair Value of Growth

With the tech debacle, the years 1999 and 2000 witnessed phenomenal wealth destruction across the globe. The world's major indices lost about 60% from their earlier peaks. With this, the investors have learnt the lesson in a hard way that investing in equities should not be done in fervor or blind enthusiasm. The article details a study to guide the investors, to spot the companies that have good growth prospects in the future, by applying sanity test that was first presented in *Fortune* magazine valuing US stocks. The model computes the present value, future growth, and sanity test for a large set of companies. A company with more than 50% sanity test would have a higher EVA growth and is a good investment. While a company with negative sanity test is a bad bet. However, many of India's largest companies have a negative sanity test. Investors beware.

Present Value of EVA earned to Perpetuity (PV)

This model computes the value of each company as the discounted value of future earnings earned to perpetuity. The model has taken the previous year's EVA as unchanged in all future years.

PV= EVA/Expected Rate of Return

Future Growth Value (FGV)

While computing PV, we assumed that EVA will remain constant to perpetuity. The difference between the market capitalization of the company and the PV indicates the market's forecast of EVA for the future years.

FGV = Market Capitalization Less Present Value

Sanity Test %

The ratio of FGV to MV of a company indicates the extent to which the market is valuing future growth. Higher the percentage, greater is the optimism for the stock. To invest in a company with more than 50% Sanity Test, an investor must be certain about the substantially higher EVA growth estimate. A negative Sanity Test, shows tremendous negative sentiment about the company.

Sanity Test % = Future Growth Value/Market Value x 100

For Indian Stocks

We have estimated the current year's EVA rather than use the previous year's EVA.

EVA = {Current Year's NPAT(Est.) – Non-Recurring Items + Depreciation}

Less: {Net Worth x Opportunity Cost of Equity}

Opportunity Cost of Capital = Risk-Free Rate of Return = 8.5%

The model was used to compute the PV, FG and Sanity Test for a large set of companies. A separate category was created for companies with a Sanity Test ratio > 30%. Since the FGV/PV ratio is higher than 30%, it suggests that the market has forecasted a higher growth rate for these companies. For the high growth companies, we have computed PV, FGV, and the Sanity Test assuming a 25% compounded EVA growth rate for 10 years.

Additional Criteria

1. PV is computed assuming that the EVA will grow at a constant compounding rate of 25%. The Present Value is computed taking 10 years EVA and thus called PV10.

2. The FGV10 and Sanity Test ratio is based on the PV10.

Undervalued or Inefficient Companies?

The model has brought forth a long list of companies with a negative Sanity Test. Some of these are India's largest companies. Most of these companies own valuable and vast resources, have shown constant earnings performance, and have rewarded dividends to its shareholders for the last decade.

Are we to assume that these companies will only suffer from negative growth in the future?

Is the market being too biased?

High Growth Category

In the US markets GE, IBM, Microsoft, Oracle are valued at Sanity Test ratios above 50%. For the Indian market, the model using optimistic growth estimates that (compounded 25% growth for the next decade) Infosys, Ranbaxy, Hindustan Lever and Wipro fall between Sanity Test ratios 30% to 80%.

Are these valuations justified?

Is the future much, much brighter than today?

Is this growth as viable as perceived by the market?

Theory suggests that the market is efficient and at any moment of time, market capitalization is the equilibrium valuation. Experience suggests that opportunities are best realized by challenging the current valuation. Revaluation in a rising market can be either an expansion in valuation of "trendy" stocks or a price discovery of "dull" stocks. A mix of both with realistic valuation methods may be the best path.

If one believes in the future existence of many of the companies with FGV negative ratios, the returns from exposure to these stocks over a longer period should be higher.

Which is a better strategy?

Investing in Value Already Created available at a large discount or

Investing in Estimated "Visible" growth largely discounted.

Source: "What is the Fair Value of Growth?" by Amit Dalal, Portfolio Organizer, March 2002.

Tests of EVA[3]

A theory states that stocks of companies having high EVAs should be able to perform better than the market as the managers of those companies would be working towards enhancing the shareholders' value. To test the suitability of EVA and MVA as the bases for selecting stocks, portfolios with equal weights of fifty stocks based on the values of EVA and MVA are formed and monitored for their monthly performance. Portfolios thus formed are rebalanced as on 31st January every year to make sure that all the relevant data are available during the time they are formed. The choice of the date is justified based on the fact that a majority of the companies within the S&P 500 have fiscal year ending in December. EVAs are calculated for each company and are compared with published data. The differences that arose between the reported figures and the calculated figures are attributed to the interest rate and the discount rates used in the calculations. The transactions costs are ignored in the calculations.

Two major findings of the study are enumerated below.

1. High EVA or MVA does not imply higher stock returns always.
2. Earnings really matter.

High EVA or MVA does not imply Higher Stock Returns Always

The results of the study indicate that high EVA and high stock returns do not go together. On comparison of the average twelve month returns of the portfolios constructed using EVA and MVA with the performance of the market, it was found that they are not very good predictors of stock outperformance. The risk adjusted returns associated with EVA and MVA limit their use further as predictors of stock performance.

EARNINGS REALLY MATTER

No strong evidence is found in the study to support that earnings and return on equity have less influence on stock performance than EVA has. A major finding is that there are several points which support that reported earnings are the major determinants of stock prices. The argument in favor of EVA is that it outperformed Dividend Discount Model (DDM).

Though theory supports the view that high EVA companies should add to MVA, a study conducted by Merrill Lynch, shows that only a weak relationship between EVA and MVA was observed. But a stronger relationship is observed between MVA and market value i.e., stock price appreciation led to increase in market capitalization and hence higher MVA.

Although EVA serves as an important management tool, one should note that the return on investment in excess of capital requirements assumes importance only if it is contributing to profitability and growth in profits. The study concludes that equity investors would be better served when they use more traditional measures of corporate valuation for selecting stocks for investment purposes like ROE.

After the study was conducted based on absolute values of EVA and MVA, it was suggested that the results would have been better if growth rates in EVA and MVA were used. The general opinion was that an improving or declining EVA would be more representative of future stock performance than the absolute level of EVA. So, Merrill Lynch conducted a second test based on the growth rates in EVA and MVA. The same procedure is followed in the selection of companies. While examining growth rates of EVA and MVA, growth rates of other measures of corporate valuation such as Return on Assets (ROA), Return on Capital (ROC) and the growth in one-year Return on Equity (ROE) were considered.

3 This section is drawn from "Quantitative Viewpoint: An Analysis of EVA" Part I and Part II, published by *Merrill Lynch and Co.*, 1998.

The test results showed that strategies based on the growth in EVA were worse performers compared to those based on the levels of EVA. But the results were different for strategies based on growth in MVA. However, compared to the strategies based on the traditional measures of corporate valuation, strategies based on EVA, MVA and their growth rates were found to have underperformed. The test results did not, however, support the theory of EVA that earnings are irrelevant. Strategies based on EVA and growth rates in MVA are not value strategies but are "momentum strategies". Consequently, these strategies are compared with other momentum strategies. The comparative analysis revealed that the risk/return profile of the strategy based on growth in MVA was far better than that of the market. The success of this strategy may be attributed to the outperformance of the large capitalization stocks. Though the portfolios built using the growth in MVA performed better than those based on the absolute levels of MVA, there is no strong evidence of their outperformance over other portfolios built using other traditional measures of corporate success and profitability. Thus, the earlier finding was confirmed in the second test too. Despite EVA serving as an important analytical tool for corporate managers, it would not be an effective one if EVA process does not bring about any change in the earnings or earnings growth.

Two Illustrative Approaches to Formula Valuations of Common Stocks

The most common approach to value common stocks is estimating the average earnings and dividends for a particular period in the future and capitalizing these elements at an appropriate discount rate. Though it appears to be very plain, it involves a number of assumptions and techniques. The first problem encountered is the choice of the time period of study or projections. The second step is the estimation of earnings and dividends in the time period under study. The last step is the determination of the appropriate discount rate which many a time has remained purely subjective. There is a high degree of uncertainty associated with market valuation of growth stocks and hence there is a widespread volatility related to the market history of its shares.

Many analysts seem to rely on past data to estimate future earnings. Sometimes this has proved disastrous particularly when the past performance could not be sustained in the future. But in most cases the past data has served as a reasonable predictor of future value. Two approaches are explained in this section for common stock valuation. In the first approach, four quality elements of profitability, growth, stability and dividend pay-out are used as multipliers to the average earnings; in addition, a weight of 20% is given to the net asset value. In the second approach, rate of future growth expected by the market is calculated from the market price. Thus in the first one, we start with the growth rate and calculate the market price, whereas in the second one, we begin with the market price and end with the growth rate.

Method 1: A Formula Valuation based on the Past Performance

The assumptions are:

a. Each component issue of the Dow Jones Industrial Average may be valued based on the value of the average as a whole, calculated from the statistical data.

b. Statistical data considered are: profitability, growth of per share earnings, stability and pay-out. These factors are chosen because they explain the nature of the company's earnings and dividend policy and thus may help determine the multiplier to be applied to the earnings. The figure calculated for each entity is then divided by the corresponding figure for the Dow Jones group as a whole. The four relative quantities are then combined on the basis of equal weights to give a "quality index" of the company as against the overall quality of the group.

One of the most appropriate measures that would help in assessing the success and quality of an enterprise is the rate of earnings on invested capital since it explains the productive use of the dollar investment in the business.

A genuine doubt that may arise is the unaccountability of the growth rate in the procedure mentioned above. However, a considerable correlation is seen to exist between market multipliers and past growth.

Equal weights are assigned to past growth, past stability and current profitability in working out the quality co-efficient for each company. Though dividend pay-out has an important role to play in measuring the earning power of a company, it is convenient to treat it on par with each of the other factors.

Net asset value is given a weight of 20% in the final valuation considering the fact that it may have long run effect on future market price. The exclusion of asset value factor would show a sort of favoritism towards issues selling at very high premiums over their formula value. If greater weightage is given to the past growth, some of the issues which would have been undervalued would have been given larger formula values.

The robust result obtained from the study is that the stock market bases its valuation of a given common stock on its expected future performance which may vary substantially from its past behavior.

Method 2: Formula based on Expected Markets P/E

This method is based on the theory that the market price of a representative stock, such as any one in the Dow Jones index, reflects the expected earnings (in a future period) times a multiplier, which is in turn based on the future growth in percentage. The following formula is used:

$$\text{Price} = (E \times G) \times (8 \times G) = 8G^2E \qquad \text{...Eq.(37)}$$

Where E is the per share earnings and G is the growth rate.

To find the expected future growth G, the current price is divided by 8 and the EPS and the square root of the result is found.

From the analysis of the prices computed using this approach, it is observed that disparities existed between the expected future growth, implicit in the market prices, and the actual growth during the past decade.

A large part of the discrepancies between carefully calculated formula values and the market prices can be traced to the growth factor. The plausible reason could be that the market may have some changes in future earnings that cannot be brought out by the company's past performance. These discrepancies pose a challenge to the analysts and they may be willing to find more than what the market is doing and thinking. They would like to do an independent judgment on their own and hence a general type of valuation method which would give a clear picture of the past record may be useful.

EVALUATION OF SECURITY ANALYSIS

To evaluate forecasts of earnings, it is required to define a loss function which measures the loss caused by an error in the forecast. The loss function is assumed to be quadratic and the most commonly used error is the mean squared forecast error.

The Mean Squared Forecast Error (MSFE) for a set of forecasts is given by,

$$\text{MSFE} = \frac{I}{N}\sum(F_i - A_i)^2 \qquad \text{...Eq.(38)}$$

Where,

MSFE is the Mean Square Forecast Error

F_i is a forecast of the earnings per share of firm i

A_i is the actual earnings per share for firm i

MSFE can also be expressed as the change in earnings as follows.

If $P_i = F_i - H_i$, and $R_i = A_i - H_i$ where P_i is the predicted change in earnings, R_i is the realized change in earnings and H_i is the level of earnings at the time the forecast was made, then MSFE is given by,

$$MSFE = \frac{I}{N}\sum(P_i - R_i)^2 \quad \ldots Eq.(39)$$

In whichever way the analysis is performed, the value of MSFE is the same. When the MSFE value is scaled it would serve as a more useful measure. Thiel has suggested a method to scale this measure and it is referred to as Thiel's Inequality Co-efficient (TIC). In this method, MSFE is divided by the sum of the squared changes in earnings. It can be expressed as follows.

$$TIC = \left(\sum(P_i - R_i)^2\right) / (\sum R_i^2) \quad \ldots Eq.(40)$$

If the predicted change in earnings is equal to the realized change in earnings, then the numerator in the above equation would be zero and it implies a null value of TIC. When TIC is zero, then it means the forecasting is perfect and there is no error in forecasting. This situation refers to perfect forecasting ability of an analyst. On the other hand, if P_i is equal to 0, then TIC would assume a value of 1. This implies that the forecasts are perfect as there was no change in the next period's earnings. TIC serves as a performance measure of a forecaster. When TIC takes a value below 1, it implies that the forecaster outperforms the no-change model and a value above 1 represents that the forecaster could not outperform the most naïve forecasting model.

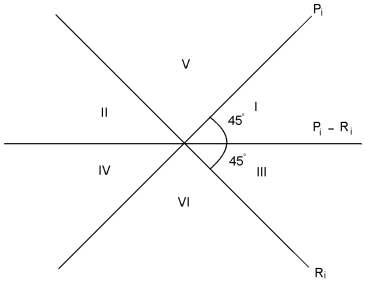
Diagnosis of Forecasting Errors

Two main methods of analyzing forecasting errors are: (1) Graphical Analysis and (2) Numerical Analysis.

GRAPHICAL ANALYSIS

One of the most popular and useful tools to analyze the pattern in forecast errors is the Prediction Realization Diagram (PRD). PRD is a plot of P_i against R_i. The predicted change is along the line that lies at 45^0 angle to the horizontal axis and the actual is plotted along a line that is inclined at 45^0 in the opposite direction. This is depicted in the following figure.

Figure 7: Prediction Realization

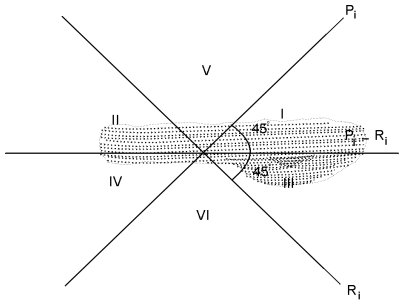


Source: Modern Portfolio Theory and Investment Analysis, Fifth Edition – Edwin J Elton and Martin J Gruber.

In the above figure, we define the different quadrants and explain each of them separately. If the forecast change in the earnings lie on the horizontal line, then it implies an exact match of the forecasted change in earnings and the actual change in earnings. If a point lies above the horizontal line, then it is an indication of high estimates. If it lies below the horizontal line, then it is an indication of low estimates. But even within this broader classification, we can further find out the forecaster's predictive ability. When a point lies between the horizontal line and the 45^0 line, then one could infer that the prediction of the forecaster about the

direction of the forecast is right but the magnitude is more than the actual. In other words, a point in the first section implies that the increase is overestimated. A point in section 2 indicates that the forecaster predicted the decrease in earnings correctly but he has underestimated the decrease. If a point lies in between the two 45^0 lines and above the horizontal axis, then it implies that the prediction of the analyst about the earnings is wrong. When the earnings actually decrease, he has predicted an increase in the earnings. Now we will see the points below the horizontal line. Consider parts marked III, IV and VI. If a point is in part III, then the prediction about an increase in earnings is right but it is an underestimate of increase in earnings. A point in part IV indicates an overestimate of the decrease. A point in part VI indicates a forecast of a decrease in earnings when there was actually an increase. Thus, parts V and VI indicate the misestimation of the direction of change in the earnings.

Figure 8: Prediction Realization Optimistic Forecaster



Source: Modern Portfolio Theory and Investment Analysis, Fifth Edition – Edwin J Elton and Martin J Gruber.

The above classification will give a hindsight about the forecast of earnings of the analyst. Let us take a hypothetical pattern about an analyst's forecasts. The following pattern shows the consistent overestimation of an optimistic forecaster. He overestimates the positive changes and underestimates the size of the negative changes. Otherwise he predicts a positive change when the changes are actually negative.

NUMERICAL ANALYSIS

Various analytical decompositions of the mean squared forecast error are possible which can provide sufficient insight about the sources of the forecasting error. Let us take two such decompositions:

1. Error based on the level of aggregation at which errors occur.
2. Forecast error in terms of the characteristics of the forecaster.

Decomposition of Error by Level of Aggregation

The first step is to determine the level of aggregation at which the errors in the forecast occurs. The earnings errors are subdivided into three parts.

$$MSFE = \frac{1}{N}\sum_{i=1}^{N}(P_i - R_i)^2 \qquad \ldots Eq.(41)$$

$$= \left((\bar{P} - \bar{R})^2 + \frac{1}{N}\sum_{i=1}^{N}\left[(\bar{P}_a - \bar{P}) - (\bar{R}_a - \bar{R})\right]^2\right) + \left(\frac{1}{N}\sum_{i=1}^{N}\left[(P_i - \bar{P}_a) - (R_i - \bar{R}_a)\right]^2\right)$$

Where,

$\bar{P}$ = Mean value of P_i across all stocks followed by all analysts

$\bar{R}$ = Mean value of R_i across all stocks followed by all analysts

$\bar{P}_a$ = Mean value of P_i for industry 'a' to which 'i' belongs. Each industry will have a different value of $\bar{P}_a$

$\bar{R}_a$ = Mean value of R_i for each industry in turn.

The first term given above is a measure of the forecast error due to the inability of the analysts to predict the average earning for the economy. This is nothing but the squared difference between the average predicted change in earnings and the realized change in earnings. The second term measures the contribution to the total error of misestimation of the differential performance of particular industries from the average for the economy. This can be explained as follows.

For each firm 'i' ($\overline{P}_a - \overline{P}$) is the difference between the average predicted change in earnings for the industry to which the firm belongs and the average predicted change in earnings for all firms. In the same way, the actual change in earnings is calculated. The difference between these two differences is calculated and summed up for all the firms in the industry. Then the mean value of this sum of the squared differences is taken.

The third term measures the inability of the analysts to predict the difference in performance of the individual stocks they follow from the appropriate industry average. The first part of the third term measures the difference between the predicted change in earnings for an individual stock P_i and the average predicted change for a stock in the industry to which it belongs. The second part refers to the deviation of the realized change in the earnings for the stock from the average realized change for a stock in the industry to which it belongs. The difference between the above two terms is squared, summed and then the mean value is taken. Tracing out the source of the error will be of great significance to the firm. For instance, if the source of error comes out of misestimated earnings, then the company should concentrate more on making the forecasts of the general economy. A higher value of the second term indicates that there is an error in understanding the economics of the substitute industries. When the value of the third term is high, then it means the inability to distinguish between the individual companies even when there are no errors in the forecasts of the economy and the industries.

Errors Decomposed by Characteristics of Forecast

This decomposition is expressed as follows:

$$\text{MSFE} = \frac{I}{N}\sum_{i=1}^{N} (P_i - R_i)^2 \qquad \text{…Eq.(42)}$$

$$\text{MSFE} = (\overline{P} - \overline{R})^2 + (1-\beta)^2\, \sigma_p^2 + (1-\rho)^2 \sigma_R^2$$

Where,

β is the slope of the regression of R on P

ρ is the correlation of P on R

σ_p^2 is the variance of P

σ_R^2 is the variance of R.

The first component in the above equation represents the bias. This measures the tendency of the average forecast to overestimate or underestimate the true average. The second component indicates inefficiency of the forecasters to be overoptimistic about the good or bad events. If beta is greater than one, then the forecasts are overestimates of earnings at high values and if beta is less than one, then it indicates that forecasts are underestimates at low values of actual earnings. The last component is the random error component. It is found from several forecasts that the large portion of the error is due to random component and not that they are unsystematic in nature. This implies that the analysts are not tempted to be over cautious or over excited about the good performance of the firms.

While it may seem indispensable to predict the accuracy of the estimates of the earnings, it is equally important to do a comparison of the forecast with some benchmark estimate. The need for benchmark becomes apparent for it is easy to predict the earnings for some of the stocks than some other stocks which are

exposed to high volatility. The absence of a benchmark would lead to a biased opinion about the forecaster who follows less volatile stocks compared to the forecaster who follows highly volatile stocks. The following reasons can be cited, in addition to the above, for setting up a benchmark:

- To adjust for the difficulty of the forecasting process.
- To develop an absolute base for comparison, so that the performance above benchmark would be interpreted as the ability to select stocks better than what is achieved by having a value of earnings estimate which is lower than the benchmark.

To evaluate the performance of the forecaster, their mean square forecast error is computed and it is compared with that of the consensus forecast. The consensus mean squared forecast error should be computed with the same set of firms for which the analyst prepared the forecasts.

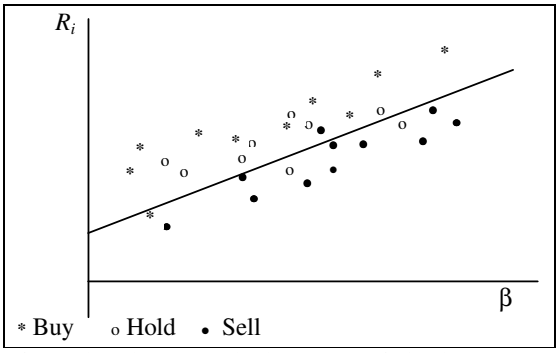
Evaluating the Valuation Process

The valuation process involves transferring the data about company fundamentals into a set of market variables. One should not fail to realize that the output from the valuation process becomes the input to portfolio analysis. The following steps are involved in the valuation process:

- Determining the predictive ability of the output of the valuation process about the future.
- Determining the predictive capacity of the output to identify the undervalued and overvalued securities.
- Determining if the optimal use of the output can produce good results.

To perform portfolio analysis effectively, one needs inputs on expected return, variances and co-variances. When the analysts provide data in this form, then many firms have a simpler form for output from the valuation process. It is a general practice in many firms that their analysts provide information to portfolio managers in the latter's decision to buy or sell or hold any security. This information will be insufficient in many cases as the portfolio managers may not be able to base their decisions on this information alone. The best solution will be to examine the performance of the three groups of stocks to see if the groupings contain any useful information. An examination of a buy-hold-sell recommendation is given below.

Figure 9: Examination of Buy-Hold-Sell Recommendations



We can infer from the above graph that most of the buy recommendations lie above the security market line and the sell recommendations lie below the line. For each of the buy and the hold recommendation, the difference between the rate of return on stock and the expected return on stock can be calculated. The mean of each group will be computed. It should be positive for the buy recommendations, approximately zero for hold and negative for sell recommendations. The underlying assumption in grouping the stocks is that equal amount is placed on each buy or sell decision. This assumption is not realistic. Nevertheless, such an assumption is useful to decide if the information is sufficient to decide to buy, hold or sell.

MINORITY INTERESTS AND DISCOUNTS

A general notion about the minority stock interests is that in a closed corporation they are worth much less than the proportionate share of the assets to which they attach. Minority (or lack of it) and marketability (or lack of it) are two distinct concepts but they are still inter-related. It is more difficult to liquidate a minority interest in a closely held company than liquidate in a controlling interest.

This section analyzes the effects of minority interest on the fair value of the firm calculated as a going concern.

The firm value usually represents the fair market value on a going concern basis. There will be certain parties that would be willing to acquire the ownership in the company at a price above the fair market value. The price paid above the fair market value is known as the premium over fair market value. The parties pay premium price as they foresee a synergistic benefit that can be derived out of the conglomeration. Hence, such buyers are called synergistic buyers. And the value they are willing to pay to acquire the firm is known as the investment value. Also, when the synergistic buyers already have a stake in the company and want to acquire additional stake at a premium, then the combined ownership is known as "acquisition premium".

The minority shareholders degree of control over the company affects the value of the company. In a closely held company, minority shareholders can act as an obstacle for the shareholders having controlling interest to exercise their power to implement policies for the benefit of the company.

The impact of minority shareholding on the value of the firm depends on the level to which the minority shareholders have a say in the policy of the company. In a closely held company, the value of the firm is discounted to a certain extent depending upon the power of minority shareholders. Also, the lack of liquidity and marketability attracts discount to the value of the firm. However, the controlling interest in the company attracts a premium, as controlling shareholders have majority rights to take important company decisions.

Significance of Control

Some of the elements of control that need to be taken care of are appointing management personnel, determining management compensation and perquisites, acquiring or liquidating assets, making acquisitions etc.

Thus, we find that the owner of a controlling interest in any firm enjoys more rights than any other owner. A control premium is defined as the additional consideration that an investor would pay over a marketable minority equity value to gain a controlling interest in the common stock of a company. Why does a controlling interest hold a higher value than a minority interest?

The buyer of a controlling interest is more influential in the framing of business policies than the buyer of a minority interest. Control premiums vary because of many factors such as the nature and the magnitude of non-operating assets, the nature and magnitude of discretionary expenses, the nature and magnitude of business opportunities which are not currently being exploited, etc. The minority stockholders' position can be explained as follows.

Minority interest holders have a limited right and can elect only a minority of the directors. If there is no practice of cumulative voting, then a minority stockholder cannot even elect a single director. When he/she does not enjoy sufficient control, then he/she cannot influence dividend payments. With in adequate control of the Board of Directors, the minority stockholder does not have a say in the corporate affairs.

Thus, we find sufficient reasons to explain the significant differences in the value of shares held by those who have controlling interest and by those who have minority interests.

Effect of the Valuation Approach on the Minority Discount/Control Premium Issue

INCOME APPROACH

The two main elements of income approach are the amount of expected economic income and a rate of return in which the economic income is discounted or capitalized. The main difference in control versus minority value in the income approach is in the expected economic income and not in the discount rate/capitalized rate.

For instance, when a public company acquires a controlling interest in another company, it is not uncommon for the acquirer to expect a higher rate of return than the cost of capital for its own publicly traded minority stock to ensure that the acquirer's existing stockholders' interests are not diluted. Though it is rational to have a lower discount rate for acquiring control as it has lower risk than that involved in acquiring a minority interest, practically no difference in the discount rate is observed.

The discount rate used should be ideally the target's and not the acquirer's. But this is applicable, only if the standard of value is fair market value. But if the standard of value is investment value, the higher the risk of the target, higher the acquirer's overall cost of capital. Therefore, the major difference between control and minority ownership in the income approach is in the estimation of economic income. If a controlling stockholder is able to enhance value to controlling shares, but unable to reflect the effect on the economic income, then the indication of value is likely to be on a minority basis, and a premium for control over the indicated value could be expected. The nature of adjustment of owners' compensation to reward for the services offered by minority ownership classifies the economic income representing a minority or control value. The justification for any control premium over the value indicated in an income approach is based on the ability of a control owner to enhance the income to control shares over and above the amounts of income already accounted for.

CAPITAL MARKET METHOD

When market conditions impose a higher value for acquiring controlling interests than that for minority interests, then a control premium is required if a controlling interest is valued. These premiums are also called acquisition premiums as they are often found to include the impact of synergies and other factors beyond pure elements of control. These premiums vary across industries, companies and time. It is imperative to analyze the market conditions at or near the valuation date when a control premium has to be added to the value arrived at from the capital market method.

MERGER AND ACQUISITION METHOD

Many of the merger and acquisition transactions are in controlling the interests. If the indication of value is developed based on merger and acquisition data, a control premium would not be an appropriate measure. If minority ownership interest is valued, then a minority interest discount would be appropriate.

ADJUSTED NET ASSET VALUE

As the decision to replace or liquidate assets or to make the appropriate use of the assets vests with the controlling interest holders, adjusted net asset value normally represents a controlling ownership interest value. When the full value of intangible assets is reflected in the net asset value, minority shares sell at a minority discount from such value.

When a minority, non-marketable interest is valued, starting from adjusted net asset value as an indicator of controlling interest, discounting can be done for minority interest first, followed by discounting for the lack of marketability. The preference of discounting depends on the type of company and the quality of the data available for quantification of the discounts for the particular type of interest.

EXCESS EARNINGS METHOD

This method is an extension of net asset value method, in that it adjusts tangible assets to fair market value and aggregates all the intangible assets' value into a single calculation based on excess earnings. As the earnings are adjusted to reflect the control rights, the excess earnings method yields a control value. When the earnings are not reflecting the prerogatives of control and the assets are not adjusted to market value, this method could yield a minority value.

Effect of Standard of Value on Minority Discounts or Control Premiums

The applicable standard of value can be classified as,

- Fair market value
- Investment value
- Intrinsic value
- Fair value.

FAIR MARKET VALUE

It is the price at which an arm's length transaction is expected to occur under normal market conditions without any bias on any particular class of buyer/seller. The discount from a proportionate share of enterprise value under the fair market value standard is large as the minority interests in closely held companies to investors are unattractive.

INVESTMENT VALUE

It is defined as the value to a particular investor taking into account investor's cost of capital, perception of risk and other unique characteristics. Because of its specific nature, the investment value of a minority interest in a certain enterprise may be equal to, greater than or less than fair market value and also equal to, greater than or less than a pro rata portion of the total enterprise value. Because of its own definition, investment value varies for each buyer or seller and hence the premiums or discounts would also vary with the individual buyer or seller. Thus, selection of a particular value, based on investment value standard is more subjective.

INTRINSIC VALUE

Otherwise known as fundamental value, it is the inherent value of the characteristics of the investment itself. This is more commonly used by public market security analysts, and hence can be perceived as a publicly traded minority value. In such a situation, a control premium becomes applicable particularly, if exercise of elements of control would enhance the value elements in the intrinsic value analysis.

FAIR VALUE

There is no unique or uniformly acceptable definition for fair value. It arises as the statutory standard of value related to appraisals under dissenting stockholders' rights or rights to dissolution.

Regulatory Impact on Minority versus Control Value

As the statutory rules related to the rights of the minority stockholders vary from one country to another, from one region to another, their impact on the values of minority interests also varies.

In some countries, a simple majority is sufficient to ratify actions such as a merger or sale of a company. Some others require a two-thirds or even greater majority to ratify such actions which implies a minority of just a little over one third has the power to block a decision on a merger or any such transaction. Thus, large minority interests are given the power of blocking a decision.

In some countries, some minority stockholders differing in their opinion about a merger decision are allowed to voice their opposition. The dissenting shareholders would have their shares appraised and be paid that value in cash. Some states require that if a minority stockholder would like to dissent to a corporate action, the decision to do so must be registered in writing at or within a few days after the shareholders meeting where the action is ratified by the majority of the stockholders.

The courts are also not in favor of dissenters' appraisal rights unless they have been admitted within the time specified in the statute.

Some other countries enable minority shares aggregating to a certain percentage of the total outstanding to enforce dissolution of the corporation under certain circumstances. However, controlling stockholders would be able to avoid dissolution by paying to those the fair value of the shares who move the courts for dissolution. In such countries, there are regulations which provide minority stockholders some control.

FACTORS AFFECTING DEGREE OF CONTROL

Distribution of Ownership

Distribution of ownership is a deciding factor in determining the degree of control in a firm. For example, if three shareholders share equal ownership, no one is said to have complete control. Everyone is in an equal position unless two of them join hands against the third. The percentage discount from pro rata value for each such equal interest would be normally smaller than that for a minority interest with no control. Each situation is different and should be separately dealt with to assess the degree of control.

Bylaws and Shareholder Agreements

Certain provisions in companies' articles of incorporation, bylaws and shareholder agreements can also affect the degree of control or lack of it for a specific block of stock or partnership interest. An analyst should be aware of such provisions in the company documents/shareholder agreements.

Potential Dilution

Whenever there is a change in the distribution of ownership either through issuance of shares or redemption of outstanding shares, there is a change in the degree of control. Degree of existing control may also be affected by issuance of stock options.

Pre-emptive Rights

A pre-emptive right is nothing but a privilege of subscription to new issues enjoyed by the existing shareholders. These rights are intended to protect the control rights of the existing shareholders.

Cumulative vs Non-cumulative Voting

In a non-cumulative voting, a simple majority of the stock enjoys the right to elect all the directors. Under cumulative voting, votes can be cumulated for a single director. That is, if the number of directors to be elected is seven, then a shareholder can cast all his votes to a single director or he can distribute seven votes in any manner. The number of shares required to elect one or more directors with cumulative voting can be calculated as follows:

$$\frac{\text{Total number of shares voting x Number of directors desired}}{\text{Total number of directors} + 1} + 1$$

Cumulative voting does not assure the minority representation on the board. Two important conditions that are required to be satisfied are: (1) Minority must have the minimum shares necessary for electing a director, and (2) Minority should cast its cumulative votes properly.

Contractual Restriction

Some contractual restrictions such as indenture provisions may pose constraints on a firm on some control rights.

Effect of Regulation

Some government regulations may affect/restrict certain control rights. Government regulations exist which prevent certain acquisitions and prevent a company from selling to some other companies or investors.

Methods of Valuing Minority Interests

1. Top down approach
2. Horizontal approach
3. Bottom-up approach.

TOP-DOWN APPROACH

Steps involved in this method are,

1. Estimate the value of the equity of the firm on control basis
2. Calculate the minority owner's pro rata interest in the total
3. Estimate the amount of discounts, if any. In addition, estimation of a further discount for lack of marketability should also be made.

Step 1

Value of a firm is defined as the value of all the classes of equity taken as a whole, assuming no long-term debt is involved. Any of the methods discussed in the earlier part of this chapter can be used to estimate the value of equity of a firm.

There is a significant difference between control evaluations and non-control evaluations due to the difference in the way business is analyzed by control buyers and non-control buyers. Control buyers analyze asset values based on only a few situations. Non-control buyers tend to place emphasis on only earnings.

Step 2

If there is only a single class of stock, (i.e., no warrants or any sort of contingent claims are outstanding) the proportionate value per share is nothing but the firm value divided by the number of shares outstanding. But when there are different classes of interests, firm value must be allocated among them thereby reflecting any dilution from any contingent interest.

Step 3

Discounting is done in two steps. In the first step, discounting is done for minority interest and then in the second step, it is done for marketability.

HORIZONTAL APPROACH

A minority interest may be valued relatively by referring to other minority interest transactions. When the value calculated using the valuation approach is a "publicly traded equivalent value", then the value needs to be discounted only for lack of marketability. If the value is compared directly with other closely held minority interests, no interests or premiums may be necessary. But in the absence of past transactions in company's own stock, it is very difficult to find reliable data on minority transactions in representative closely held company stocks.

BOTTOM-UP APPROACH

Minority interest holders realize income in the form of dividends and capital gains (proceeds on the sales). In this approach, first the dividend cash flows (timing and amounts) should be estimated followed by projection of capital gains (timing and amount). These two cash flows have to be then discounted at an appropriate discount rate, which reflects the degree of uncertainty of realizing the expected return at the time and in the amounts projected. The lack of marketability of the closely held minority interest can be captured in the discount rate.

DISCOUNTS FROM NET ASSET VALUE

Net asset value or adjusted net asset value is not equal to the value of a company's stock unless a complete asset accumulation valuation is carried out taking into account all intangible assets and all forms of obsolescence.

Adjusted net asset values are available for most publicly traded closed end investment companies including REIT (Real Estate Investment Trusts) and operating real estate companies with significant holding). If we assume that the company can be liquidated for its adjusted net asset value, then the price at which minority shares trade might be an indication of minority interest discount.

The factors identified as affecting the size of the discount are: revenues, earnings, dividend pay-out ratio and unrealized capital gains.

In many limited partnership deals, substantial discounts are involved. Most of these deals sold in public offerings fail to make to the secondary market. Hence, liquidity is very low. The lack of marketability has to be taken care of in the form of discounts.

Other Discounts

If there is any difference between voting and non-voting minority shares, then it may be mainly due to the huge size of the block and the distribution of ownership. Impact of voting rights on the stock's value is based on the extent of control. There is sufficient empirical evidence that for small minority interests, the market assigns an insignificant value to voting rights. In the absence of cumulative voting, if one stockholder has complete control, then it becomes very difficult to infer if minority shares are voting or non-voting. If voting stocks have some restrictions attached to them based on agreements which make them non-voting, then voting rights will not have any impact on valuation.

If the block of stock that is to be sold is of a huge size, then it becomes difficult to sell without a discount. This concept may not be applicable directly to closely held stocks as there would not be any record of average trading volume for comparison purposes.

There may exist some businesses that depend on a few key people or a single key person. The actual or potential lack of availability of the key person's services may be perceived to affect the performance of the company and hence in such cases a higher discount may be warranted. An appraiser, while determining the discount, should take into consideration the following:

- Deceased executive's actual duties and areas of active involvement.
- Ability of existing successor management to move up the organizational ladder.
- Compensation necessary for replacing the key executive or filling the vacancies created by those who move up the hierarchy.
- Damages that are likely to arise from risks which the company is exposed to as a result of change in the key position.

The remedy for offsetting these losses is: Insurance of the key person's life and stopping of compensation other than mandatory payable obligations to the deceased person. Adjustment of normalized earnings or price-to-earnings multiples is required in valuation. Alternatively, the loss can be deducted from the company's indicated value as a separate item similar to the discount for lack of marketability.

Portfolio Discount

It is a discount for a company that owns two or more unidentical operations and/or assets that do not necessarily fit well together. This is important because the buyer may not be interested in these diversified operations of the company and hence may seek a discount in this regard.

SUMMARY

- Apart from the basic dividend discount models, there are several kinds of models available to measure the value of a stock based on different assumptions for calculations. Some of them are Gordon model, Two-stage dividend discount model, H-model and Three-stage dividend discount model.
- Gordon model assumes a constant growth rate over a long-term. This is a very popular equity valuation model. However, there are certain limitations of Gordon model.
- The two-stage dividend discount model assumes two stages of growth; the first stage in which the growth rate is high, and the second stage which represents steady rate in which the growth rate is assumed to be stable and is expected to continue for the long-term.
- H-model is similar to the two-stage model except that a gradual change in the growth rate is assumed rather than a sudden change. This model is best suited to those firms, which have high growth rate in the beginning and a gradual decline in the growth rate over a period of time.
- There are three measures of relative value, which are widely used to calculate the relative value of common stock. They do not give absolute value of common stocks like dividend discount model.
- The dividend discount model formulas can be modified to calculate the price-earning ratio of the firm showing stable growth rate. There are some inherent problems in using the P/E ratio, which mars its utility. P/E ratio is not a meaningful tool to calculate the relative value when EPS is negative. Again P/E ratio may have wide variation over time depending on the variability of earnings.
- Price/Book value ratio helps the investor in identifying the undervalued/ overvalued stock. The price to book value ratio for a stable growth firm is calculated from the price of the stock determined as per the Gordon model whereas the two-stage growth dividend discount model is used to calculate P/BV of a high growth firm. The disadvantage of P/BV ratio is that book values are influenced by the method of depreciation used; also, if the firm does not have significant fixed asset, the book value may not be the optimal tool to measure the relative value.
- Price/Sales ratio can be estimated using earning growth rate, payout ratio and risk. The advantage of using the P/S ratio is that it can never be negative. It is not influenced by any accounting methods and it is not as volatile as the P/E ratio. The biggest limitation of this measure is that though revenues are considered to be more stable than earning, the revenue may not be affected when the earning and value may drop suddenly in case the firm faces problems in cost control.

Chapter IX

Technical Analysis

After reading this chapter, you will be conversant with:

- Concept of Technical Analysis
- Fundamental Analysis vs Technical Analysis
- Technical Trading Rules and Indicators
- The Dow Theory
- Charting
- Price Patterns
- Trendlines
- Advanced Technical Tools
- Pitfalls in Interpretation of Charts

Introduction

Investors may adopt two different approaches to equity investment. They may buy stocks at a certain point of time and simply hold these stocks over a period of time, without restructuring their portfolio. Such a passive approach to investment is also called the 'buy and hold' policy. Alternatively, investors may adopt an active investment strategy, constantly evaluating their holdings, and reshuffling the stocks they hold. This approach requires constant evaluation of the market. It is a well-established fact that stock markets also portray cyclical movements similar to business cycle. An active investor who is able to identify the turns in the market would be able to buy at bottoms (low prices) and sell at peaks (high prices) and make substantial gains out of cyclical investments.

CONCEPT OF TECHNICAL ANALYSIS

In practice, however, such gains can be registered only if an investor is able to consistently buy and sell at turning points, and if the gains are substantial enough, then it will be useful to cover transaction costs and taxes. Suppose an investor plans his strategies on the basis of his prediction of cyclical trends, he will be able to take an investment decision only after a 15% price movement occurs from, say, a peak or trough. Even then, he may register substantial gains over the buy and hold strategy. Technical analysis is the study of technical characteristics which may be expected at major market turning points, and their objective assessment.

According to technical analysts, the cyclical trend visible in the movement of stock prices is due to the changes in the attitude of investors, reflected in changes in the demand for and supply of securities. The previous turning points are studied with a view to develop some characteristics that would aid identification of major market tops and bottoms. It is assumed that human reaction to similar situations is by and large consistent and recurrence of a certain characteristic is expected to spur a similar, though not identical, reaction.

Technical analysts have developed tools and techniques to study past patterns and predict future price. The basic assumptions underlying technical analysis are as follows:

- Market value is determined solely by the interaction of supply and demand.
- Supply and demand are governed by numerous factors, both rational and irrational.
- Ignoring minor fluctuations in the market, stock prices tend to move in trends which persist for an appreciable length of time.
- Changes in trend are caused by shifts in supply and demand.
- Shifts in supply and demand, no matter why they occur, can be detected sooner or later in charts of market value.
- Some chart patterns tend to repeat themselves.

Unlike fundamental analysis where factors like earnings of the company, its management, products, etc., are studied, technical analysis is based purely on study of the behavior of past prices. The supply and demand for a security is supposed to have incorporated not only the fundamental factors, but also the psychological and behavioral factors. While fundamental analysis is directed towards determining the intrinsic value of a security, technical analysis is directed towards predicting the price of a security. The price at which a buyer and a seller settle a deal is considered to be the 'one precise figure' which synthesizes, weighs and finally expresses all factors, rational and irrational, quantifiable and non-quantifiable, and is the only figure that counts. The spirit of technical analysis can be summed up thus: "The going price as established by the market itself comprehends all the fundamental information which the statistical analyst can hope to learn (plus some which is perhaps secret to him, known only to a few insiders) and much more of equal or even greater importance".

FUNDAMENTAL ANALYSIS VS TECHNICAL ANALYSIS

While fundamental analysis serves as a guide to an investor in stock selection, technical analysis serves as a guide to decide on the timing of a stock purchase/sale. Technical analysts are of the opinion that when fundamental analysts are supplied with an adequate information to make them analyze the firm's fundamentals, they will be able to achieve above average returns. But the fundamental analysts in addition should be provided with new information ahead of other investors to enable them achieve superior returns. While fundamental analysis is based on the financial statements of a company and the related industry, technical analysis is independent of these financial statements.

Problems encountered by technical analysts are:

- They do not get adequate information about individual product service from the financial statements on certain parameters like sales, general expenses, etc.
- Different corporations follow different procedures for reporting expenses, assets or liabilities while they still adhere to GAAP (Generally Accepted Accounting Principles) norms. These differences pose difficulty in comparing the statements of two firms in the same industry.
- Psychological factors and some non-quantifiable factors such as goodwill, investor confidence, etc., do not find a place in the financial statements.

Thus, technical analysis places more confidence on market related information such as security prices, volume of trading, etc., than on information in the financial statements. However, this requirement of technical analysis calls for quick responses from the technical analysts to the changes in the market related information. Technical analysts should be quick enough to catch up with the market to stay in the race.

However, some problems are involved in using fundamental analysis for valuation, which have popularized technical analysis. The significant among them are:

- Fundamental analysis involves compilation and analysis of huge amount of data, and is therefore, complex and time consuming.
- Even if an analyst identifies an underpriced security, market may take time to bid its price up.
- Gains, therefore, may be realized very late, before which certain fundamental factors may undergo change.
- Financial statements, which provide the basic inputs for fundamental analysis, are plagued by certain deficiencies like subjectivity, inadequate disclosure, etc. These factors affect the quality of fundamental analysis.

Technical analysis is not based on a strong conceptual framework, but depends fully on the use of historical trends to predict future prices. Though technical and fundamental analyses provide diagonally opposite approaches to valuation, in practice, a judicious blend of the two approaches is attempted to arrive at better results.

Technical analysis is done from four important view points, viz:

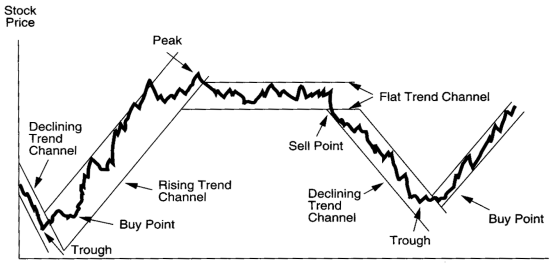
- ***Price:*** Changes in price reflect changes in investor attitude and demand for and supply of securities.
- ***Time:*** The degree of movement in prices is a function of time. The longer it takes for a reversal in trend, the greater the price change that would follow.
- ***Volume:*** The intensity of price changes is reflected in the volume of transactions that accompany the change. An increase in price accompanied by a low volume implies that the change is not strong enough.
- ***Breadth:*** The quality of price change is measured by studying whether a change in trend spreads across most sectors and industries or is concentrated in a few scrips. Study of the breadth of the market indicates the extent to which price changes have taken place in the market in accordance with a certain overall trend.

We shall discuss in detail the tools and techniques of technical analysis in terms of the above dimensions.

TECHNICAL TRADING RULES AND INDICATORS

A model of stock price cycle is shown in Figure 1 which could serve as an overall picture of the stock market cycle or for an individual stock.

Figure 1



Source: "Investment Analysis and Portfolio Management" by Frank K Reilly and Keith C Brown.

End of declining market or a bear market ends in a trough followed by an upward trend that passes through the declining trend channel. When the trend is reversed, it will confirm a buy signal. When the reversal of the trend occurs at this stage, technical analysts would buy stocks in general or an individual stock that display such a pattern.

When the stock price is rising, the technical analyst would hold the stock(s) till the expected peak level is reached. He/she would normally sell at the peak which would be evident again only at the time of reversal of the trend. If the market starts trading in a flat pattern, it will come out of its rising trend channel. At this juncture of trend reversal, some technical analysts would sell, with most of them holding still to find out if the stock experiences a period of consolidation and then breaks rising again. If the stock breaks out on the downside, it will be construed as a sell signal and a declining trend channel is anticipated. The next buy signal would be after the trough when the declining channel is broken and a rising trend is established. Later in this chapter, we will discuss about the method of detecting these changes in the trend and the significance of volume of trading in technical analysis.

A number of technical trading rules exist and each one of them has to be interpreted differently. Though a majority of technical analysts keep track of alternative rules and decide on a buy or sell decision based on a consensus of the signals, a complete agreement of all the rules is not common.

Techniques of Trading Rules

CONTRARY-OPINION RULES

This is based on the premise that the technical analysts tend to act in the opposite direction of the majority of investors. When the investors are bullish, technical analysts are bearish and vice versa.

MUTUAL FUND CASH POSITION

This serves as a good proxy for the technical analysts following contrary opinion rules. These technical analysts are of the opinion that mutual funds do not adopt the right strategy during peaks and troughs. Mutual funds hold cash for the following reasons:

- To meet the payments towards the purchase of securities from the investors when they sell back to them.
- Idle cash which is yet to be invested.
- Bearish outlook of the fund managers may trigger them towards the maintenance of extra cash as a defensive strategy.

Whatever be the reason, mutual funds are known to maintain a high percentage of cash near the trough of a market cycle. This implies that they are bearish and they should be fully invested to take advantage of the expected market rise. But at the peak, technical analysts expect mutual funds to hold a low percentage of cash. This indicates a bearish outlook by the mutual funds and they would be selling stocks and realizing gains on some part of their portfolios. Similarly, if mutual funds maintain a high cash position, it will signify a bullish attitude by the mutual funds and they are expected to engage in buying stock with excess cash. Contrary-opinion technicians would keep a close watch on the cash position of the mutual funds and would act in the opposite direction.

CREDIT BALANCES IN BROKERAGE ACCOUNTS

Brokerage accounts are left with credit balances when the investors sell stocks and leave the proceeds with brokers for a brief period of time till some other stocks are purchased or such funds are withdrawn to be invested elsewhere. Technical analysts view these credit balances as pools of potential purchasing power. In addition, if there is any drop in these balances, it is interpreted as a bearish signal indicating lower purchasing power as the market approaches a peak. Similarly, an increase in credit balances can be viewed as an increase in buying power and thus indicating a bullish signal.

INVESTMENT ADVISORY OPINIONS

If a majority of investment advisors share a bearish attitude about the market, then the technicians expect a market trough and the onset of the bull market. As most investment advisory services are expected to follow the trend, the number of bears will be more when market bottoms are approaching. This trading rule is developed based on the ratio of the number of advisory services to the number of services expressing an opinion. For instance, a "bearish sentiment index" of 60 would indicate that a bearish attitude is prevalent among advisory services and the contrarians would therefore consider this a bullish indicator. Similarly, when the bearish sentiment index falls below 20%, it indicates the prevalence of a bullish attitude among advisory services and the contrarian would therefore act according to their bearish sentiment.

OTC VS NYSE VOLUME

Another measure usually followed by technical analysts is the ratio of OTC volume on the NASDAQ system to NYSE volume. This ratio is used by them for speculative trading.

CHICAGO BOARD OPTIONS EXCHANGE (CBOE) PUT/CALL RATIO

CBOE equity put/call ratio is another tool used by contrary-opinion technicians. Put options (which give the holder the right to sell stock at a specified price for a given time period) are used as signals of a bearish attitude. Higher the put/call ratio, more pervasive the bearish attitude and hence this will serve as a bullish indicator for the contrarians.

FUTURES TRADERS BULLISH ON STOCK INDEX FUTURES

The proportion of speculators in stock index futures who are bullish is also used as one of the tools by the contrarians.

FOLLOW THE SMART MONEY

A set of indicators that indicate the behavior of smart, sophisticated investors. These indicators are constructed by some technical analysts to create some rules to follow them as explained on the next page.

Confidence Index

It is the ratio of Barron's average yield on 10 top-grade corporate bonds to the yield on the DowJones average of 40 bonds. This ratio is always less than one as the yields on high-grade bonds always should be lower than those on a large cross section of bonds.

When this ratio is high, it is interpreted to indicate a bullish signal. This is because when investors are confident, they are expected to invest more in lower-quality bonds for the added yield. Because of this attitude of the investors, there will be a decline in the average yield for the large cross-section of bonds relative to the yield on high-grade bonds and hence the ratio is high. The opposite holds good when investors are pessimistic and hence the index will be low.

But the flaw in this approach is due to the assumption that bond investor behavior is solely determined based on demand, i.e., changes in the yield spread are caused by changes in investor demand for different quality bonds. This ignores the supply factor which also plays a vital role in determining the yield differences. A change in the supply of bonds can cause the series to generate a false signal about the confidence in the investors.

T-Bill – Eurodollar Yield Spread

This is another measure of investor confidence based on the spread between T-bill and Euro dollar rates. It is observed that during times of international crisis, this spread widens as money flows to the US T-bills increases causing a decline in the ratio. This would serve as a leading indicator of stock market trough which is expected to occur subsequently.

Short Sales by Specialists

Specialists trading on the exchange often engage themselves in short sales for market making purposes. They often exercise their discretion in this area when they feel strongly about future expected market changes. For technicians, a value below 30% of specialists would be minimizing their participation in short sales. When the ratio crosses 50%, then a bearish market is expected to prevail.

Debit Balances in Brokerage Accounts (Margin Debt)

When money is borrowed by the investors from their brokers, brokerage accounts show debit balances. These balances represent the attitude of investors who involve themselves in margin transactions. Therefore, any increase in debit balances would indicate a bullish sign. On the other hand, a decline in debit balances would indicate a bearish sign.

OTHER MARKET ENVIRONMENT INDICATORS

- **Breadth of Market:** It measures the ratio of number of issues that have increased in price each day to the number of issues that have decreased in price. This is useful in explaining the cause of a change of direction in DJIA or the S&P 500 index.
- **Short Interest:** It is the cumulative number of shares that have been sold short by investors and not covered. The short interest ratio is calculated by the technical analysts as a ratio of outstanding short interest to the average daily volume of trading on the exchange.
- **Block Uptick-Downtick Ratio:** As nearly 50% of trade volume in NYSE is done by block trading by institutions, the exchange can determine the direction of price change accompanied by a particular block trade relative to the price of the prior transactions. If the block trade price is higher than the prior transactions, then it is known as uptick. On the other hand, if the block trade price is lower than that on the prior transactions, then it is known as downtick.

When the block trade is initiated by a buyer, then one can expect an uptick, if it is initiated by a seller, then one can expect a downtick. Uptick-downtick ratio, thus, would indicate institutional investor sentiment. If the ratio is around 0.7, then it indicates a bullish condition and if it is around 1.1, then it indicates a bearish sentiment.

THE DOW THEORY

The Dow Theory, originally propounded by Charles Dow in 1900, is one of the oldest methods of identifying trends in the stock market. The basic principles of technical analysis originated from this theory. In a nutshell, this theory seeks to study the major movements in the market with a view to establish trends. Until a reversal occurs, a trend is assumed to exist. It should be noted that the Dow Theory only describes the direction of market trends, and does not attempt to forecast future movements or estimate either the duration or the size of such market trends. [However, subsequent analysts like Robert Rheas who provided a formalized account of the theory ('The Dow Theory', 1932) attempted to measure size and duration of trends proposed by Dow.] The theory uses the behavior of the stock market as a barometer of business conditions, rather than as a basis for forecasting stock prices themselves. It is assumed that most of the time a majority of the stocks follow the underlying market trend. Therefore, the postulates of the theory were framed with reference to market indices, specifically constructed to measure market trends. (The Dow Jones Industrial Average, one of the popular market indicators in the United States, was one such index developed by Charles Dow.)

The six basic tenets of the Dow Theory are as follows:

THE AVERAGE DISCOUNTS EVERYTHING

The aggregate judgment of all stock market participants, regarding both the current and potential changes in the demand-supply relationships of stocks, is reflected in the share prices. In other words, the share prices that are determined in the market evolve out of a discounting process that takes all known and predictable factors into account.

THE MARKET HAS THREE MOVEMENTS

The Dow Theory classifies the movements in stock prices into:

a. Primary movements
b. Secondary reactions
c. Minor movements.

Primary Movements

Primary movements, which last from about a year to several years, represent the major market trends. It can either be a rising (bull) trend or a falling (bear) trend. A primary bear market trend can be seen as a long decline, interrupted by some rallies. (A rally is an increase in price that occurs after a falling trend in prices.) It is important that, though a few rallies have occurred, the long-term trend in prices is bearish. A primary bull market trend is a broad upward movement interrupted by some reversals. (A reversal is a decrease in price that occurs after a rise in prices.) Primary trends are thus, long-term movements in prices, interrupted by swings in the opposite direction.

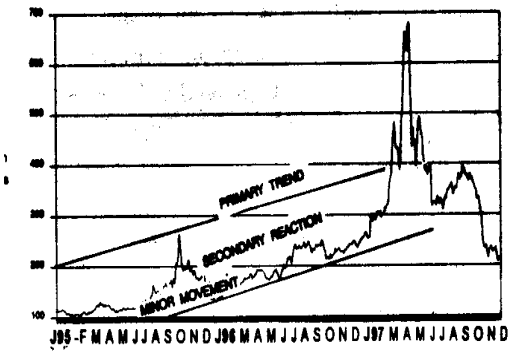
Secondary Reactions

A secondary or intermediate reaction is defined as '....an important decline in a bull market, or advance in a bear market lasting from three weeks to as many months, during which interval, the movement generally retraces from 33 to 66% of the primary price change since the termination of the last preceding secondary reaction' (Robert Rheas, Dow Theory, 1932). Sometimes, a secondary reaction almost wholly retraces the primary trend. Where the reaction is more than 50% of the preceding primary trend, technical analysts find it difficult to say whether the reaction is indeed secondary, or if it signals a new primary trend in the opposite direction.

Minor Movements

Movements in prices that form only a part of a primary trend or a secondary movement are called minor movements. They have no implication on long-term forecasting, though short-term investors tend to manipulate them to some extent. Figure 2 provides an illustration of the three trends in prices.

Figure 2



PRICE ACTION DETERMINES THE TREND

A trend can be called primarily bullish when successive rallies lead to peaks that are higher than the preceding ones, and when troughs reached by the intervening secondary reactions are above the preceding troughs. Similarly, a bearish trend is marked by a series of descending peaks and troughs. A reversal in primary trend is indicated when the above tenet does not hold.

Figure 3a

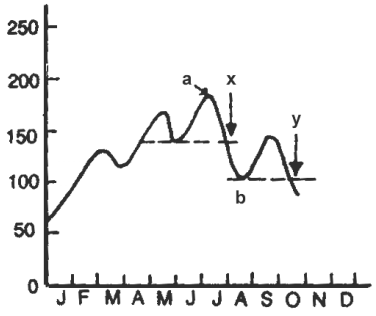


Figure 3b

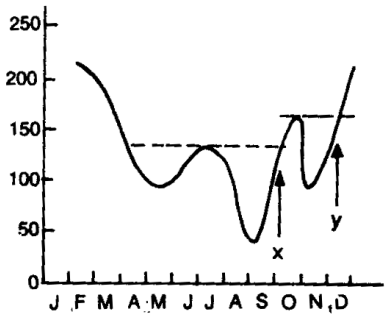


Figure 3 illustrates reversals implied by this tenet of the Dow Theory. Figure 3a shows a bull market interrupted by reactions. A reversal occurs at point 'a' when the rally does not surpass the previous peak. The reversal is confirmed by the next decline, as the trough lies at point 'b' much below the previous trough. A Dow theorist considers penetration at point X to indicate a bear market. More conservative analysts, however, await a rally or penetration of previous trough at point Y. Similarly, Figure 3b illustrates a change in a primarily bearish trend.

As was stated earlier, it is very important to distinguish between a secondary reaction, and a reversal in primary trend. Technical analysts generally measure the depth of the reaction to confirm whether a reversal is actually a signal to a new trend or not. It is also seen that the secondary reaction that is deep enough, lasts for at least 3 to 4 weeks, and is confirmed by vital changes in volume of shares traded.

LINES INDICATE MOVEMENT

In certain cases, price movements which initially look like secondary reactions persist within a narrow range, forming what is called in technical parlance a 'line'. A line is formed by price movements within a range of 5% of its mean average (see Figure 4a). This is called an 'accumulation' (where a 'line' is formed in between a primary bear trend) or a 'distribution' (where a line is formed in between a primary bull trend). If prices advance above an accumulation, it marks a reversal in the bearish trend; if prices continue to fall after an accumulation, the line is only a consolidation of the bearish trend, and is only a horizontal secondary movement. The converse is true for a distribution.

Figure 4a

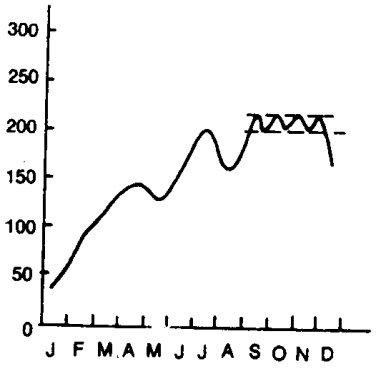
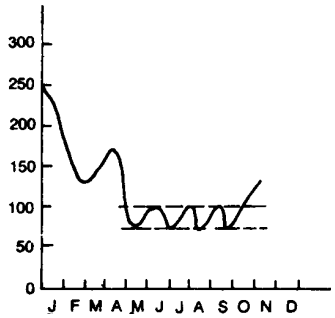


Figure 4b



PRICE/VOLUME RELATIONSHIPS PROVIDE BACKGROUND

The relationship between share prices and volume of shares traded is very important in technical analysis. Volume is normally expected to complement the movement in prices. A reversal in trend is signaled if a dull volume accompanies a rally, or a high volume, a downtrend.

THE AVERAGES MUST CONFIRM

The Dow Theory was illustrated, as we noted earlier, with the help of a few indices/averages constructed for the purpose. An important tenet of the theory is that the averages must conform each other. If the market is truly a barometer of future business conditions, the industry averages and market averages should by and large move together. This principle has been tested in the United States where averages that are industry specific (like the Transportation Average) exist. In the Indian context, all indices that are widely used, measure the overall market trend. This principle, therefore, is yet to be tested in India.

The Dow Theory is widely applied by technical analysts and has stood the test of time. However, one criticism against the theory is that it helps in recognizing reversals in primary trends a bit too late. It is estimated that the theory confirms a reversal in trend often 20 to 25% after a peak or trough has occurred. The tenets of the theory have, therefore, been supplemented by use of other information, the most important of them being dividend yield. One rule of thumb widely used in the Wall Street is that a 3% or a higher fall in dividend yield indicates maturity of the bull market, and a 6% or a higher rise in the dividend yield is said to be the end of a bear market.

In brief, it may be said that the Dow Theory concerns itself with determining the direction of the primary trend of the market; the identification of the phases of the trend, and any possible divergence in trend. Where the movement of share prices provides inconclusive evidence, supplementary information is used to make decisions.

CHARTING

The basic tool in technical analysis is movement in prices measured by charts. It is for this reason that the technical analyst is sometimes called the "Chartist". Three types of charts that are commonly used are:

a. Line Chart

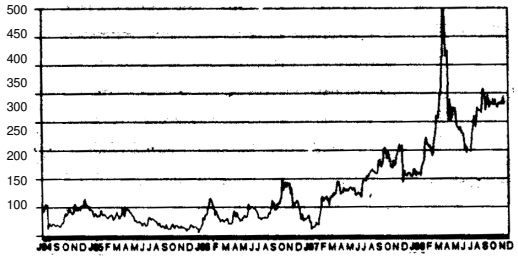
b. Bar Chart

c. Point and Figure Chart.

Line Charts

Line charts are simple graphs drawn by plotting the closing price of the stock on a given day and connecting the points thus plotted over a period of time. The charts are easily drawn and widely used in technical analysis. The price is marked on the Y-axis and the period of time on the X-axis. Line charts help in easy identification of patterns. (See Figure 5 for a typical chart.)

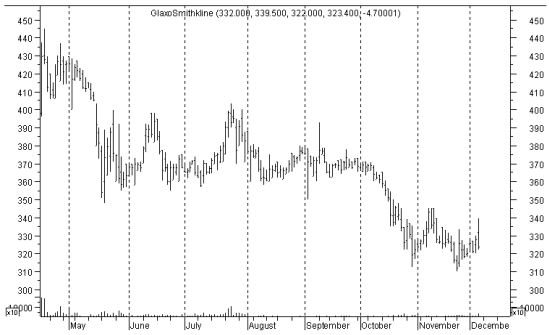
Figure 5



Bar Charts

In order to draw a bar chart, the data on a day's high, low and closing prices are necessary. To plot a stock's price movement, the high and low reached on a said day is marked and connected by a vertical line. The closing price is indicated by a small horizontal tick on this line. (See Figure 6 for a typical bar chart.)

Figure 6



Point and Figure Charts

Though the Point and Figure Chart (hereinafter referred to as PFC) is not as commonly used as the other two charts, it differs from the others in concept and construction. The construction of the PFC is discussed in detail.

While the line and bar charts are plotted at specific time intervals, the PFC does not have a time dimension. A PFC concerns itself only with the measurement of prices. Further, a PFC does not measure every movement in price. Unlike a bar chart, PFC records changes in prices that are larger than a specific amount, called points. For example, a PFC can be constructed to measure changes in prices over and above Rs.2. Such a chart is called a 2-point chart. It is a common practice to use 1-point charts for shares with face value of Rs.10, and 3-point charts for shares of Rs.100.

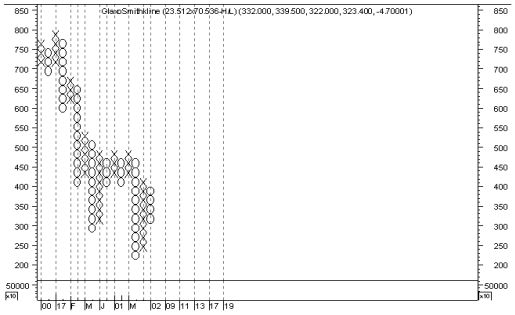
For plotting indices, a 10-point or a 20-point chart may be constructed. As the size of a point decreases, the details of even minor fluctuations in the graph drawn increases and vice versa. Some chartists chart graphs with varying point sizes for the same stock for better analysis. The decision about the size of a point is essentially based on price range and degree of volatility of the stock.

Construction of a PFC involves the use of 2 symbols –'X' and 'O'; while 'X' indicates increase in prices, 'O' indicates downward movement.

PFCs are plotted on cross-section paper that has arithmetically ruled squares. Suppose a 2-point PFC is to be plotted. The graph may begin by recording the price at a chosen level. Across the price levels marked on the Y-axis, either 'X' or 'O' is marked for the beginning price. Subsequent change in price level is noted. If the price increases, for every increase equal to or over Rs.2, an 'X' is marked on the same column if the chart began with an 'X' mark for the beginning price level. A decrease in price equal to or above Rs.2 is treated as a change in direction. The chartist shifts to the next column and marks a series of 'O's to indicate the magnitude of fall in prices. No marking is made if prices remain at the same level or if changes are less than Rs.2. Prices are marked in the same column irrespective of the time period as long as the direction of change remains unaltered.

A typical Point and Figure chart looks as follows:

Figure 7



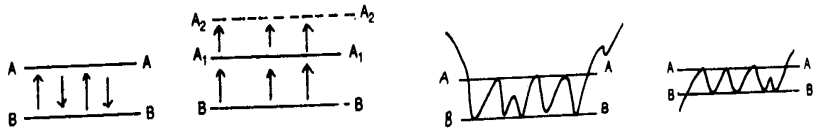
PRICE PATTERNS

The cyclical trends in prices are of utmost interest to the technical analyst who looks at them with a view to forecast trend reversals preferably in advance, or at least before the reversal is complete. It can be observed that share prices do not always switch from a bullish phase to a bearish phase, or vice versa almost overnight. The transitional period which lies in between the two trends, throws up indications as to the direction of price change. The concept of price patterns is based on the invariable occurrence of a transitional phase, which shows up as an intermediate trend, in between two major trends. In a rising market, prices increase as the buyers' optimism about the market outweighs the cautiousness of the sellers. The uptrend subsequently slows down either because buyers are booking gains, or because the balance tends to get even with the sellers exerting more pressure. At the end of this exercise, the market either continues to surge ahead or turns down due to increased selling pressures. Sometimes, a highly emotional market changes without warning. These instances, however, are only exceptions to the rule.

According to the technical analysts, the transitional phase is marked by clearly discernible price patterns which signal (a) The end of a bull/bear market, (b) The reversal in trend, (c) The magnitude and direction of the new trend, and (d) Confirmation of the new trend.

In order to explain this concept of transition, Martin Pring[1] likens the 'battle' between buyers and sellers to one fought by two armies engaged in trench warfare. Figure 8 illustrates the behavior of prices in the transitional period.

Figure 8a **Figure 8b**



1 Pring Martin J, Technical Analysis Explained, McGraw-Hill, Page 42.

In Figure 8a, one finds armies A and B facing one another in a position of attack. AA and BB are lines of defense of the armies A and B respectively. The arrows indicate attack on the opposite side's line of defense. If army B, for instance, manages to push through the line AA, army A is forced to retreat to line A_2A_2. In the stock market, line AA represents selling resistance, which once overcome signifies a change in balance between buyers and sellers, in favor of the buyers. If the price line, after meeting resistance for a while, penetrates the line of defense, it is most likely to advance quickly until a new line of defense is met. Army B may penetrate defense A_2A_2 also, but if it continues to advance without waiting to consolidate its position, the possibility of receiving a serious setback is high. In the stock market also, a rising trend arrested by reactions all along the way is more dependable than an unchecked rally.

The transitional period, as we already noted, may end either in reversal as explained above, or mean a consolidation of the existing trend. In case the price moves in the same direction after the transition, it is difficult to say during the period of formation in which direction the breakout would occur. The army B, in our example, may either advance after an attack on line A_2A_2 or may retreat when army A breaks through the line of defense of army B. It is, therefore, assumed that a prevailing trend continues to exist, until it is proved to be reversed.

The following are important principles to be borne in mind, while analyzing price patterns:

i. The significance of a pattern is a direct function of its size and depth. The longer a pattern takes to complete, and greater the price fluctuations within the pattern, the more substantial the ensuing move is likely to be.

   The fluctuations that occur indicate the combat between buyers and sellers. The longer it takes for prices to break through a pattern, the greater is the significance of the penetration.

ii. The longer it takes for prices to move out of the pattern, the stronger is the base of the new trend.

   This is due to the presence of both uninformed investors and professionals in the market.

   When the prices hit a new low, uninformed investors panic, and start selling. Professionals would, however, accumulate stocks in anticipation of improved conditions in the future. The stocks, therefore, move from weak to strong hands. The reverse process occurs at the market tops. The professionals who accumulated stocks at the bottom, sell to uninformed investors who are attracted by the rising prices, and buy these stocks.

   Thus at market bottoms, the base from which prices rise is strong, as most of the stocks have moved into the hands of professionals. At market tops, the reverse is true as most stock is in the hands of less sophisticated investors, and triggers a sharp fall in prices.

iii. Price patterns offer certain forecasting possibilities, because the duration of a trend can be measured, with a certain level of accuracy, on the price charts.

iv. A valid breakout can be confirmed, in most cases, if the penetration of the boundaries of a pattern are marked by a price change equal to or more than 3%.

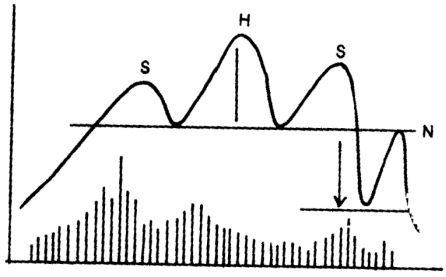
v. The validity of a breakout should be confirmed by volume statistics. Volume advances with rising prices and declines with falling prices. A divergence from this relationship throws up important signals.

We shall now discuss some of the widely used price patterns.

Head and Shoulders

This pattern is by far the most reliable, and widely used, of all reversal patterns. This pattern occurs at the end of a bull market and is characterized by two smaller rallies flanking a higher rally just as the head lies in between two shoulders. A typical head and shoulder formation is shown in Figure 9.

Figure 9

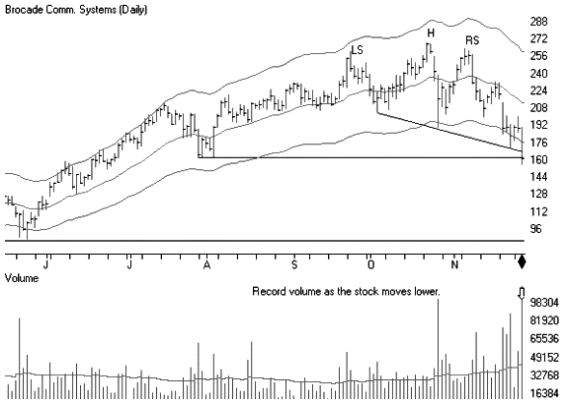


In reality, however, the shoulders are not always symmetrical. This does not, in any way, alter the signals provided by the pattern. The important requirement is that the shoulders should be at lower levels than the head. The left shoulder signifies the penultimate rally in the bull market. The right shoulder confirms the beginning of a bear market, as it fails to climb above the previous rally (the head). The formation is easily discernible, once the right shoulder is formed. The line that joins the points from where the final rally (head) begins and ends is called the neckline. A trend reversal almost always occurs when the neckline is penetrated by the price line. The technical analyst sells when the price falls at least by 3% from the point of penetration of neckline. The possibility of price line hovering around the neckline, or rising after a penetration, is very rare, making this pattern the most reliable indicator of the onset of a bear market.

Volume characteristics have to confirm the reversal signaled by the head and shoulders formation. Volume is very heavy at the left shoulder, and continues to rise, albeit at a lower rate at the head. The formation of the right shoulder is accompanied by a noticeably low volume.

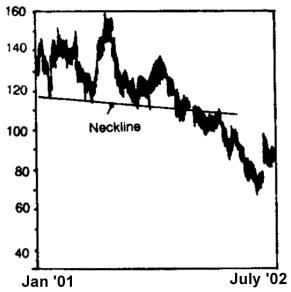
The formation also provides scope for measuring the extent of fall in prices. The prices are expected to decline after the penetration at least as much as the distance between the head and the neckline. The head and shoulders pattern may be formed over short periods of a few weeks, or take even years to emerge. As noted earlier, longer the period, greater the distribution of the pattern, and stronger the ensuing bear trend.

Figure 10



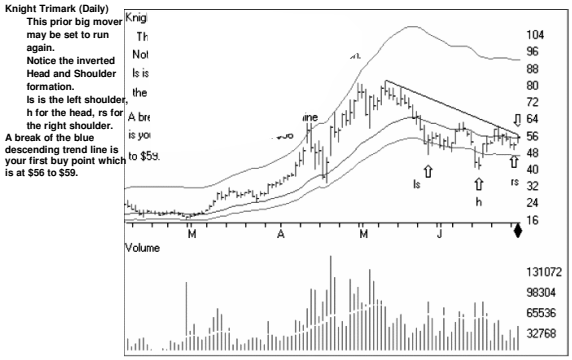
The price chart in Figure 10 illustrates a head and shoulder formation that extended over six months. The neckline has been penetrated, after which, a sharp fall in price is seen. Also, note that volumes confirm the pattern by reaching the peak at the left shoulder formation and tapering off after right shoulder emerges.

Figure 11



Sometimes, one can see more than one shoulder on either side of the head. Although these represent prolonging of the distribution at the end of a bull market, reversal is signified once the right shoulder is clearly visible. Figure 11 illustrates such a clustered head and shoulders pattern.

Figure 12



Head and Shoulders pattern occurring at market bottoms indicates a reversal and is called 'inverted head and shoulders'. Volume is high at the bottom of the left shouloder and significantly contracts during the formation of a right shoulder. The bull market is heralded when the neckline is penetrated. Figure 12 illustrates the inverse head and shoulder pattern.

Sometimes, a head and shoulder formation is seen, but the price line either fails to penetrate the neckline, or rallies immediately after penetration. Though this pattern called head and shoulders failure is very rare, it is followed by a very strong rally. It is, therefore, advisable to wait for a decisive breakout, and see whether volume characteristics confirm the pattern or not.

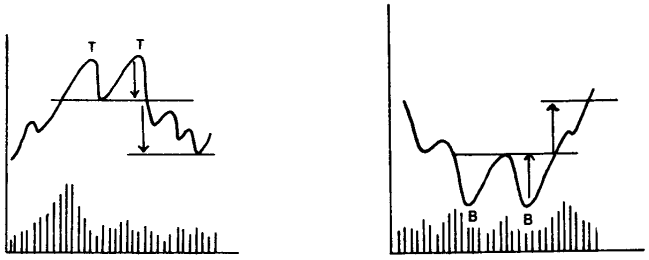
Double Tops and Bottoms

When prices are found to react after rallying up to a certain level, technical analysts watch the rallies with caution. If subsequent rallies also fail to rise above the previous highs, a level of resistance is found to be developing. A classic pattern that indicates such a tendency is the "Double Top" formation.

A double top is formed when prices reach the previous high, and react immediately, the two highs reached being almost at the same level. Two peaks at comparable heights are seen with a reaction forming a valley in between them. The prices breakout into a bearish phase, once they penetrate the neckline drawn across the bottom of the intervening reaction. The measuring implication is similar as for the head and shoulder formation. If the price line falls from the neckline by a distance equal to the distance between the peak and the trough, the indication is to

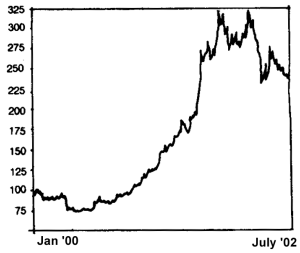
sell. Volume is found to be distinctly low at the second top. A double bottom is just the reverse of a double top and occurs at the end of a downtrend in prices. (Figure 13 is a typical example of a double top and a double bottom).

Figure 13a **Figure 13b**



Sometimes, the tops and bottoms are not found at exactly equal levels. All the same, these formations provide valid reversal signals. Sometimes, the patterns extend to form triple tops or triple bottoms.

Figure 14



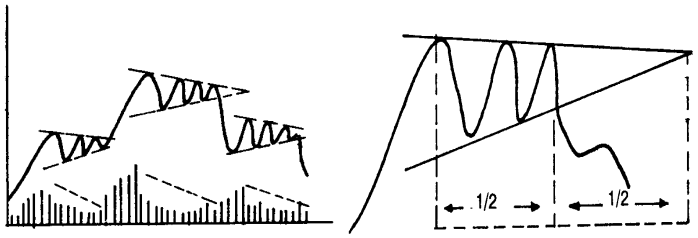
While identifying double tops and bottoms, it must be remembered that longer it takes for the second top (bottom) to appear, and deeper the intervening valley (peak), more reliable the reversal. Sometimes, a minor rally (reversal) can be seen in between the peaks (troughs) of a double top (bottom) formation. This does not hamper the signals given by the formation. See Figure 14 for a double top.

Triangles

Triangles are commonly used to identify reversals and consolidation but are not very reliable formations. There are two types of triangle formations – symmetrical and right-angled.

A symmetrical triangle is formed when, in a series of rallies, each succeeding one peaks at a lower level than the preceding peaks, and the bottoms of the intervening relations are progressively high. The lines joining the peaks and bottoms of such a formation converge. When prices breakout of a symmetrical triangle, the reversal is generally sharp. Volumes reduce as the triangle narrows towards the apex. When the breakout occurs between the half and three-fourths of the distance between the widest peak and rally, and the apex, the formation is said to be a highly reliable indicator of a reversal (see Figure 15). It is, however, not known before the breakout as to whether the triangle is a continuation pattern or a reversal pattern.

Figure 15a **Figure 15b**



A right-angled triangle is also formed when a series of rallies converge, but with an important difference. One of the two boundaries of the series is horizontal to the X-axis. In a right angled triangle, since the resistance or support level is implied in its formation, the direction of breakout can be identified even before the actual breakout. However, sometimes a right-angled triangle develops into a rectangle, thus making such identification difficult. The validity of the breakout is measured by drawing a line parallel to the sloping side of triangle (hypotenuse) through the first rally or reaction. Figure 16 shows a right angle formation. (see Figure 17 for an illustration.)

Figure 16a

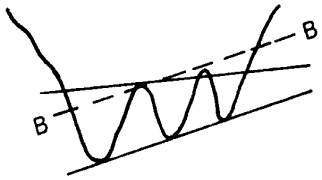


Figure 16b

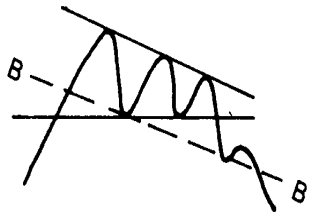
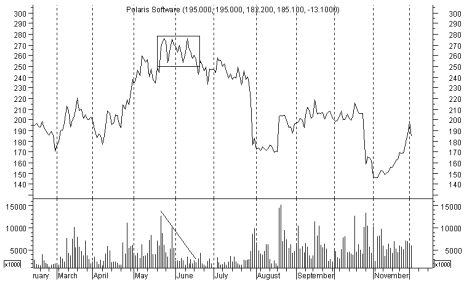


Figure 17

Rectangles

A rectangle is an important consolidation pattern, which can be formed either during an uptrend or in the course of a downtrend in prices. A series of minor rallies and reactions, which have almost identical peaks and troughs signal the formation of a rectangle. (Note that rectangles are formations indicated as 'Lines' in the Dow Theory.) A rectangle indicates equal pressure being exercised by buyers and sellers, and the combat is indecisive until a breakout occurs. The price line may breakout on either side. A rectangle, therefore, may be a consolidation pattern or result in reversal. Just as in the case of the symmetrical triangle, one cannot predict the course of prices when a rectangle is being formed, but has to wait for the breakout.

Figure 18



Volume is usually high when the rectangle begins to form, and tapers off significantly as the rectangle extends. The breakout is definitely accompanied by a high volume (Figure 18). The breakout from a rectangle is fairly reliable, as prices

generally do not return to the rectangle. Even if the prices subsequently touch the boundary level, they generally do not penetrate the rectangle. These formations are more commonly found at the market bottoms than at tops. The measuring implication for a breakout is that prices should move out at least by a distance equal to the maximum distance between the boundaries of the rectangle (breadthwise).

Flags

If a vertical rally or a decline is interrupted by a consolidation pattern akin to a rectangle, such a formation is called a flag. After the flag formation, prices move in the same direction as before. Flags only represent a pause in a rally or reaction before prices continue in their course. Flags may be horizontal, though it has been found that flags in a rising market are formed with a slight downtrend, and flags in a falling market have a slight uptrend.

Volume is generally very high as the flag begins to form and tapers off when the formation is complete. When the prices breakout of the flag, a sudden increase in volume can be noticed. In a rising market, bullish traders may pause to register gains in the course of an uptrend that is particularly sharp, causing a flag formation in prices.

A flag formation in a declining market is marked by falling volumes. Since a flag in a downtrend in prices means a series of minor rallies, analysts who watch the increase in prices accompanied by falling volumes, identify the ensuing bear market. When prices breakout, the downtrend in prices continue. Volumes accompanying a downward breakout are not very high as in the case of a flag formed in an uptrend (see Figure 19a for a typical flag formation).

Since flags by definition are minor interruptions of a trend, a flag extending over more than 4 weeks should be treated with caution. The price trend in such a case may reverse. A flag takes 5 days to 2 weeks to form. If a flag formation is not accompanied by a contraction in volume, a reversal might occur. It is estimated that flags occur somewhere near the mid-point of a trend. Therefore, the measuring implication is continuance of the trend by a length equal to that which prevailed before the flag was formed. Figure 20 illustrates a flag formation.

Figure 19a

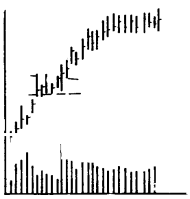


Figure 19b

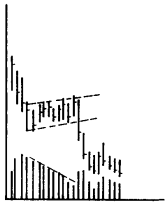
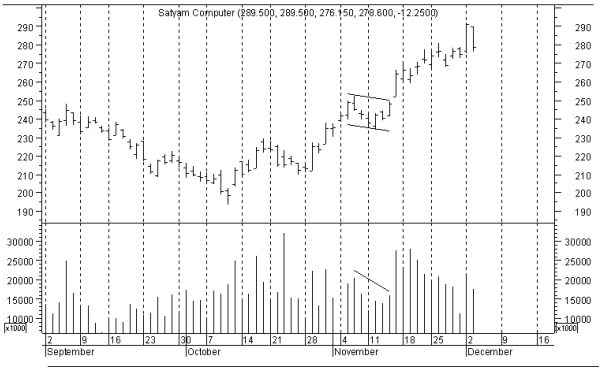


Figure 20



A pennant is similar to a flag in all respects except that it looks like a triangle rather than a rectangle. The volumes accompanying a pennant formation are much smaller, and contract more than during a flag formation. Figure 21 illustrates a typical pennant formation.

Figure 21a

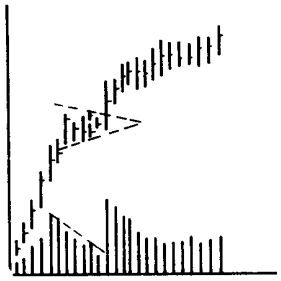
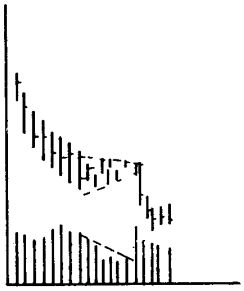


Figure 21b



Saucers and Rounding Tops

A saucer generally occurs at market bottoms when the investor's interest in the share is at its lowest ebb. The lows reached at the end of the market are all formed by reactions that are small, and rallies are not marked enough due to lack of enthusiasm. However, these minor fluctuations while continuing for sometime, form a saucer-like pattern indicating that fluctuations have been occurring at higher price levels, after a bottom was reached. This triggers an increase in price as well as volume, which explode at the end of the formation to a smart rally.

In case of a saucer being formed during a period of near inaction in the market, volumes almost dry up at the bottom of the saucer and pickup once the upward movement in prices begins. Saucers, sometimes, are formed when the rally in the beginning of a bull market is sluggish, and have the same characteristics as described above. In such cases, saucers confirm a reversal.

Figure 22

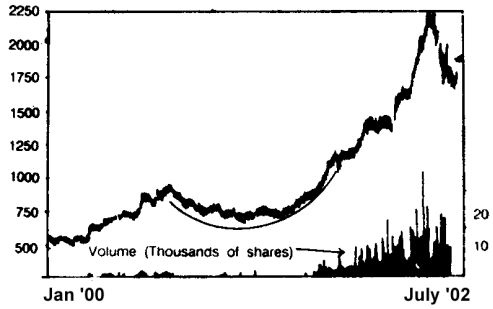
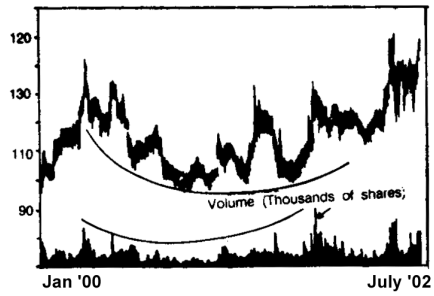


Figure 23

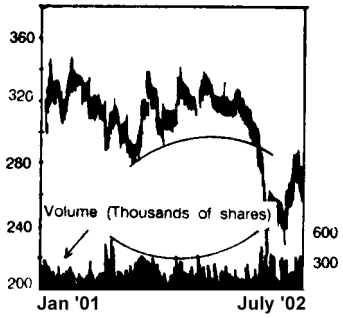


The price charts in Figures 22 and 23 are provided as illustrations. Notice that volume moves along with the formation, picking up after the formation.

A rounding top is exactly opposite to a saucer, but volume characteristics are same for both the patterns. A rounding top is formed to indicate a slow change in the demand-supply balance, and is an important reversal pattern.

The price volume relationship in a rounding top formation provides important tips. The volume behaves just opposite to the price pattern, resulting in low volume when the price is at the highest level, and expanding volumes when prices begin to fall. As seen in the section on volumes, both of these indicate a downtrend in prices.

Figure 24



It is difficult to obtain support or resistance levels, or breakout levels for both saucers and rounded tops. These patterns typically develop slowly and over a long span of time. Interestingly these very characteristics are responsible for the substantial moves that invariably follow these two formations.

Figure 24 illustrates a rounding top. Being a very volatile scrip, few strong increases in volumes are noted. Otherwise, volumes have been low during the rounded top formation. This pattern extends over 6 months.

Gaps

A gap refers to the occurrence of an empty space in a bar chart between the prices of two consecutive trading periods. Typically, the lowest price of the period after the gap is higher than the highest price of the preceding period or vice versa.

Figure 25a

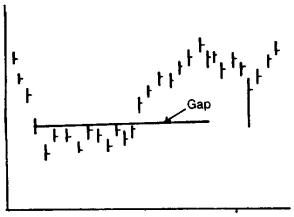
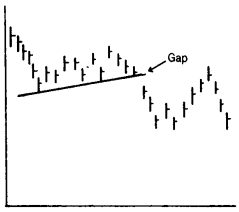


Figure 25b

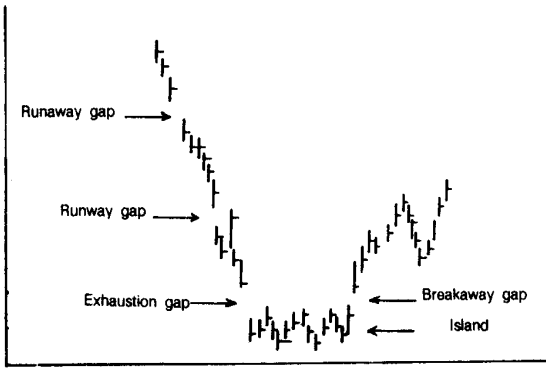


By definition, gaps can occur only in a bar chart where, for every period, the lowest, highest and closing prices are plotted. (See Figure 25 for an illustration of a gap.) Gaps which occur during the formation of a pattern, or gaps occurring when a stock becomes ex-dividend, are of little significance and can be ignored.

Technicians have generally analyzed three types of gaps – Runaway gaps, Breakaway gaps and Exhaustion gaps.

Runaway gaps occur when prices are on a rapid uptrend or downtrend. They generally occur almost halfway through a trend, and are also called measuring gaps. *Breakaway gaps* are created when price breaks out of a price pattern, and such breakouts are more valid than those occurring without a gap. The breakaway to be a gap emphasizes the bullishness or bearishness of the breakout. An upside breakout has to be accompanied by an increase in volume, whether or not formed after a gap.

Figure 26



Exhaustion gaps represent gaps occurring before a trend ends, or gaps that precede the last leg of a bullish or a bearish trend. A series of runaway gaps indicate that an exhaustion gap is round the corner, and that the trend could be expected to end soon after. It is, however, not possible to say whether or not a gap, while it occurs, signals a runaway or exhaustion gap. An exhaustion gap should normally be treated as a sign of consolidation. Reversal may be confirmed by the formation of *Islands*. (See Figure 26 for an illustration.) Notice the occurrence of a breakaway gap at the beginning of the reversal, runaway gaps in the middle of the trend and exhaustion gap at the end of the move.

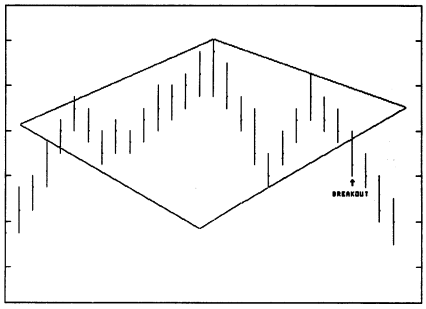
Islands refer to the formation of an isolated price pattern, usually within a narrow range, at the end of a price trend. The island is separated from the previous trend by an exhaustion gap, and a breakaway gap (see Figure 27 for an illustration of an island). Islands signal price reversals which have to be confirmed by a noticeable drop in volume occurring as the pattern forms, and an increase in volume after the breakaway gap.

Figure 27

Price patterns are widely used by technical analysts to discern trends. Conformation of reversals, however, requires looking at patterns along with the supporting volumes, momentum, etc. The subsequent sections deal with these topics.

Diamond: The diamond formation is a combination of two chart patterns namely, the expanding triangle and the symmetrical triangle. During the expanding triangle part, price swings widen, and during the symmetrical triangle part, price swings narrow. The formation is completed when one of the boundary lines forming the symmetrical triangle part of the diamond formation is broken. In most cases, the diamond formation is a reversal pattern.

Figure 28



Volume increases during the first half of the diamond formation (on the part that looks like an expanding triangle) and declines gradually during the second half (on the part that looks like a symmetrical triangle). Volume increases on the breakout from the diamond function. On a breakout of the diamond formation, prices should move a minimum amount equal to the distance from the top to the bottom of the pattern. Generally, prices move farther than the minimum measurement.

The diamond formation is rare. It usually appears at market tops and not at market bottoms, since it requires a relatively active environment to develop. (see Figure 28 for Diamond Formation.)

Rising and Falling Wedges: Wedges are characterized by prices fluctuating between two converging boundary lines. In the case of a rising wedge, the boundary lines slope upward with the lower line being at a steeper angle than the upper line. In the case of a falling wedge, the boundary lines slope down and the upper line is at a steeper angle than the lower line. Usually, breakouts occur, at least two-thirds of the way to the apex of the converging boundary lines.

Wedges are formed on a regular basis and trading volume in a wedge gradually diminishes as prices move towards the apex of the wedge and then rises on the breakout. From a technical point of view, a rising wedge implies a situation that is growing weaker. When prices break through the lower line of a rising wedge, they usually fall intensely. Sell signals, which are generated by breakouts below the lower line of rising wedges, are more reliable than in bull markets. Falling wedges depict a situation that gets stronger from a technical perspective. When prices break from the upper boundary of a falling wedge, they tend to move sideways for a certain period before they begin to rise.

Figure 29: Rising Wedge

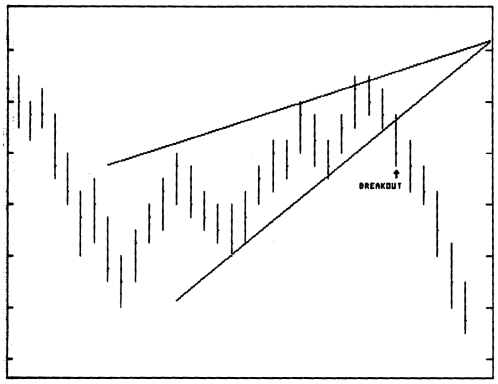
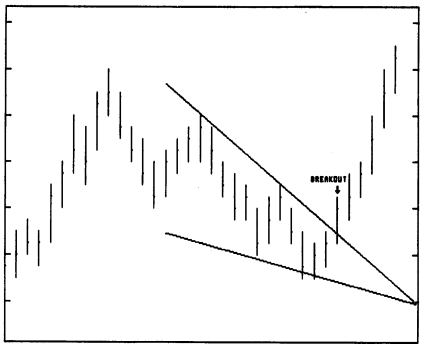


Figure 30: Falling Wedge



V Formations (Spikes): The V formation suddenly reverses the trend with little warning unlike the most reversal patterns, which gradually change direction. Prices move quickly either up or down and move beyond expectations. V formations develop regularly, particularly in volatile, popular stocks. Volumes are heavy throughout the pattern.

Figure 31: V Top

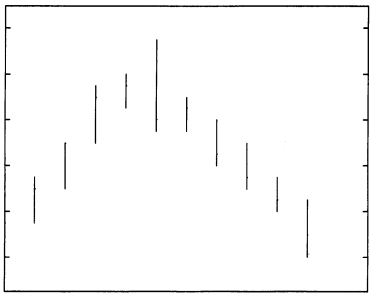
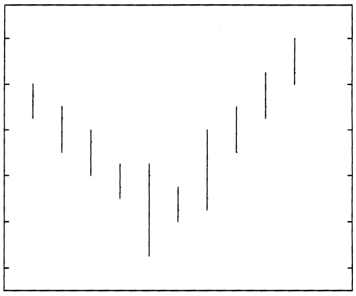


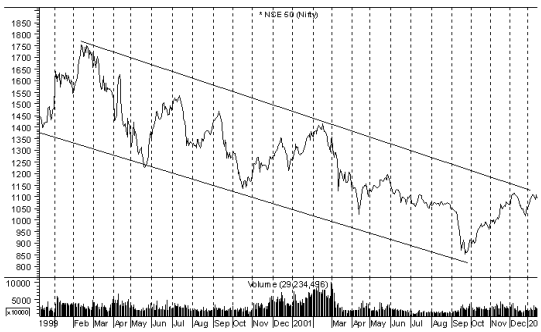
Figure 32: V Bottom



TRENDLINES

A rising primary trend in prices would be marked by a series of ascending rallies, while a falling trend would be characterized by a series of descending rallies. Trendlines are lines that are drawn to identify such trends and extend them into the future. These lines typically connect the peaks of rallies and bottoms of reversals. Sometimes, an intermediate trend that extends horizontally, is seen. Trendlines can also be drawn to describe such patterns. The boundaries of a rectangle can be called a horizontal trendline.

Figure 33



Penetration of a trendline may either mean a reversal or a consolidation. In other words, after a price chart breaks out of the trendline a reversal in the previous trend may occur, or the same trend may be continued. Trendlines have to, therefore, be analyzed along with the price patterns discernible on the chart. The neckline of head and shoulders pattern can be seen as a horizontal trendline, while penetration signals reversal. Similarly, penetration of a trendline that joins the troughs of a right-angled triangle formation indicates a reversal. Trendline violation can be further analyzed with the help of volume statistics that accompany it. A bullish trend can be recognized to be near its end, if volumes at each successive rally are on the decrease. A trendline penetration in such circumstances can signal a reversal.

The following principles have to be borne in mind while analyzing trendline penetrations:

i. The larger the number of peaks/troughs that touch a trendline, the greater its significance. When peaks of rallies reach the trendline, and return without penetration, the recurrence of this tendency indicates that the trend 'obeys' the trendline. Further, the number of points contributing to a trendline determine the direction of the line. More the points, greater the accuracy of the line.

ii. The length of a trendline indicates whether a penetration is significant or not. Longer the time span covered by a trendline, greater the importance of a violation.

Figure 34a

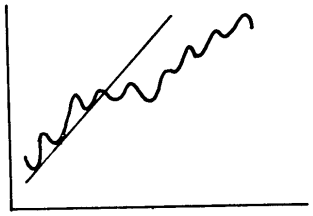
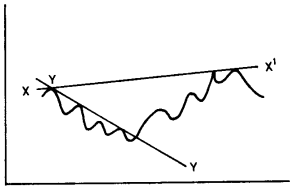


Figure 34b



iii. A steep trendline is easily violated by small sideward movements in the price chart, and is not particularly useful in identifying reversals (see Figure 34a). A flat trendline, on the other hand, might miss out certain key reversals. The trendline XX^{I} in figure 34b violated at the end of the bull market while trendline YY^{I} indicates reversal much earlier. Also note that XX^{I} is touched by 2 points only, but covers a longer time span and YY^{I} is touched by more number of peaks but covers a shorter time span. In reality, therefore, trendlines have to be drawn exercising judgment, and balancing the factors that influence its predictive ability.

iv. Penetration of a steep trendline generally results in a corrective movement, after which the previous trend continues. Violation of a slower, sustainable trend is an indication of a reversal.

Just like price patterns, penetration of trendlines also has measuring implications. For a rising trendline, the distance between the higher rally, before penetration, and the trendline is measured. This distance is projected downward from the point of penetration. (see Figure 35a, Distance AB is projected downward from point x, the point of penetration.)

Figure 35a

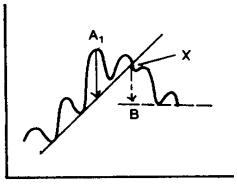
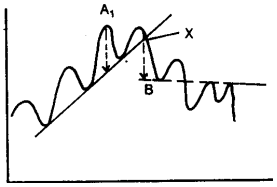


Figure 35b



When prices fall, the price objective (the level indicated by the measuring implication), generally acts as a resistance level, beyond which subsequent rallies do not rise (see Figure 35b). The reverse is true in case of a falling trendline.

A trendline penetration should also be read along with other technical indicators like volume, momentum, etc., as there is no way of determining how long a certain move would exist. Trendlines are commonly used as confirmation of reversals.

TREND CHANNELS

Trendlines encompass rallies or reactions by joining successive tops or bottoms. Sometimes, it is useful to 'trap' trends by drawing trendlines on both the sides of an uptrend or a downtrend. These parallel lines drawn to encompass trends from both the sides are called channels. (see Figure 36a & b)

Figure 36a

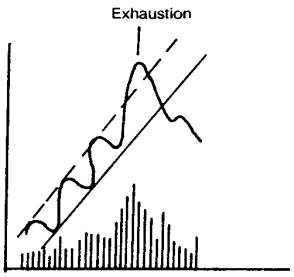
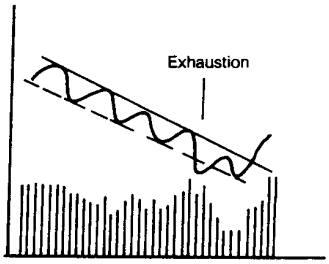


Figure 36b



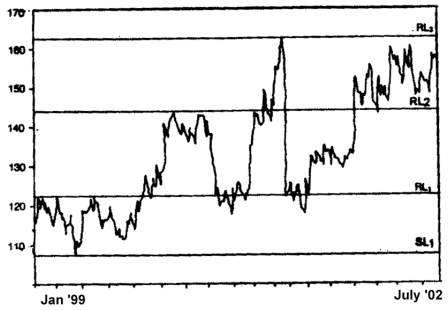
Penetration of an upchannel indicates a reversal of at least a temporary proportion, because it confirms that the price line not only fails to reach the previous rally, but also reaches a new low, below the previous troughs. The reverse is true for penetration of a down channel.

SUPPORT AND RESISTANCE

An important application of trendlines is in identification of support and resistance levels. Resistance is defined by Edward and Magee as 'Selling, actual or potential, sufficient in volume to satisfy all bids and hence stop prices from going higher for a time period'. Support is defined as 'Buying, actual or potential, sufficient in volume to halt a downtrend in prices for an appreciable period'.

A support zone is formed when the demand supply balance tilts in favor of buyers, resulting in a concentration of demand. A resistance zone similarly represents a concentration of supply. The concepts of support and resistance can be illustrated with the help of an example. Consider Figure 37 which shows the price chart.

Figure 37



The behavior of prices during January-May does not throw up any price pattern, but the range within which the prices are found to be fluctuating warrants attention. On almost 6 occasions, prices have climbed to the level of Rs.122 and returned. Prices can be observed to face resistance at this level, as every time they reach there, they fail to climb further, and fall back. A trendline drawn to represent this level is called a resistance line (designated RL_1 in the figure).

Similarly, prices have not fallen beyond a level of Rs.110, and most of the time they returned from the resistance line. It can be said that a support level exists at which prices have shown a tendency to climb up again, rather than continue to fall. The maximum fall registered is at Rs.106, and represents the level at which support has almost invariably occurred. Line SL_1 represents this line of support.

Support and resistance lines are, therefore, trendlines drawn to indicate the ranges a trend can be expected to take, using the past behavior as a reference point. These lines throw up further interesting inferences. When the prices pierce the resistance level RL_1, it is an indication that buyers have succeeded in breaking the resistance, and prices can be expected to climb up. The new high reached would represent a new level of resistance (represented as RL_2). Prices now are found to fluctuate between the old RL_1, and the new RL_2. The point to be noted is that the old resistance line is the new support line, as prices receive support at a level almost equal to RL_1. Similarly, prices can be observed to reach a new resistance level RL_3, and find support at the previous RL_2.

The support and resistance levels are important tools in confirming a reversal in forecasting the course of prices, and in making appropriate price moves. The following principles are to be applied while using support and resistance lines for trend analysis:

i. Support and resistance lines are only approximations of the levels, prices may be expected to 'obey'. They should, therefore, be drawn using judgment, and clues from the past price behavior.

ii. Penetration of a support or resistance line, also confirmed by an underlying price pattern, is a fairly sure indication of a strong ensuing move in the same direction. New highs are reached after a resistance line is penetrated and new lows follow penetration of a support line.

iii. Prices are said to remain in a 'congestion zone' as long as they fluctuate in narrow ranges within a support and resistance level. The direction of breakout from a congestion zone cannot be predicted in advance.

iv. The higher the volume accompanying the confirmation of a support or resistance level, the more its significance.

v. The speed and extent of the previous move determines the significance of a support or resistance level. Prices penetrate support (resistance) level generally after slowing down from a previous low (high) and hovering around a level for sometime (see Figure 37).

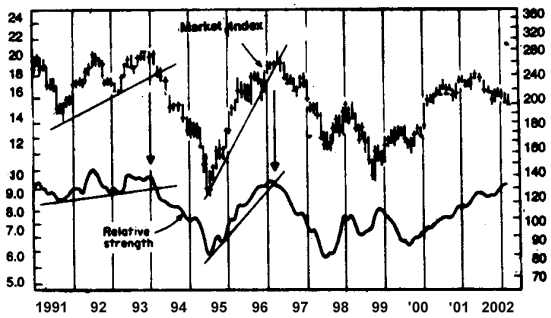
vi. Support and resistance levels repeat their effectiveness time and again, even if separated by many years.

RELATIVE STRENGTH ANALYSIS

Stock prices tend to move more or less in tandem with the overall market trend, represented by a market index. When the price chart of an industry, or an individual stock diverts from the course chartered by an index, the concept of relative strength can be used to study such divergence. Relative Strength (RS) refers to the ability of an industry or stock to outperform the market at turning points. Relative strength arises out of inherent merit of an industry or stock to recover from a bear market or to peak out earlier than most of the stocks trading in the market.

Relative strength is obtained by dividing the price of the stock by the market index. The divisor is always the measure of the trend that is expected to be outperformed. When computed in this manner, a rising RS index indicates that the stock is doing better and vice versa. RS index also follows trends, reversal of which signifies changes in the relative strength of the stock. RS indexes are normally used in stock selection.

Figure 38



When a stock and its relative strength (in terms of the market) are plotted together on a graph (see Figure 38), the relative strength generally reverses ahead of the stock prices. Analysts, however, wait for the stock also to reverse before acting on the basis of relative strength alone.

Moving Averages

While trends in share prices can be studied for possible patterns, sometimes it may so happen that the prices appear to move rather haphazardly, and be very volatile. Using moving averages can help under such circumstances. A moving average is a summary measure of price movement which reduces the distortions to a minimum by evening out the fluctuations in share prices. The underlying trend in prices is thus clearly discernible when moving averages are used.

The three basic types of moving averages are:

a. Simple moving average

b. Weighted moving average

c. Exponential moving average.

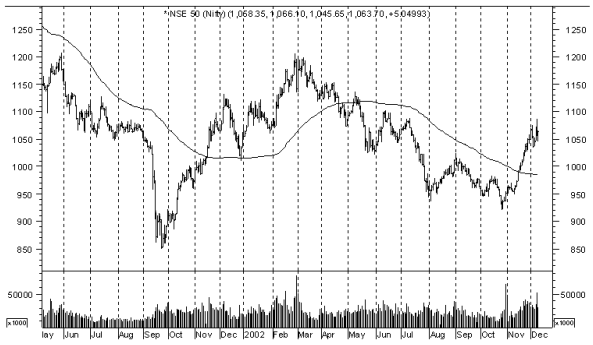
SIMPLE MOVING AVERAGE (SMA)

A simple moving average is easy to construct and is widely used by technical analysts. To construct a moving average, the time span of the average has to be first determined. A 30-day moving average, averages out every fluctuation occurring over all the possible 30-day time spans over the period under observation. To construct a 100-day SMA for instance, the prices observed over the first 100 days are first summed up and divided by hundred to obtain a simple average. This is the first value for constructing a 100-day SMA. To obtain the next value, the price prevailing on the 1st day is excluded, while including the price on the 101st day. This represents the next 100-day period. The average of these observations is the next value of 100-day SMA. This process is repeated for the time period one intends to cover. Table 1 illustrates the computation of SMA. A 100-day SMA of the NSE (Nifty) is plotted in Figure 39.

Table 1: Simple Moving Average

Day	NSE (Nifty) (1)	100-day Total (2)	NSE (Nifty) 100 days ago (3)	100 days SMA (4)
1	3469.40	339796.80	3409.85	3397.968
2	3425.88	339812.70	3384.99	3398.127
3	3364.71	339792.60	3367.55	3397.926
4	3316.00	339741.60	3399.36	3397.416
5	3280.06	339623.50	3388.48	3396.235
6	3193.77	339430.70	3359.27	3394.307

Figure 39: 50-Day Simple Moving Average



The choice of time span is very important in constructing moving averages. If prices move in cycles, say over 2 years, a 750-day moving average will smoothen out all intermediate trends. A 10-day moving average will represent many minor fluctuations present on the price line, and would be of little use in determining tops and bottoms of a trend. Lesser the time span, more sensitive the moving average and vice versa. A moving average, therefore, should provide an optimum trade off between over sensitivity and delay in identifying reversals. A 300-day moving average is widely used by analysts, and is believed to represent an optimum span.

The importance of the choice of time span is crucial. The moving average with longer time span turns much later than those with shorter spans.

Technical analysts observe moving averages more for 'crossovers' (price chart over the moving average or vice versa) than for the changes in direction and obtain more clear-out buy-sell signals than those obtainable from use of trendlines. The following are the important principles useful in this regard:

i. When the moving average rises above the price line, a reversal in bullish trend is signaled. This is based on the simple logic that as long as price at the end of a period is above the average that prevailed in the immediate past, prices are on an uptrend. The converse is true for confirming the end of a bear market. The price line in that case would crossover the moving average. (see points A and B in Figure 40.)

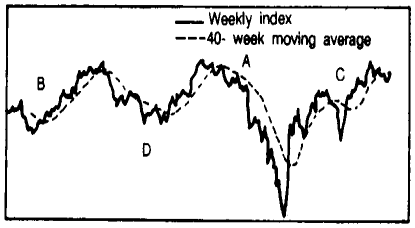
ii. The price line moving average crossover has to be examined cautiously when the price line and moving average move in opposite directions before the crossover. The price line that falls below a rising moving average only indicates a secondary reaction and need not signal a trend reversal. Similarly, a price line that rises above a falling moving average is an indication to sell. (see point C in Figure 40.)

iii. A moving average represents a smoothened trend and therefore, also acts as a support/resistance line. A declining price line often finds support at the moving average line and rallies without crossing the line. Similarly, a rally in a bear market meets resistance at the moving average, and turns down.

iv. If the moving average is flat or has already begun to change direction, a crossover by the price line is a fairly reliable indicator of trend reversal.

v. The significance of a crossover signal depends, to a large extent, on the time span covered by a moving average. A moving average covering a longer time span is actually smoothening a long-term trend, and its crossover is more significant than a crossover of an average of shorter time span.

Figure 40



Some technicians use more than one moving average to smoothen the same price trend. This procedure smoothens the data twice, and provides warning signals for trend reversals, comparatively more quickly after they have taken place. It is common for analysts to use 100-day and 300-day averages simultaneously.

When the 100-day average moves below the declining 300-day average, a trend reversal is signaled. Multiple moving averages are useful because shorter-span averages reach the turning points earlier than the longer-span averages, and are very useful in confirming a trend reversal.

A point of caution is in order. Simple moving averages always invariably provide signals to buy or sell after the trend reversal has begun. They are neither lead indicators, nor juncture points for change in trends. Simple moving averages, therefore, should only be used along with other indicators. In an accumulation/distribution phase, a series of crossovers can occur when the market is moving sidewards, and provide misleading signals. (see point D in Figure 40.)

WEIGHTED MOVING AVERAGES

In figure 39, it can be observed that the moving average invariably changes direction after the price chart and lags the reversal in trend. This is because the moving average line is so constructed as to plot the average of a given period at its end (A 100-day moving average is plotted from the 100th day onwards). This methodology leads to shifting the average, which can be assumed to occur in the middle (50th day) of the period to the end of that period. By plotting the average for the period at the middle of the period, the moving average line would be 'centered' as shown in figure 41.

Figure 41

Such a technique of centering would not be of utility in stock price analysis because if this technique is used, the analyst has to wait for the next half period (50 days in case of a 100-day average) to ascertain if there is a trend reversal. Such waiting can prove costly in terms of lost profitable opportunities as stock prices fluctuate rapidly.

One way of overcoming this problem is to use weighted moving averages. A weighted moving average is weighted in favor of the most recent observations, and therefore, turns earlier than the simple moving average.

One of the simpler methods of weighing, which is also widely used, is to multiply the first set of observations by 1, the next set by 2, the third by 3 and so on. The values thus obtained are added, and the sum is divided not by the number of observations, but by the total of the weights. This method, however, gets cumbersome and laborious when the time span of the average is long.

EXPONENTIAL MOVING AVERAGE (EMA)

As noted earlier, averages constructed over a longer time span have higher utility in technical analysis. But a simple moving average constructed over a long time span lags the price trend. An exponential moving average provides a short cut method of weighting. This method also provides more weightage to the recent data.

The procedure for computing the EMA can be explained with the help of an example. 100-day EMA for the BSE Sensitive Index is computed in Table 2.

Table 2: 100-day Exponential Moving Average

Day	BSE Sensex	EMA for previous day	(1) – (2)	(3) x 0.02	EMA = (2) ± (4)
	(1)	(2)	(3)	(4)	(5)
1	3469.40	—	—	—	3397.793*
2	3425.88	3397.79	28.09	0.5618	3398.3518
3	3364.71	3398.3518	–33.6418	–0.67283	3397.678
4	3316.00	3397.678	–81.678	–1.6335	3396.044
5	3280.06	3396.044	–115.984	–2.319	3393.724
6	3193.77	3393.724	–199.954	–3.999	3389.7249

* The 100-day SMA on day 1 is posted here.

To construct a 100-day moving average, the first step is to compute a simple average for the first 100 days (the first value in column 5). The value is used as a starting point at column 2. The index value for the 101st day is computed with this value and the difference is shown in column 3. The exponent for the 100-day EMA is calculated as 2/100 = 0.02. The difference obtained in column 3 is multiplied by the exponential 0.02, and posted in column 4. The EMA value for the next 100 days (excluding the first day and including the 101st day) would be the EMA value in column 2 plus or minus the product obtained in column 4, depending upon whether the difference in column 2 is negative or positive. The procedure is repeated for each succeeding day. Figure 42 shows the 50-day EMA for the Telco stock.

Figure 42

The EMA, thus, provides a smooth base for analyzing price trends. Since the exponent is used, it should be remembered that a 100-day EMA would be thrice as sensitive as a 300-day EMA, the exponent of the former being twice the exponent of the latter. If it is found that the EMA is very sensitive, the time span can be extended. Alternatively, the EMA can be further smoothened by constructing another EMA for the values first obtained, using a further exponent.

The Filter Rules

The filter rules, many a time, define the mechanical trading schemes. An x% filter implies that a downtrend is indicated as soon as a stock moves down by x% from the most recent peak, and uptrend is indicated whenever a stock moves up by x% from the most recent low point. Let us apply a 4% filter rule to Tata Steel between February 19 and February 23, 1998 (Table 4). The share touched a low of Rs.120.70 on February 20. A 4% filter, that is, 120.70 (1 + 0.04) = 125.53, would have given a buy signal on February 26, when the price touched Rs.126.20. Then the scrip touched a peak of Rs.138.00. Therefore, the same filter that is, 138.00 (1 – 0.04) = 132.42 would give a signal to sell on March 3, when the price touched Rs.132.10 (that is about 4% below the peak). The net gain to a person, before transaction costs, and had he been able to transact precisely at the prices indicated by the rule, would have been Rs.5.90 per share.

Table 4
Price of Tisco Shares

Newspaper Date	Tisco
Feb. 16, '98	124.50
17	123.20
18	121.60
19	122.20
20	120.70
23	122.80
24	122.80
26	126.20
27	132.30
March 2, '98	138.00
3	132.10
4	136.00
5	133.90
6	133.90
9	137.90
10	141.00
11	137.20
12	135.20
16	139.20
17	145.60
18	146.90
19	145.70
20	149.90
23	156.00
24	153.90
25	153.60
26	150.00

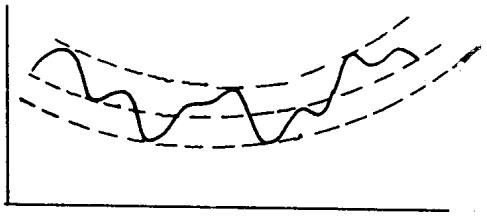
It is clear that smaller filters are likely to result in larger number of transactions and therefore larger transaction costs. In general, these rules can be effectively used in the market only if the transaction costs are very low. Since these rules can be easily mechanized, they are widely used for computerized trading. In fact, the October, '87 crash of Wall Street and the other developed capital markets has been ascribed to such 'mindless' trading rules. It is also obvious that infinitely large number of filter rules can be (and are) used by operators in the market. Do these trading rules work? Do they indeed provide extra-normal returns to investors?

Envelopes

We have already noted that moving averages can be looked upon as smoothened trendlines, which function as support and resistance feels for the prices. A moving average with a longer time span would serve this purpose better.

On drawing envelopes, moving averages can also be looked upon as juncture points around which stock prices fluctuate in cycles. We can draw parallel lines to the moving average to envelop the cyclical movement around the average (See figure 40). Envelopes represent moving averages as the center of a trend, with the envelopes enclosing points of maximum and minimum divergence from that trend. Depending upon the volatility of the chart being monitored, and the time span of the moving average, the distance of the envelope from the moving average is determined.

Figure 40 Envelopes



An envelope is useful in developing a 'feel' for the overall trend, and to discern when a rally or reaction has over-extended. It cannot be said with certainty that the envelopes would act as the eventual turning point, though a good probability of reversal exists when the price chart breaches an envelope. The technical analyst however, assesses the other technical characteristics before taking action.

Breadth of the Market

The extent of a trend is monitored by breadth. Breadth refers to the extent to which share issues move along with the market trend and is generally measured in terms of number of issues whose prices advance, decline, and remain unaltered in the period over which a trend persists. A reversal in trend is imminent if the number of issues moving with the trend are fewer than those moving against. Breadth also measures the underlying strength of the market. If the index continues to move up, when most listed shares are declining, a reversal can be read from the breadth of the market statistics. In other words, if a price trend does not receive a follow up from the broad market, it is vulnerable, and may not persist for long.

Numerous methods exist for measuring the breadth of the market. One of the simplest is to compare the number of issues whose prices advanced on a particular day, to the number of issues whose prices declined on the same day. The net advances or declines, thus, obtained are cumulated over the period under observation. The cumulated figures are also plotted on a graph, preferably along with a market index. The *Advance-Decline line* (A-D line) and the index generally move in tandem. However, a divergence in the A-D line is indicative of a turning point, and technical analysts look for such signals from the A-D line.

For example, consider the following table showing net advances or declines for issues traded on the Bombay Stock Exchange, during a certain period.

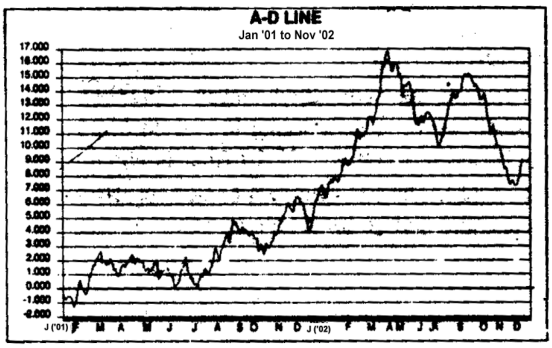
Table 3

Day	Issues Traded	Advances	Declines	Net	Cumulative Advances/ Declines
	(1)	(2)	(3)	(4)	(5)
25 Nov. '02	1318	454	686	–232	–232
26	1392	417	811	–394	–626
27	1403	344	841	–497	–1123
28	1392	417	811	–394	–1517
29	1008	480	385	95	–1422

Day	Issues Traded	Advances	Declines	Net	Cumulative Advances/ Declines
2 Dec. '02	1219	538	483	55	–1367
3	1306	514	601	–87	–1454
4	1226	434	620	–186	–1640
5	1306	514	601	–87	–1727
6	1141	641	366	275	–1452

The breadth of the market statistics in the last column is simply the cumulative value of net advances or declines. The value becomes negative when the number of declines exceed the number of advances. This in itself need not cause concern, because the value of the cumulative advances/declines depends on the value obtained on the first data from which observations were made. However, the change in direction of the breadth statistics is to be noted. It is the direction of the statistics that is more important than the magnitude. Figure 43 plots the A-D line for the period.

Figure 43



The A-D line drawn from a simple cumulation of the net advances or declines is generally used to observe the breadth of the market over short periods of a month or two. For long run observations, the A-D line is drawn after considering the number of issues also whose prices remain unaltered. The A-D line is drawn by cumulating the value of $\sqrt{A/u - D/u}$, where A = number of stocks whose prices are advancing; D = number of stocks whose prices are declining; and u = number of stocks whose prices remain unaltered. It is possible for the value D/u to be higher than A/u when declines are more than advances. Such a tendency signals change in direction of the A-D line. Therefore, in such cases the value $\sqrt{A/u - D/u}$, is computed, and the resulting answer is subtracted from the cumulative total (note that square root of a negative number cannot be mathematically computed).

OTHER METHODS FOR ANALYZING MARKET BREADTH

Breadth of the market is popularly studied using A-D lines. Other techniques are also used along with the A-D lines by technical analysts. The four popular methods are

i. Stocks in positive trends
ii. Percentage of stocks over a moving average
iii. Diffusion indexes
iv. High-Low statistics

Stocks in Positive Trends

A stock which rallies after a decline to reach a new high is said to be in an uptrend; a stock that reacts to reach a new low is said to be in a downtrend. The percentage of stock in an uptrend to the total stock traded is computed and plotted on a graph. A rising market is expected to have an increasing percentage of uptrend stock. Reversal is signalled when stock in positive trend begin to diminish.

Percentage of Stock Over a Moving Average

A specific moving average for a number of stocks is first computed, and the percentage of the number that is above the average is ascertained. The percentage of stocks over a moving average increases in a bull market, and generally moves along with the positive trend index computed in (i) above. When the percentage of stocks over a moving average reaches an extreme of 90-100 percent or 10-15 percent, it indicates that a substantial proportion of the prevailing move has taken place and that reversal is imminent. When the percentage index reverses direction, the reversal in market trend is almost immediate.

Diffusion Index

A diffusion index is computed by calculating the rate at which a certain group of stocks change price over a given period of time. It is generally calculated on either a wide number of stocks, or a number of industry indexes. Also called the momentum index, a rise in the index signals the onset of a bull market and vice versa.

High-Low Statistics

Technical analysts also study the high-low statistics to confirm market trends. A rising market should be accompanied by a healthy number of net new highs. A graph of net new highs can be plotted to be read along with a market index. If net new highs trace a series of declining peaks while the index continues to rise, a reversal is imminent. Similarly, a graph of net new lows can be expected to signal the end of a bear market, when it does not confirm the new trough reached by the market index. This is because, a declining number of stocks reaching new lows implies that larger number of stocks are resisting the downtrend in the market index, and thus signifies the end of a bear market.

Breadth of the market, thus, is an important indicator of the depth of the prevailing trend, and is of immense utility to the analyst in identifying trend reversals.

Volume

Technical analysts confirm a price reaction by looking at the volume of shares traded. Volume generally moves along with price, and is indicative of the intensity of a price reaction. Study of volumes also helps in forecasting reversals in trend. It has been found by technical analysts that volume leads the trend of prices, and indicates the trend reversals in advance. A study by William Gordo[3] in the United States found that between 1877 to 1966, in 84% of the bull markets, the volume high did not occur at the price peak, but some months before. Of the 18 bull markets during the period, 2 ended with volume and price reaching a peak simultaneously, and in one uptrend, volume lagged by a month. The lead time of volume in the remaining 15 cycles was from 2 months to 24 months. The average for all cycles was 9 months. The volume curve has an almost consistent tendency to peak out ahead of price, both during bull and bear phases.

Figure 43a

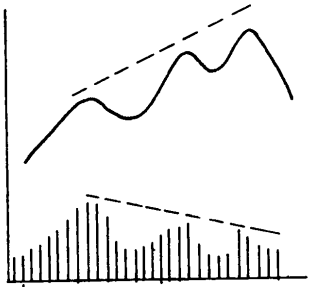


Figure 43b

3 William Gordon, The Stock Market Indicators, Investors Press, New York, 1968.

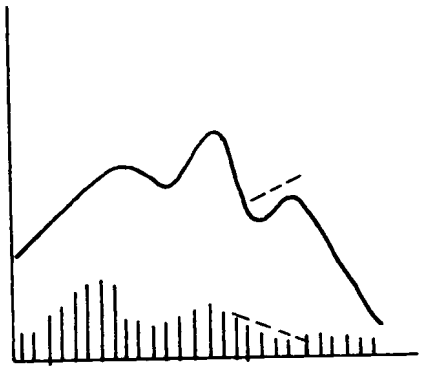


Figure 43c

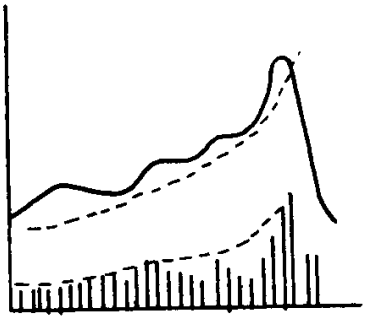
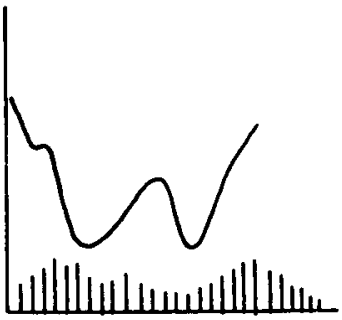


Figure 43d



The following, in brief, are the principles to be borne in mind while studying Price-Volume relationships:

i. A price rise that is accompanied by expanding volume is a normal market tendency and therefore is not indicative of any potential trend reversal.

Figure 43e

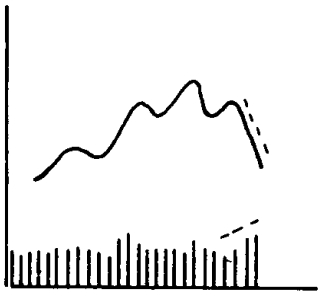


Figure 43f

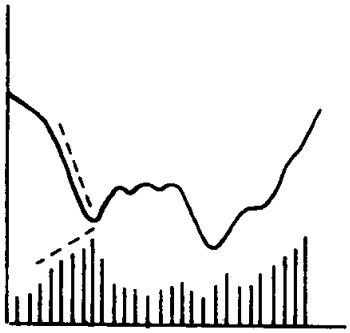


Figure 43g

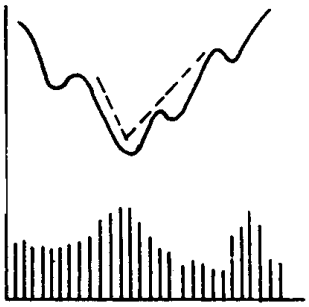
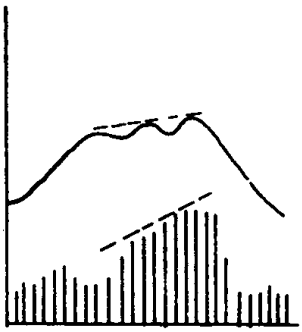


Figure 43h



ii. A new high reached with a volume that is actually diminishing is a warning to a reversal in price (Figure 43a)

iii. A rally which reaches a new high would also be accompanied by a volume that is higher than that obtained at the preceding peak. If volumes obtained at a new high are lower, a trend reversal is indicated. (Figure 43a)

iv. After a slow expansion over a period, sometimes both prices and volume work into an exponential rise. This is indicative of heavy off-loading by bulls and is called a 'speculative blow off' and marks the end of the bull market. Price and volumes both fall sharply after this development. (Figure 43b)

v. When prices recover after a bearish phase and subsequently react to a level equal to or slightly above the previous low, if the volume accompanying such reaction is lower than that obtained at the previous low, a bullish trend is indicated. Lower volumes accompanying such reactions is indicative of the weakness of the reaction. (Figure 43c)

vi. A reversal in trend indicated by a downside breakout from a price pattern, trendline or moving average, can be acted upon if accompanied by heavy volume, which confirms the bearish sign. (Figure 43d)

vii. Termination of a bear market is often signalled by a 'selling climax'. A selling climax occurs when prices fall for a considerable time at an accelerated pace and are accompanied by expanding volume. Price may be expected to rise subsequently. (Figure 43e and 43f).

viii. An accumulation in the course of a bearish market, accompanied by high volume, indicates persistent effort to push up prices, and would spark a bullish phase. Similarly, a distribution accompanied by increased volume is a bearish factor. However, where volumes do not increase at an accumulation or distribution, the indication is that there is only a consolidation of the prevailing trend. (Figure 43g and 43h).

Momentum

We have so far discussed the application of trendlines, moving averages and price patterns to analyze the movement of share prices. In most cases, a trend reversal can be identified with the help of these techniques only sometime after the reversal has actually taken place. The concept of momentum is used to overcome this weakness in technical analysis, by identifying a reversal much before a trend peaks or bottoms out. Momentum measures the rate at which prices rise or fall and is based on the principle that prices usually rise at the fastest pace well ahead of their peak, and decline at their greatest speed before their trough.

The concept of momentum can be explained with the help of an example. A ball thrown into the air, generally shoots up with speed, but subsequently slows down considerably before it turns to come down again. The loss of upward momentum that occurs before the ball changes course can be seen in the stock market also. Before peaking out, share prices register a noticeable decrease in momentum. Similarly, the behavior of prices in a downtrend can be compared to the course of a car that is pushed over the top of the hill. Though the speed decreases, the car continues to move, till it comes to a halt. Share prices behave in a similar manner and the loss of momentum in a downtrend shows much before the final low is reached. Momentum, thus, is an important lead indicator of the quality of price movement.

There is, however, an exception to the above behavior of prices. Sometimes momentum and price may peak simultaneously, just like a ball hitting the ceiling even when its momentum is rising, and turning course with speed. When a ceiling of selling resistance is met, or buying power is temporarily exhausted, momentum does not provide any advance indications of the reversal, but peaks along with the price. Similarly in a downtrend, when prices meet a major level of support, momentum and price turn together. Despite these exceptions, momentum has been found to lead price in most occasions, to be used as a reliable lead indicator of trend reversals.

Momentum can be looked upon from two angles: As a measure of rate of change, and as a measure of internal market volatility. Rate of change indices are widely used to measure the speed of advance or decline of market indices and stock prices. Measures of internal strength are generally applied to market indicators like the breadth of the market, and are known as oscillators. In order to determine the quality of a certain price trend, momentum indices are used.

RATE OF CHANGE INDEX (ROC INDEX)

One of the simplest and widely used methods to measure momentum is to compute the rate at which the price of a stock, or market index, changes over a certain period of time. The ROC Index is an index constructed to measure such price changes. Assume, for instance, that a ROC Index is to be constructed for measuring 50-day rate of change in prices. (see Table 4)

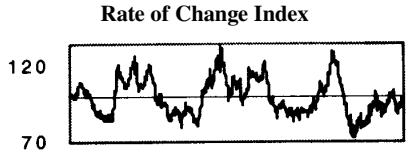
The price prevailing on a certain day is compared to the price 50 days earlier. The resulting ratio is the ROC Index value for that day.

The ROC Index value is computed as the ratio of the index on that date to that of 50 days earlier (382.6/377.19) x 100 (Note that index values are available only on the days on which trading actually took place in the market, and not for all days in a month. The index computed is, therefore, for rate of change over 50 trading days and not 50 calendar days). The reading means that the price has increased by 143 points since the level prevailing 50 trading days earlier. The ROC Index, thus, oscillates around 100, which would be the index value if the price did not undergo any change during the period under observation (see Figure 44 for a graphical presentation of the ROC Index).

Table 4: Computation of ROC Index Values

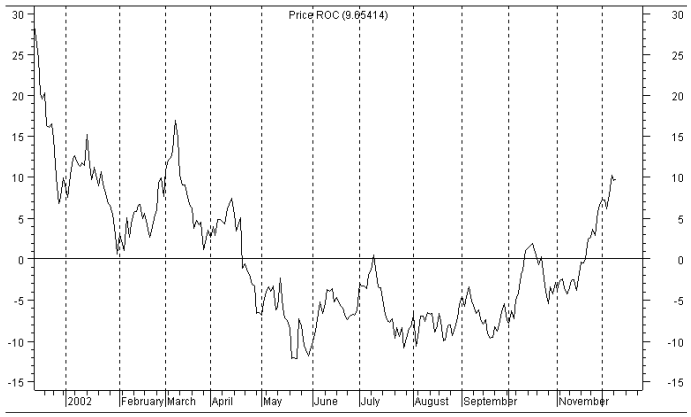
Day	BSENI Values	BSENI 50 Days Ago	ROC Index Value (1)/(2) x100
	(1)	(2)	(3)
1	382.60	377.19	101.43
2	385.19	373.69	103.07
3	385.79	373.66	103.25
4	381.27	380.79	100.13
5	378.79	383.00	98.90
6	378.45	383.28	98.74
7	379.62	383.27	99.05
8	384.19	389.83	98.55
9	383.16	393.81	97.30
10	385.24	375.28	102.65

Figure 44: BSE (Sensex)



A rising ROC Index indicates a growth in momentum (a bullish factor) and a falling index a loss in momentum (a bearish factor). The line drawn at level 100 functions as a reference line to study the movement of the index. When the ROC Index is above the reference line, the market price is at a higher level than the prevailing 50 days earlier. If the ROC Index is above the reference line and is also raising, then the rate at which the price increases grows. Any fall in the ROC represents a drop in momentum. If the index is falling but is still above reference line, it indicates a slow down in the rate of increase in price.

Figure 45



When the index falls below the reference line, a future loss of momentum is indicated. The point at which the momentum index crosses the reference line, marks the onset of a trend reversal (Note that the ROC Index reaches its peak much before it crosses the reference line).

When the index is below the reference line, but is rising, this is indicative of an increase in upward momentum. The ROC Index turning upward, even while it lies below the reference line, marks a reversal of bearish trend.

MOVING AVERAGE CONVERGENCE AND DIVERGENCE (MACD)

MACD like ROC is an oscillator which measures momentum. This oscillator is called Moving Average Convergence and Divergence Oscillator, as it continuously converges and diverges away from the horizontal reference line. It is constructed by taking the difference or the ratio of short-term and the long-term moving average. The points obtained are plotted against a horizontal reference line. The reference line represents the points where the two EMAs have identical values. From the movement of the MACD indicator it can be known, whether the shorter term moving average is above or below the longer term moving average. This can be observed in the Figures 46a and 46b.

The first figure shows the movement of 9-day and 20-day EMAs. The second figure shows the movement of the MACD oscillator around the reference horizontal line drawn at "1". The graph has been drawn using the ratio of 9-day EMA to the 20-day EMA. Points A, B, C, D, E etc., in figure 46a are points where the two EMAs intersect. They can be seen as points of crossover in figure 46b (points G, H and I).

The points of crossing between the oscillator and the reference line act as signals to buy and sell the stock. In the figure 46b, at the points 'G' and 'H', since the indicator crosses the reference line from below, we interpret those points as signals for buying the stock, whereas at point 'K' since the indicator crosses the reference line from above, we interpret that point as a sell signal. In addition to this, we can superimpose a third EMA or a moving average obtained from the oscillator itself. This is referred to as a "Signal Line" as it acts as a trigger which alerts the trader to take an appropriate buy or sell decision. The other objective achieved by plotting the third EMA is to get an overall view of the market trend.

Figure 46a: 50-Day ROC (Nifty)

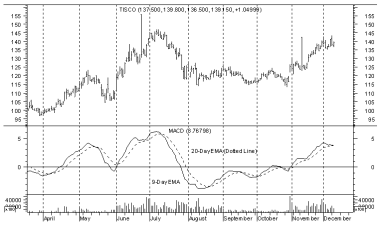
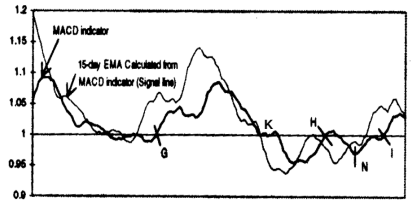


Figure 46b



In this technique, a buy signal will occur when the indicator moves above the reference line and the signal line as at point 'H' and a sell signal when the indicator crosses below the reference line and the signal line as at point 'N'.

RELATIVE STRENGTH INDEX

Here we study about another oscillator which measures momentum called Relative Strength Index (RSI). Opposed to what we have studied above, this indicator measures the relative internal strength of a stock or a market against itself. The RSI is calculated by the formula given below:

$$RSI = 100 - \frac{100}{1 + RS}$$

Where RS is the ratio of the average of X day's up closes to the average of X day's down closes. For example, the closing prices of Excel Industries Ltd., on five consecutive trading days are given here:

Days	Closing Prices
0	120.00
1	119.00
2	128.75
3	125.80
4	127.25

We require the first point (day 0) to decide whether the closing price following it (that is, the price on the first day) is either greater or lower.

Since the closing price 119.00 on the first day is lower than the preceding closing price, we count it as a down closing, whereas the price on the second day 128.75 being higher than the closing price of 119.00 on the first day, we count it as up closing. Therefore, the prices 119.00 and 125.80 are considered to be down closing prices, and the prices 128.75 and 127.25 are considered as up closing prices. In this case, RSI will be calculated as follows:

$$\text{RS} = \frac{(128.75+127.25)/2}{(119.00+125.80)/2} = \frac{256}{244.80} = 1.046$$

$$\text{RSI} = 100 - \frac{100}{1+1.046} = 100 - 48.87 = 51.13$$

From the formula it should be evident that the values of the RSI indicator fluctuate between 0 and 100. A graph is plotted using the RSI values. On this graph, the oversold and the overbought positions are drawn at 30 and 70 levels on a scale of 0 to 100. When the indicator crosses the overbought or oversold position line, it is a warning signal to the trader. At this stage, it presents an opportunity to the trader to consider either to buy or sell. When the indicator crosses the oversold position at 30 from above, it signals that one should sell the stock, while at the same position if the indicator crosses it from below, it is taken as a signal for buying. At the overbought position at 70, the opposite of this holds true. Though the RSI indicates that a buy/sell action is required, the actual buying or selling should be done only after the price line also shows a trend reversal. The oversold position is defined as a situation when there are more buyers in the market who are willing to take delivery than the number of shares available for delivery. In other words, the demand for that stock outstrips its supply. This happens only when there is more of speculative selling than speculative buying. The overbought position is exactly the opposite of oversold position.

ADVANCED TECHNICAL TOOLS

The Confidence Index

The Confidence Index is supposed to reveal how willing investors are to take a chance in the market. It is the ratio of high-grade bond yields to low-grade bond yields. When bond investors grow more confident about the economy, they shift their holding from high-grade to low-grade bonds in order to obtain the higher yield. This change bids up the prices of low-grade bonds, lowers their yields relative to high-grade bonds, and increases the confidence index.

Markets for bonds are frequented mostly by large institutional investors who are believed to be less emotional about their portfolio decisions than many investors in the market. In an effort to measure the market expectations some chartists study the confidence index.

The Confidence Index, published weekly by Barron's, attempts to measure investor optimism and pessimism by examining investor actions in the bond market. It is calculated as follows:

$$\text{Confidence Index} = \frac{\text{Yield on 10 high-grade corporate bonds}}{\text{Average yield on 40 Dow Jones bonds}}$$

Since high-grade bonds should always yield less than lower quality bonds, the Confidence Index should always be less than 1.0. As investors become more optimistic about the future, the difference between the two yields in the index decreases (i.e., the default risk premium narrows and the ratio increases). As investors become more pessimistic about the future, the difference between the two yields increases (i.e., the default risk premium rises) and the ratio decreases. Because the bond market tends to be dominated by institutional investors, the Confidence Index is viewed by some as a barometer of sophisticated investors' expectations (and behavior).

Advocates of the Confidence Index believe that it should move in the same direction as the stock market because increased confidence in the bond market should lead to increased confidence in the stock market. Therefore, an increase (decrease) in the index is a buy (sell) signal. If the Confidence Index leads the market, it can be useful as an indicator. Because it is available weekly in Barron's, it is a convenient and accessible indicator.

Although the bond and stock markets generally move together, there is no theoretical reason that confidence in the bond market should precede confidence in the stock market. The latter is considered by most observers to be the preeminent discounter of future events. In fact, the Confidence Index does not always lead the market and has given a number of false signals. Thus, its record as a predictor is mixed at best.

Contrary Opinion Theories

Several indicators are based on the theory of contrary opinion. The idea is to trade contrary to most investors, who supposedly almost always lose – in other words, to go against the crowd. This is an old idea on Wall Street, and over the years technicians have developed several measures designed to capitalize on this concept.

ODD-LOT THEORY

According to the odd-lot theory small investors who often buy or sell odd lots (less than 100 shares of stock) are usually wrong in their actions at market peaks and troughs. Supposedly, such investors typically buy (sell) when the market is at or close to a peak (bottom).

To take advantage of the (wrong) actions of these investors, an indicator must be calculated. A commonly used Odd-lot index is defined as:

$$\text{Odd-lot index} = \frac{\text{Odd-lot sales}}{\text{Odd-lot purchases}}$$

A decline in this index would indicate more purchases in relation to sales by small investors, suggesting they are optimistic. According to contrary opinion, it is time to sell – to go against the 'man in the street.' Conversely, a rise in this index would indicate more sales relative to purchases, a sign of pessimism by small investors but an opportune time for a contrarian to buy.

A variation of the odd-lot index is the odd-lot short sales ratio, defined as follows:

$$\text{Odd-lot short sales ratio} = \frac{\text{Odd-lot short sales}}{\text{Total Odd-lot sales}}$$

As short sales by odd-lotters increase (decrease), these investors are becoming more pessimistic (optimistic). For a contrarian, it is time to buy (sell). The rationale for this ratio is the same as before. Odd-lotters are expected to sell short at precisely the wrong time; that is, prior to a rise in prices.

Regardless of which odd-lot indicator is used, odd-lot theories have not been particularly successful. Small investors have often been correct in their judgments, particularly since the 1970s. This analysis seems to have proved incorrect at least as often as it has proved accurate. Many market professionals today do not believe in odd-lot theories.

MUTUAL FUND LIQUIDITY

It is interesting to note that mutual fund liquidity can be used as a contrary opinion technique. Under this scenario, mutual funds are viewed in a manner similar to odd-lotters – they are presumed to act incorrectly before a market turning point. Therefore, when mutual fund liquidity is low because the funds are fully invested, contrarians believe that the market is at, or near, a peak. The funds should be building up cash (liquidity); instead they are extremely bullish and are fully invested. Conversely, when funds hold large liquid reserves, it suggests that they are bearish; contrarians would consider this a good time to buy because the market may be at, or near, its low point.

Oscillators

The Rate of Change (ROC) Index is widely used to measure the momentum of price changes. In order to measure the momentum inherent in indicators of internal market strength, like volume and breadth, oscillators are more widely used. The ROC Index is also an oscillator in the sense that it is interpreted in terms of oscillation around the reference line. But the ROC Index cannot be used to gauge breadth of the market, which is measured from an arbitrary point, and can provide both positive and negative values. The ROC Index, for instance, computed between a negative and positive value of breadth statistics can provide a total misleading impression of the prevailing momentum. It is for this reason that the ROC Index constructed for measuring momentum of breadth of the market, does not use the cumulative breadth statistics. We call it a momentum oscillator rather than an index, for purposes of clarity.

Momentum of breadth is measured by dividing the total number of issues advancing in a given period against the total number of issues declining in the same period.

Computation of Momentum Oscillator
(Issues Traded on Bombay Stock Exchange)

Day	No. of Issues Advancing	10-day Total of Advances	No. of Issues Declining	10-day Total of Declines	10-day Momentum Index $\frac{(2)}{(4)}$ x100
	(1)	(2)	(3)	(4)	(5)
1	332	-	456	-	-
2	273	-	492	-	-
3	274	-	501	-	-
4	334	-	444	-	-
5	335	-	452	-	-
6	225	-	586	-	-
7	276	-	532	-	-
8	334	-	410	-	-
9	505	-	255	-	-
10	370	3258	341	4469	72.90
11	411	3337	310	4323	77.19
12	324	3388	418	4249	79.74
13	398	3512	294	4042	86.89

Stochastics

Stochastics is a price velocity technique based on the theory that as prices increase, closing prices have a tendency to be ever nearer to the peaks reached during that period. Similarly, as prices tend to fall, closing prices tend to be closer and closer to the troughs reached during that period. This approach was developed by George C Laire.

Calculation of Stochastics based on the simple formula that follows:

$$\% K = \frac{C-L}{H-L} x 100$$

where,

% K is Stochastics

C is the latest closing price

L is the low price during the last N periods

H is the high price during the last N periods

N can be any number of periods. Laire suggests 5 to 21 periods

% K is then smoothened to derive % D by using the simple moving average technique.

When plotted, the resultant lines will show where the closing price is relative to the range of prices for a given period of time (N).

Figure 46

Price Chart for Scrip Alpha

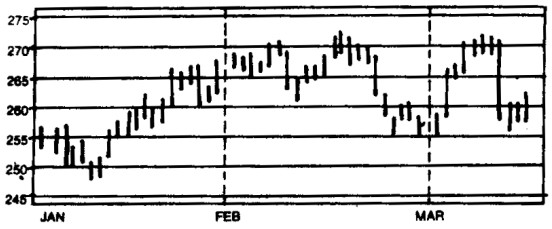
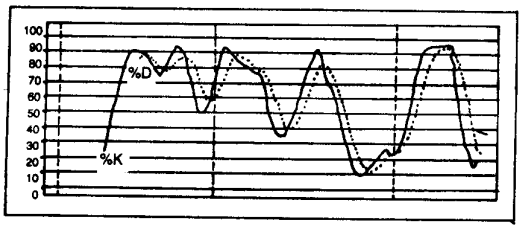


Figure 47

5% K 3% D Stochastic Chart



The principal method of interpreting Stochastics for buy and sell signals is through divergence analysis.

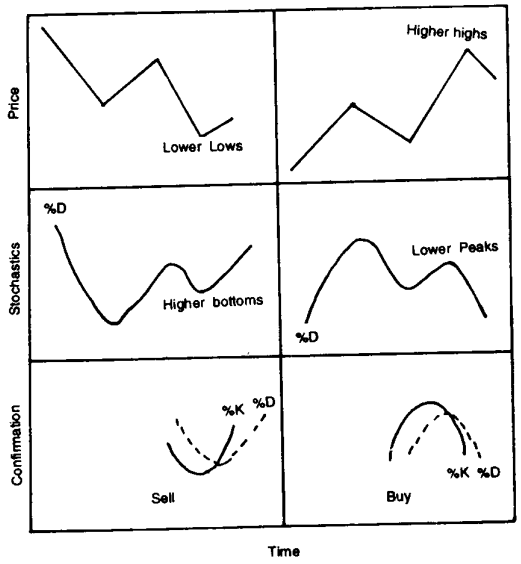
A bearish divergence occurs when the security's price makes a high then corrects moving lower and subsequently reaches a higher high. At the same time, corresponding dealers of the %D line make a high followed by a lower high.

A bullish divergence occurs when the security's price makes a low, then corrects moving higher, and subsequently, reaches a lower low. At the same time, corresponding bottoms of the %D line makes a low followed by a higher bottom.

In the final analysis, in bearish divergence, a sell signal occurs when %K lines move below %D line. Success rate will be high in the 85 to 90 percent range. In a bullish divergence a high signal occurs when %K line moves above the %D line.

Sometimes %K line might touch 0 or 100 percent. This only suggests great weakness (0%) or great strength (100%) of the scrip.

Figure 48



A warning signal: When %K line reverses direction sharply from the previous direction say for 2 to 12 percent, the prices would be reversing their direction in one or two periods (N).

Elliott Wave Theory

The Elliott Wave Principle is difficult to grasp and somewhat intimidating. The principles behind the theory are actually relatively simple. You may notice that many of the points covered are very familiar. This is because much of the Elliott material fits very nicely with the principles of the Dow theory and traditional charting techniques. Elliott Wave Theory, however, goes beyond traditional charting by providing an overall perspective to market movement that helps to explain why and where certain chart patterns develop and why they mean what they do. It also helps the market analyst to determine where the market is in its overall cycles. Much of technical analysis is trend-following in nature. Dow Theory, despite all its merits, tends to give its signals well after trend has been established. Elliott Wave Theory gives the analyst more advanced warning of tops and bottoms, which can then be confirmed by the more traditional approaches. We will cover the Elliott Wave Principle very briefly without going into all the finer points.

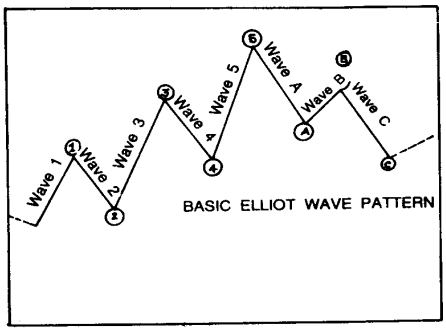
BASIC TENETS

The most important element of Elliott Wave Theory is wave patterns or formations. The other important aspect is ratio analysis which is useful in determining retracement points and price objectives by measuring the relationships between different waves. Finally, time relationships also exist and can be used to confirm the wave patterns and ratios, but are considered by some Elliotticians as less reliable in market forecasting.

Elliott Wave Theory was originally applied to the major stock market averages, particularly the Dow Jones Industrial Average. In its most basic form, the theory says that the stock market follows a repetitive rhythm of a five-wave advance followed by a three-wave decline. Figure 47 shows one complete cycle. If you count the waves, you will find that one complete cycle has eight waves – five up and three down. In the advancing portion of the cycle, notice that each of the five waves are numbered. Waves 1, 3 and 5 – called impulse waves – are rising waves,

while waves 2 and 4 move against the uptrend. Waves 2 and 4 are called corrective waves because they correct waves 1 and 3. After the five-wave numbered advance has been completed, a three-wave correction begins. The three corrective waves are identified by the letters A, B and C.

Figure 47



Along with the constant form of the various waves, there is an important consideration of degree. There are many different degrees of trend. Elliott, in fact, categorized nine different degrees of trend (or magnitude) ranging from a Grand Supercycle spanning two hundred years to a subminute degree covering only a few hours. The point to remember is that the basic eight-wave cycle remains constant no matter what degree of trend is being studied.

Each wave subdivides into waves of one lesser degree which, in turn, can also be subdivided into waves of even lesser degree. It also follows then that each wave is itself part of the wave of the next higher degree.

CONNECTION BETWEEN ELLIOTT WAVE AND DOW THEORY

In Elliott theory, three up waves, with two intervening corrections, fit nicely with the Dow theory. While Elliott was no doubt influenced by Dow's analysis, it also seems clear that Elliott believed he had gone well beyond Dow's theory and had in fact improved on it.

It is also interesting to note the influence of the sea on both men in the formulation of their theories. Dow compared the major, intermediate, and minor trends in the market with the tides, waves, and ripples in the ocean. Elliott referred to 'ebbs and flows' in the writing and named his theory the 'wave' principle.

WAVE PERSONALITIES

Another area where the two theories overlap to some extent is in the description of the three phases of a bull market. A knowledge of these wave personalities can be helpful, especially when wave counts are unclear. It is also important to remember that these wave personalities remain constant in all the different degrees of trend.

Wave 1

About half of the first waves are part of the basing process and often appear to be nothing more than a rebound from very depressed levels. First waves are usually the shortest of the five waves. These first waves can sometimes be dynamic, especially if they occur from major base formations.

Wave 2

Second waves usually retrace or give back, all or most of wave 1. The ability of wave 2, however, to hold above the bottom of wave 1 is what produces many of the traditional chart patterns, such as double or triple bottoms and inverse head and shoulders bottoms.

Wave 3

The third wave is usually the longest and the most dynamic, at least in the common stock area. The penetration of the top of wave 1 registers all kinds of traditional breakouts and Dow Theory buy signals. Virtually, all technical trend following systems have jumped on the bull bandwagon by this point. Volume is usually the heaviest during this wave and gaps prevail. Not surprisingly, the third wave is also most likely to extend. Wave 3 can never be the shortest in a five-wave advance. By this time, even the fundamentals are looking good.

Wave 4

The fourth wave is usually a complex pattern. Like wave 2, it is a corrective or a consolidation phase, but usually differs from wave 2 in its construction. Triangles usually occur in the fourth wave. One cardinal rule of Elliott analysis is that the bottom of wave 4 can never overlap the top of wave 1.

Wave 5

In stocks, wave 5 is usually much less dynamic than wave 3. In commodities, wave 5 is often the longest wave and the one most likely to extend. It is during wave 5 that many of the confirming technical indicators, such as On Balance Volume (OBV), begin to lag behind the price action. It is also at this point that negative divergences begin to develop on various oscillators, warning of a possible market top.

Wave A

Wave A of the corrective phase is usually misinterpreted as just a normal pull-back in the uptrend. Having already spotted several oscillator divergences on the prior advance, the alert technician may also notice a shift in the volume pattern at this point. Heavier volume may now have shifted to the downside, although that is not necessarily a requirement.

Wave B

Wave B, the bounce in the new downtrend, usually occurs on light volume and usually represents the last chance to exit old long positions gracefully and a second chance to initiate new short sales. Depending on the type of correction taking place, the rally may test the old highs (forming a double top) or even exceed the old highs before turning back down.

Wave C

Wave C leaves little doubt that the uptrend has ended. Again, depending on the type of correction in progress, wave C will often decline well below the bottom of wave A, registering all kinds of traditional technical sell signals. In fact, by drawing a trendline under the bottoms of wave 4 and wave A, the familiar head and shoulders top sometimes appears.

PITFALLS IN INTERPRETATION OF CHARTS

Several charting softwares are available in India, and charting is very extensively used by operators in the market for their trading decisions. It appears so easy to view a chart, just press a few keys on the keyboard and you have the chart you want on the screen. Almost all softwares allows you to zoom in on to a small segment chosen by the user and some allow plotting of up to four charts on separate windows simultaneously on the screen. How can there be any pitfalls in such a simple process? Well, appearances, they say, can sometimes be very deceptive. Let us see why that is particularly true of charting.

We have to understand a little bit about the computer screen to appreciate the issues raised on charting. The screen is made up of thousands of dots (known as pixels). These dots are selectively lit up to form characters and other impressions on the screen for the user. While the number of dots varies with the kind of monitor used, we shall discuss the situation where the screen has 640 x 480 dots (that is, there are 640 columns and 480 rows of dots). Assuming that about 20% of these dots are used up in drawing and naming the axes and in naming the chart, etc., we would have roughly a space of 400 x 380 dots for actual plotting. That is, the chart can plot 400 distinct periods and 380 distinct prices at one time on the screen. This physical dimension can pose difficulties in several situations.

Let us say we want to plot the price of TELCO shares for the last three years on the screen. The total number of observations may be about 650. How do we compress 650 observations into 400 columns available for plotting? We could use two approaches namely, plot every alternate point or plot the average price of every pair of successive observations, in both cases the number of observations would be brought down to a manageable level of 325. But either of the two procedures could lead to serious distortions in the picture presented to us on the screen. And we would not even know that such a distortion has taken place!

Let us take another situation. We may like to plot a share quoting below Rs.100 and the BSE Sensitive Index, which is say above 1000, on the same chart. What kind of a scale shall we choose? Given that only 380 rows are available for representing prices, each row may have to represent an increase of three points, so that we can accommodate the Index. Therefore, a price series of 30, 32, 34, 36, 37, ... may be altered to 30, 33, 33, 36, 36 (rounding on the actual price to the nearest value that can be represented on the chart). And again we would not be aware that the plot presented to us has suffered for the inherent limitations of the display equipment.

The software designers are not to blame for this. They are constrained by the limitations of the equipment. But what we must certainly do is to find out from them, the manner in which data is being compressed whenever a need for such compression arises. This would ensure that we are aware of the possible impact of that compression on the chart and therefore before reaching any conclusions, we plot the data in every possible manner to overcome as best as possible, the limitations of the display technology.

Another limitation of charting that an intelligent user must be aware of is the optical illusion that is often created by the method of drawing the graphs. Let us say, we plot TISCO share price data from July 1 to December 31, 2002, which has say 100 observations. Since the space available on the screen is for 400 observations, a point in every fourth column would be lit up and a line would be drawn through these points to give us the line chart. Now, let us say, to get a better perspective about the price movement, we expand the period to one year, from January 1 to December 31, 2002, which has say 200 observations. A point in every second column would now be lit up and joined with a line to produce the chart. To make a comparison of price movement in a similar period the previous year, we further expand the period to two years, from January 1, 2001 to December 31, 2002, which has say 400 observations. This would light up one point in every column. What is the impact of all this on the chart for the period of primary interest to us? From being spread across 400 columns, it has got compressed to 100 columns. And more often than not, we would notice that the pattern that we visualize when it is spread across a larger number of columns is different from the pattern we visualize when it is spread across lesser number of columns. We would call this as optical illusion, and we have to be wary of this all the time when we are interpreting charts. A simple example to drive home the point: examine the two graphs on sales (Figures 48 and 49) and very quickly answer as to which case has

the growth in sales been higher? Our answer is likely to be: Case 2. Now let us look at the charts more closely; in fact, the growth in sales is higher in Case 1. It is the choice of scale that conveyed the wrong impression.

Figure 48: Case 1

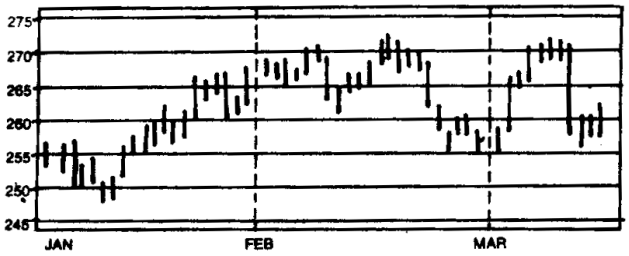
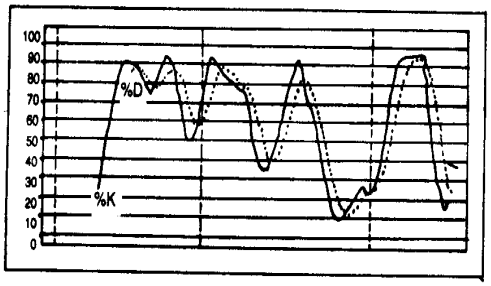


Figure 49: Case 2



To sum up, charting may appear simple and yet is full of details which when ignored would lead to erroneous conclusions. Therefore, before we firm up our interpretation of a chart, it is advisable to plot it in several ways, for different time periods, and examine it from all angles, before drawing inferences. Unless we do this, it is likely that we would be as often wrong as right in our interpretation.

RECENT DEVELOPMENTS

Technical analysis is by definition based on the assumption that past prices can be used to predict future prices. But as a perceptive reader you would have noticed something strange about the methods of technical analysis discussed so far. None of these methods bear any resemblance to the standard statistical methods of predicting the future from the past. If a technical analyst were to approach a statistician for advice, the statistician in all likelihood would recommend regression analysis, particularly auto-regressions and ARIMA (Box-Jenkins) analysis. However, chartists do not use these techniques and the methods that they do use would be totally alien to a statistician trained in classical prediction theory.

It is well known that the standard statistical methods are the best linear prediction techniques possible. For charting techniques to make sense it is therefore, necessary not merely that future prices depend on past prices but that they depend on past prices in a highly non-linear manner so as to make standard statistical techniques irrelevant. In this section, we shall very briefly cover some recently developed mathematical techniques for dealing with highly non-linear process which have been used for charting.

Chaos theory has been proposed to study highly non-linear processes which exhibit the following features:

a. The processes appear to be totally random and unpredictable.

b. The processes are in fact predictable using non-linear prediction techniques.

c. The accuracy of prediction drops rapidly as the prediction horizon is increased.

d. The processes are highly sensitive to initial conditions.

These features make chaos theory an attractive tool for technical analysts who have powerful computers at their disposal to perform the complex calculations required by the theory. These analysts hope to detect subtle patterns in price movements which would not have been observed by people who employ less sophisticated mathematics.

Neural network, originally designed on the basis of an analogy with the network of neurons in the human brain, is another computer based technique for detecting subtle patterns in voluminous data. Neural networks today do not attempt anything as ambitious as imitating the human brain. They are instead highly versatile pattern recognizers. Given large amounts of data to train on, a neural network can learn to recognize highly complex patterns. The network learns the pattern by a sophisticated form of trial and error known as back-propagation technique that has led to the rapid growth of the neural network technology since the early 1980s.

As far as chartist is concerned, neural network is just another tool that allows him to search for patterns in the prices and the success of the technique depends to a great extent on the experience and ingenuity of the chartist himself. The neural network has another major disadvantage in that it is a black box which gives no reasons or explanation for its buy or sell recommendations. Just as you and I would find it impossible to explain how we balance ourselves while walking, so also the neural network is unable to explain how it works.

The use of these techniques in technical analysis dates back only to the 1980s and it is still too early to say whether they are worthwhile charting techniques or whether they are merely a passing fad.

ACADEMIC PERSPECTIVE

Academics have consistently been sceptical about Technical Analysis, as all their attempts to unravel the golden rule that consistently provides extra-normal returns have failed. A large number of studies, both in the Indian as well as markets the world over, using a variety of statistical procedures and trading rules have invariably concluded that no single rule can earn consistently above average returns from the market over long periods of time. A rule may work very well for a short time, but would fail miserably in the next time span, in which some other rule would have yielded extra normal returns. No one has been able to predict with certainty as to which rule is to be applied when for consistently out-performing the market.

Academics also argue that even if knowledge for always earning superior returns exists, it would never be disclosed as the one who possesses the knowledge could use it profitably. The argument goes a step further: if the knowledge (to out-perform the market) were to be made public, then that very act would destroy its effectiveness because if everyone in the market were to act according to that, no one will be able to make extra profits. Therefore, it is impossible that a trading rule which yields extra normal profits with certainty would ever be known. Charting and Technical Analysis are, therefore, an attempt to build an edifice without foundation.

These arguments comprise what is known as ‘market efficiency’. The thesis is that the presence of large number of experts in the stock market, who are constantly trying to outwit each other to make the extra buck, would ensure that the market is very efficient in pricing of securities. In the long run, therefore, an investor would earn the returns commensurate with the risks assumed, no more no less. The search for patterns in the prices on the assumption that there is future in the history of prices is meaningless. The view appears too fatalistic as it seems to do away with the need to manage our portfolios. Well, that is not entirely true, because the risk one assumes in the market, which depends on the composition of the portfolio, is still a decision that needs to be made and constantly reviewed by an investor. That would necessitate transactions and reshuffle of portfolios.

SUMMARY

- Technical analysis is not based on strong conceptual framework, but depends fully on the use of historical trends to predict future prices. Though technical and fundamental analysis provide diagonally opposite approaches to valuation, in practice, a judicious blend of the two approaches is attempted to arrive at better results.
- The technical analysis is done from important points of view namely, price, time, volume and breadth. The Dow theory is one of the oldest methods of identifying trends and it has six basic tenets.
- The basic tool in Technical Analysis is movement in prices, measured by charts. The analyst uses line chart, bar chart and point and figure chart. He is also called chartist.
- Stock prices tend to move more or less in tandem with the overall market trends, represented by a market index; relative strength refers to the ability of an industry or stock to outperform the market at turning points. It arises on account of inherent strength in the industry.
- Moving averages can help determine the share price when they appear to move rather haphazardly and be very volatile. There are three basic types of moving averages namely simple moving averages, weighted moving average and exponential moving average.
- The Rate of Change (ROC) of index is widely used to measure the momentum of price changes. Momentum measures the rate at which prices rise or fall and is based on the principle that prices usually rise at the fastest pace well ahead of their peak, and decline at their greatest speed before their trough.
- Stochastic is a price velocity technique based on the theory that as prices increase, closing prices have tendency to be ever nearer to the peaks reached during that period.

Chapter X

Efficient Market Hypothesis

After reading this chapter, you will be conversant with:

- Concept of Efficiency of the Stock Markets
- Forms of EMH
- Empirical Tests of EMH in the Indian Market
- Description of Tests of EMH

Introduction

Two commonly used approaches for decision-making on investments are fundamental analysis and technical analysis. In fundamental analysis, the investor's decisions are based on the intrinsic value of a security which helps in identifying the mispriced securities. In technical analysis, the decisions are based on the price and volume of the stock as they are perceived to reflect the value of the stock. Besides these two approaches, there are some qualitative factors which also have a role in decision-making.

Investors are likely to make systematic errors which would push the stock prices away from that determined by fundamental analysis. The psychological aspect of the stock price movements forms a separate field of study termed "Behavioral Finance". The unexpected shocks in the stock markets can be explained by behavioral finance, which has gained an upper hand over the traditional Efficient Market Hypothesis (EMH). The theory that irrational behavior by some of the investors leads to a distortion in the prices of securities, is seen to be gaining increased importance over the EMH in the recent past. As research is still going on in this field, EMH, however, still retains its hold in explaining stock movements.

Box 1: Behavioral Finance – An Introduction

Over the past decade, a different view of financial markets, broadly known as "behavioral finance", has emerged. Proponents say that investors can make systematic errors in forecasting cash flows or in setting the discount rate, and these errors can push stock prices away from fundamental value for extended periods of time.

The stratospheric rise in the value of the US equities and of the technology sector in particular during the late 1990s has shaken many observers' belief in efficient markets, and drawn many to the behavioral finance view.

This raises the possibility that behavioral finance will replace the efficient markets hypothesis as a dominant model, a prospect that strikes fear into the hearts of financial economists who have built careers on the efficient markets hypothesis.

Researchers in behavioral finance spend a good deal of time studying work by psychologists trying to understand the biases that affect decision-making.

Source: "Speculative Bubble, Irrationality and Chaos", by Niamh Brodie, Merrion-capital.com.

CONCEPT OF EFFICIENCY OF STOCK MARKETS

Market efficiency signifies how 'quickly and accurately' does relevant information have its effect on the asset prices. Depending upon the degree of efficiency of a market or a sector thereof, the return earned by an investor will vary from the normal return (return appropriate to risk level).

Efficient Market Hypothesis (EMH)

According to EMH, successive absolute short run price changes are independent. The hypothesis is based on the assumption that the market comprises rational investors. The term 'rational' means that investors will select assets based on their risk-return profile. If the behavior of the market participants, as revealed by various empirical studies, towards various kinds of value relevant information is compared with this term, we will see that the very assumption of EMH comes under cloud. It must be noted that the empirical results existed well before attempts were made to formulate a theory for explaining those results; therefore, issues like competitive market, quicker adjustment to information, informed market participants, easy access to markets, are not a part of EMH, but rather explanations of empirical results.

Now, there is a need to explore how useful or redundant are the two approaches to investing – fundamental and technical analysis.

The very phenomenon of market equilibrium brings to the fore the point that mispricing is the basic feature of any market. Only the duration, speed and frequency with which this mispricing disappears as a result of the action of various market participants is something worth examining. Technical analysis, as an approach, has been fairly useful in detecting trends and reversals of market movement. A majority of the mutual funds which entered when the market was ascending great heights are performing poorly even after several years, thus, emphasizing the importance of time as a factor. The mere fact that technical analysis will not fetch abnormal returns consistently does not render it redundant. Technical analysis only gives an idea about the likely range of price movements and reversals, and there is no serious attempt on its part to predict the future price. Moreover, technical analysis is commonly used as a supplement to fundamental analysis. Tests conducted to test trading strategies based on technical analysis do not support its exclusive use. It is argued that the strategies are tested separately, instead of testing them together and then arriving at a weighted result.

In fundamental analysis, EMH is entirely in agreement with upward or downward change in trends since only the short run price changes are random and not the price trends themselves. While discussing semi-strong form of EMH, we will see that the market does not always react to value relevant information in an 'accurate' manner. It is this inaccurate price adjustment, which increases the possibility of developing trading strategies which might work and so the desirability of fundamental analysis. The semi-strong form of Random Walk opines that analysts who employ fundamental analysis should possess superior insight into companies' future prospects using their own data rather than using merely publicly available information and even inside information for consistently earning abnormal returns. This is indeed a tougher proposition to achieve, but even on a simple plane, analysts who employ fundamental analysis have their worth proved as far as identifying securities in the risk-return framework is concerned. Even for a buy and hold strategy, one needs to pick securities which are at least priced equal to (if not less than) their intrinsic value. According to Warren Buffett – What is investing, if not the act of seeking value at least sufficient to justifying the amount paid?

Box 2: The Efficient Market Hypothesis

Market efficiency infers that market prices reflect all publicly available information. This includes information about confidence amongst investors and consumers, as well as information regarding the likelihood of future events. Prices react immediately and correctly to new information. Furthermore, changes in share prices will be completely random unless new information is received and assimilated. Speculative bubbles involve persistent deviations from a share's 'correct' value and cannot be deemed random. Are efficient markets consistent with Wall Street crashes? EMH implies that share prices should not increase on the whims of the crowd. To examine how delusion in the stock market can occur, we must thus assume that EMH does not always hold, and examine the basis upon which investors value shares, the efficiency of their actions, and the role of expectations.

Source: "Speculative Bubble, Irrationality and Chaos", by Niamh Brodie, Merrion-capital.com.

FORMS OF EMH

Depending upon the level of information considered, there are three forms of EMH. They are:

a. **Weak Form:** Also known as random walk model, it says that current prices fully reflect all historical information, hence, any attempt to predict prices based on historical price or information is totally futile as future price changes are independent of past price changes.

   It is not surprising to note that the weak form holds good in any market, since even the critics of EMH will admit that prices adjust to information albeit with a lag.

b. **Semi-strong Form:** According to this form, current stock prices reflect all publicly available information such as earnings, stock and cash dividends, splits, mergers and takeovers, interest rate changes, etc. It also says that prices adjust to such information 'quickly and accurately' so abnormal/superior profits on a consistent basis cannot be earned.

c. **Strong Form:** According to the strong form, prices of securities fully reflect all available information – both public and private. That is, if this form is true, prices reflect the information that is available to only selected groups – like the management, financiers and stock exchange officials. There are two versions of the strong form – the near-strong form and the super-strong form. As per the near-strong form, conclusions and opinions drawn by analysts based on publicly available information are also reflected in the prices. The super-strong form is more extreme and states that confidential information available only to selected groups of people mentioned is also of no use in obtaining abnormal returns, as the prices contain adjustment for that information as well. As can be expected, the super-strong form has been rejected by many while the near-strong form found some support.

EMPIRICAL TESTS OF EMH IN INDIAN MARKET

Market efficiency as a phenomenon certainly plays a great role in bringing equilibrium in any market. With a variety of market participants at work and their actions influenced by their respective opinion about prices or returns, the market should at all times be in a state of dynamic equilibrium. In a nutshell, EMH states that successive absolute price changes are independent in the short run and subject to the assumption that the market comprises rational investors. However, investors are not always rational in that they consider factors other than risk and return for selecting securities. It is extremely difficult, if not impossible, to segregate the fractional influences of these factors. In the Indian stock market, sentiments play a major role in price behavior at the counters.

Box 3: The Behavior of Investors and Security Analysts

Irrationality affects trading, expectations and prices in capital markets. Several recent surveys summarize evidences about psychology of the individuals and its relevance for financial and other economists. There are other possible reasons for systematic decision errors. Most familiar psychological biases can be viewed as outgrowths of heuristic simplification, self-deception, and emotion-based judgments. Heuristic simplification helps explain many different documented biases, such as salience and availability effects, framing effects, money illusion, and mental accounting.

Investors

Investors Often do not Participate in Asset and Security Categories: Investors invest only in stocks that are in limelight. Non-participation may also be related to the extent of familiarity or "mere exposure" effects, for example, a perception that what is familiar is more attractive and less risky. Even now, many investors entirely neglect major asset classes (such as commodities, stocks, bonds, real estate), and omit many individual securities within each class. Investors are strongly biased toward home country stocks.

Individual Investors Exhibit Loss-averse Behavior: Owing to limited attention and mental processing power, individuals engage in mental accounting, which can lead them to confuse the unpleasantness of experiencing an economic loss with the unpleasantness of realizing the loss. This is related to the notion of loss-aversion in which individuals are concerned about gains and losses as measured relative to an arbitrary reference point. Investors are more prone to realizing gains than losses. Specifically, the individual investors trading through a large discount brokerage firm tend to be more likely to sell their winners than their losers.

Investors use Past Performance as an Indicator of Future Performance in Mutual Fund and Stock Purchase Decisions: Representativeness (a tendency to judge likelihoods based upon naive comparison of characteristics of the event being predicted with characteristics of the observed sample) suggests that investors will sometimes extrapolate past price trends naively. Evidence suggests that investors are naively extrapolating past mutual fund success, when empirical evidence suggests that there is little or no persistence in performance. The fact that the flows are concentrated among the top performing mutual funds in each category is potentially consistent with limited attention/salience effects.

Investors Trade too Aggressively: It has been argued that the volume of trade in speculative markets is too large, and overconfidence of traders has been advanced as an explanation. Whether volume is too large or not is hard to establish without a benchmark rational level of volume. Rational dynamic hedging strategies, in principle, can generate enormous volume with moderate amounts of news. Stronger support for overconfidence is provided by an evidence suggesting that more active investors earn lower returns as a result of incurring higher transaction costs.

Investors do not always form Efficient Portfolios: More generally, there is an evidence that investors sometimes fail to form efficient portfolios. Several experimental studies examined portfolio allocation when there are two risky assets and a risk-free asset and returns are distributed normally. People often invest in inefficient portfolios that violate two-fund separation.

Certain Classes of Investors and their Agents Change their Behaviors in Parallel.

This phenomenon, called herding, is consistent with rational responses to new information, agency problems or conformity bias. Herding behavior has been documented in the trading decisions of institutional investors in recommendation decisions of stock analysts. Investors may form theories of how the market works based upon irrelevant historical values and make decisions based upon mental accounting with respect to arbitrary reference points.

Security Analysts

Analyst forecasts and recommendations are biased. Analyst forecasts and recommendations have investment value. Nevertheless, there is a strong evidence that analysts are biased in their forecasts and recommendations. It is likely that agency problems, analyst misconceptions and investor gullibility play a role in generating biases. Forecasts are generally optimistic especially at 12-month and longer time horizons, both in the US and other countries.

Analyst Forecast Errors are Predictable Based upon Past Accruals, Past Forecast Revisions and other Accounting Value Indicators: The presence of systematic bias suggests inefficient forecasts and predictable forecast errors. Past accounting accruals, the adjustments firms make for cash flows to obtain reported earnings, predict forecast errors for new issue firms and more generally in firms where earnings have been managed upward by taking high accruals. Analysts' overoptimism about new issue firms, therefore, contributes to the new issue anomaly. These findings suggest that investors are excessively credulous about the motives of management, perhaps because of limited attention. It is not clear in general whether analysts underreact or overreact to information.

Source: ICFAI Research Center.

Tests of Weak Form

The weak form enjoys a fair degree of chance to hold good even in a developing market like India. The reason is the behavior of the market participants which is driven by their sentiments rather than historical prices and returns.

Serial Correlation and Runs Test: Both the tests done by Obaidullah (1990) taking weekly returns for the period 1985-88 do not contradict the weak form of EMH. The correlation coefficients are not significantly different from zero. Similarly, the actual number of runs too are not significantly different from runs generated out of random numbers.

In another study, Chaudhary (1991) found the first order serial correlation coefficients for 70 (out of 93) shares to be significantly different from 0 at 1% level. However, the values of the correlation coefficients were very low. This indicates that only 30% of the price changes are explained by previous day price changes.

Table 1: Serial Correlation Coefficients

Company Code (k)	1	2	3	4	5	6
1	0.040	–0.133	–0.163	0.066	0.007	–0.499
2	–0.038	0.013	0.042	–0.080	–0.479	0.016
3	0.133	–0.047	–0.304	–0.059	–0.049	0.011
4	0.091	–0.046	0.095	–0.062	0.132	–0.185
5	–0.100	–0.054	–0.057	–0.086	–0.035	0.356
6	–0.001	0.041	0.027	0.067	–0.066	–0.196
7	–0.030	0.065	–0.011	–0.102	0.064	0.019
8	–0.016	–0.074	0.053	0.269	0.035	–0.021
9	–0.022	–0.095	–0.021	0.004	–0.006	0.015
10	–0.028	0.101	–0.112	–0.064	0.067	0.007

Company Code (k)	7	8	9	10	11	12
1	–0.247	–0.134	–0.127	–0.151	0.127	–0.025
2	–0.130	–0.078	0.020	0.023	–0.028	0.014
3	0.194	–0.085	0.003	–0.077	–0.060	0.004
4	–0.100	0.043	–0.003	0.029	–0.178	0.045
5	–0.003	0.007	0.045	–0.103	–0.136	–0.003
6	0.024	0.201	–0.009	0.050	0.038	0.115
7	–0.029	0.035	–0.092	0.018	0.062	0.071
8	0.102	–0.012	0.127	–0.046	0.066	0.081
9	0.058	–0.065	0.008	0.012	0.037	–0.083
10	–0.200	0.003	–0.033	–0.039	–0.104	0.057

Table 2: Runs Tests Results

Company Code	Actual No. of Runs	Expected No. of Runs	Standardized Variable
1	111	104.41	1.038
2	110	113.51	–0.556
3	114	110.20	0.589
4	114	119.63	–0.888
5	118	107.79	–1.564
6	101	107.81	–1.051
7	129	121.21	1.222
8	120	110.64	1.493
9	113	107.92	0.793
10	113	112.41	0.094
11	96	107.58	–1.822
12	96	106.97	–1.711

Filter Tests: Unlike the serial correlation tests which assume linearity of relation between prices (which may be an oversimplified assumption), here the strategy of using filter rules for trading has been put to test. This has been done by comparing the returns from different filter rules with that from a buy and hold strategy. The test by Rao (1988) shows that the returns under buy and hold strategy are higher than that under filter strategy without considering the transaction costs.

Table 3: Rates of Return Under Filter Techniques and Buy-and-Hold Strategy

Company	0.03 Rf	Filter Rb	0.05 Rf	Filter Rb	0.10 Rf	Filter Rb
L&T	–0.1415	0.3876	0.1050	0.3150	0.0021	0.2565
Bajaj Auto	–0.0087	0.8450	0.0339	0.7708	0.0223	0.6235
HM	–0.1050	0.1589	–0.6070	0.1634	–0.0800	0.0980
Spic	–0.3150	0.5845	–0.1085	0.5044	–0.0046	0.5672
Colgate	–0.0375	0.7640	–0.0053	0.7973	–0.0160	0.5725
Nocil	–0.2150	0.4850	–0.2150	0.5350	–0.0117	0.4130
Grasim	–0.9020	0.2700	–0.7500	0.2000	–0.0265	0.1895
Telco	–0.1200	0.0079	–0.1375	0.0070	–0.0345	0.0080
Reliance	–0.1203	0.0641	–0.0547	0.1068	–0.0659	0.1450
FSL	–0.0620	0.6400	–0.1115	0.2750	–0.0440	0.3909

Notes: Rf – denotes the average annual rates of return under Filter Technique.

Rb – denotes the average annual rates of return under Buy-and-Hold Strategy.

Thus, the significant support for 'weak form' is a direct rejection of past prices to predict future prices. Technical analysis, if used as an independent trading tool, is exposed to harsh criticism as a result of the above. However, this does not mean that technical analysis can be ignored, considering its usefulness in conjunction with fundamental analysis. Moreover, looking at the performance of the mutual funds, it is more than evident that timing is an important factor that cannot be overlooked.

Tests for Semi-strong Form

These tests examine how 'quickly and accurately' the stock returns get revised upwards or downwards as a result of release of information like earnings, stock and cash dividends, splits, additional issues, mergers and takeovers, interest rate changes, etc. While testing the semi-strong form, only changes in the residual return in the equation $R_{it} = a_i + b_i (R_{mt}) + e_{it}$ that is, changes in e_{it} are considered. That is, by ignoring the changes in the other components of the return, the impact of market movement on the returns is got rid of.

This return is computed in the form of Cumulative Average Abnormal Return (CAAR) for periods both before and after the zero date. The zero date is the date on which price-sensitive information has been released.

Earnings Impact: In a study by Obaidullah (1991), the CAAR (computed over 1986-90) for both positive and negative unexpected earnings was found to move up and down respectively in equal measure with no significant post release drift, thus, indicating quick adjustment of returns to earnings information.

Figure 1: Behavior of CAAR (Impact of Earnings)

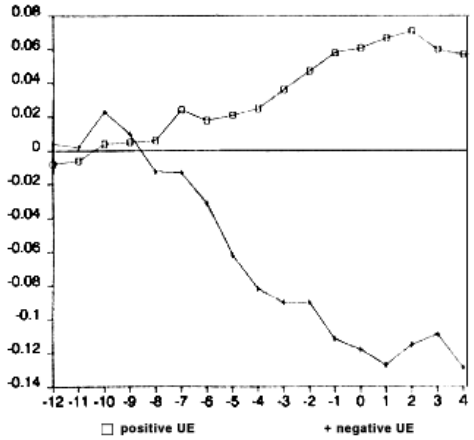


Table 4: Returns/Earnings Correlation Coefficients

Window	Residual Analysis	Raw
–12, +6	0.179 (0.256)	0.168
–12, 0	0.163	0.226 (0.378)
–6, +6	0.152	0.093
–6, +3	0.156	0.143
–1, +1	0.049	0.066

Bonus Impact: Even though a bonus issue never brings any additional value to investors, it does influence the expectations regarding future. As a result, the adjustment which starts well before such announcement is less than accurate as against the ideal 'one to one' adjustment with the bonus ratio. As before, the CAAR after zero date does not drift significantly indicating fairly quick price adjustment. However, there has been a significant upward drift before the zero date, which means the market has anticipated the event. This is considered to be an indication of the efficiency of the market.

Figure 2: Impact of Bonus Issue (All R)

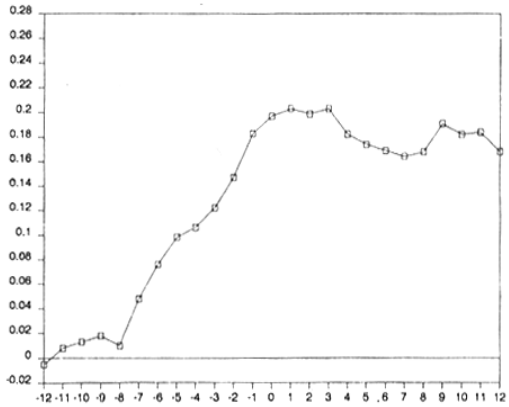


Table 5: Impact of Bonus Issues

Period	all R	R = 1:1	1:1 > R > 1:2	R = 1:2	R < 1:2
–12	–0.005	0.000	0.008	–0.038	0.022
–11	0.008	0.029	–0.020	–0.007	0.004
–10	0.013	0.038	0.012	–0.012	–0.018
–9	0.018	0.042	0.015	–0.008	–0.004
–8	0.010	0.031	0.062	–0.056	–0.001
–7	0.048	0.045	0.055	0.098	–0.028
–6	0.076	0.082	0.066	0.144	–0.032
–5	0.098	0.117	0.083	0.158	–0.030
–4	0.106	0.131	0.053	0.188	–0.031
–3	0.122	0.155	0.062	0.194	–0.016
–2	0.147	0.193	0.055	0.215	0.011
–1	0.183	0.230	0.134	0.237	0.021
0	0.197	0.258	0.106	0.240	0.052
1	0.203	0.268	0.131	0.247	0.028
2	0.199	0.266	0.125	0.252	0.011
3	0.203	0.262	0.098	0.277	0.036
4	0.182	0.239	0.074	0.265	0.010
5	0.174	0.233	0.064	0.228	0.040
6	0.169	0.220	0.074	0.230	0.029
7	0.164	0.220	0.073	0.211	0.034
8	0.168	0.228	0.059	0.195	0.069
9	0.191	0.262	0.102	0.209	0.062
10	0.182	0.248	0.114	0.196	0.046
11	0.184	0.240	0.099	0.222	0.060
12	0.168	0.226	0.074	0.190	0.069

Tests of Strong Form

The studies done by Barua and Verma (1991) and Obaidullah and Ganeshan (1991) show that mutual funds do provide abnormal returns thus contradicting the near strong form EMH. As far as the super strong form is concerned, it does not hold good even in developed markets.

DESCRIPTION OF TESTS OF EMH

Tests of Weak Form EMH

According to the weak form of EMH, investors cannot reap abnormal profits by observing the historical data of stock prices as they follow a random path. That is, the stock price on a particular day is not related to the stock price on any other day.

To prove the independent nature of share prices, analysts generally conduct the tests described below.

AUTO-CORRELATION TEST

In this test, certain number of stocks are selected. For a particular period, the changes in the prices of these stocks are observed. Then in another period, for the same stocks the changes in the stock prices are noted. For these changes, correlational analysis is conducted. If the correlation between these changes is near or equal to zero, it implies that the price changes are independent of each other. First, we calculate the coefficient of determination, 'r square' by the formula given below:

$$r^2 = \frac{a\sum Y + b\sum XY - n.\overline{Y}^2}{\sum Y^2 - n\overline{Y}^2}$$

where 'b' is given by $\frac{\sum XY - n\overline{XY}}{\sum X^2 - n\overline{X}^2}$ and 'a' by $\overline{Y} - b\overline{X}$.

If we compute the square root of 'r', we get the magnitude of correlation between the price changes in two different periods. For the price changes to be independent, the value of 'r' should be close to zero or statistically insignificant.

Illustration 1

The data given below relates to stock prices of Xylon Tech Ltd. during July 20x0, and July 20x2. Check whether these stock prices are independent or not.

Days on which trading took place in July, 20x0	Stock price	Days on which trading took place in July, 20x2	Stock price
3	650.00	1	2507.00
4	665.00	2	2461.50
5	665.00	3	2363.75
6	685.00	4	2303.25
7	685.00	5	2080.25
10	705.00	8	1960.25
11	708.50	9	2151.00
12	707.00	10	2080.25
13	709.50	11	2252.25
14	707.00	12	2282.75
17	706.50	15	2055.00
18	718.25	16	2031.50
19	715.00	17	2229.00
20	710.00	18	2124.00
21	705.00	19	2063.50
24	698.00	22	1995.00
25	691.00	23	2110.75
26	705.00	24	2278.00
27	706.25	25	2281.00
28	709.00	26	2210.00
30	715.00	29	2292.00

Price Changes X	Price Changes Y	X^2	Y^2	XY
15.00	–45.50	225.0000	2070.2500	–682.500
0.00	–97.75	0.0000	9555.0625	0.000
20.00	–60.50	400.0000	3660.2500	–1210.000
0.00	–223.00	0.0000	49729.0000	0.000
20.00	–120.00	400.0000	14400.0000	–2400.000
3.50	190.75	12.2500	36385.5625	667.625
–1.50	–70.75	2.2500	5005.5625	106.125
2.50	172.00	6.2500	29584.0000	430.000
–2.50	30.50	6.2500	930.2500	–76.250
–0.50	–227.75	0.2500	51870.062500	113.875
11.75	–23.50	138.0625	552.2500	–276.125
–3.25	197.50	10.5625	39006.2500	–641.875
–5.00	–105.00	25.0000	11025.0000	525.000
–5.00	–60.50	25.0000	3660.2500	302.500
–7.00	–68.50	49.0000	4692.2500	479.500
–7.00	115.75	49.0000	13398.0625	–810.250
14.00	167.25	196.0000	27972.5625	2341.500
1.25	3.00	1.5625	9.0000	3.750
2.75	–71.00	7.5625	5041.0000	–195.250
6.00	82.00	36.0000	6724.0000	492.000
Total		1590.0000	315270.6250	–830.375
$\sum X = 65$	$\sum Y = -215$			
$\bar{X} = 3.25$	$\bar{Y} = -10.75$			
$\bar{X}^2 = 10.5625$	$\bar{Y}^2 = 115.5625$			

$$b = \frac{\sum XY - n\bar{X}\bar{Y}}{\sum X^2 - n\bar{X}^2} = \frac{-830.375 - 20(3.25)(-10.75)}{1590 - 20(10.5625)} = \frac{-131.625}{1378.75} = -0.095$$

$$a = \bar{Y} - b\bar{X} = -10.75 - (-0.095)\,(3.25) = -10.75 + 0.309 = -10.44$$

$$r^2 = \frac{a\sum Y + b\sum XY - n.\bar{Y}^2}{\sum Y^2 - nV^{-2}}$$

$$= \frac{(-10.44)(-215) + (-0.095)(-830.375) - (20)(115.5625)}{315270.625 - (20)(115.5625)} = \frac{12.24}{312959.375}$$

$$= 3.9 \times 10^{-5}$$

$$r = \sqrt{3.9 \times 10^{-5}} = 0.0063$$

We observe that the correlation between the prices in two different periods is very small and insignificant. Therefore, we conclude that prices moved in a random fashion.

RUNS TEST

By this test, we test a sample for randomness of order. A run is defined as "a sequence of identical occurrences preceded and followed by different occurrences or by none at all." For testing the randomness of share prices, we take a series of stock prices. Starting with the first price, each price change is denoted by a plus (+) or a minus (–) sign. Plus (+) sign indicates that the price under consideration has increased compared to its preceding price and a minus (–) sign indicates that the price under consideration has decreased compared to the preceding price. In case the price under consideration is same as its preceding price, we indicate it by

a zero. In case the sign has changed from a plus to minus or from a minus to plus, a new run is counted to have begun. To test the independence of the prices, we require:

Total number of runs : r

Number of positive price changes : n_1

Number of negative price changes : n_2

Once we have this data, the mean and the standard deviation of the mean, are calculated by using the formulae given below.

$$\mu_r = \frac{2.n_1.n_2}{n_1+n_2}+1$$

and $$\sigma_r = \sqrt{\frac{2.n_1.n_2(2n_1n_2-n_1-n_2)}{(n_1+n_2)^2(n_1+n_2-1)}}$$

At a given level of significance, we calculate the upper and lower limits and check whether the number of runs observed from the test falls within the limits or not. If it is between the limits, we conclude that the prices are random or independent of each other, otherwise not.

Illustration 2

Given below are the share prices of Laser Ltd. for the months of April, May, June and July. For this data, conduct runs test and determine whether or not the prices are independent at 5%, 10% and 20% levels of significance.

Days on which trading was done		Stock Price (X)
20x2		
April	1	881.50
	2	856.50
	3	859.75
	4	918.50
	5	1010.25
	8	1072.25
	9	1074.50
	10	1123.50
	11	1203.50
	12	1256.25
	15	1341.50
	16	1469.75
	17	1450.25
	18	1306.50
	19	1258.00
	22	1332.75
	23	1315.75
	24	1351.00
	25	1407.50
	26	1547.75
	29	1521.00
	30	1484.25

Days on which trading was done		Stock Price (X)
May	1	1458.00
	2	1425.00
	3	1350.75
	6	1447.50
	7	1448.25
	8	1505.25
	9	1511.25
	10	1588.25
	13	1560.00
	14	1576.00
	15	1638.50
	16	1648.50
	17	1710.75
	20	1703.00
	21	1665.00
	22	1665.75
	23	1550.75
	24	1508.00
	27	1460.00
	28	1316.25
	29	1229.00
	30	1324.75
	31	1205.75
June	3	1295.50
	4	1292.25
	5	1191.50
	6	1179.50
	7	1279.00
	10	1280.25
	11	1247.50
	12	1186.50
	13	1207.75
	14	1323.00
	17	1366.75
	18	1312.00
	19	1412.75
	20	1420.50
	21	1375.50
	24	1377.50
	25	1304.50
	26	1395.00
	27	1498.75
	28	1549.75
July	1	1520.00
	2	1489.50
	3	1397.75

Days on which trading was done	Stock Price (X)
4	1425.00
5	1487.50
8	1536.50
9	1500.50
10	1481.25
11	1437.25
12	1460.75
15	1385.50
16	1401.25
17	1381.25
18	1487.25
19	1471.25
22	1452.75
23	1442.50

Solution

For the given data, we mark the price changes. Negative sign denotes that the price has decreased as compared to the price on the preceding day and a positive sign denotes the opposite of this.

Days on which trading was done		Stock price (X)	Price change
April, 20x2	1	881.50	
			–
	2	856.50	
			+
	3	859.75	
			+
	4	918.50	
			+
	5	1010.25	
			+
	8	1072.25	
			+
	9	1074.50	
			+
	10	1123.50	
			+
	11	1203.5	
			+
	12	1256.25	
			+
	15	1341.50	
			+
	16	1469.75	
			–
	17	1450.25	
			–
	18	1306.50	
			–
	19	1258.00	
			+
	22	1332.75	–

Days on which trading was done		Stock price (X)	Price change
	23	1315.75	
	24	1351.00	+
	25	1407.50	+
	26	1547.75	+
	29	1521.00	−
	30	1484.25	−
May	1	1458.00	−
	2	1425.00	−
	3	1350.75	−
	6	1447.50	+
	7	1448.25	+
	8	1505.25	+
	9	1511.25	+
	10	1588.25	+
	13	1560.00	−
	14	1576.00	+
	15	1638.50	+
	16	1648.50	+
	17	1710.75	+
	20	1703.00	−
	21	1665.00	−
	22	1665.75	+
	23	1550.75	−
	24	1508.00	−
	27	1460.00	−
	28	1316.25	−
	29	1229.00	−
	30	1324.75	+
	31	1205.75	−
			+

Days on which trading was done		Stock price (X)	Price change
June	3	1295.50	
	4	1292.25	–
	5	1191.50	–
	6	1179.50	–
	7	1279.00	+
	10	1280.25	+
	11	1247.50	–
	12	1186.50	–
	13	1207.75	+
	14	1323.00	+
	17	1366.75	+
	18	1312.00	–
	19	1412.75	+
	20	1420.50	+
	21	1375.50	–
	24	1377.50	+
	25	1304.50	–
	26	1395.00	+
	27	1498.75	+
	28	1549.75	+
July	1	1520.00	–
	2	1489.50	–
	3	1397.75	–
	4	1425.00	+
	5	1487.50	+
	8	1536.50	+
	9	1500.50	–
	10	1481.25	–
			–

Days on which trading was done	Stock price (X)	Price change
11	1437.25	
		+
12	1460.75	
		–
15	1385.50	
		+
16	1401.25	
		–
17	1381.25	
		+
18	1487.25	
		–
19	1471.25	
		–
22	1452.75	
		–
23	1442.50	

From above, the total number of runs : r = 35

Number of positive price changes : n_1 = 43

Number of negative price changes : n_2 = 38

The mean for this data is given by $\mu_r = \frac{2.n_1.n_2}{n_1+n_2}+1 = \frac{2(43)(38)}{43+38}+1 = 41.34$

Standard error = $\sigma_r = \sqrt{\frac{2n_1n_2(2n_1n_2-n_1-n_2)}{(n_1+n_2)^2(n_1+n_2-1)}}$

$$= \sqrt{\frac{2(43)(38)\,((2)(43)(38)-43-38)}{(43+38)^2(43+38-1)}} = \sqrt{\frac{10415116}{524880}} = \sqrt{19.84} = 4.45$$

Since too many or too few runs would indicate that the movement of prices is not random, we employ a two-tailed test to test the randomness of prices.

Test at 5% Level of Significance

At $\alpha = 0.05$, Z = 1.96

The lower limit: $\mu_r - Z\sigma_r = 41.34 - 1.96(4.45) = 32.62$

The upper limit: $\mu_r + Z\sigma_r = 41.34 + 1.96(4.45) = 50.06$

Since the observed number of runs (35), falls within the lower and the upper limits, we conclude that the prices are independent at 5% level of significance.

Test at 10% Level of Significance

At $\alpha = 0.10$, Z = 1.65

The lower limit: $\mu_r - Z\sigma_r = 41.34 - 1.65(4.45) = 33.99$

The upper limit: $\mu_r + Z\sigma_r = 41.34 + 1.65(4.45) = 48.68$

Since the observed number of runs (35), falls within the lower and the upper limits, we conclude that the prices are independent at 10% level of significance.

Test at 20% Level of Significance

At $\alpha = 0.20$, Z = 1.28

The lower limit: $\mu_r - Z\sigma_r = 41.34 - 1.28(4.45) = 35.64$

The upper limit: $\mu_r + Z\sigma_r = 41.34 + 1.28(4.45) = 47.036$

Since the observed number of runs (35) does not fall within the lower and the upper limits, we conclude that the prices are not independent but are affected by some other factors.

Tests of Semi-strong Form of EMH

According to this form of EMH, investors will not be able to make abnormal profits using the publicly available information. That is, the current stock prices discount all the information which is common knowledge. To examine the validity of this hypothesis, the tests conducted are (i) Residual Analysis and (ii) Event Studies.

RESIDUAL ANALYSIS

In this test, to estimate the value of realized or normal return of a security, we regress the security returns against the returns on market index. The normal return is given by the relation,

$$r_{it} = a_i + \beta_i r_{mt} + e_{it} \quad \ldots(1)$$

where,

- r_{it} denotes the realized return on the i th stock in the period 't'
- r_{mt} denotes the realized return on the index
- a_i denotes the regression constant
- e_{it} denotes the error or the residual term
- β_i denotes the slope of the characteristic line.

Due to the fact that the deviations in the security's returns from the estimating line cancel each other, on average, the error term should be zero.

Therefore, the normal return is given by:

$$r_{it} = a_i + \beta_i \ r_{mt} \quad \ldots(2)$$

From the relation (1), if the normal returns (as given by (2)) are subtracted from the realized return r_{it}, we get the abnormal returns as,

$$e_{it} = r_{it} - (a_i + \beta_i r_{mt})$$

where e_{it} denotes the abnormal returns.

Since, we happen to use the error or the residual term to calculate the abnormal return, this analysis is referred to as Residual Analysis.

For the market to be efficient in the semi-strong form, the sum of the residual returns (abnormal returns) should be close to zero.

Illustration 3

South Indian Bearings Ltd. has announced a stock split in 20x0-x1. A fund manager, in order to test the consistency of the semi-strong form of the market efficiency, conducted regressional analysis taking into account the returns from South Indian Bearings scrip and the market index for a period of three years on monthly basis up to three months before the stock split decision was announced. The characteristic line obtained by him was:

$$r_{SI,t} = 1.33\% + 1.1 r_{mt}$$

where $r_{SI,t}$ is the return on South India Bearings during period 't' and r_{mt} is the market return during period 't'.

ADJUSTMENT FOR MARKET EFFECTS

For testing the alternative efficient market hypotheses, the security's rate of return should be adjusted for the rates of return of the overall market during the period under consideration. Without knowing the performance of the market in terms of returns, the performance of the stock in terms of returns does not convey any meaning.

A need for adjustments to the stock returns was realized in the early 1970s for it was assumed that the individual stocks should experience a change equal to the aggregate stock market. So, it became imperative to subtract the return on the market from the return on the stock to arrive at the abnormal rate of return.

$$AR_a = R_{it} - R_{mt}$$

Where,

AR_a = Abnormal rate of return on security 'i' during period 't'

R_{it} = Rate of return on security 'i' during period 't'

R_{mt} = Rate of return on a market index during period 't'.

If the return on the stock is 15% and the return on the market is 10%, then the abnormal rate of return is 5%.

According to CAPM, different stocks move differently in relation to the movements in the market. Hence, the above method of calculation of the abnormal rate of return may not be suitable in such cases. Some stocks may be more volatile and some less volatile. Therefore, the expected rate of return for the stock based on the market rate of return and the stock's relationship with the market should be determined. The abnormal rate of return can then be computed as the difference between the stock's actual rate of return and its expected rate of return as follows:

$$AR_a = R_{it} - E(R_{it})$$

Where,

$E(R_{it})$ = Expected rate of return for stock 'i' during period 't' based on the market rate of return and the stock's normal relationship with the market.

For example, suppose that a stock is 15% more volatile than the market. Then, if the market experiences a 10 percent rate of return, one would expect this stock to experience a 11.5 percent return. Now, if this stock has only 5 percent return, its abnormal rate of return during the period would be minus 6.5 percent.

Over the normal long run period, the returns on the stock and that on the market tend to coincide, thus, making the abnormal rate of return to be zero. During one period, the returns may exceed expectations, and in the next period they may fall short of expectations.

There are two sets of tests of the semi-strong form of EMH. In the first set, the future rates of return for individual stocks are predicted using public information, such as the aggregate price-earnings ratio, dividend yield, or the risk premium spread for bonds. Sometimes, analysts also seek information which would help them to predict the cross-sectional distribution of risk adjusted rates of return. The second set of tests, known as event studies, involve examining abnormal rates of return during the period immediately following the announcement of any significant economic event to determine if it is possible for any investor to earn above average risk adjusted rates of return.

Both sets of tests emphasize on the analysis of abnormal rates if returns deviate from long-term expectations, or returns that are adjusted for a stock's specific risk characteristics and overall market rates of return during the period.

Illustration 4

Given below is the data regarding the actual and the market returns observed during a seven-month period. Conduct residual analysis to test the semi-strong form of market efficiency.

Months	Actual Return (%)	Market Return (%)
1	14.75	12.15
2	14.40	11.95
3	14.82	12.20
4	15.01	12.35
5	14.92	12.30
6	14.68	12.20
7	14.38	11.95

When $r_{mt} = 12.15$,

Expected return ($r_{SI,t}$) = 1.33% + 1.1(12.15) = 14.70

Abnormal return for the first month = Actual Return – Expected Return
= 14.75 – 14.70 = 0.05

Solution

Months	Actual Return (%)	Market Return (%)	Expected Return (%)	Abnormal Return (%)
1	14.75	12.15	14.70	0.05
2	14.40	11.95	14.48	–0.08
3	14.82	12.20	14.75	0.07
4	15.01	12.35	14.92	0.09
5	14.92	12.30	14.86	0.06
6	14.68	12.20	14.75	–0.07
7	14.38	11.95	14.48	–0.10
				0.02

From the table, we observe that the sum of abnormal returns is close to zero. Therefore, we conclude that the market is efficient in the semi-strong form.

RESULTS OF RETURN PREDICTION STUDIES[1]

The time series tests of efficient market hypotheses are based on the assumption that in an efficient market, the best estimate of future rates of return will be the long run historical rates of return. The objective of the tests is to determine whether there is any public information that will provide superior estimates of returns for a short run horizon or a long run horizon.

While the studies based on the returns are successful in predicting the long horizon returns, they were less successful in predicting the returns for short horizons. When the aggregate dividend yield (D/P) was taken as a proxy for the risk premium on stocks, a positive relationship is observed to exist between D/P and future stock market returns. A further analysis of this relationship showed that the predictive power increases with horizon. It was also found that the stock prices need not follow a random walk and long run returns on stocks can be predicted as long as aggregate output can be predicted.

Two commonly used variables in several studies are those that are related to the term structure of interest rates viz., (i) the difference between yields on lower rated bonds and higher rated bonds, the risk premium, (ii) the difference between yield on long-term higher rated bonds and yield on short-term bonds referred to as the term structure of horizon spread. These variables can also be used to predict stock returns and bond returns and for predicting returns for even foreign common stocks.

High values of dividend yield and the default spread imply that a high return on stocks and bonds is expected by the investors. This occurs when the economic environment has been poor, indicating a low wealth environment wherein investors perceive higher risk for investments, which means that the investors require a high rate of return in order to invest and shift consumption from the present to the future.

When a number of business cycle variables are considered, the predictive power of various economic factors related to stock returns is found to change with time and the volatility of returns. It was found that the predictability of returns was low in the calm markets and the predictions were based on economic factors that could be exploited in the volatile markets.

QUARTERLY EARNINGS STUDIES

The Quarterly Earnings Studies are a part of time-series analysis. These studies aim at predicting future returns for a stock based on publicly available quarterly earnings reports.

1 This section and the next three sections draw from "Investment Analysis and Portfolio Management" by Frank K Reilly and Keith C Brown, 6th Edition, *The Dryden Press*.

Several studies were conducted by different groups to examine firms that experienced unanticipated changes in quarterly earnings based on three categories as to how actual earnings deviated from expectations i.e., (i) any deviation from expectations, (ii) a deviation plus or minus 20 percent, and (iii) a deviation of at least 40 percent. The study examined the abnormal price movements for all the above mentioned categories of deviations, and compared the post-announcement effects on the stocks with the earnings surprise (the amount by which the actual earnings is more than the expected results). The results of these studies suggested that favorable information contained in quarterly earnings reports is not instantaneously reflected in stock prices and a significant relationship exists between the size of the earnings surprise and the post announcement stock price change.

When the results of these studies were subsequently reviewed, it was found that post-announcement risk-adjusted abnormal returns were consistently positive, which is inconsistent with market efficiency. The abnormal returns could be due to problems in the CAPM and not due to market inefficiencies.

Recent studies use the concept of Standardized Unexpected Earnings (SUE), which normalizes the difference between actual and expected earnings for the quarter by the standard error of estimate from the regression used to derive the expected earnings figure, instead of just examining the percentage differences between actual and expected results. The SUE can be defined as:

$$\frac{\text{Reported EPS}_t - \text{Predicted EPS}_t}{\text{Standard Error of Estimate for the Estimating Regression Equation}}$$

The standard error of a statistic is the standard deviation of the sampling distribution of that statistic. Standard errors are important because they reflect how much sampling fluctuation a statistic will show. The standard error of a statistic depends on the sample size. In general, the larger the sample size, the smaller the standard error. The standard error of a statistic is usually designated by the Greek letter sigma (σ) with a subscript indicating the statistic. For instance, the standard error of the mean is indicated by the symbol: σ_M.

The predicted earnings are estimated by a time-series model that considers the earnings during the prior 20 quarters and includes quarterly dummy variables that adjust for any seasonal factors. Therefore, the SUE indicates the number of standard errors, which are above or below the predicted EPS figure.

Large SUEs were observed to be accompanied by significant abnormal stock price changes. When the impact of different risk adjustments was analyzed, it was concluded that the results were not sensitive to the risk adjustments.

The drift in the return following earnings announcements are examined and it was found that over 80% of the stock price drift following announcements of the earnings is brought about by the unexpected earnings. The results of many studies indicate that the market has not adjusted stock prices to reflect the release of quarterly earnings surprises as fast as expected by the semi-strong EMH. This may lead to the use of earnings surprises to predict returns for individual stocks.

CALENDAR STUDIES

These attempted to predict rates of return during a calendar year and examine if there is any particular observable pattern in the rates of return on the stocks that would allow investors to predict returns on stocks in advance. They also test for the presence of any irregularities. Besides "January Anomaly", they also consider a variety of other daily and weekly regularities.

The January Anomaly: This was proposed as a unique trading rule to make use of tax selling. Most investors are observed to adopt tax selling at the end of the year to establish losses on stocks that have declined and re-acquire the same shares in the next year or buy other stocks that are attractive. This tendency of the investors leads to a downward pressure on the stock prices during the end of the

year (November and December) and positive pressure during the beginning (January) of the next year. This is termed as *January Anomaly*. The advocates of the efficient markets believe that this kind of seasonal pattern does not last for a longer period as it is likely to be eliminated by arbitrageurs' action of buying in December and selling in January of the next year.

Several studies conducted by different people at different points of time supported this January Anomaly. December trading volume was found to be abnormally high for the stocks that have declined during the previous year and the volume was low for stocks that have experienced large gains.

Another observation confirmed that the price patterns on the last day of December and the first four days of January support the anomaly. The presence of transaction costs does not deter the arbitrageurs from engaging in the January tax selling anomaly.

One of the studies indicated the existence of a negative relationship between size and abnormal returns. More than 50% of the January effect would be concentrated in the first week of trading, particularly on the first day of the year. In addition, a non-linear relationship is found to exist between dividend yields and stock returns in January. A strong seasonal pattern was also observed because the dividend yield-stock return relationship existed only during January. The year end effect was also observed for small firms particularly during the last day of the year with above normal trading activity continuing in January.

All the studies reveal that the January Anomaly is intriguing because it is pervasive. The seasonal impact also influences the dividend yield effect and trading volume, and a tax-loss explanation of this anomaly has received a mixed support.

Other Calendar Effects: Many other "calendar" effects like monthly effect, a weekend/day-of-the-week effect, and an intraday effect have also been examined.

The weekend effect was documented by French, and Gibbons and Hess. While mean return for Monday was observed to be significantly negative, the average return for the other 4 days was positive. Returns were negative on Mondays for both individual stocks and Treasury Bills. The Monday effect was the same for different size firms and it remained the same irrespective of the nature of trading of the stock.

The Monday effect was measured from Friday close to Monday close. When the Monday effect was decomposed into weekend effect (Friday close to Monday open) and Monday trading effect (Monday open to Monday close), it was found that the weekend effect was negative and the Monday trading effect was positive. When the day-of-the-week returns were segmented into January and the rest of the year, the Monday effect was positive in January and negative in all the other months. The size effect also existed only in January.

The analysis of NYSE transactions data on trading and non-trading returns indicate that for large firms, the negative Monday effect occurred before the market opened whereas for smaller firms most of the negative Monday effect occurred during the day on Monday.

PREDICTING CROSS-SECTIONAL RETURNS

If the market is assumed to be efficient, all securities should lie along the security market line that relates the expected rate of return to an appropriate risk measure. It is mandatory that all the securities have equal risk-adjusted returns because security prices should reflect all public information that would influence the security's risk. Therefore, it is necessary to determine whether the future distribution of risk-adjusted rates of return can be predicted (i.e., using public information, the possibility of identifying the stocks which experience below-average, risk-adjusted returns, and the stocks which experience above-average, risk-adjusted returns).

The cross-sectional returns can be predicted by examining the usefulness of alternative measures of size or quality as tools to rank stocks in terms of risk-adjusted returns. The tests for predicting cross-sectional returns are dependent on the asset-pricing model that provides the measure of risk used in the test as well as the efficiency of the market.

Price-Earnings Ratios and Returns: EMH can be tested by examining the relationship between the historical Price-Earnings (P/E) ratios for stocks and their returns. There was an opinion that low P/E stocks outperform high P/E stocks because growth companies enjoy high P/E ratios, but the market tends to overestimate the growth potential and thus overvalues the growth companies while undervaluing low-growth firms with low P/E ratios. A relationship between the historical P/E ratios and subsequent risk-adjusted market performance would serve as an evidence against the semi-strong EMH because it implies that investors can use publicly available P/E ratios to predict future abnormal returns.

For testing purposes, the stocks were divided into five P/E classes and the risk and return for portfolios of high and low P/E ratio stocks were determined. Measures of risk-adjusted performance indicated that low P/E ratio stocks experienced superior results relative to the market, whereas high P/E ratio stocks had significantly inferior results. Therefore, it was concluded that publicly available P/E ratios possess valuable information. But these results were not consistent with semi-strong efficiency.

P/E ratios were also examined after making adjustments for firm size, industry effects, and infrequent trading. With these adjustments it was found that the risk-adjusted returns for stocks with low P/E ratios were superior to those with high P/E ratios.

Price-Earnings/Growth Rate Ratios: The Price-Earnings/Growth Rate Ratio (referred to as PEG ratio) is used as a relative valuation tool, for stocks of growth companies whose P/E ratios are relatively above average. An inverse relationship was observed to exist between the PEG ratio and subsequent rates of return, i.e., stocks with relatively low PEG ratios will have above average rates of return whereas stocks with high PEG ratios experience below average rates of return. The tests used to measure the PEG ratio do not support the EMH. When a sample of stocks was examined by dividing it on the basis of a risk measure (beta), market value size and expected growth rate, the results were not consistent with the hypothesis of an inverse relationship between the PEG ratio and subsequent rates of return except for stocks with low betas and those with very low expected growth rates.

The Size Effect: An examination of the impact of size (as measured by total market value), on risk adjusted rates of return showed that small firms consistently experienced significantly larger risk-adjusted returns than larger firms; and that it was the size that influenced the risk-adjusted returns and not the P/E ratio as per the earlier studies.

Inefficiency of the markets or the incorrect estimates of the expected returns provided by the market model may give rise to abnormal returns. According to Reinganum, abnormal returns were considered to be the result of the simple one-period CAPM, which is perceived to be an inadequate description of the real-world capital markets.

When betas were computed using two different models, Ordinary Least Squares Model and the Aggregates Coefficients Model, a substantial difference was observed in the estimated betas for smaller firms. The results demonstrated that the risk for small firms was underestimated, but at the same time, the larger betas could not explain the very large differences in rates of return. Several results imply that most of the differences in size related returns can be explained by complete measures of risk.

Since transaction costs vary inversely with price per share (because they include both the dealer's bid-ask spread and the broker's commission), their impact on the risk-return relationship of large and small firms cannot be ignored. Also, a differential in transaction costs – with frequent trading – can have significant impact on the results. These results imply that subsequent size effect studies must consider realistic transaction costs and specify the holding period assumptions (if any). If an annual rebalancing is assumed, it was found that small firms outperformed the large ones after considering risk and transaction costs.

Thus, we see that firm size seemed to influence future returns and had remained an anomaly in the efficient market literature. In an attempt to explain the anomaly, several attempts were made; however, no single study was able to explain the unusual results. But the two strongest explanations were risk measurements and the higher transaction costs.

Book Value-Market Value (BM/MV) Method: Another predictor of stock returns identified is the ratio of a firm's book value of equity to its market value. A significant positive relationship is found to exist between a firm's historical BV/MV and the future stock returns. This result does not agree with the EMH.

The joint effects of market beta, size, E/P ratio, leverage and the BV/MV ratio on the cross section average returns on the NYSE, AMEX and NASDAQ stocks provide strong evidences in support of this ratio. Both size and BV/MV ratio are significant when included together and dominate other ratios. Though leverage and E/P ratio were significant by themselves or when considered with size, they become insignificant when both size and the BV/MV ratio are considered. The influence of the behavior of stock price to size and the BV/MV ratio on earnings changes is also studied. The focus of the analysis is on the relationship of high and low BV/MV stocks and profitability (measured as ROE). Low BV/MV stocks (growth stocks) have high ROE prior to forming portfolios but lower ROE in subsequent years. On the other hand, high BV/MV stocks (value stocks) experience low ROE prior to the formation of portfolios, but high ROE after the formation. Thus, size was found to play a major role in the small-stock portfolios, while the BV/MV ratio is more important for firms with high BV/MV ratios.

Following these studies, some more studies were conducted to test (i) the relationship between beta and rates of return and (ii) the manner in which BV/MV can be used to predict rates of return. Another opinion was that the relationship between returns and the BV/MV ratio is periodic and is not significant over a longer period.

The tests of publicly available ratios used to predict the cross-sectional returns provided substantial evidence in conflict with the semi-strong EMH.

EVENT STUDIES

Event studies aimed at testing the EMH by examining how abnormal rates of return react to significant economic information. Proponents of EMH opine that returns would adjust very quickly to announcements of new information. This implies that it is not possible for investors to experience positive abnormal rates of return by responding positively to the announcement. Some of the events that bring out changes in the stock returns are stock splits, exchange listings, initial public offerings, unexpected world or economic events, and the announcement of significant accounting changes.

Stock split studies are used to analyze the effect of stock splits on the stock prices and hence their returns. There is a general perception that a stock split will lead to an increase in the price of the share as the demand for stocks increases after the stock split. But proponents of EMH do not agree with this view as they do not anticipate any change in the price of the stock after the announcement of the stock split. One plausible reason in favor of increase in the stock price after the announcement of a stock split is that the dividends tend to increase after the stock is split. The dividend change, thus, has an information effect because it indicates that management strongly expects a new higher level of earnings in future, which in turn, influences the dividends. However, results of several studies on these lines indicate that stock splits do not result in higher rates of return for stockholders after the split thus supporting the semi-strong form of EMH, because they assert that investors cannot gain from the information on a split after the public announcement. Though the results of various studies in this aspect are not unique, most of them conclude that stock splits do not have any short run or long run impact on security returns.

In the event of *initial public offering*, the results showed that the price adjustment takes place within one day after the offering. Abnormal returns are not possible for the investors who acquire the stock after the initial adjustment. In the event of *exchange listing*, the studies proved that the stocks' prices increase before any listing announcement, and they decline after the actual listing. The studies on exchange listings do not indicate long run effects on value or risk. They provide evidence of short run profit opportunities from public information and it does not support the semi-strong EMH. There is a possibility of short run profits between the period of announcement and the period of listing.

The studies on other major economic events in and around the world have provided different results. Most of them conform to the view of stock price movements as per semi-strong form. The stock prices were found to adjust to the news before the market opened or before it reopened after the announcement. The studies on the impact of announcement of accounting changes on the stock prices revealed that in efficient markets, they should react quickly and predictably to the announcements of accounting changes. If an accounting change brings about a change in the economic value of a firm, a quick change in the stock prices is expected. The results of the studies supported the EMH because there was no indication of positive price changes following the change in the accounting policy. Corporate events like mergers and acquisitions, reorganizations, and various security offerings also have an impact on the market and the security prices. Studies of these events unanimously support the semi-strong EMH.

The semi-strong EMH has got a mixed support from numerous studies. It received uniform support from almost all the event studies excepting the event of exchange listing. However, studies on predicting rates of return over time or for a cross-section of stocks presented evidence against the semi-strong hypothesis.

In this method, the average of the abnormal returns for a number of months before and after the date of a particular event is computed. Mathematically, this may be expressed as:

$$AAR_t = 1/n \sum AR$$

where 'n' represents the number of securities under consideration.

Then the sum of Average Abnormal Returns (AAR) gives us the Cumulative Average Abnormal Returns (CAAR).

That is, $CAAR = \sum AAR_t$

The value of CAAR will be close to zero if the markets are efficient.

Illustration 5

Four companies, Castle Bearings Ltd., Auto Spares Ltd., Mobiles Ltd., and Heavy Vehicles Ltd., have increased their level of cash dividends for the year 20x0-x1. A financial analyst at a mutual fund wanted to test the consistency of the semi-strong form of market efficiency. He calculated the characteristic lines for a period of six years on a monthly basis up to four months before the announcement took place. The relationship between the returns on these four companies and the market are given by:

$r_{C,t} = 1.70\% + 1.05r_{m,t}$

$r_{A,t} = 1.53\% + 1.08r_{m,t}$

$r_{M,t} = 1.92\% + 1.02r_{m,t}$ and

$r_{HV,t} = 1.42\% + 1.09r_{m,t}$

where $r_{C,t}$, $r_{A,t}$, $r_{M,t}$, and $r_{HV,t}$ are the respective returns of the companies during period "t" and $r_{m,t}$ is the market return during the same period. The following data is given:

Period (months)	Actual Return				Market Return
	$r_{C,t}$	$r_{A,t}$	$r_{M,t}$	$r_{HV,t}$	$r_{m,t}$
4	13.47	13.61	13.35	13.60	11.00
3	11.90	12.04	11.82	12.03	10.00
2	13.50	13.67	13.42	13.71	11.15
1	12.97	13.12	12.88	13.13	10.88
0	13.43	13.60	13.31	13.59	10.90
1	12.50	12.62	12.41	12.63	10.05
2	13.09	13.25	12.99	13.27	11.05
3	14.51	14.71	14.37	14.76	12.15
4	14.80	14.99	14.65	15.02	12.67

Solution

Castle Bearings Ltd.

Period	Actual Return (%)	Market Return (%)	Expected Return (%)	Abnormal Return (%)
4	13.47	11.00	13.25	0.22
3	11.90	10.00	12.20	–0.30
2	13.50	11.15	13.40	0.10
1	12.97	10.88	13.12	–0.15
0	13.43	10.90	13.15	0.28
1	12.50	10.05	12.25	0.25
2	13.09	11.05	13.30	–0.21
3	14.51	12.15	14.45	0.06
4	14.80	12.67	15.00	–0.20

Expected return is calculated by substituting market returns in the characteristic line equation.

For market return of 10.88%, the expected return is given by

$$r_{C,t} = 1.70\% + 1.05r_{m,t} = 1.7\% + 1.05(10.88) = 13.124\%$$

The abnormal return is given by the difference between the actual return and the expected return.

At an actual return of 11.90% and an expected return of 12.20%, the abnormal return = 11.90 – 12.20 = –0.30%.

Auto Spares Ltd.

Period	Actual Return (%)	Market Return (%)	Expected Return (%)	Abnormal Return (%)
4	13.61	11.00	13.41	0.20
3	12.04	10.00	12.33	–0.29
2	13.67	11.15	13.57	0.10
1	13.12	10.88	13.28	–0.16
0	13.60	10.90	13.30	0.30
1	12.62	10.05	12.38	0.24
2	13.25	11.05	13.46	–0.21
3	14.71	12.15	14.65	0.06
4	14.99	12.67	15.21	–0.22

Mobiles Ltd.

Period	Actual Return (%)	Market Return (%)	Expected Return (%)	Abnormal Return (%)
4	13.35	11.00	13.14	0.21
3	11.82	10.00	12.12	–0.30
2	13.42	11.15	13.30	0.12
1	12.88	10.88	13.02	–0.14
0	13.31	10.90	13.04	0.27
1	12.41	10.05	12.17	0.24
2	12.99	11.05	13.20	–0.21
3	14.37	12.15	14.31	0.06
4	14.65	12.67	14.84	–0.19

Heavy Vehicles Ltd.

Period	Actual Return (%)	Market Return (%)	Expected Return (%)	Abnormal Return (%)
4	13.60	11.00	13.41	0.19
3	12.03	10.00	12.32	–0.29
2	13.71	11.15	13.57	0.14
1	13.13	10.88	13.28	–0.15
0	13.59	10.90	13.30	0.29
1	12.63	10.05	12.37	0.26
2	13.27	11.05	13.46	–0.19
3	14.76	12.15	14.66	0.10
4	15.02	12.67	15.23	–0.21

Now, we calculate the average abnormal returns for each of the weeks before and after the dividend was announced.

Fourth week before the announcement of dividend

AAR = (1/4)(0.22 + 0.20 + 0.21 + 0.19) = 0.205

Third week before the announcement of dividend

AAR = (1/4)(–0.30 – 0.29 – 0.30 – 0.29) = –0.295

Second week before the announcement of dividend

AAR = (1/4)(0.10 + 0.10 + 0.12 + 0.14) = 0.115

First week before the announcement of dividend

AAR = (1/4)(–0.15 – 0.16 – 0.14 – 0.15) = –0.15

Week zero during which the dividend was announced

AAR = (1/4)(0.28 + 0.30 + 0.27 + 0.29) = 0.285

First week after the announcement of dividend

AAR = (1/4)(0.25 + 0.24 + 0.24 + 0.26) = 0.2475

Second week after the announcement of dividend

AAR = (1/4)(–0.21 – 0.21 – 0.21 – 0.19) = –0.205

Third week after the announcement of dividend

AAR = (1/4)(0.06 + 0.06 + 0.06 + 0.10) = 0.07

Fourth week after the announcement of dividend

AAR = (1/4)(–0.20 – 0.22 – 0.19 – 0.21) = –0.205

Now, we compute the Cumulative Average Abnormal Returns for the period of one month before and after the announcement of the dividend.

CAAR = 0.205 – 0.295 + 0.115 – 0.15 + 0.285 + 0.2475 – 0.205 + 0.07 – 0.205

= 0.0675

Since the value of CAAR is close to zero, we conclude that markets are efficient in the semi-strong form.

Box 4: Rational Pricing

Rational pricing of securities is of primary importance in economics not merely to indicate the correct wealth of shareholders; it is also "of critical importance for resource allocation," and to ensure that prices eventually correspond to their long run competitive equilibrium. Speculative bubbles indicate that the pricing of securities is irrational. The obvious culprit for such irrationality is the role of expectations in the pricing of securities. Eugene F Fama, in analyzing the 1987 crash from a rational pricing perspective saw that all explanations were "driven by a change in expectations about conditions." No reason has been found for expectations to change initially.

In reality, investors are more concerned with the behavior of their colleagues than with market fundamentals. "If an ordinary rational investor had good reason to believe that other investors would not behave rationally, then it might well be rational for him to adopt a strategy he would otherwise have rejected as irrational." Stock market crashes could easily result from similar behavior; if an investor perceives panic, or impending hysteria, he himself will panic. If such behavior occurs during the building and bursting of speculative bubbles, can we have confidence in security prices in general? Is the determination of security prices truly a 'speculative and anticipatory phenomenon'? During the 1987 Wall Street crash, when $1 tn of paper money was wiped out in a day, *The Economist* blamed the 'madness of crowds', and 'mob psychology' for the bull market and the subsequent crash. As for the belief in fundamental values – "Just before the stock market crash, commodity analysts were saying that metal prices were rising because of 'market fundamentals'. Came the crash, they threw their fundamentals out of the window and indulged in old fashioned panic instead."

We must assume that the irrationality prevalent during speculative bubbles is exceptional, despite the fact that one can construct simple and plausible models of bubbles that never break. One of the greatest problems for economists is that "there is no scientific way to show that security prices are rational or irrational." A fundamental assumption of economic theory is that all economic agents act rationally. In case of speculative bubbles, (and perhaps in many other cases) rationality breaks down, and economic theory goes out the window. This is why nobody will ever satisfactorily explain the Great Depression, Black Monday, or the craze for tulip bulbs.

Chaos Theory

Is there any other theory that could possibly shed some light on the subject of speculative bubbles? Chaos theory may be the answer. Chaotic models (despite the name) have a pattern behind the chaos. These models are deterministic mathematical models, (usually non-linear), which explain every nuance of the behavior of the variables in question. The observations resulting from Chaotic models have the following properties.

- They appear random (even when subject to sophisticated statistical analysis).
  - No pattern repeats itself. Thus even with infinite data, no two patterns will ever be exactly alike.
  - The time series is subject to sharp and substantial breaks in the usual pattern or trend, which are completely undetermined by what went before. Thus, a series of observations with a high degree of volatility and an upward trend can be suddenly replaced by a flat downward trend.
  - The qualitative behavior of a Chaotic time series is subject to complete upheaval in response to the most microscopic change in the values of the underlying parameters.

Despite the appearances conveyed by such properties, Chaotic models are non-random, and (given the model) completely predictable. Let us examine the explanatory power of such properties in relation to speculative bubbles:

- Stock market prices have been found in some empirical studies to be completely random.
- Technical analysts cannot systematically beat the market, despite their in-depth study of past patterns.
- 'Sharp and substantive breaks'… : The events of 1929 and 1987 fall into this category.
- 'Microscopic changes'.... : This could well be the reason why a true cause for Black Monday cannot be found. Could a farmer in New Zealand increasing prices of his produce possibly be responsible for a crash in Wall Street? Chaos theory suggests that this is possible.
- As we have seen, Chaos theory appears to have strong explanatory power regarding the behavior of share prices. In applying this model to financial markets, the parameters may be consistent with historical events, but too complex to be of use in predictions of the future. These sentiments, however, are as yet untested and further empirical research into this area is necessary. In conclusion, behavior during speculative bubbles appears to be outside the scope of traditional economic explanation. Although agents may have rational beliefs, they do not always behave in such a manner. To understand the actions of economic agents during bubbles, psychological analysis appears to have greater explanatory power. Alternatively, perhaps by replacing established economic models with a chaotic model, these events will appear logical. These results portray an unkind picture of the stock market; it is either irrational and inefficient, or ruled by chaos.

Source: "Speculative Bubble, Irrationality and Chaos", by Niamh Brodie, Merrion-capital.com.

Tests of Strong Form of EMH

According to this hypothesis, all the information, public as well as private, are known to the investors and hence a particular investor cannot reap abnormal profits using this information. Since there are people who are privy to certain types of information, to examine the validity of this hypothesis, we can divide this into two groups: (i) the super-strong form consisting of Corporate Insiders and the Specialists at the stock exchanges and (ii) the near-strong form consisting of Mutual Fund Managers.

Trading by Exchange Officials: Top officials of the stock exchanges have access to information on the overbought/oversold position of the market. If private information is not of any use, it should not be possible for them to make profits using the information. Analysis of profits or losses made by them in their trades reveal whether they make profits or not, but this information is almost impossible to get. However, studies carried out in the US on the profits made by 'Specialists' who have access to such information have shown that specialists consistently make abnormal profits, which indicate that the super-strong form of EMH does not hold.

Trading by Mutual Fund Managers: Mutual fund managers are supposed to be specialists in investment decision-making and are therefore, supposed to be able to obtain such conclusions from publicly available information that is not accessible to the common man not derivable by the common people. Therefore, if the near-strong form holds good, mutual fund managers must be able to earn consistent abnormal returns. Various studies have revealed that mutual fund managers have not achieved consistent abnormal returns, which means that the near-strong form of EMH does not hold good.

INSIDER TRADING

Insider trading refers to dealing in securities by persons who are privy to specific information of companies. This possession of confidential information gives those persons undue advantage to either buy or sell the securities as the circumstances warrant. This specific information is not disclosed to the investors in the general course of business, and therefore, places them at a great disadvantage.

If the stock markets are to function efficiently, it is a prerequisite that the regulatory authority be in a position to identify such instances and take corrective measures. This also boosts the retail investors' confidence in the impartial working of the exchange.

SEBI amended the SEBI (Insider Trading) Regulations, 1992 in February 2002 to provide for the following:

- The regulation would now cover subscription in the primary issue based on inside information.
- A person, who is an intermediary, investment company, trust company, asset management company or an employee or director thereof or an official of a stock exchange or of a clearing house or corporation, would be deemed to be a connected person.
- Price sensitive information would mean any information, which relates directly or indirectly to a company and which if published, is likely to materially affect the price of securities of a company. Periodical financial results of the company, intended declaration of dividends (both interim and final), issue of securities or buy-back of securities, any major expansion plans or execution of new projects, amalgamation, mergers or takeovers, disposal of the whole or substantial part of the undertaking, and any significant changes in policies, plans or operations of the company would be deemed to be price sensitive information.
- Speculative reports in print or electronic media would not be considered as published information.
- Only dealing in securities based on unpublished price sensitive information is prohibited and communication of price sensitive information *per se* is not an offense.
- Corporate dealing in securities of another company based on inside information is specifically prohibited.
- All listed companies and organizations associated with securities market including the intermediaries, asset management company, trustees of MFs, self-regulatory organizations, stock exchanges, clearing house/corporations, public financial institutions, professional firms such as auditors, accounting firms, law firms, analysts, consultants, etc., assisting or advising listed companies shall frame a code on internal procedure and conduct on lines of model code specified in Regulations. These entities shall abide by the Code for Corporate Disclosure Practices specified in the Regulations. They shall adopt appropriate mechanisms and procedures to enforce these codes.
- Any person who holds more than 5% shares or voting rights in any listed company shall disclose to the company, the number of shares or voting rights held by such person, within four working days of the receipt of intimation of allotment of shares, or the acquisition of shares or voting rights, as the case may be. He shall also disclose to the company the change in shareholding or voting rights, even if such change results in shareholding falling below 5%, if there has been a change in such holdings from the last disclosure and such a change exceeds 2% of total shareholding or voting rights held by such person within four working days of becoming director or officer of the company. He

shall also disclose the change in shareholding or voting rights, if there has been a change in such holdings from the last disclosure made and the change exceeds Rs.5 lakh in value or 5,000 shares or 2% of total shareholding or voting rights, whichever is lower. Every listed company, within 5 days of receipts of these disclosures, shall disclose to all stock exchanges on which the company is listed.

SEBI Regulations also prohibit the insider to communicate or counsel other persons directly or indirectly about the confidential price-sensitive information. It can appoint an officer to probe into allegations which come to its notice on its own or when it possesses a written complaint from investors or intermediaries. During the probe, the person against whom investigations are initiated (insider) is expected to provide all the cooperation and assistance required by the investigating officer. In the due course of the probe, SEBI appoints an auditor who examines the relevant books to check their authenticity and appropriateness. After completion of the probe, the investigating officer submits his report to SEBI, which then gives the insider an opportunity to present his case.

If it finds evidence against the person, it imposes punishments. The punished person can appeal to the Appellate Authority or the central government against the order if he feels that the order is unjust.

SUMMARY

- The hypothesis is based on the assumption that the market comprises rational investors. In a nutshell, EMH states that successive absolute price changes are independent in the short run as per the assumption that the market comprises rational investors. However, investors are not always rational in that, they consider factors other than risk and returns for selecting securities.
- On the basis of the level of information considered, the EMH can be divided into three forms namely, Weak Form, Semi-Strong Form and Strong Form.
- In developing market, the weak form enjoys a fair degree of chance to hold good. The reason is the behavior of the market participants, which is driven by their sentiments rather than historical prices and returns.
- According to Semi-strong form of EMH, investors will not be able to make abnormal profits using the publicly available information. That is, the current stock prices discount all the information, which is common knowledge.
- According to Strong form of EMH, the investors know all the information, both public as well as private. Hence, a particular investor cannot reap abnormal profits using this information, since there are people who are privy to certain types of information.
- In the Indian stock market, sentiments play a major role in price behavior at the counters.

Chapter XI

Bond Valuation

After reading this chapter, you will be conversant with:

- Strategic Role of Bonds from an Investor's Point of View
- Bond Terminology
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Introduction

In comparison to equities, bond at first sight appears less glamorous and exciting. But bonds too have their subtleties and pitfalls for the investors. In general, there is less uncertainty about the cash flows accruing to the bondholders as compared to the shareholder. The emphasis is, therefore, more on fine tuned calculations and analysis. Such careful computations may not be worthwhile in equities because there is greater uncertainty about the numbers that one is working with. Typically, bond prices fluctuate less than equity prices, and the investor who desires superior performance has to be on the lookout for even small differentials in prices and returns. In this lesson, we look at the nuances of bond valuation in detail.

STRATEGIC ROLE OF BONDS FROM AN INVESTOR'S POINT OF VIEW

While constructing a portfolio, it is quite important to consider the risk-return profile of an investor. The portfolio of an investor who is willing to take high risks to earn high returns might consist of common stock. On the other side, the portfolio of an investor whose only objective is to minimize the risk might consist wholly of securities issued by government and other bodies whose default risk is almost nil.

Most of the investors adopt a middle path. These investors find that their investment needs are modest and usually prefer less volatility in returns. These investors will be at an advantage if corporate bonds are incorporated into their portfolios. We know that each and every security in the portfolio contributes to the total risk. Some securities individually or as a group tend to increase the risk while some others tend to decrease it. That is, there can be different constituents of a portfolio so that their returns move in opposite directions negating the effect of one on the other so that a portfolio of little or no risk can be constructed. Quantitatively, this association is measured by correlation. Therefore, the correlation between the constituents should be as low as possible if not negative. It has been observed that the correlation of risk although positive is very low between common stock and corporate bonds. This fact should be taken into consideration while constructing a portfolio, as bonds which normally not only possess lower risk than common stocks but also tend to reduce the portfolio's risk more than proportionately than the reduction in the overall returns.

The interest paid on bonds is a tax-deductible expenditure unlike dividends which are not only post-tax expenditure, but also attract additional tax in terms of the current guidelines. Consequently, an issuer will be able to offer better interest rates on bonds, an advantage to the investor.

Unlike the stockholder who faces uncertainty regarding the rate as well as returns on his investment, a bondholder receives interest payments regularly irrespective of the profits of the firm since payment of interest is an obligation on the part of the issuer unlike dividend which is discretionary and dependent on the profits of the firm. Thus, a bondholder can lock-in income as compared to a stockholder. Also, in case of the firm being liquidated the debt-holder will have a preferential rights over a stockholder to recover his investment.

BOND TERMINOLOGY

In order to value a bond correctly, we must understand the terms and conditions of the bond precisely. These terms define the contractual rights of the bondholder and of the issuer and determine the cash flows that the bondholder will receive. In this lesson, we describe the terminology that is used in the bond market to specify the terms and conditions of the bond. They facilitate easy description of the salient features of the bond.

Face Value

The face value or nominal value of the bond can be thought of as the principal amount on which interest is paid by the issuer. In many cases, this is also the amount which is repaid at the end of the life of the bond. This is also often the price at which the bond is originally issued by the issuer. But there are exceptions to both of these as explained subsequently.

Coupon

Bonds typically pay interest periodically at a prespecified rate of interest. The annual rate at which this interest is paid is known as the coupon rate or simply the coupon. Interest is paid half-yearly, monthly, quarterly, annually or at some other frequency. For example, a bond of the face value of Rs.1,000 with a 10% coupon payable semi-annually will pay Rs.50 as interest every six months. The dates on which the interest payments are made are known as the coupon due dates.

Maturity Date and Maturity

The maturity date of the bond is the date on which the bond is repaid and extinguished. A bond is often described by specifying the coupon rate, the name of the issuer and the maturity date. For example 11.5% GoI 2010 denotes a bond with a coupon rate of 11.5% issued by the Government of India (GoI) maturing in 2010. The holder of this bond will receive 11.5% interest every year till 2010 and also receive the principal amount of the bond in the year 2010.

Some bonds do not repay the principal amount in one installment but spread it out over several years. In this case, the date of the last installment is often taken as the maturity date though the very notion of a maturity date becomes less useful in this case.

The maturity at issue refers to the time to maturity from the date of issue of the bond and the residual maturity refers to the time to maturity at any subsequent point of time. For example, a bond with a maturity date of 2005 issued in 1990 has a maturity at issue of 15 years, but in 2000 its residual maturity is only 5 years.

Redemption Premium

Bonds are not always redeemed at par on the maturity date. In other words, the repayment on the maturity date is not necessarily equal to the face value. Some bonds pay a redemption premium in addition to the face value. For example, in the case of a bond with a face value of Rs.1,000 and a redemption premium of 5%, the amount repaid on maturity will be Rs.1,050 and not Rs.1,000.

Call Option

Internationally, many bonds contain a call option which entitles the issuer to call back the bonds and redeem them before maturity. For example, in 1993 a company issues a bond with a maturity of 10 years (redeemable in 2003) which is callable at any time after 5 years (i.e. after 1998). Suppose the bond has a coupon of 17% while in 1999, interest rates have come down and the company can issue new bonds at a coupon of only 14%. The company could then issue fresh bonds at 14% and call back the earlier issued more expensive 17% bonds. If the bonds do not have a call option, the company cannot do this and the bondholders would continue to enjoy the benefit of the higher coupon rate till 2003.

Put Option

Internationally, many bonds contain a put option which entitles the bondholder to put the bonds back to the issuer for redemption before the maturity date. For example, in 1994 a company issues a bond with a maturity of 10 years (redeemable in 2004) which is puttable at any time after 3 years (i.e. after 1997). Suppose the bond has a coupon of 15% while in 2001, interest rates have gone up and a similar company is issuing new bonds at a coupon of 17%. The bondholder could then buy these fresh bonds and put his existing 15% bonds back to the issuer for redemption. If the bonds do not have a put option, the shareholder cannot do this and would, therefore, be stuck with the lower coupon rate till 2004.

Bond Price

The price of a bond in the market is often expressed as a percentage of face value. For example, if the price of a bond with a face value of Rs.5,000 is stated as 105, the actual price would be Rs.5,000 x 105/100 = Rs.5,250.

Basis Point

A basis point is simply one-hundredth of one percent. Changes in interest rates and differences between two interest rates are usually stated in basis points for the sake of convenience. For example, if interest rates rise from 8.25% to 8.40%, we say that the rate has risen by 15 basis points. Similarly, if the yield on a high grade bond is 11.5% while the yield on a low grade bond is 12.25%, we say that the yield spread is 75 basis points. The use of this unit of measure serves to highlight the fact that the bond portfolio manager is always fighting for that last basis point of return and cannot afford the luxury of the equity manager who may be content to measure returns in percentage points.

TYPES OF BONDS

Bonds can be classified into the following categories:

Secured versus Unsecured Bonds

Along the dimension of security, bonds can be classified into unsecured (straight) bonds and secured (mortgage) bonds. Unsecured bonds have no charge on any specific assets of the company while secured bonds carry a fixed or floating charge on the assets of the company.

The distinction between secured and unsecured bonds becomes relevant in case the issuer defaults in the payment of interest or principal. The secured bondholders are entitled to take possession of the security given to them and realize their dues by selling these assets (typically land, building, machinery, etc). This right is valuable to the bondholders provided the security is valuable, easily saleable and has not been simultaneously given as security to other creditors as well. All these factors have to be examined while evaluating a secured bond. Unsecured bonds are not backed by any such security, but the bondholder does not need to worry about this if he believes that the company is financially very sound and is unlikely to default.

Senior versus Subordinate Bonds

This is again a distinction which becomes important in the case of a default. The senior bondholders have to be paid before the subordinated bondholders. This means that if the assets of the company are insufficient to pay even the senior bondholders, they get whatever amount can be realized and the subordinated bondholders will get nothing. If the assets are a little more, the senior bondholders may be paid in full and the subordinated bondholders may get partial payment. Of course, if the company has sufficient assets, all bondholders will be paid in full. In general, a company may have more than two classes of debt and the rules regarding the seniority of these different classes can become quite complex.

Registered and Unregistered Bonds

On the dimension of transferability, debentures can be classified as registered and unregistered debentures. Unregistered debentures (or bearer debentures) are freely negotiable and can be transferred by a simple endorsement. On the other hand, registered debentures can be transferred only by executing a transfer deed and filing a copy of it with the company. The registered debenture holders receive interest cheques automatically from the company whereas interest is paid on bearer debentures only on presentation.

Convertible and Non-convertible Bonds

Bonds can also be classified into convertible and non-convertible depending upon whether they carry a conversion feature or not. Convertible bonds are the ones which can be converted into equity shares at the option of the bondholders. In this case, the ratio of conversion (the number of shares exchanged for the converted portion) or alternatively the conversion price (the price at which equity shares are exchanged for the converted portion of the debentures), and the period during which the conversion can be effected are specified at the time of the issue. Convertible bonds can be either fully convertible or partly convertible. In the case of partly convertible bonds, the non-converted portion will carry interest until it is repaid as per the provisions in the indenture.

Bond Market Innovations

As the liberalization bandwagon is gathering momentum, the corporate treasurers and merchant bankers are dreaming of new products to suit the needs of investors and corporates. They are looking for something more than plain debt and equity instruments from the pack. The process of financial engineering involves creating new instruments and techniques by unpackaging and rebundling the same characteristics in a different fashion to suit the ever changing needs of the issuers and investors.

The recent years have been witnessing the emergence of some innovative financial instruments in the Indian financial market.

Pure debt instruments have become almost forgotten instruments. The preference of the investors for equity to other fixed income investments has been the attractions of capital gains. Taking this cue, the companies formulated instruments with mixed features and varying attributes.

TREASURY BONDS

Bonds issued by the government are termed as treasury bonds. For example, dated securities released by the government. These bonds are normally issued for longer maturity.

CORPORATE BONDS

Like treasury bonds, these bonds are issued by the corporate sector for borrowing purposes. These bonds are traded in the secondary market and the price of the bonds depends on the market interest rates ruling at the time of trading. The price will appreciate if the coupon rate is higher than the prevailing market interest rates. As such, these bonds are quoted at a premium. Conversely, if the coupon rate on the bond is less than the prevailing market rates, then the bonds are quoted at a discount.

PREFERRED STOCK OR PREFERENCE SHARE

Though in the stricter sense it is to be treated as equity, it is often included under fixed income securities as the dividend income is fixed for preference shares. At the time of liquidation of a company, the preference shareholders have low priority compared to the bondholders, but they have higher priority compared to the equity shareholders. Dividends payable or due are cumulative and the preference shareholders have priority over ordinary shareholders in dividend payments.

FLOATING RATE BONDS

Interest rates on these bonds are floated with some reference rate in the market. For example, a bond can be issued with a feature that the interest rate on this bond is 1% above the bank rate. The rates of interest are always in tune with the market rates because of this special feature of ‘floating’.

INDEXED BONDS

In indexed bonds, the principal and coupon payment are linked to the market index like inflation and price index. Index bonds are attractive to investors as they are safer than the conventional bonds in terms of real interest rate risk and inflation expectation risk. Indexed bonds, apart from providing safety to investors, also provide a steady interest income from investment while keeping the principal intact. Because both coupon and principal payments of an indexed bond are

adjusted for inflation, an investor can count on the steady purchasing power provided by the coupon interest payment during the life of the bond. Further, when an indexed bond matures, its principal has the same purchasing power as when it was invested.

JUNK BONDS

Junk bonds are high yield bonds issued by companies and are considered highly speculative because of high risk of default.

INTERNATIONAL BONDS

International bonds are divided into two categories namely, foreign bonds and euro bonds. Foreign bonds are issued by a borrowing company in another country and the bond is denominated in the currency of the country where it is marketed or sold.

For example, an Indian company sells bonds in the USA in dollar denomination.

Euro bonds are issued in the currency of one country but sold in other countries.

For example, a dollar denominated bond sold in the UK and a rupee denominated bond issued in the USA.

BOND INDENTURES

A bond indenture is a contract between the issuer and the bondholder and specifies the provisions relating to the issue.

DEBENTURES

Debentures are also fixed income securities with a specified interest rate. These securities have charge over the assets of the issuer. In contrast to bonds which are insecured, debentures are secured. Debentures are an alternative source of borrowing based on assets similar to borrowings from banks and FIs with charge on assets.

Bond Derivatives

CALLABLE BONDS

Callable bonds give the right to the issuer to redeem the bond prior to its maturity to date, at a specified call price. These bonds are beneficial to the issuers when the coupon interest paid by the bond is higher than the prevailing interest rates. Basically, the company can issue the same bonds at a lower interest rate leading to lower cost of financing.

CONVERTIBLE BONDS

The issuer offers bonds with an option to the investor for convert these bonds into equity shares at a pre-fixed ratio. These can be fully convertible bonds or partly convertible bonds.

For example, a convertible bond is issued on par with a face value of Rs.1,000 convertible into 40 shares of a firm X's stock. The current market price for the stock is Rs.20 per share. At present, it is not profitable to purchase the bond at Rs.1,000. The market conversion value is the current value of the shares exchanged for a bond. At the price of Rs.20 per share, the value of the bond can be Rs.800.

PUTTABLE BONDS

Puttable bonds can be redeemed prior to maturity at the initiative of the bondholder. These bonds are more advantageous to the investors as they get an opportunity to redeem their bonds when the prevailing market interest is more than the coupon interest on the bonds. This feature enables the investors to unlock their current investment and invest in more profitable avenues.

Trust Indenture Covenants[1]

Bonds may be secured by an indenture by and between the company and a corporate trustee, which may be any bank or other corporation having the power of a trust company or any trust company. The role of trust indenture is to maintain a desirable risk profile of the investment throughout the life of the bond. In the current scenario of high yield, high risk and explosive growth of corporate bond market environment, the provisions of trust indenture work as balancing tools to manage the risk/return analysis of corporate debt. Indenture may contain such provisions for protecting and enforcing the rights and remedies of the bondholders as may be reasonable and proper and not in violation of law, including covenants setting forth the duties of the company in relation to the exercise of its powers and the custody, safekeeping and application of all money. The company may provide, through an indenture, for the payment of the proceeds of the bonds and revenues to the trustee under the indenture or other depository. The method of disbursement thereof and other safeguards and restrictions as the company may be determined by the issuer when the bonds are secured by an indenture, the bondholders do not hold any authority to appoint a separate trustee to represent them.

The covenants between the bondholder and the issuer have various direct and indirect costs associated with them. The direct cost covenants to creditors include higher transactional costs of negotiating, drawing up and monitoring trust indenture provisions. However, the more significant is the indirect cost i.e., the opportunity cost that can result from management being precluded from considering the full range of potential initiatives.

Generally, the cost of debt to the company is seen to increase with a more restrictive covenants pattern. This is because of the rise in the agency costs brought about by an increase in the likelihood of technical default and by provision of incentives for an inefficient allocation of resources. For instance, issuer might be forced to adopt a less than optimal capital structure weighted too heavily towards equity because of covenants restricting the incurrence of additional debt or creation of additional security. Further, covenants restricting asset sales may also force the issuer to rely on external financing which may prove less efficient than internal sources of financing.

To solve the above problem, a trust indenture comes to rescue. Trust indenture strikes a balance between desirable risk profiles of creditors against the costs to the borrower.

Some of the important covenants forming a part of trust indenture are discussed hereunder.

NEGATIVE PLEDGE

The main objective behind a negative pledge is to place a restriction on the amount of new debt with a higher priority than that on the existing debt proposed to be issued by a company. This would not affect the amount available for recovery on default for the outstanding debtholders. In other words, a negative pledge is a promise by the issuer whereby he agrees not to pledge assets owned by the company as security for the future debt owing to the third party as long as the debt issued under the trust indenture is outstanding. Negative pledge has the following three distinct features:

- Prohibition
- Unless Clause
- List of Exceptions.

1 This section is drawn from "Role of Trust Indenture Covenants" by Joanna Zapior and Shahen Mirakian, CIBC World Markets Debt Research, 1998.

Prohibition

It would be helpful in examining an annual information form to know the quantum of the consolidated assets of the issuer covered by the negative pledge. Most negative pledge covenants are devised in such a way that they prohibit all security interest that may arise through a statute or through previous court decisions or by any contract between the borrower and the lender. Though, in general, a negative pledge applies to all types of assets and property, whether tangible or intangible, personal or real, present or future, in some specific cases, such as natural resource firms, it is applied to only resource related properties.

Unless Clause

The purpose of unless clause is to permit the issuer to provide security on its future issue of debt without disturbing the protection given to the outstanding debtholders. The unless clause also states that if a new debt is secured with a higher priority than the outstanding debt securities, then the security of the outstanding debt securities is to be changed accordingly. The basic objective of "unless clause" is to provide a cushion against the possibility of facing default when circumstances warrant the use of security that is prohibited by the clause.

Exceptions

There are certain exceptions to negative pledge covenant. The most common are PMSI (Purchase Money Security Interest) and non-recourse debt. Other exceptions are otherwise prohibited liens up to a certain stated amount, existing liens, liens on purchased property or assets, liens on current assets to secure short-term debt, inter-company liens and liens in the ordinary course of business not relating to the borrowing of money. There are some liens which may arise from the rights of public authorities or others due to statute or common law and do not arise from the borrowing of money or the purchase of property. The issuer cannot have a control over such liens. However, these liens do not cause concern to the debtholders as they do not affect the prospects of recovery of their stake.

Purchase Money Security Interest (PMSI)

Purchase Money Security Interest (PMSI) is a lien granted by the issuer to secure indebtedness incurred as the cost of acquiring, improving or constructing property. It is applicable only to the acquired property and is generally non-recourse to the issuer. Non-recourse means that if the secured assets fail to cover the cost of debt, the lender will not be able to make a claim on the issuer's remaining assets. PMSIs are generally used for smaller acquisitions such as office equipments, etc. There is usually a lock-in period specified after which a PMSI can be attached to an asset after its acquisition. This period in most of the cases is set between 6 and 24 months. The lock-in period is meant to prevent the issuer from liquidating the acquired assets in times of liquidity crises. The absence of this protection will act detrimental to long-term lenders of the firms which have a high rate of asset turnover.

Tailor-made Exceptions

There are certain exceptions in the negative pledge that deal with specific circumstances unique to the issuer or industry. Issuers often tend to exclude security which must be granted under the terms of a previous trust indenture or credit agreement. In such cases, the scope and purpose of the exception needs to be examined to determine the fairness of the terms.

If the amount of any exception is limited either in absolute terms or in relation to the issuer's asset base or equity, then it would give an idea about the quantum of debt which enjoys seniority in the event of default. The legal impact of exceptions is more important than their number. The negative pledge thus plays a vital role in safeguarding the priority position of the investment. It is the sole way to ensure that lender will be able to make payments for the unsecured investments. A weak negative pledge is a sign whereby the issuer may issue high priority debt and make the existing debt subordinate to the new debt. Negative pledge helps in analyzing the true and fair position of one's debt. It ensures that a senior debt retains its seniority and is not pushed to the subordinate level by the new debt issued by a firm.

LIMITATION ON ADDITIONAL INDEBTEDNESS[2]

Limitation on additional debt can be considered to be the most sensitive balancing act for all covenants. It provides protection against any possibility of dilution of the priority enjoyed by the existing debtholders. A strong limitation on additional debt would provide greater cushion to the investors against liquidity and insolvency risk. A weak covenant may, in turn, force the issuer to excessive debt exposure that his ability to repay his debt may be severely impaired. But at the same time, too many restrictions hamper the growth of a firm as they limit the sources of funds and raise the opportunity cost too.

The major objective of the previously mentioned clause is to restrict the amount of debt exposure of a firm at any given point of time. This is a cautious measure against liquidity and solvency risk.

The restriction is generally decided based on the financial ratios. When interest coverage ratio is used, the covenant is intended to ensure that short-term commitment to pay interest on outstanding liabilities is met by the firm. Apart from this, there are other ratios like debt to assets, debt to equity and fixed charge coverage ratios which primarily ensure that the issuer's liabilities do not exceed the assets and hence does not face insolvency or bankruptcy.

The limitation on additional indebtedness also prevents the issuer from diluting a class of debt. Dilution refers to the act of issuing new debt which has priority in par with the existing debtholders thus reducing the amount available to the existing debtholding community. It is similar to the negative pledge that limits the new debt ahead of the current debtholder, in that it poses a limitation on the issuance of debt of an equal ranking to that of the current debtholder. But it is not as standardized as the negative pledge.

The limitation on additional indebtedness is a promise by the issuer not to issue any new debt so long as any debt issued under the trust indenture remains outstanding, unless certain financial performance ratios are met. This clause has three parts, namely:

- Prohibition
- Ratios
- Permitted Indebtedness.

Prohibition

Indebtedness is defined in the trust indenture as: It includes money borrowed (e.g., loans), indebtedness assumed by means of issuing bonds, debentures or other similar obligations and liabilities on which interest is charged, lease obligations undertaken, etc. Some indentures provide for quasi-equity obligations like preference shares also. But indebtedness does not include current liabilities that are incurred in the ordinary course of business. There are certain other trust indentures that would include only funded obligations or money borrowed. The funded obligations are those liabilities that are subject to interest. It may refer to those liabilities that may mature in a year or more than one year. Both these forms allow for greater discretion on the part of the issuer.

Ratios

The 'ratio' is the deciding factor of the level of new indebtedness. The issuer is allowed to incur additional debt as long as the total debt, after giving effect to the proposed new issues does not exceed the ratio. The ratios are decided from two aspects (i) ratios that guard against liquidity risk, and (ii) ratios intended to protect against the risk of insolvency.

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2 Indebtedness includes money borrowed in the form of bonds, debentures, obligations under bankers acceptances or letter of credit, all liabilities upon which interest is customarily charged, all obligations under leases which have to be capitalized and guarantees from any of the above.

Liquidity risk ratios are based on interest coverage. The commonly used ratio is EBITDA divided by consolidated interest charges. The definitions of these ratios as given in the trust indenture are more important to clearly assess the liquidity risk. The ratios that are meant to protect against insolvency usually include either fixed charge coverage or debt to assets ratio. The definition of fixed charges coverage ratio remains more or less uniform across various indentures whereas the definition of debt to assets ratio differs.

Permitted Indebtedness

Permitted indebtedness or permitted debt is the primary source of exceptions to the limitation on additional indebtedness. There are five different categories of permitted indebtedness, they are:

- *Indebtedness under an existing credit facility:* Indebtedness under credit facility sets the maximum amount of borrowing allowed. In some instances, indebtedness is capped by a certain figure. This gives a crude estimate of additional debt that can be incurred by a firm under the credit facility.
- Outstanding indebtedness (including indebtedness incurred in the indenture itself).
- *Inter-company indebtedness:* Inter-company indebtedness may raise some concern if debts between the issuer and partially owned subsidiaries are allowed since this introduces a creditor from outside the corporate family and may lead to dilution of the debtholder's priority class. However, generally, inter-company indebtedness is limited to the issuer and wholly owned subsidiary.
- Indebtedness whose proceeds are used to repurchase outstanding debt with equal or higher priority to that issued under the indenture.
- Otherwise prohibited indebtedness to a specified amount.

Limitation on additional indebtedness plays an important role in three other covenants; viz., limitation on sale and leaseback, the mergers and acquisitions covenant and the limitation on distributions.

The limitation on additional indebtedness provides investors with their only protection against the dilution of their debt. A strong covenant should safeguard the interests of the debtholder against liquidity risk and solvency risk. This covenant has the same limitations as that of negative pledge.

LIMITATION ON ASSET SALES[3]

The limitation on asset sales defines the terms and conditions under which a significant portion of the asset base can be disposed by the company through sale. The terms are designed in such a way that the management is allowed to retain an appropriate level of discretion in choosing the method of allocation of assets. At the same time, debtholders are also assured of maintaining the risk profile on which the investment decision is based. Thus, this covenant acts as a compromise between an issuer's need for flexibility and a debtholder's need for protection. This is achieved by restricting the assets that can be disposed off by sale. Further protection can be ensured by defining how the proceeds of the assets sales have to be utilized.

The objective of limitation of asset sales is to ensure the maintenance of the risk profile of the debtholders until the securities remain outstanding. It is very important for debtholders' safety of investments that the capital assets of the company are not disposed in an irregular manner. As capital assets and to some extent intangible assets represent the vital sources of income for the issuer, out of which debt repayment is made, this covenant assumes importance.

3 An asset sale, or more rarely, an asset disposition is most often defined as any sale or transfer of assets with value exceeding a certain amount, as well as the entirety of the business line or division, or the stock of restricted subsidiaries.

A sale of a substantial portion of assets sometimes leads to liquidity problems. Even though converting the illiquid assets into highly liquid cash can solve the liquidity problem to a certain extent, sometimes sale of assets show signs of winding up of the firm. Indications of liquidity crisis or winding up crisis will lead to devaluation of the assets of the issuer. This is particularly true when there is a substantial pressure on the sale of the assets.

When there is a transfer of value generating parts of the company to another related entity leaving the debt obligations in the remaining shell company by the management, the risk of the debtholders is increased. Limitation on asset sales aims to avoid such problems.

The structure of limitation on asset sales is often customized to meet the needs of the individual issuers. But the basic constituents are:

- Prohibition
- Conditions
- Use of proceeds.

"Prohibition" states that the issuer may not engage in asset sale. *"Conditions"* define the exceptions to *"prohibition"* or the terms under which an issuer can conduct asset sales. Most often, the statement emphasizes that a certain portion of consideration that issuer receives should be in cash or the consideration should at least be valued at fair market price. The cash portion of consideration can range between 70-85% depending upon the terms given in the trust indenture. Sometimes the payment is made in the form of similar assets or by servicing issuer's debt obligation. Additionally, there should be sufficient proof produced by the issuer to ensure that the assets were sold at a fair market value. The proof, usually in the form of a written copy of the terms of sales and a resolution of the Board of Directors attesting the authenticity of those terms, is supplied to the debtholders.

"Use of proceeds" governs the mode and the order of allocation of funds from the proceeds of sale. Usually reinvestment of funds in similar assets, redemption of debt senior to other similar assets, redemption of debt senior to debt securities under the trust indenture or redemption of the debt securities are allowed to the issuer. This section also governs the redemption of the specified debt and limits the amount that can be redeemed under this covenant.

As stated earlier, this clause is a trade-off between the debtholders and the issuer. While the issuer requires flexibility to properly manage its interests and generate favorable returns, the debtholders ensure that its investment is not subject to default risk. The management should be able to sell any assets it chooses so long as the proceeds are used in a manner which ensures that the risk profile of the enterprise and hence the debtholders is maintained. This implies that the proceeds of the sale are either to reduce the amount of debt outstanding or to purchase similar assets. Thus, both the goals of the issuer and the debtholders are achieved simultaneously.

Here, proceeds means the "net cash proceeds" left with the issuer after paying all associated costs with the sale. The proceeds are then used to redeem the higher priority debt or debts with equal priority as that of the debt in consideration, or the repurchase of the debt securities in the open market and to the purchase of assets similar to assets sold. The repurchase of the debt securities in question is usually the last one in the order. The time frame for each stage usually ranges between 180 and 360 days. The clause also sets limits on how much of the debt securities can be purchased prior to a specified date. The covenant also states how the remaining proceeds are to be used. They are normally returned to the issuer as a part of the general fund.

LIMITATION ON RESTRICTED PAYMENTS COVENANTS

The Limitation on Restricted Payments poses a limit on the level of discretion that can be exercised by the issuer while distributing its funds to its shareholders. Optimal allocation of the firm's capital is of utmost importance for the issuers. The issuer should make a choice between retaining the capital and distributing to the

shareholders. The decision is based on the firm's ability to utilize the funds in a more profitable manner than that could be done by the external shareholders. But in times of crises faced by the issuer in meeting its fixed obligations, the equity holders or affiliated parties try to exercise their control over the firm to withdraw funds before the issuer becomes insolvent. It is not an uncommon practice observed that powerful shareholders misallocate the firm's capital to deal with personal financial difficulties. There is a possibility of biased decisions on the part of the issuer in favor of some class of debtholders which would act detrimental to others.

This covenant by way of posing restrictions on the issuer's discretion in the distribution of its wealth ensures that the firm is able to safeguard the interests of the debtholders and limits any favorable decisions made with regard to non-debt stakeholders. Thus, it acts as a guarantee that the issuer will give priority always to its mandatory obligations. It is more customized than any of the covenants discussed earlier. Therefore, one should be cautious in interpreting this covenant to ensure that its basic function is clearly specified.

The Limitation on restricted payments has four parts:

- A prohibition on restricted payments
- A list of restricted payments
- A financial test to determine the time at which restricted payments are allowed
- A list of permitted distribution.

Some of the items that find place in the list of restricted payments are the payment of dividends, share repurchases, the optional redemption of debt subordinated to that governed by the indenture, payments to affiliated parties and investments. The common feature of all these items is that they are beneficial to the shareholders and not the holders of debt specified in the indenture. The distribution of these payments should not lead to prohibition of any mandatory payments. Prohibition of payments to debtholders would lead to conflicts between debtholders and non-debt stakeholders. The covenant should not impose restriction on dividend payments as it does not bring any effect on the debtholders' interests and prohibiting such payments would only lead to a potential conflict between debt and equity holders.

There is no standardized test available for determining the amount of Restricted payments allowed. However, two most common forms of tests used are – the ratio and absolute amount tests. The ratio test compares debt to EBITDA. A benchmark ratio is set and the issuer is allowed to make restricted payments as long as it meets the ratio set out in the test.

The absolute amount test sets the limitation on Restricted Payments as a percentage of the sum of net income, proceeds from the sale of stock and a specific dollar figure. The issuer's need for discretion is compared with the debtholder's need for protection in analyzing the absolute amount test. Both the tests are used simultaneously to ensure greater protection to the debtholders.

Permitted Distributions are payments, which are discretionary in legal sense, however, are made mandatory by the market forces. For instance, preferred dividends are discretionary in legal sense; however, the market demands their payments and they also affect the future growth of the company. The most common permitted distributions are (i) the payment of dividends which met the test when declared but no longer do so, (ii) redemptions of debt upon the issuance of new debt, (iii) repurchases of shares with the proceeds from the sale of new shares, (iv) distribution under credit facilities, (v) preferred share dividends, (vi) share repurchases pursuant to Employee Share Ownership Plans and (vii) distributions within the corporate family. These distributions, in general, do not act against the interests of the debtholders. For determining these distributions, their effect on debtholders' rights is considered.

The limitation on restricted payments safeguards the debtholders from the potentially poor judgment of issuers when weighing the rights of the debtholders against that of other stakeholders. The limitation on the amount of discretionary distribution ensures that the firm has sufficient funds to meet its obligation towards the debtholders. In times of financial crises, equityholders tend to liquidate the firm and take as much amount as possible as dividends. Though it is not as standardized as the other covenants discussed earlier, it has sufficient provision which would help the debtholders make a judgment about the extent of vulnerability of their investment to potential misallocation of capital.

Interpretation of Debt Market Quotations

Here, we present a clipping from "The Economic Times" which explains the various terms used in quoting debt instruments (Government securities and debentures issued by various organizations) in the wholesale debt market of National Stock Exchange. The table quotes the market as on 29th January 2002.

NSE Debt Market Deals **Part I**

Market as on 29 January, 2002

	WDM Trades (Rs. Cr.)		Corporate Debentures (Rs. lakhs)	
Category	Today	This Week	Today	This Week
Traded Value	6,489.23	11,992.19	1,052.46	1,827.71
No. of Trades	993	1,873	2	4

Top Securities Traded Today Non Repo Trades

Category	Sec type	Security	Issue	Traded Value (Rs. Cr.)	Weighted Yield (%)	
					Trade Value > 1 Cr.	Trade Value < 1 Cr.
Govt. Securities	GS	CG2015	9.85%	895.00	7.92	–
	GS	CG2011A	11.50%	895.00	7.69	–
	GS	CG2013	9.81%	760.00	7.76	–

Nse-Mibid/Mibor

		MIBID		MIBOR	
Period	IST	Rate	Std. Dev.	Rate	Std. Dev.
OVER NIGHT	09.40 AM	6.51	0.0155	6.64	0.0112
14 DAY	11:30 AM	6.88	0.1054	7.36	0.1066
1 MONTH	11:30 AM	7.10	0.0651	7.67	0.0836
3 MONTH	11:30 AM	7.62	0.0887	8.31	0.1209

Traded Securities on WDM Segment

Sectype	Security	Issue Name	Trade Type	No. of Trades	Trade Value	Low Price/Rate	High Price/Rate	Last Traded Price/Rate	Weighted Yield
BB	PNB08	10%	NR	1	5.00	103.3801	103.3801	103.3801	9.2460
BB	SBI06	11.55%	NR	1	5.00	109.4174	109.4174	109.4174	8.7450
BB	SBI08	11.90%	NR	1	5.00	113.7915	113.7915	113.7915	8.8890
CP	BPCL	220402	NR	1	25.00	98,3495	98,3495	98,3495	7.4700
DB	GACEM08	9.60%	NR	1	5.00	104.6973	104.6973	104.6973	9.5321
DB	HDFC03	11.30%	NR	1	5.00	105.7944	105.7944	105.7944	8.6860
GS	CG2002	11.15%	NR	2	15.00	102.5500	102.5500	102.5500	6.6530
GS	CG2002	13.80%	NR	1	5.00	102.3000	102.3000	102.3000	6.7460
GS	CG2003	11.10%	NR	1	10.00	104.9800	104.9800	104.9800	6.6590
GS	CG2004	12.50%	NR	10	75.00	111.2400	111.3000	111.3000	6.7693
GS	CG2004	12.59%	NR	3	45.00	112.3700	112.4300	112.4200	6.8640

NSE Debt Market Deals

GS	CG2021	10.25%	NR	25	140.00	119.1900	119.6000	119.5000	8.2216
GS	CG2026	10.18%	NR	5	16.50	119.2500	119.4300	119.2500	8.3181
ID	ICIC03C	16%	NR	1	12.00	112.2061	112.2061	112.2061	9.3800
ID	ICIC03E	16%	NR	1	5.00	112.0798	112.0798	112.0798	9.3800
ID	ICIC06B	10.25%	NR	1	2.00	100.5342	100.5342	100.5342	10.0240
ID	IDBI04A	12.50%	NR	1	2.75	104.7694	104.7694	104.7694	10.2070
PT	BHEL08	8.85%	NR	2	10.00	100.2210	100.2408	100.2408	8.7790
PT	BPCL08	9.95%	NR	2	10.00	104.6790	104.6790	104.6790	8.9120
PT	NHPC07	9.55%	NR	1	25.00	101.1489	101.1489	101.1489	9.2500
PT	NTPC07	10%	NR	1	7.40	105.7780	105.7780	105.7780	8.6780
SG	AP09	12.50%	NR	1	1.00	122.0300	122.0300	122.0300	8.2950
SG	MAH08	12.50%	NR	1	1.50	121.2300	121.2300	121.2300	8.3010
TB	364D	100103	NR	1	30.00	94.0945	94.0945	94.0945	6.6400
TB	364D	271202	NR	1	15.00	94.3124	94.3124	94.3124	6.6300
TB	364D	310502	NR	1	10.00	97.8432	97.8432	97.8432	6.5950
Total				993	6489.23				

Description	No. of Trades	Total Qty.	Consideration (Rs. in lakh)	Open	High	Low	Close	Indicative Yield
GUJ AMB CEM 9.60% 2008(S-19)*	1	500000	523.4865	104.70	104.70	104.70	104.70	9.53
HDFC 11.30% 2003(S-16)*	1	500000	528.9720	105.79	105.79	105.79	105.79	8.69
Total	2	1000000	1052.4585					

* Indicates trades done on WDM segment of the Exchange.

Legend for Daily Market Reports

Traded Securities on WDM Segment:

1. **Security Type:** The instruments issued by various issuers are clubbed under different homogeneous categories which are known as Security Types. Security type starting with 'Z' indicates retail lot in which small/odd value transactions can be done.
2. **Security:** Security indicates either issuer name and year of maturity or term of the instrument, depending upon nature of the instrument.Suffixes such as A, B, etc. to the security name have been given purely for the purpose of differentiating various securities issued by the same issuer and maturing in the same year and carrying the same coupon rate.
3. **Issue:** Issue indicates either maturity date, coupon rate or mark-up rate over benchmark depending upon the nature of the instrument. Explanation of Security and Issue for different types of instruments is given hereunder.

   Sr.No/Type of instrument/Security Indicates/Issue Indicates/Example

   1. T-Bills\Term of T-bills – 91 days, 364 days\Date of maturity\"TB 364D 290102" stands for Treasury Bill issued for 364 days and maturing on 29/01/2002.
   2. Discounted instrument other than T-bills\Issuer\Date of maturity\"CP BPCL 220402" stands for Commercial Paper issued by Jindal Polyester maturing on 22nd April, 2002.
   3. Coupon bearing instruments including zero coupon instruments\Issuer and year of maturity\Coupon rate\"GS CG2005 14%" stands for Govt. dated security, issued by the Central Government and maturing in 2005 carrying a coupon of 14%.

      "PT NHPC 02 18%" stands for taxable PSU bonds issued by the NHPC maturing in 2002 carrying a coupon rate of 18%.
   4. Floating rate instruments\Issuer and year of maturity\Mark-up over benchmark\"BF SBI04 + 3%" stands for Floating Rate Bond issued by SBI maturing in 2004 with a mark-up of 3% over the benchmark.
4. **Weighted Yield:** Weighted yield indicated for the traded security is calculated on the basis of all trades done in the security during the day.

Debentures Traded on NSE:

The opening, closing, high and low prices are given separately for WDM & CM segments. Similarly, the total quantity and number of trades are also shown separately for both the segments.

If a debenture is traded on both WDM and CM segments, then the trade in WDM segment is shown with '*'.

Yield is calculated assuming the settlement date falls on the trading day.

List of Security Types:

Issuer\Description\Regular Lot\Retail Lot Central Government\Compensation Bond\GD\ZM; Converted Stock\GC\ZG; Floating Rate Bond\GF\ZN; Government Loan\GS\ZG; Partly Paid-up Loan\GP; Treasury Bill\TB\ZB; Zero Coupon Bond\GZ\ZZ; State Government\ Development Loan\SG\ZS; Public Sector Unit\Promissory Note\PD; Taxable Bond\PT\ZT; Tax-Free Bond\PF\ZF; Zero Coupon Bond\PZ; Cumulative Bond\PE\ZE; Institutions\Floating Rate Bond\FB\ZR; Non-SLR Bond\ID\ZD; SLR Bond\IB\ZI; Zero Coupon Bond\IZ\ZL; Deep Discount Bond\DI; Tax-Free Bond\IF; Banks\Bonds\BB\ZO; Certificate of Deposit\CD\ZC; Floating Rate Bond\BF\ZK; Zero Coupon Bonds\BZ\ZA; Corporate\Commercial Paper\CP; Debentures\DB; Promissory Note\CN; Deep discount Debentures\DC; Securitized Debt\SD; Mutual Funds\Unit 64\US\ZU; Mutual Funds units\MF.

VALUE OF A BOND

To understand how a bond may be valued, let us consider the following illustration.

Illustration 1

A debenture of Rs.100 face value that carries an interest rate of 14 percent is redeemable after 6 years, at a premium of 2 percent. If you own this debenture, you will enjoy the following benefits:

End of year	Interest income Rs.	Principal repayment Rs.
1	14	
2	14	
3	14	
4	14	
5	14	
6	14	102

If you require a rate of return of 16 percent from this debenture, the present value of it to you will be:

$Rs.14\ (PVAF_{16\%,\ 6\ yrs}) + Rs.102\ (DF_{16\%,\ 6\ yrs})$

$= Rs.14\ (3.685) + Rs.102\ (0.41)$

$= Rs.51.59 + Rs.41.82$

$= Rs.93.41$

In general terms, the value of a bond may be expressed as follows:

$$V = I\ (PVAF_{k,n}) + F\ (DF_{k,n}) \qquad \text{..... Eq. (1)}$$

$$\text{Value of a bond} = \begin{pmatrix}\text{Annual}\\ \text{interest}\\ \text{payable}\end{pmatrix}\begin{pmatrix}\text{Present}\\ \text{value}\\ \text{annuity}\\ \text{factor}\end{pmatrix} + \begin{pmatrix}\text{Redemption}\\ \text{value}\end{pmatrix}\begin{pmatrix}\text{Discount}\\ \text{factor}\end{pmatrix}$$

Bond Values with Semi-annual Interest

Most of the bonds pay interest semi-annually. To value such bonds, we have to work with a unit period of six months, and not one year.

The basic bond valuation equation becomes:

$$V = I/2\ (PVAF_{k/2,2n}) + F\ (DF_{k/2,2n}) \qquad \text{..... Eq. (2)}$$

Illustration 2

Consider a debenture of Rs.100 par value bond that carries a coupon rate of 14 percent (interest payable semi-annually) and has a maturity period of 6 years and your required rate of return (discount rate) for this bond is 8 percent for six months, the value of the bond to you is:

$$V = Rs.14/2\ (PVAF_{16\%/2,2x6\ yrs}) + Rs.100\ (DF_{16\%/2,2x6\ yrs})$$

$$= Rs.7\ (PVAF_{8\%,12\ yrs}) + Rs.100\ (DF_{8\%,12\ yrs})$$

$$= Rs.7\ (7.536) + Rs.100\ (0.397)$$

$$= Rs.92.45$$

BOND YIELD MEASURES

The investor in bond typically receives income from the following:

i. Interest payments at a contracted rate i.e. coupon interest.
ii. Capital gain or loss arising out of sale of the bond.
iii. Cash realization on sale of bond.
iv. Redemption of the bond by the issuer at a contracted value.

Items (i) and (ii) constitute returns to the bond investor, while (iii) and (iv) are principal recoveries. An investor's income on bond investment depends on whether he holds the bond to maturity or disinvests before maturity. If the bond is held to maturity, cash flows (i) and (iv) will accrue. However, if he sells before maturity he receives cash flows (i), (ii) and (iii) above. The return to the bond investor can be measured in terms of the following:

a. Current Yield (CY)
b. Yield to Maturity (YTM)
c. Realized Yield (RY)

Current Yield (CY)

CY is measured by comparing (i) with the prevailing market price. Thus,

$$CY = \frac{\text{Coupon interest}}{\text{Prevailing market price}}$$

Illustration 3

An 8% bond (Face value of Rs.100) selling for Rs.96, would have a current yield of,

$$r_c = \frac{8}{96} = 8.33\%$$

Current yield of bonds selling at par would be equal to the coupon interest rate. Current yield of bonds selling at a premium (discount) would be less (more) than the coupon interest rate.

An important drawback of current yield is that it considers only coupon income as a source of return to the investor, ignoring interest and capital gains (loss) that would also accrue to him.

Yield-To-Maturity (YTM)

The correct way of computing the return on any asset involves considering the entire sequence of cash flows and their timing and calculating the Internal Rate of Return (IRR). In the case of a bond, there is a cash outflow (equal to the price of the bond) when the bond is bought and there are cash inflows when the periodic interest coupons are received and when the redemption value is received on maturity. Calculating the IRR of this stream of cash flows gives the true return on the bond, which is known as Yield-To-Maturity (YTM).

Thus, yield-to-maturity is measured by comparing the present values of (i) and (iv) dealt in the previous paragraphs with the prevailing market price.

Illustration 4

Consider a bond with an annual coupon rate of 12.5% redeemable on 1/7/20x5 selling at Rs.80.60 on 1/7/20x2. What is the return earned by the investor, who buys the bond on 1/7/20x2 and holds it till maturity?

The investor incurs a cash outflow on 1/7/20x2 of Rs.80.60 and receives interest of Rs.12.50 each on July 1, 20x3, 20x4 and 20x5. On maturity (1/7/20x5), he also receives Rs.100. The structure of cash flow is thus:

Year	20x2	20x3	20x4	20x5
Cash flow	–80.60	12.50	12.50	112.50

The IRR of this stream of cash flows works out to 22% as shown by the following calculation.

Solution

01/07/xxxx	20x2	20x3	20x4	20x5
Cash flow	80.60	12.50	12.50	112.50
Present value of cash flow at 22%	80.60	10.25	8.40	61.95
Net Present Value	0.00			

The YTM is, therefore, 22% compounded annually.

In bond valuation, the convention is to quote yields in terms of half-yearly (semi-annual) compounded rates of interest. This convention is useful because most bonds have semi-annual coupons; therefore, the YTM of such a bond selling at par would be equal to the coupon rate, only if the YTM uses semi-annual compounding. Since 11% compounded half-yearly equals 22% compounded annually, the YTM of the bond would be quoted as 11% rather than 22%. However, for simplicity, in many of our illustrations, we shall assume annual coupons and annual compounding of the interest rates.

For the mathematically inclined students, the semi-annually compounded YTM can be defined as the value of 'r' which solves the following equation:

$$P = C_1\left(1+\frac{r}{2}\right)^{-t_1} + C_2\left(1+\frac{r}{2}\right)^{-t_2} + \ldots + C_{2n}\left(1+\frac{r}{2}\right)^{-t_{2n}} + RV\left(1+\frac{r}{2}\right)^{-t_{2n}} \quad \ldots\text{Eq.(3)}$$

Where,

- P is the price of the bond today
- C_1 is the next coupon
- t_1 is the time from today till the next coupon date and in general
- C_i is the ith coupon, where i = 1, 2, ..., 2n
- t_i is the time (in years) from today when this coupon will be received,

While t_{2n} is the time-to-maturity and RV is the redemption value.

Eq. (3) essentially restates algebraically, the IRR calculation except that it uses semi-annually compounded rates of interest. This equation can be solved by trial and error, either manually or, by using a computer.

For a bond with a constant semi-annual coupon redeemable at par, we can use the formula for the present value of annuities to obtain:

$$P = C\,PVIFA_{\left(\frac{r}{2},2n\right)} + RV\,PVIF_{\left(\frac{r}{2},2n\right)} \quad \text{...Eq.(4)}$$

Where 'C' is the half-yearly coupon.

This equation can also be solved by trial and error. This formula is especially useful when there are several more coupons to be received, because, in this case, Eq. (4) would have a large number of terms (one for each coupon infact).

APPROXIMATION TO YTM

Many investors do not bother to calculate the YTM, and instead, analyze the return earned in a very simple way. The reason is that the total return consists of interest payments and the capital gain/loss on redemption. The average annual return then is:

$$\text{Average annual return}^4 = \text{Annual interest} + \frac{\text{Capital gains}}{\text{Number of years}}$$

Similarly, one can also calculate the average investment as the average of the current price and the redemption value. Many investors then compute the yield as the average annual return divided by the average investment.

For the bond as in Illustration 2, the annual interest is Rs.12.50, the total capital gain is Rs.19.40 (100 – 80.60), the annual capital gain is Rs.6.47 (19.40/3), the annual average return is Rs.18.97 and the average investment[5] is Rs.90.30. Hence, the yield by this method works out to 18.97/90.30 = 21%. We have already seen that the correct yield is 22% compounded annually, an error of 100 basis points. The reason for this error is that the approximate calculation ignores the fact that capital gains and the interest are received at different points of time. To compute an average return is not quite correct.

Many other approximations of this kind are in common use. Some approximations do not use the notions of average investment, but divide the return either by the redemption value or by the price. There are some approximations which divide the annual interest by the price and divide the capital gains by the redemption value. All these approximations involve the same error of ignoring the timing of the cash flows. While some of them may give a nearly correct answer, for some bonds they can be off by a hundred basis points or more.

These approximations are, however, very useful in calculating the YTM by trial and error, since they provide a very good initial guess, the process of trial and error gives the true YTM in a few steps.

ASSUMPTIONS UNDERLYING YTM

The YTM of a bond represents the expected or required rate of return on a bond. While computing the YTM, the following assumptions are made:

1. All coupon and principal payments are made as per the schedule.
2. The bond is held to maturity.
3. The coupon payments are fully and immediately reinvested at precisely the same interest rate as the promised YTM.

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4 Annual return can also be calculated by the formula $\frac{C + (F - P)/n}{(F + P)/2}$, where 'C' is the coupon, 'F' is the redemption value and 'P' is the purchase price.

5 Average investment is equal to half the redemption price and purchase price i.e., (F + P)/2.

The YTM and the realized yield would be equal, if the above conditions are fulfilled. Any violation of the above assumptions will cause the YTM to differ from the realized yield.

Let us see the effects of relaxing the above assumptions on realized yield.

An investor may hold a bond to maturity, or decide to sell the bond before that. Similarly, the reinvestment rate, or the rate at which coupon payments are reinvested can be more or less than the promised YTM.

After relaxing the assumptions on holding period and reinvestment rates, the returns available to the investor have to be redefined:

- If the investor disposes the bond before maturity, the price at which he sells the bond.[6]
- Since the reinvestment rates are different from the YTM, the interest earned on the coupon interest will be at the reinvestment rate and has to be separately considered.

The total returns to an investor, as already noted,

= Coupon interest + Interest on interest + Capital gains (or loss).

We shall consider these components in detail for the effect of interest rate changes, and varying holding periods on the total return.

Coupon Interest

Coupon interest, as already known to us, is stated in the bond indenture, and is computed by applying the interest rate to the face value of the bond.

Interest on Interest

The coupon interests received on bonds may be reinvested and in turn earn interest. The interest on interest can be computed as,

$$I = C_1(1+r)^{n-1} + C_2(1+r)^{n-2} + C_3(1+r)^{n-3} + ... + C_n(1+r)^0 - [C_1 + C_2 + C_3 + ... + C_n] \quad ...Eq.(5)$$

In case of equal coupons received, the above equation will reduce to,

$$C_t\left(\frac{(1+r)^n - 1}{r}\right) - \sum_{t=1}^{n} C_t = C_t FVIFA_{r,k} - n.C_t \quad ...Eq.(6)$$

Where 'r' is the relevant reinvestment rate.

Illustration 5

Consider a 13% bond (face value Rs.200) redeemable after 5 years at a premium of 5%. Let the purchase price of the bond be Rs.191.50.

The YTM of the bond is the value of 'r' in the equation:

$191.50 = 26\ PVIFA_{r,5} + 210\ PVIFA_{r,5}$

At, r = 15%, the RHS of the above equation

= 87.152 + 104.37 = 191.52

The YTM of the bond is about 15%.

The interest on interest earned by the bond, if the reinvestment rate is equal to the YTM,

$= 26\ FVIFA_{15,5} - 26 \times 5 = 175.29 - 130 = Rs.45.29$

Suppose the reinvestment rate is 12%, then the interest on interest would be,

$= 26\ FVIFA_{12,5} - 26 \times 5 = 165.18 - 130 = Rs.35.18$

The realized yield can vary from the promised YTM, if coupons are reinvested at a rate different from the YTM. In the above case, while the promised interest is Rs.175.29, only Rs.165.18 can be realized, if the reinvestment rate available is 12%. A fall in interest rates, therefore, reduces the return available from the interest on interest component.

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6 Market prices available on the bond would also depend on the market interest rates. An increase in interest rates would be accompanied by a fall in market prices and vice versa. It may be different from the acquisition price, resulting in capital gains or losses.

Suppose the bond is not held to maturity, then the interest on interest component would vary with the holding period. The interest on interest at both the reinvestment rates, 12% and 15% for various holding periods, is summarized below.

Table 1: Interest on Interest

Reinvestment Rate	1	2	3	4	5
15%	26 x $FVIFA_{15,1}$ – (26 x 1) = 0	26 x $FVIFA_{15,2}$ – (26 x 2) = 3.9	26 x $FVIFA_{15,3}$ – (26 x 3) = 12.3	26 x $FVIFA_{15,4}$ – (26 x 4) = 25.82	26 x $FVIFA_{15,5}$ – (26 x 5) = 45.29
12%	26 x $FVIFA_{12,1}$ – (26 x 1) = 0	26 x $FVIFA_{12,2}$ – (26 x 2) = 3.12	26 x $FVIFA_{12,3}$ – (26 x 3) = 9.72	26 x $FVIFA_{12,4}$ – (26 x 4) = 20.25	26 x $FVIFA_{12,5}$ – (26 x 5) = 35.18

CAPITAL GAIN (LOSS)

If the bond is held to maturity, the redemption value is known in advance, but if the bondholder decides to disinvest before maturity, then the price at which he will be able to dispose it off should be determined.

Returning to the basic bond valuation equation (also the equation of the YTM), we are aware that the price at which a bond is expected to sell, is the present value of future cash inflows discounted at the YTM rate. With the help of this equation, we can determine the expected market price for any holding period, up to the maturity of the bond, using the following formula.

Market value at the end of t years = $C \times PVIFA_{r,(n-t)} + F \times PVIF_{r,(n-t)}$ ... Eq.(7)

Where,

C = Coupon

r = Reinvestment rate

n = Term to maturity

t = Holding period

F = Redemption price.

Illustration 6

Reconsider the previous illustration. The redemption value of Rs.210 can be realized if the bond is held to maturity. The expected market prices for various holding periods at a reinvestment rate of 15% (YTM) and the capital gains that would arise if the bond is sold at that price is given in Table 2.

Table 2: Capital Gains

At reinvestment rate of 15%	Holding Period (Years)				
	1	2	3	4	5
1. Purchase price (Rs.)	191.5	191.5	191.5	191.5	191.5
2. Market price at the end of the holding period (Rs.)	26 x $PVIFA_{15,4}$ + 210 x $PVIF_{15,4}$	26 x $PVIFA_{15,3}$ + 210 x $PVIF_{15,3}$	26 x $PVIFA_{15,2}$ + 210 x $PVIF_{15,2}$	26 x $PVIFA_{15,1}$ + 210 x $PVIF_{15,1}$	210
	= 194.35	= 197.54	= 201.04	= 205.32	= 210
3. Capital gain (2) – (1) (Rs.)	2.85	6.04	9.54	13.82	18.5

We shall work the capital gains at a reinvestment rate of 12% to illustrate the effect of a different reinvestment rate, on the capital gains component. Table 3 provides the capital gains for various holding periods. The inverse relationship between YTM and market prices result in increased capital gains when the interest rate falls to 12%.

Table 3: Capital Gains

At reinvestment rate of 12%	Holding Period (Years)				
	1	2	3	4	5
1. Purchase price (Rs.)	191.5	191.5	191.5	191.5	191.5
2. Market price at the end of the holding period (Rs.)	26 x $PVIFA_{12,4}$ + 210 x $PVIF_{12,4}$	26 x $PVIFA_{12,3}$ + 210 x $PVIF_{12,3}$	26 x $PVIFA_{12,2}$ + 210 x $PVIF_{12,2}$	26 x $PVIFA_{12,1}$ + 210 x $PVIF_{12,1}$	26 x 0 + 210
	= 213.46	= 211.97	= 211.31	= 210.75	= 210
3. Capital gain (2) – (1) (Rs.)	21.96	20.47	19.81	19.25	18.5

TOTAL RETURN

As mentioned earlier, the total return comprises the three elements explained above – namely, coupon payments, interest on interest, and capital gains.

Let us consider the total returns for the bond as coupons, interest on interest, and capital gains for varying holding periods, have already been computed by us (Illustration 4).

The total returns earned for various holding periods and the two reinvestment rates can be summarized as follows.

Table 4: Total Return (Rs.)

Reinvestment rate		Holding Period (Years)				
		1	2	3	4	5
15% (ytm)	Coupon Income	26	52	78	104	130
	Interest on Interest	0	3.9	12.3	25.82	45.29
	Capital Gains	2.85	6.04	9.54	13.82	18.5
	Total Return	28.85	61.94	99.84	143.64	193.79
12% (ytm)	Coupon Income	26	52	78	104	130
	Interest on Interest	0	3.12	9.72	20.25	35.18
	Capital Gains	21.96	20.47	19.81	19.25	18.5
	Total Return	47.96	75.59	107.53	143.5	183.68

In Table 4, we can see the combined effect of varying the holding period, and the reinvestment rate, on the total return. It can be observed that two opposing forces work on the return. A fall in interest rates reduces interest on interest, while increasing the capital gains. This is due to the inverse relationship between YTM and the market prices (discussed later). The choice of the holding period can be made after considering the realized yield.

Realized Yield (RY)

Realized yield is the yield actually earned by the investor on his investment and depends on the reinvestment rate and the holding period chosen by him. The realized yield can be stated as the rate that equates the future value of the purchase price to the total cash flow realized on the bond. Therefore, it can be represented as:

$$P_0 \times FVIF_{r,n} = \text{Total returns} + \text{Purchase price}$$

Total returns include coupon payments, interest on interest and capital gains realized on sale.

The realized yield or horizon yield measures the expected rate of return of a bond that an investor expects to sell prior to its maturity. Realized (horizon) yield can be used to estimate rates of return attainable from various trading strategies. For computing this, the investor should specifically estimate the expected future

selling price of the bond at the end of the holding period. Also, a specific estimate of the reinvestment rate is made for the coupon flows prior to the liquidation of the bond. This technique can also be used by investors to measure their actual yields after selling bonds.

The realized yields are variations on the promised yield equations. With a small modification in the formula given in footnote 4, the Approximate Realized Yield (ARY) is calculated as follows:

$$ARY = \frac{C_i + \frac{P_f - P_m}{hp}}{\frac{P_f + P_m}{2}} \qquad \text{...Eq.(8)}$$

ARY = the Approximate Realized (horizon) Yield

C_i = the annual coupon payment of the bond i

P_f = the future selling price of the bond

P_m = the current market price of the bond

hp = the holding period of the bond (in years).

Since the realized yield measures are based on an uncertain future selling price, the approximate realized (horizon) yield method is appropriate under many circumstances. A high realized (horizon) yield reflects an investor's expectation of substantial capital gains in a fairly short period of time. The substitution of P_f and hp into the present value model provides the following realized yield model.

$$P_m = \sum_{t=1}^{2hp} \frac{C_t/2}{(1+i/2)^t} + \frac{P_t}{(1+i/2)^{2hp}} \qquad \text{...Eq.(9)}$$

This equation represents the standard present value formula with the changes in holding period and ending price. As such it includes the implicit reinvestment rate assumption that all cash flows are reinvested at the computed interest rate. There may be instances where such an implicit assumption is not appropriate, given one's expectations for future interest rates. In such cases, it would be appropriate and realistic to explicitly estimate the reinvestment rates and calculate the realized yields based on the investors' ending-wealth position. This procedure is more precise and realistic, and it is easier because it does not require iteration.

Illustration 7

Consider the total return computed in Table 4. The realized yield for both the reinvestment rates, and various holding periods, would be computed as follows:

The realized yield for a holding period of 1 year, at a reinvestment rate of 15% is computed as the value of r in the equation,

$191.5\ FVIF_{r,1} = 28.85 + 191.5$

$191.5\ FVIF_{r,1} = 220.35$

$FVIF_{r,1} = 1.150$

Looking at the FVIF tables, we find that the value of r = 15%. The realized yield, therefore, is 15%.

The realized yield for a holding period of 1 year, at reinvestment rate of 12%, is computed as the value of 'r' in the equation,

$191.5\ FVIF_{r,1} = 47.96 + 191.5$

$191.5\ FVIF_{r,1} = 239.46$

$FVIF_{r,1} = 1.250$

The value of 'r' lies between 24% and 28%. Using linear approximation,

$$r = 24 + \left(\frac{1.250 - 1.240}{1.280 - 1.240}\right) = 24 + (0.25 \times 4) = 25\%$$

The realized yield for both the reinvestment rates for various holding periods is summarized in Table 5.

Table 5: Realized Yield (%)

Reinvestment rate	Holding Period (Years)				
	1	2	3	4	5
15%	15	15.00	15	15	15.0
12%	25	18.54	16	15	14.4

Realized yield, thus, depends on the holding period chosen and the reinvestment rate available. In an environment of falling interest rates, the investor realizes a lower yield as term to maturity approaches. He benefits by shortening his holding period and realizing the capital gains. Realized yield falls beyond a holding period of 4 years (at an interest rate of 12%) because the reduction in interest on interest is not offset by an increase in the capital gains component.

It is apparent that the opposing forces – interest on interest and capital gains are balanced at a holding period of 4 years. The determination of such a holding period that immunizes the two opposing forces is done with the help of a concept called 'Duration'.

Note that the realized yield is equal to the YTM for all holding periods, if the reinvestment rate is equal to the YTM.

Alternatively, the realized (horizon) return with different reinvestment rates can be calculated in the following manner.

In this method, the value of all cash flows at the end of the holding period is calculated, which is the investor's ending-wealth value. This ending-wealth value is compared with the beginning-wealth value to determine the compound rate of return that equalizes these two values.

Steps to calculate an expected realized (horizon) yield can be summarized as follows:

1. Calculate the future value at the horizon date of all coupon payments reinvested at estimated rates.
2. Calculate the expected sales price of the bond at the expected horizon date based on the estimate of the required yield-to-maturity at that time.
3. Sum the values in (1) and (2) to arrive at the total ending-wealth value.
4. Calculate the ending-wealth value to the beginning-value (the purchase price of the bond). Given this ratio and the time horizon, compute the compound rate of interest that will grow to this ratio over the time horizon.

$$\left[\frac{\text{Ending-wealth Value}}{\text{Beginning-wealth Value}}\right]^{1/2n} - 1$$

5. If all calculations assume semi-annual compounding, double the interest rate derived from (4).

Illustration 8

Consider a 20-year bond (14% coupon) to take advantage of an expected decline in rates from 13% to 10% over a two-year period.

Assume that P_m = Rs.1,000

i = Interest rate payments of Rs.60 in 6, 12, 18, and 24 months

P_i = Rs.1,550.75 (ending-value of the bond).

Reinvestment rates of 12%, 11% and 10%.

The ending value of the four interest payments is determined by our assumption regarding specific reinvestment rates. Assume each payment is reinvested at a different declining rate that holds for its time period (i.e., the first three interest payments are reinvested at progressively lower rates and the fourth interest payment is received at the end of the holding period).

i_1 at 12% for 18 months	= Rs.60 x $(1 + 0.12/2)^3$	= Rs.71.46
i_2 at 11% for 12 months	= Rs.60 x $(1 + 0.11/2)^2$	= Rs.66.78
i_3 at 10% for 06 months	= Rs.60 x (1 + 0.10/2)	= Rs.63.00
i_4 not reinvested	= Rs.60 x (1.0)	= Rs.60.00
Future Value of Interest Payments		= Rs.261.24

Therefore, the ending-wealth value = Rs.1,550.75 + Rs.261.24 = Rs.1,810.99.

The compound realized (horizon) rate of return is calculated by comparing the ending-wealth value (Rs.1,810.99) to the beginning-wealth value (Rs.1,000) and determining what interest rate would equalize these two values over a two-year holding period. Ratio of ending-wealth to beginning-wealth = 1.81.

$$\text{Compound rate of interest} = \left[\frac{\text{Ending-wealth Value}}{\text{Beginning-wealth Value}}\right]^{1/2n} - 1$$

Where 'n' is the holding period = $(1.81)^{1/4} - 1 = 16\%$.

This rate is compared with the realized rate of return, calculated assuming that all the cash flows are reinvested at a single rate.

When the ARY method is used, sufficient accuracy is obtained by extrapolating for transactions on non-interest payment dates also.

PROPERTIES OF THE REALIZED YIELD

The realized yield will have the following properties:

1. The realized yield will always lie between the YTM and the reinvestment rate. If the reinvestment rate is equal to the YTM, then the realized yield will also be equal to the YTM. If the reinvestment rate is greater (smaller) than YTM, then the realized yield will also be greater (smaller) than the YTM. Note from Table 5 that when the reinvestment rate of 12% is less than YTM of 15%, the realized yield is 14.4%.

   RI = RY = YTM

   RI > RY > YTM

   RI < RY < YTM

2. For bonds with longer term to maturity, realized yield will be closer to the reinvestment rate.

   For bonds with a shorter term to maturity, realized yield will be closer to the YTM.

Yield to Call

Yield calculation for bonds with call options is different from that of regular bonds. At present the corporates and the financial institutions are mostly issuing bonds with callable option so as to protect themselves from the changes in the interest rates. They normally fix a certain time called lock-in period for call options to be exercised in the callable bond so that the investors are protected till such time when the bond is due for call. For long investment decision and to measure the return of the bond in case of bond callable on a future day, we normally take the callable date as due date to calculate the yield to call. It will be the yield-to-maturity for a callable bond. But the due date here is the callable date instead of regular expiration date. It is assumed that the cash flow terminates on

the first call date. If we equate the present value based on this calculation and the discount rate which gives equivalent value to the bond, then the present market value will be the yield to call.

For example, a bond with a coupon rate of 8.75% is issued at a face value of Rs.1,000 for 30 years. If the first call date is 5 years hence and the call price is fixed at Rs.1,070, and if we work out yield-to-maturity by assuming that the coupon payment is payable semi-annually, then the yield-to-maturity will be 8.15%.

If we calculate the yield to call by taking cash flows for 5 years and a redemption payment of Rs.1,070 (call price), present value comes to Rs.1,077.74 by taking discount rate of 8% as per the calculation given below.

	Rs.	Rs.
Coupon payment (semi-annual)	43.75 x 8.1109	354.85
Redemption payment	1070 x 0.6756	722.89
		1,077.74

So, we can conclude that the yield to call is 8% as against the yield-to-maturity of 8.15%.

Yield to call can be calculated by using the general formula, as given below if the coupon payment is made semi-annually.

$$P_M = \sum_{n=1}^{2N_c} \frac{I_n / 2}{(1+i/2)^n} + \frac{P_c}{(1+i/2)^{2N_c}} \quad \text{...Eq.(10)}$$

Where, P_M = Present market value
N_C = Number of years to call date (time)
P_C = Call price
I_n = Interest during the nth period
i = Discount rate or call rate.

BOND PRICE ANALYSIS

BASIC PRICE/YIELD RELATIONSHIP

The price of any financial instrument is equal to the present value of the cash flows expected from the financial instrument under consideration. We require the following for computing the price.

1. Expected cash flows
2. Required yield from the instrument.

For some financial securities, it may be easy to estimate the cash flows while for others, it may be difficult. The yield required is the yield expected with comparable risk.

In case of a non-callable bond, we can compute the expected returns, that is periodic coupon payments and the par value receivable on the maturity due date.

If we assume that the coupon interest payable annually and the coupon rate is unchanged during the tenure of the bond, then we can work out the price as follows.

Generally, the price of a bond can be computed using the present value as,

$$P = \frac{C}{1+r} + \frac{C}{(1+r)^2} + \frac{C}{(1+r)^3} + \ldots + \frac{C}{(1+r)^n} + \frac{M}{(1+r)^n} \quad \text{...Eq.(11)}$$

Where,

C = Coupon interest (annual)
P = Price
r = Required interest rate
M = Par value of the bond at maturity.

For example, a bond has the following characteristics with par value Rs.100, coupon rate = 15%, r = 12%, n = 10 years.

$$\text{Then, } P = \frac{15}{(1+0.12)} + \frac{15}{(1+0.12)^2} + \frac{15}{(1+0.12)^3} + \ldots + \frac{15}{(1+0.12)^{10}} + \frac{100}{(1+0.12)^{10}}$$

$$= 15(5.6502) + 100 \times 0.3220 = 84.753 + 32.20 = 116.953$$

[5.6502 = Present value of an annuity of Re.1 for 10 years @12%]

[0.3220 = Present value of Re.1 for 10 years @12%]

The value of bond as per the present value method is Rs.116.953.

If the coupon payment is made semi-annually, then the bond value for the above example can be computed as follows.

$$P = \frac{7.5}{(1+0.06)} + \frac{7.5}{(1+0.06)^2} + \frac{7.5}{(1+0.06)^3} + \ldots + \frac{7.5}{(1+0.06)^{20}} + \frac{100}{(1+0.12)^{10}}$$

$$= 7.5 \times 11.46991 + 100 \times 0.3220 = 86.02 + 32.20 = \text{Rs.}118.22.$$

VALUATION OF A ZERO-COUPON BOND

Some bonds are issued without any periodic coupon payments. The investor gets the interest and the principal on a maturity date. The interest is the difference between the purchase price and the maturity value. These types of bonds are known as zero-coupon bonds. The price of the bond can be computed by substituting zero for C and M for RV in equation (4).

Then the price of this bond is computed as follows:

$$P = \frac{M}{(1+r)^n} \qquad \ldots\text{Eq.(12)}$$

Where,

M = Maturity value

r = Expected rate of return

n = Period of the bond.

If M = Rs.1,00,000, r = 12%, n = 25 years

$$\text{Then, } P = \frac{1,00,000}{(1+0.12)^{25}} = 1,00,000 \times 0.059 = \text{Rs.}5,900$$

If a zero-coupon bond is issued with a maturity value of Rs.1,00,000 and is issued for a price of Rs.2,500 maturing after 20 years, then we can calculate the realized yield as follows:

Initial issue price		=	Rs.2,500
Maturity value (face value)		=	Rs.1,00,000
	n	=	20 years
(Realized yield)	r	=	?

$$2,500 = \frac{1,00,000}{(1+r)^{20}}$$

$$\text{i.e., } (1+r)^{20} = \frac{1,00,000}{2,500} = 40$$

then $r \approx 20\%$

Pricing of a Floating Rate Security

We do not know the exact cash flows in these cases as the interest rate is floated with a reference rate. However, two important points are to be noted. They are:

1. The spread over the reference rate.
2. There may be a cap on the maximum rate and a floor with a minimum rate.

If the market expects a higher spread, the price of this bond will be quoted below par.

Calculating Future Bond Prices[7]

Bond prices can be calculated in two instances: (i) future selling price of a bond can be calculated while computing realized (horizon) yield, if it is to be sold before maturity or first call, and (ii) when issues are quoted on a promised yield basis. A yield-based quote can be converted to a dollar price by using the following equation,

$$P_m = \sum_{t=1}^{2n} \frac{C_t/2}{(1+i/2)^t} + \frac{P_p}{(1+i/2)^{2n}}$$

Where,

P_m = The current market price of the bond

n = The number of years to maturity

C_t = The annual coupon payment for bond i

i = The prevailing yield-to-maturity for the bond issue

P_p = The par value of the bond.

The value computed indicates what an investor would be willing to pay for the bond to realize a rate of return that takes into account expectations regarding the RFR, the expected rate of inflation, and the risk of the bond. For instance, for a 12%, 20-year bond (par value = Rs.1,000), with a promised YTM of 10%, maturing after 15 years, the price of the issue would be,

$$P_m = 100/2 \sum_{t=1}^{30} \frac{1}{(1+0.10/2)^t} + 1000\frac{1}{(1+0.10/2)^{30}}$$

$$= 50(15.372) + 1000(0.231) = \text{Rs.}999.6$$

In the above example, the prevailing market price of the bond is determined based on the current market YTM. These figures indicate consensus of all investors regarding the value of the bond. An investor with a required rate of return different from the market YTM would estimate a different value for the bond.

In contrast to the current market price, a future price (P_f) can be computed when estimating the expected realized (horizon) yield performance of alternative bonds. P_f is usually computed by investors or portfolio managers who trade in bonds for capital gains. The following formula is used for computing P_f:

$$P_f = \sum_{t=1}^{2n-2hp} \frac{C_t/2}{(1+i/2)^t} + \frac{P_p}{(1+i/2)^{2n-2hp}} \quad \text{...Eq.(13)}$$

Where,

P_f = The future selling price of the bond

P_p = The par value of the bond

n = The number of years to maturity

hp = The holding period of the bond (in years)

C_t = The annual coupon payment of the bond i

i = The expected market YTM at the end of the holding period.

This equation is a modified version of the present value model that is used to calculate the expected price of the bond at the end of the holding period (hp). The term 2n – 2hp equals the bond's remaining term to maturity at the end of the investor's holding period, i.e., the number of 6-month periods remaining after the bond is sold. Therefore, the determination of P_f is based on four variables, out of which two are known and two must be estimated by the investor.

7 This section draws from "Overview of Forward Rate Analysis – Understanding Yield Curve: Part I", published by *Salomon Brothers*, 1995.

The coupon (C_t) and the par value (P_p) are given. The investor must forecast the length of the holding period, and therefore the number of years remaining to maturity at the time the bond is sold (n – hp). The investor must also forecast the expected market YTM at the time of sale (i). The real difficulty (and the principal source of error) in estimating P_f lies in predicting hp and i.

Assume an investor bought the bond discussed above at Rs.999, giving it a promised yield of 10%. Based on the analysis of the economy and the capital market, he expects the bond's market YTM to decline to 7% in 4 years. Therefore, if he wants to compute the future price at the end of year 4 to estimate his expected rate of return (assuming that he is correct in his assessment of the decline in overall market interest rates), he must estimate the holding period (5 years), which implies a remaining life of 10 years, and the market YTM of 8%. A semi-annual model gives a future price.

$$P_f = 50 \sum_{t=1}^{20} \frac{1}{(1+0.08/2)^t} + 1000 \frac{1}{(1+0.08/2)^{20}}$$

$$= 50(13.59) + 1000(0.456) = \text{Rs.}1,135.89$$

Based on the estimate of the selling price, the approximate (horizon) yield on this investment can be estimated on an annual basis in the following manner:

$$\text{APY} = \frac{100 + \frac{1,135.89 - 999.6}{5}}{\frac{1135.89 + 999.6}{2}} = 0.1192 = 11.92\%$$

PRICE QUOTES AND ACCRUED INTEREST

When quoting bond prices, in some markets, traders quote the price as a percentage of the par value of the bond. For example, a bond with a price of Rs.109 will be quoted in percentage terms as 1.09 (a decimal i.e., price/one hundred).

ACCRUED INTEREST

When an investor buys a bond in between coupon payments, he is supposed to compensate the seller with the coupon interest earned on the bond from the last coupon payment date to the settlement date. This amount of interest is called accrued interest, so the buyer pays the seller the agreed price plus the accrued interest. This is known as full price. The price of the bond without the accrued interest is known as clean price.

In Illustration 4, the YTM was calculated on a coupon date and there was, therefore, no accrued interest. As already discussed, in the government bonds market in India, and in most bonds markets in the world, the buyer has to pay accrued interest to the seller. In this case, the bond price for the YTM calculation must be taken inclusive of accrued interest.

Suppose, a bond pays interest semi-annually on July 1 and January 1. If a person sells the bond on May 1, he gets no interest for the four months from January 1 to April 30 for which he held the bond, while the buyer would get six months interest on July 1 though he held it only for two months (May 1 to June 30). The interest for the period from the last coupon due date to the date of the sale is known as accrued interest. In the above illustration, if the bond had a face value of Rs.100 and carried a coupon of 12%, then the accrued interest would amount to Rs.100 x 12/100 x 4/12 = Rs.4.

It is often a convention in the bond markets that the buyer pays the accrued interest to the seller in addition to the price. In other words, the actual cash price paid is equal to the quoted price plus the accrued interest. In India, this is the practice in the government bonds market, but not in the corporate bonds market. In the above illustration, if the quoted price is Rs.98 then under this convention, the actual cash price would be Rs.98 + 4 = Rs.102.

Illustration 9

In the middle of July, 20x2, the 12.75% bond issued by Exec Ltd. maturing in 20x3, was quoted at Rs.104. The coupon dates for this bond fall in the middle of April and October and the bond matures in the middle of April, 20x4. What is the YTM of this bond?

Solution

Using equation (13),

P : We have to consider accrued interest for three months from mid-April to mid-July. This comes to Rs.3.19. So, the full cash price of the bond is Rs.104 + Rs.3.19 = Rs.107.19. Hence, P = 107.19.

t_1 : The next coupon is in mid-Oct, which is 3 months or 0.25 years away. So, $t_1 = 0.25$.

C : C is clearly 12.75.

n : There are 4 more coupons: Oct., 20x2, Apr., 20x3, Oct., 20x3 and Apr., 20x4. So n = 4.

By trial and error in Eq. (13), we obtain r = 0.1017.

Therefore, the YTM (semi-annually compounded) is 10.17%.

Eq. (12) can be used to obtain the price of the bond (P) if the YTM (r) is known. In this case, there is no need for a process of trial and error. The P that is obtained includes accrued interest. This has to be subtracted to obtain the quoted price. For example, in the above illustration, if we were given the yield of 10.17%, we would use Eq. (12) to find that P is Rs.107.19. We would then subtract the accrued interest of Rs.3.19 to get the quoted price of Rs.104.

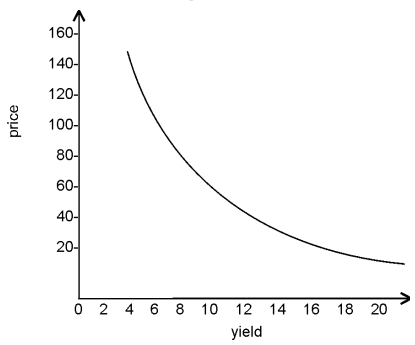
PRICE-YIELD RELATIONSHIP

For a bond, the relationship between the price and the required yield is opposite. This is because, the price of the bond is the present value of cash flows. If the required yield increases, the present value of the cash flow declines and hence the bond value also declines. Let us compute the relationship between the price and the required yield for a bond with coupon rate of 10% with par value of Rs.100 maturing after 10 years for different required yields as per the table given below:

Table 6: Price Yield Relationship

Yield (in %)	Price in Rs.
4	148.70
6	129.40
8	113.40
10	100.05
12	88.70
14	79.16
16	71.53
18	64.04

Figure 1



If we graph the price-yield relationship, we can get a convex curve as seen above in the graph. This convexity has important implications with investment characteristics of a bond. Whenever yields in the market change, the bond prices also change to compensate the yield expectations of the investor. For example, if the coupon rate of a bond is 11% and the present market coupon rate for similar bonds is 12%, then the bond value gets depleted as it yields only 11% as against the current market yield of 12%. Conversely, if the current market yield is 9.5%, then the bond gets traded at premium as the bond under reference gives an yield of 11% as against the current yield of 9.5%. When the bond is sold below par value, then it is said to be sold at a discount. When the bond is sold above par value, it is said to be traded at a 'premium'. It can be summed up as follows:

Coupon rate < required yield → price < par (discount)

Coupon rate > required yield → price > par (premium).

Relationship between Bond Price and Time (If Interest Rates are Constant)

The bond price remains constant when the bond moves towards its maturity, and if the interest rates remain constant. If the bond is quoted at a premium, the price of the bond decreases when it approaches maturity. Discount bonds increase their prices when they approach maturity. In both the cases, the bonds will reach par value at the time-of-maturity.

Illustration 10

	Discount bond (5 yr. bond with 10% coupon) (expected rate yield at 12%)	Premium bond (expected yield at 7.8%)
5	92.6	109.0
4	93.8	107.4
3	95.1	105.8
2	96.5	104.0
1	98.2	102.0
0	100.0	100.0

Reasons for price changes of a bond:

a. Change in the yield requirement of the issuer due to changes in the quality of credit of the issuer.

b. Change in the price as the bond approaches maturity in case of premium or discount bond.

c. Change in the prices because of changes in the yields of comparable bonds/securities.

While computing the bond pricing, the following assumptions are made:

1. Cash flows are known
2. Coupon payment annually/semi-annually at exact period
3. Required yield can be estimated
4. One rate is used to discount all cash flows, i.e., with required yield rate.

The following cash factors are to be considered:

1. For callable bonds, cash flows cannot be certain. The investment decisions of the issuer depend on interest rate movements and other factors.
2. It is not possible to determine the appropriate yields and it need not be a single rate for all the future cash flows.

COUPON-PRICE YIELD RELATIONSHIP

a. **The market price of the bond will be equal to the par value of the bond, if the YTM equals its coupon rate.**

Intrinsic value/market price of a Rs.1,000 par value bond bearing a 10% coupon rate with an expected YTM of 10% and a maturity of 10 years is equal to

$$100\ PVIFA_{10\%,10} + 1{,}000\ PVIF_{10\%,10} = 100 \times 6.145 + 1{,}000 \times 0.386$$
$$= Rs.1{,}000.50$$

Thus, when the YTM is equal to the coupon rate, the market value is equal to the face value of the bond.

b. **If the YTM increases above the coupon rate, then the market value drops below the face value.**

If the YTM of the above bond increases to 12%, then the market value of the bond will drop to Rs.887.

100 $PVIFA_{12\%,10}$ + 1,000 $PVIF_{12\%,10}$ = 100 x 5.65 + 1,000 x 0.322 = Rs.887.

c. **Inversely to the above principle, if YTM drops below the coupon rate, the market value will be more than the face value of the bond.**

In the case of the above bond, if the YTM falls to 8%, then the market value of the bond will rise to,

= 100 $PVIFA_{8\%,10}$ + 1,000 $PVIF_{8\%,10}$ = 100 x 6.71 + 1,000 x 0.463
= Rs.1,134.

PRINCIPLES OF BOND PRICE MOVEMENTS

As YTM determines a bond's market price and vice versa, we can say that the bond's price will fluctuate in response to the changes in market interest rates in the following ways:

i. **A bond's price is inversely proportional to its yield-to-maturity.**

The present value principle states that the present value of a cash flow varies in inverse proportion to the interest rate used as a discount rate. As such, if the YTM of the bond rises, the bond's market price drops and if the YTM falls, the bond's market price rises.

Illustration 11

The YTM of a Rs.1,000 par value bond bearing a coupon rate of 10% and maturing in 10 years is 12%. Thus, the market value of the bond is Rs.887 (as calculated previously). If the YTM increases to 14%, the market value of the bond will drops to Rs.791.60, as calculated below.

100 $PVIFA_{14\%,10}$ + 1,000 $PVIF_{14\%,10}$ = 100 x 5.216 + 1,000 x 0.270 = Rs.791.60

If the YTM of the same bond comes down to 8%, then the market value of the bond rises to Rs.1,134.

ii. **For a given difference between the YTM and the coupon rate of the bonds, the longer the term to maturity, the greater will be the change in price with change in the YTM.** It is so because, in case of long maturity bonds, a change in the YTM is cumulatively applied to the entire series of the coupon payments and the principal payment is discounted at the new rate for the entire number of years to maturity; whereas in case of short-term maturity bonds, the new YTM is applied to comparatively a few coupon payments; and also, principal payment is discounted for only a short period of time. Thus, the prices of the long-term bonds are more variable to changes in interest rates than the short-term bonds.

Illustration 12

Let us take two hypothetical bonds differing only in term to maturity.

	A	B
Face value	Rs.1,000	Rs.1,000
Coupon rate	10%	10%
YTM	10%	10%
Years to maturity	3	6
Market value at YTM of 10%	Rs.1,000	Rs.1,000
Market value at YTM of 11%	100 $PVIFA_{11\%,3}$ + 1,000 $PVIF_{11\%,3}$ = 975.56	100 $PVIFA_{11\%,6}$ + 1,000$PVIF_{11\%,6}$ = 957.69
Change in price	–2.5%	– 4.2%

The market value of the bonds, when the YTM was equal to the coupon rate, was equal to the face value of the bonds i.e., Rs.1,000. When, however, the YTM increased to 11%, the market value of the bond with shorter maturity period dropped by only 2.5% to Rs.975 whereas the market value of the bond with longer maturity period of 6 years has dropped by 4.2% to Rs.958. Thus, the long-term bonds are characteristically more sensitive to interest rate changes than the short-term bonds.

Box 1: Principles of Bond Price Movements

- The yield-to-maturity is inversely related to the price of the bond. As yield-to-maturity increases, the price of the bond decreases and as the yield-to-maturity decreases, the price of the bond increases.
- For a difference between the coupon and the YTM, the extent of change in the price of the bond depends on the remaining term to maturity. The larger the period, the greater will be the price change.
- The increase in the price of a bond associated with the changes in the interest rates will be at a diminishing rate as the term to maturity increases.
- For every change in the interest rate, there will be a corresponding change in the price of the bond. However, for the same change in the interest rate in either direction (that is, if the interest rate increases or decreases by say 1%), the corresponding change in the price is not by the same magnitude. The price increase caused by a yield decrease is always more than the decrease caused by a yield increase.
- For a given change in a bond's yield-to-maturity, the percentage price change will be higher for low coupon bonds than for high coupon bonds.
- A change in YTM affects the bonds with a higher YTM more than it affects the bonds with a lower YTM

iii. **The percentage price change described above increases at a diminishing rate as the bond's maturity time increases.**

Let us take the case of bond B with face value of Rs.1,000, coupon rate and YTM of 10% and maturity period of 6 years. Suppose the YTM changes to 11% at the end of the fifth year, i.e., when the time to maturity of the bond is 1 year, then the value of the bond will fall to Rs.991.1.

Similarly, at differing maturity periods, with the change in the YTM, the price of the bond changes as follows:

Time to Maturity	Bond Price (Rs.)	Change %
1	991.10	0.890
2	982.87	0.830
3	975.40	0.760
4	969.20	0.640
5	963.04	0.635

Thus, the longer the maturity, the greater the change with the change in the YTM, but the change (increase/decrease) will be at a diminishing rate.

iv. **Given the maturity, the change in bond price will be greater with a decrease in the bond's YTM than the change in bond price with an equal increase in the bond's YTM. That is, for equal fixed increases and decreases in the YTM, price movements are not symmetrical.**

Illustration 13

Take Rs.1,000 par value bond with a coupon rate of 10% and a maturity period of 5 years. Let the YTM be 10%. Market price of the bond will be equal to Rs.1,000. A 1% increase in the YTM to 11% changes the price to Rs.963.04 (100 $PVIFA_{11\%,5}$ + 1,000 $PVIF_{11\%,5}$), a decrease of 3.7%. A decrease of 1% YTM to 9% changes the price to Rs.1,039 (100 $PVIFA_{9\%,5}$ + 1,000 $PVIF_{9\%,5}$) an increase of 3.9%.

Thus, an increase in the bond's yield caused a price decrease that is smaller than the price increase caused by an equal-size decrease in yield.

v. **For any given change in YTM, the percentage price change in case of bonds of high coupon rate will be smaller than in case of bonds of low coupon rate, other things remaining the same.**

Illustration 14

Consider two bonds A and B with the same par value of Rs.1,000, maturing in 4 years and a YTM of 10%. Bond A bears a coupon rate of 10% whereas bond B bears a coupon rate of 12%.

	Bond A	Bond B
Market price at YTM of 10%	(Rs.) 1,000	1,063.4
Market price at the changed YTM of 12%	(Rs.) 939.7	1000.44
Change in price	6.03%	5.92%

Change in the price with the change in YTM in case of bond B carrying a higher coupon rate of 12% is only 5.92%, whereas in case of the bond with a coupon rate of 10%, the change in the price is 6.03%.

vi. **A change in the YTM affects the bonds with a higher YTM more than it does the bonds with a lower YTM.**

Illustration 15

Consider a Rs.1,000 par value ABC bond with a coupon rate of 12%, maturity period of 6 years and YTM of 10%. The market value of the bond will be Rs.1,087.

Consider another identical bond XYZ but with differing YTM of 20%. The market value of this bond will be Rs.734.

Suppose there is an increase in YTM by 20% i.e., YTM of bond ABC rises to 12% (10 x 1.2) and that of bond XYZ rises to 24% (i.e., 20 x 1.2). Then, the market value of both the bonds will change to,

Bond ABC : 120 $PVIFA_{12\%,6}$ + 1,000 $PVIF_{12\%,6}$ = Rs.1,000

Bond XYZ : 120 $PVIFA_{24\%,6}$ + 1,000 $PVIF_{24\%,6}$ = Rs.638

Market value of the ABC bond with a lower YTM decreased by 8% whereas, in case of XYZ bond with a higher YTM, the decrease is 13%.

RISKS ASSOCIATED WITH BONDS

Suppose, the investor has calculated the YTMs of all the major bonds available in the market, should he then simply pickup the bonds with the highest YTMs? In equity investment, we know that it is not just a question of choosing the stock with the highest expected return. We have to look at both risk and return before taking a decision. But what risks should we worry about when it comes to bonds? Are bonds not supposed to be risk-free?

The answer is that, bonds are less risky than equities, but are not entirely risk-free. Specifically, two main types of risks involved are:

1. **Default Risk:** This risk arises when the company defaults the interest or principal obligations. In case the company goes bankrupt and is unable to pay all its debts fully, a part of the money may be completely lost, and even the remaining part may be paid after a long delay resulting in a loss of present value. As investors, we must always recognize that, even if no money is ultimately lost, the loss of present value can be very substantial if there is a long delay.

2. **Interest Rate Risk:** When calculating the YTM, we assumed that the bond is simply held till maturity. In practice, matters are not so simple. In some cases, the bond may be sold before maturity; in some other cases, the redemption value of the bond may be reinvested in other bonds. It is only in rare cases that the maturity of the bond exactly matches the investment horizon of the investor. Even in this case, the annual interest on the bond may have to be reinvested, unless it exactly matches the annual requirements of funds of the investor. In all these cases, the YTM of the bond does not represent the true return to the investor over his holding period, unless the interest rates remain unchanged throughout the holding period. The holding period return is exposed to interest rate risk.

To manage bond portfolios, therefore, we must assess these two components of risk and evaluate the YTM in relation to these risks.

FORECASTING INTEREST RATES AND DETERMINANTS OF INTEREST RATES

Bonds are usually recognized by yields, which change from time to time owing to many market forces. There exists an inverse relationship between the bond prices and the interest rates. When the interest rates rise, the price of the bonds decline; and when interest rates decrease, the prices of the bonds increase. Either of the two, i.e., the bond prices or the interest rates, could be the driving force. Both of them change simultaneously. But many practitioners describe that the interest rates cause a change in the bond prices, because they are comparable across bonds. The price of the bond depends not only on the interest rates but also on other characteristics of bonds like coupon and maturity. The price-yield curve also demonstrates that the price moves inversely to the yield.

Knowledge of the change in the determinants of the interest rates is necessary for investors who wish to maximize their returns by investing in bonds. Let us discuss the following questions: Why the overall market interest rates rise and fall? Why alternative bonds have different interest rates? and Why the difference in rates between alternative bonds changes over time? The term structure of interest rates relates the interest rates to a set of comparable bonds to their terms to maturity. The term structure is important because it implies a set of spot rates that can be used in the valuation of bonds. Also, it reflects the current risk attitude of the investors and their future expectations about the interest rates.

Forecasting Interest Rates

Forecasting interest rates and the changes in the rates is critical to successful bond investing. The interest rates are the prices charged for the loanable funds. They are determined by the supply and demand for these funds. On one side, the investors would be willing to provide funds at prices based on their required rates of return for a particular borrower. On the other side, borrowers (like governments, corporations and individuals) need funds to support budget deficits, or to invest in capital projects, or to acquire durable goods or homes.

Although lenders and borrowers have some fundamental factors that determine supply of and demand for the funds, the prices for these funds are also affected for short periods by certain events. For example, major government bond issues affect demand; similarly, changes in the monetary policy may affect the supply of money. Therefore, the bond investors and bond portfolio managers should monitor current and expected interest rate behavior. They should also continuously assess the major factors that affect the interest rate behavior and also rely on other sources like economic consulting firms, banks, or investment banking firms.

FORECASTING INTEREST RATE TRENDS

While forecasting the interest rates, the state of the social, political, economic environment and the expectations of people regarding the price changes in the country should be considered. Since these are all interrelated, significant changes in one sphere brings about changes in the other spheres also. These changes have a cumulative effect on the magnitude of the interest rates which move them upwards or downwards.

It is essential for those who invest in fixed income securities to take a view of the movement in interest rates for the following two reasons:

i. The degree of impact of changes in interest rates on securities belonging to the same class depends on maturity.

ii. For securities of the same maturity, the degree of impact of changes in interest rates depends on the quality of the security.

Assumptions of an Economic Model

To begin with, an analyst should build an economic model. A realistic economic model can be developed taking into consideration the recent economic trends. The existing government policies will go a long way in accurately predicting the interest rates.

The emphasis should be on determining the present level of economic activity and the future course it is likely to take. This is because, a recession in the economy generally brings in the regime of falling interest rates and rising bond prices and an economic boom is generally accompanied by rising interest rates and falling bond prices. This helps the analyst to formulate a strategy for investing in the fixed income securities. He can go ahead and invest in bonds, if his prognosis is that the interest rates are not going to rise over his investment period and hence can choose the time to sell if the rates are expected to rise.

While forecasting economic cycles, he should actively search for coincident economic indicators like industrial production and manufacturing and trade sales. The following factors are considered while forecasting the interest rate trends.

Prices and Employment

The prevailing interest rates are the result of the existing economic and business scenario in the country. It is logical for the after effects of an economy which, till recently, has been in depression, to exist for some time even after the trend has reversed. The effect of this is a difference in the interest rate cycles and the business cycles. Therefore, the bond markets which were bearish during the depression periods continued to do so, even after the economy is on the road to recovery.

In this scenario, an analyst should also probe the price behavior of raw materials and the cost of labor, specially from the employment point of view as they affect the formulation of monetary and fiscal policies. Existence of stable prices and high unemployment rate will prompt the government to adopt expansionary policies without worrying much about the inflation rate. This, in turn, results in stable or falling bond yields.

If the economic scenario is accompanied by low unemployment rates and rising prices, the opposite of what we have studied above would occur.

Supply and Demand for Credit

After the analyst has prepared an outlook for the economy, his next task is to prepare a statement of various components, which affect demand and supply of funds. Clearly, the aim of this exercise is to quantify the forces of supply and demand in the economy and to identify whether the balance of the force lies in the direction of the low or high interest rates and whether the funds will be forthcoming for short- or long-terms. This helps the analyst to identify the specific sectors in the economy where the flow of funds (i) has been adequate, (ii) has experienced a shortage or (iii) has experienced a surplus.

Monetary and Fiscal Policy

The monetary policy of a country affects its economy and its international standing. In the domestic arena, the monetary policy is a major determinant of economic growth, price stability, and employment. In the international arena, it has, a direct impact on the Balance of Payments and the value of the currency. The domestic objectives are achieved by keeping a tight control on the spending and investment activities of the government and by influencing the cost and

availability of the funds. If the government tightens the monetary policy, the money supply in the economy decreases and as a result the interest rates increase. This prompts the savers of funds to increase the supply of funds and decrease the demand.

Also, the central bank on behalf of the government, controls the money supply in the economy. It makes changes in the short-term interest rates and these changes are transmitted to the long-term interest rates in a phased manner. This is done by "Open Market Operations" of the central bank. If the bank wants to increase the money supply, it purchases the government securities in the market and if it wants to decrease the money supply, it sells the securities in the market. The apex bank can also bring about the changes in the interest rates by specifying reserve requirements of the banks.

The government's policy with respect to spending and taxing is called fiscal policy. The manner in which the government handles its borrowing objectives has a bearing on the credit markets and the interest rates. This is because in the presence of budgetary deficits, the government tends to roll over the securities issued by it. Reducing the deficit does not necessarily bring down the interest rates. If the deficit is bridged through, say additional taxes, the changes in the interest rates depend on who has been taxed and how the people taxed have tried to maintain their income. For example, increasing the tax on interest income may result in an increase in the interest rates.

At this stage, it will be worthwhile to note that the government under certain conditions formulates the monetary policy in a direction, which would contain inflationary tendencies and simultaneously would pursue a fiscal policy, which would stimulate growth and under some other conditions the exact opposite is true. The result of these two policies, opposing in nature to some extent results in a moderating effect on inflation and growth. In other words, the rate in growth will not be to the desired level, if the monetary policy is formulated with a view to contain inflation and the magnitude of inflation will not be reduced to the extent, envisioned, if the fiscal policy was formulated in order to stimulate growth.

On the whole, monetary and fiscal policies are influenced by the economic outlook, the price and employment characteristics and the supply and demand of the funds in the light of the first two factors. Therefore, the investor should carefully analyze the probable effects of monetary and fiscal policies on the interest rates.

Determinants of Interest Rates[8]

It is not uncommon to observe the investor experiencing abnormal return during the period of fall in the interest rates and poor returns during the period of rise in the interest rates. A model that can be used to describe the relation between interest rates and the inflation rates is expressed in the form of the following equation.

$$i = RFR + I + RP \qquad \ldots Eq.(14)$$

Where, i = Interest Rate

RFR = Risk-free Rate of Interest

I = Expected Rate of Inflation

RP = Risk Premium.

Alternatively, interest rate can be expressed as a function of the economic conditions and issue characteristics that determine the rate of return on a bond:

$$i = f(\text{Economic forces} + \text{Issue characteristics}) = (RFR + I) + RP$$

8 This section draws from "Investment Analysis and Portfolio Management" by Frank K Reilly and Keith C Brown, 6th Edition, *The Dryden Press*.

EFFECTS OF ECONOMIC FACTORS

The risk-free rate of return may be interpreted as the opportunity cost of money for an individual to forego his/her consumption. It is market determined by the real growth rate of the economy with short-term disturbance on account of ease or tightness in the capital market. The expected rate of future inflation is another economic factor that affects interest rates. The sum of real risk-free rate and inflation rate gives the nominal risk-free return. Thus, to determine the nominal RFR, the real growth rate of the economy is adjusted for short run ease or tightness in the capital market and the resulting real rate of interest is adjusted for the expected rate of future inflation.

Alternatively, nominal rate or changes in the rate can be determined based on supply and demand for loanable funds. When there is an increase in supply of funds, level of interest rates falls, other factors remaining constant. The factors determining the supply of funds are government monetary policies, savings pattern of the individuals, etc. When the demand for funds increases, then there is a rise in the level of interest rates. The factors determining the demand for funds are capital requirements for government spending, budget deficit/surplus, etc.

EFFECT OF BOND CHARACTERISTICS

Apart from the general macroeconomic factors that influence the interest rates of a specific bond issue, there are certain bond specific characteristics that affect the interest rates. These issue characteristics are the major determinants of the bond risk premium. This risk premium can be subdivided into the following components:

a. Default risk
b. Term to maturity which affects yield and price volatility
c. Any indenture provisions such as collateral, call feature, sinking fund provisions, etc.
d. Exchange rate risk and country risk particularly in the case of foreign bonds.

All these factors have been discussed earlier in the chapter. Depending on the above, individual components bond risk premium is determined and thereby the interest rate on the bond.

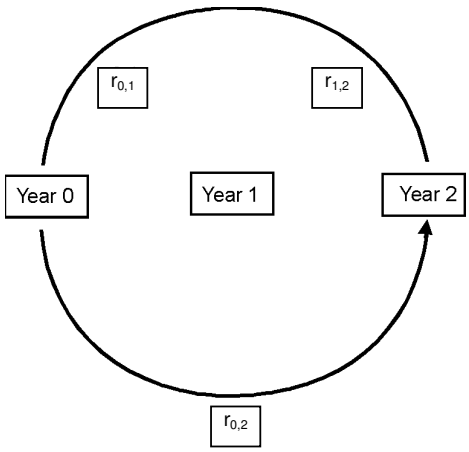
THEORIES OF INTEREST RATES

The phrase 'yield curve' is synonymous with the theories of interest rates as they determine the shape of the yield curve.

THE PURE EXPECTATIONS THEORY

According to this theory, the current term structure of interest rates are determined by the consensus forecast of future interest rates. To understand this hypothesis let us consider the following.

Figure 2



At time 0 there is short-term interest rate $r_{0,1}$ for money borrowed in year 0 and repayable in year 1. There is also a long-term interest rate $r_{0,2}$ for money borrowed in year 0 for repayment in year 2. Linking these two rates is an unobservable "forward" rate $r_{1,2}$ that is expected to prevail in year 1 for money to be borrowed then for repayment in year 2. In terms of this forward rate, one can write the arbitrage condition as,

$$(1 + r_{0,2})^2 = (1 + r_{0,1})(1 + r_{1,2})$$

This says that the total money (principal plus interest) repaid in year 2 should be the same whether the money is borrowed long-term at $r_{0,2}$ or borrowed short-term at $r_{0,1}$ and then "rolled-over" in year 1 at the then prevailing short-term rate $r_{1,2}$. Of course, exactly the same condition holds if we look at the matter from the point of view of the investor: the investor has the choice between investing, his money in a long-term bond at $r_{0,2}$ or investing short-term at $r_{0,1}$ and then "rolling-over" his investment in year 1 at the then prevailng short-term rate $r_{1,2}$. The arbitrage condition says that the investor must be indifferent between these two alternatives.

For example, if the one year interest rate is 15% ($r_{0,1}$ = 15%) but is expected to go up to 20% at the end of one year ($r_{1,2}$ = 20%), then the arbitrage condition says that,

$(1 + r_{0,2})^2 = (1 + 0.15)(1 + 0.20) = 1.38$

so that the two-year rate $r_{0,2}$ will be 17.5%.

On the other hand, if the short-term rate had been expected to go down to 10%, then we would have had

$(1 + r_{0,2})^2 = (1 + 0.15)(1 + 0.10) = 1.265$

so that the two-year rate $r_{0,2}$ would have been 12.5%.

That is, an investor will opt for one year security now only when he is certain that the interest rate after one year is greater than the interest rate on two year security. In case he feels that the interest rate on one year security is going to decline after one year, he will opt for a two-year instrument. An upward sloping yield curve according to this theory indicates that the investors expect the interest rates to rise, a flat yield curve indicates that the investors expect the rates to remain at the same level and a downward sloping curve indicates that the investors expect a fall in the interest rates.

How forward rates are determined given the current spot rates for bonds with a term-to-maturity longer than one year is explained by the illustration 15 below. The current spot rate is nothing but the present Yield-to-Maturity (YTM) on a bond. The expected future one-year spot rate embodied in the current spot rate is called the forward rate. Assuming that expectations are unbiased the relationship between current spot rate and forward rate(s) can be expressed as follows:

$$1 + r_n = [(1 + r_1)(1 + f_2) .... (1 + f_n)]^{1/n} \quad \text{... Eq. (15)}$$

where r_n = current spot rate or YTM on a n-year bond

f_n = expected spot rate prevailing at the end of year 't'

t = time period

n = forward rate for the nth year.

How to determine f_2, f_3, etc. given information on the current spot rates? This question is answered through the following illustrations.

Illustration 16

The spot rate on one-year, two-year, and three-year central government securities on 1.1.x1 were 8.5%, 9%, and 10.5% respectively. Find the forward rates f_2 and f_3 embodied in the prevailing term structure?

Forward rate denoted by f_2 can be determined from the equation

$$1 + r_2 = [(1 + r_1)(1 + f_2)]^{1/2}$$

$$\text{i.e. } 1 + f_2 = \frac{(1 + r_2)^2}{(1 + r_1)}$$

$$\text{or} \quad f_2 = \frac{(1+r_2)^2}{(1+r_1)} - 1$$

Given $r_2 = 0.09$ and $r_1 = 0.085$

$$f_2 = \frac{(1+0.09)^2}{(1+0.085)} - 1 = \frac{(1.09)^2}{(1.085)} - 1$$

$$= 0.09502 \text{ or } 9.502\%$$

Forward rate (f_3) can be determined from the equation

$1 + r_3 = [(1 + r_1)(1 + f_2)(1 + f_3)]^{1/3}$

$$\text{Therefore } f_3 = \frac{(1+r_3)^3}{(1+r_1)(1+f_2)} - 1$$

$$= \frac{(1.105)^3}{(1.085)(1.09502)} - 1$$

$$= 0.13559 \text{ or } 13.559\%$$

Illustration 17

Assume that 4-year bonds are currently yielding 7 percent and 3-year bonds are yielding 6 percent. What is the implied yield for 1-year bonds starting 3 years from now?

We are given that $r_3 = 0.06$ and $r_4 = 0.07$. We are required to determine f_4

$(1 + r_3) = [(1 + r_1)(1 + f_2)(1 + f_3)]^{1/3}$

$(1 + r_1)(1 + f_2)(1 + f_3) = (1 + r_3)^3$ ..... (16)

Similarly, $(1 + r_1)(1 + f_2)(1 + f_3)(1 + f_4) = (1 + r_4)^4$ ..... (17)

Dividing (2) by (1) we get

$$1 + f_4 = \frac{(1+r_4)^4}{(1+r_3)^3}$$

$$f_4 = \frac{(1.07)^4}{(1.06)^3} - 1$$

$$= 0.1006 \text{ or } 10.06\%$$

Two cautions are in order in using the above arbitrage relationship:

- The relationship is postulated ex-ante in the sense that $r_{1,2}$ is what we in year 0 expect the one year rate to be at the end of year 1. The actual one year rate in year 1 may be more or less than $r_{1,2}$, but that is what we would expect it to be on average. The arbitrage condition would, therefore, hold ex-post on an average but not in each individual case.
- Even ex-ante, the equation need not hold if either borrowers or lenders demand a risk premium to cover the "roll-over" risk in year 1. It is usually believed that the risk premium causes the long-term rate to be slightly higher than what is prescribed by the arbitrage condition.

Liquidity Preference Theory

According to this theory, spenders keep a proportion of their assets as cash balances for maintaining liquidity. These funds being idle, do not earn any returns. Therefore, such balances have an opportunity cost to the extent of what can be earned by employing them productively. The opportunity cost differs from one spending unit to another.

The opportunity cost increases as the cost of funds, i.e., as the interest rate increases. Also, as the opportunity cost increases, the demand for cash balances decreases. That is, there is an inverse relationship between the rate of interest and the demand for cash balances.

The demand for cash balances across various industrial sectors depends on the level of activity in those sectors. The level of activity can be gauged broadly from the overall economic scenario. The long run growth rate of the economy has an important bearing in deciding the direction of the interest rates. This is because, in the years of rapid economic growth, the investors have more qualitative opportunities to choose from and invest. During this period, most of the projects earn positive rate of return and as a result, the suppliers demand a higher rate of return on their investments.

Therefore, the relationship between the demand for funds and the interest rates can be expressed as,

$$DM = f(Y, \bar{i}) \quad \text{... Eq.(18)}$$

Where,

DM is the demand for funds

Y is the gross national product and

$\bar{i}$ is the market interest rate.

In this function, the relationship between Demand for Money (DM) and the interest rate is inverse in nature and positive between DM and the rate of growth of economy measured by GNP. The inverse relationship with 'i' has been indicated with a bar on top.

If M denotes the supply of money balances, at the equilibrium interest rate, then the demand for funds matches the supply.

Therefore, DM = M

i.e., $f(Y, \bar{i}) = M$

If we express the same in terms of the interest rate 'i' we have,

$$i = f(\overline{M}, \overline{Y}) \quad \text{... Eq.(19)}$$

Simultaneously, the nature of relationships stated changes.

If the supplier of funds expects that the price level is going to increase during his investment horizon, he demands a compensation in terms of higher rate of return. Unless they increase the required rate of return, they cannot realize the expected rate of return adjusted after inflation rate. Therefore, as the rate of inflation increases, the interest rates also increase. If we take into account the inflation rate also, the relationship given by Eq.(19) above will be,

$$i = f(\overline{M}, \overline{Y}, P) \quad \text{...Eq.(20)}$$

In the above relationship, P denotes the rate of change in the price level expected at the beginning of the period when we committed funds and this change in the price level will occur during the investment horizon.

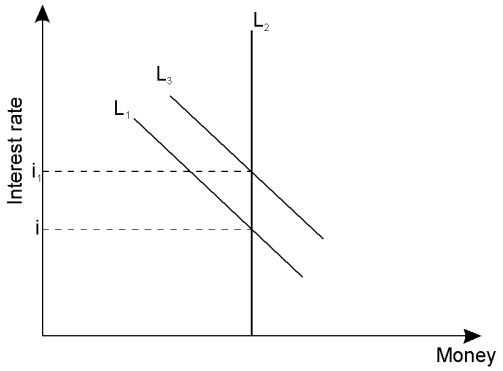
From this relation, we conclude that increase in the rate of inflation increases the interest rates and increase in the money supply decreases them. Also, when the prices do not change, i.e., when the rate of inflation remains the same, the nominal interest rate represents the real interest rate. This can be explained as follows:

Nominal rate = Real risk-free rate + Inflation rate

When the inflation rate for the investment horizon is zero, 'i' in equation (19) represents real interest rate and not the nominal interest rate. Therefore, it can be said that the real interest rate is affected only by changes in the aggregate demand and supply of money as determined by the central bank and not by the changes in the inflation rate.

The determination of the equilibrium interest rate can also be explained with the help of a diagram. In the diagram, the demand for the money at various levels of income and price expectations is represented by line L_1 and the supply of the funds by line L_2. It has been assumed that the amount of money supply is held fixed by the monetary authority. Therefore, the line L_2 is vertical.

Figure 3

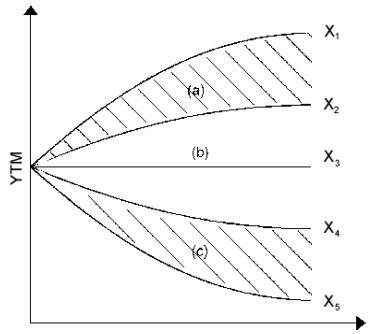


The equilibrium interest rate is given by the intersection point of the lines L_1 and L_2 at the point 'i'. Depending on whether the income or the price expectation increases or decreases, the line L_1 shifts to the right or to the left. Suppose, there is an increase in the inflationary expectations and more money is demanded across the entire range of interest rates, then line L_1 moves to the right and is shown as L_3. The interest rates rise to i_1. If the central bank increases the money supply, then the interest rates decline. However, this change is expected to be effective only for a temporary period.

Illustration 18

If an investor follows a maturity strategy, wherein he holds a 2-year security, he may have to sell the same after 1-year if he requires cash, immediately putting him to a loss. However, here also there is a certain amount of risk involved in the price the investor would obtain if he sells the 2-year security after 1-year. Alternatively, if he follows the rollover strategy, wherein he will hold a 1-year security rather than a 2-year security, he can be sure of having certain cash at the end of one year without incurring an opportunity loss.

Figure 4: Term to Maturity



An investor with a two-year holding period will choose the maturity strategy if the returns obtained from it are greater than those obtained from the rollover strategy. In our example of one year spot rate of 7% and two year spot rate of 8%, if the expected future spot rate is say 8.6% and the forward rate is 9.01%, the value of

Re.1 in two years with the maturity strategy will yield Re.1(1.08)(1.08) = Rs.1.1664. If the rollover strategy is followed, the value of Re.1 in two years will be Re.1(1.07)(1.086) = Rs.1.1620.

Therefore, it can be seen that the rollover strategy has a lower return when compared to the maturity strategy, which is due to the lower degree of price risk.

Liquidity premium can be defined as the difference between the forward rate and the expected future spot rate. This is offered as an extra return to the investor in order to persuade him to invest in risky securities (here, the 2-year security).

$$L_{1,2} = - es_{1,2} \quad \text{...Eq.(21)}$$

Where,

$L_{1,2}$ = Liquidity premium for period commencing one year from now and ending two years from now.

Substituting in Eq.(21),

$L_{1,2} = 9.01\% - 8.6\% \quad = 0.41\%$

Expected spot rate is the rate the investors expect to prevail when a particular time period becomes the current time period. Figure 4 shows when the investors expect the spot rates to rise, remain constant and fall. It can be noticed that the implicit forward rates exceed the expected spot rates by the 'liquidity premium'. Therefore, the forward rates include both the factors – investor expectations of future spot rates and liquidity premium. With reference to Figure 4 we analyze the following cases.

a. Liquidity premium when expected spot rates are rising
   X_1 = Implicit forward rate
   X_2 = Expected spot rate
b. Liquidity premium when expected spot rates are constant
   X_2 = Implicit forward rate
   X_3 = Expected spot rate
c. Liquidity premium when expected spot rates are falling
   X_4 = Implicit forward rate
   X_5 = Expected spot rate

The drawbacks with respect to the liquidity preference theory are:

- In a longer time frame, the fluctuations in the short-term rates cannot be predicted. Therefore, there is a risk of having periodic reinvestments, which may result in uncertain returns.
- The transaction and information costs for short-term maturities are on a larger scale than that for long-term maturities.
- There is no scope for hedging the returns on short-term securities by which risk can be minimized. Whereas, for the long-term securities, this can be achieved by balancing the assets and liabilities.
- Interest rates can reduce due to low inflation premiums causing the yield curve to slope downward.

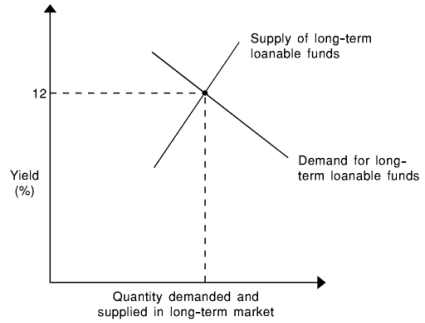
Segmentation Theory

The market comprises various types of investors. A certain class of investors prefer to invest in short-term securities, while some would invest in intermediate securities, and yet others would invest in long-term securities. All depends on the investors' perception of risk. The combined effort of all these aspects determines the spot rates in the market. The risk averse investors try to hedge their investment

by matching the capital losses to the maturities of their assets and liabilities, leading this theory to be also known as the hedging theory. When the investors restrict themselves to the segments where the term to maturity is in their favor, it is called the preferred habitat theory.

For example, commercial banks prefer to hold short-term securities to comply with some regulatory requirements, whereas, the Life Insurance Corporations prefer to invest in long-term bonds to minimize the extent of risk.

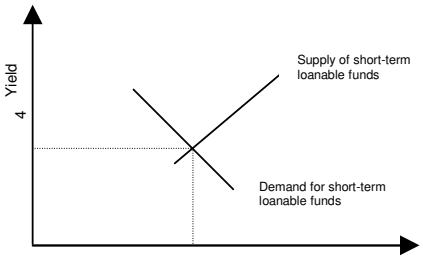
Figure 5



A graphical representation of this theory indicates:

- Intersection of the supply and demand curves for short-term funds at lower rates of interest than the intersection of long-term funds which shows an upward sloping yield curve.
- Intersection for short-term funds at an interest rate higher than the intersection for long-term funds indicates a downward sloping yield curve.

Figure 6



Loanable Funds Theory

This theory mainly focuses on the demand and supply aspects of the funds in an economy with different sectors like the household sector, the business sector and the government sector. At any particular instance, one or more of these sectors have a tendency to save a part of their income for later consumption. Generally, the household sector leads in this aspect as compared to business and government sectors. These units postpone current consumption in the expectation that at a later stage they can have more funds for consumption. Therefore, they demand an interest charge. As there are units which supply funds, there are also units which require funds. The pattern of consumption of these units is such that they spend more than what their current income warrants. These units do not differ from the ones we have seen above. Only that, at a particular instance of time, some units behave as the supplier of funds and other units behave as the buyer of funds. Since these units demand and employ funds saved by others, they have to pay an interest charge for employing the funds.

If the interest charge is more, the suppliers of funds are willing to make available more funds and if the interest charge is less, the borrowing units ask for more funds. That is, the supply of funds is inversely related to the changes in interest rates. In this scenario, an equilibrium interest rate is reached, when the demand for funds matches the supply of funds.

The spending units issue securities evidencing the fact that they are in debt to the suppliers of funds. The funds supplied by savers may reach the demanding units either directly or through intermediaries. This is because, it is not always possible for the savers and the spenders to come into direct contact with each other. Intermediaries collect funds from the savers and make them available to the spenders. The importance of this fact is that the nature (risk) of the securities differs if they are issued by an intermediary, rather than the spender himself.

This theory is also widely used to predict interest rates in different sectors of the economy.

The Liquidity Premium Theory

The shortcoming of the pure expectations theory is that, it assumes that the investors will act only on the basis of expected returns on bonds of different maturities. It does not take into account the possibility that the actual returns may deviate from the returns expected. In order to overcome such shortcomings, the liquidity premium theory has been formulated. According to this theory, the investors are not indifferent to risk and they charge higher rates than the expected future rates, if the maturity of the instrument increases. That is, the investors realize that the prices of bonds with longer maturity are more sensitive to the interest rate changes and the liquidity premium they charge is actually the risk premium. The extent of the premium increases as does the maturity but at a decreasing rate. Since the future rates include the liquidity premium, they are biased and do not reflect only the expectations of the investors. Therefore, an upward sloping yield curve reflects the expectations of the investors, that irrespective of the changes in the future interest rates, the liquidity premium will increase at a fast pace along with maturity, which would assure the upward slope of the yield curve.

The Preferred Habitat Theory

According to this theory, it is not necessary that the liquidity premium should increase at a uniform rate with maturity.

Different players in the market have assets and liabilities maturing at different periods, which in turn, dictate their borrowing and investment needs. However, the availability of funds in the market and the interest rate depend on the demand and supply in various maturities. If funds are not available in the maturities desired by some of the players, they may be forced to move on to other maturities and for this they demand a premium. Therefore, the premium should be paid to the extent of price or reinvestment risk which they are subjected to while investing in securities with other maturities. This theory considers price risk as well as reinvestment risk as against the price risk considered by the liquidity premium theory.

As this theory takes into account both expectations and the premiums, positive or negative, the yield curve can be of any shape.

ANALYSIS OF DEEP DISCOUNT BONDS

In November, 1992, the Small Industries Development Bank of India (SIDBI) came out with an issue of deep discount bonds. Each bond having a face value of Rs.1,00,000 was issued at a deep discounted price of Rs.2,500 with a maturity period of 25 years from the date of allotment (i.e. February 1, 1993). The investor as well as SIDBI have the option to withdraw or redeem the bond respectively at

the end of 5th or 9th or 12th or 15th or 20th year from the date of allotment. In the event of earlier withdrawal of redemption, the deemed face value of the bond would be as under:

In the event of withdrawal/redemption	Deemed face value Rs.
At the end of 5 years	5,300
At the end of 9 years	9,600
At the end of 12 years	15,300
At the end of 15 years	25,000
At the end of 20 years	50,000

In the offer document, SIDBI stated that it has been advised by its tax consultants that as per the present laws, the difference between the sale value (on transfer) or the deemed face value (on redemption by SIDBI or withdrawal by the bondholder) and the indexed cost of acquisition of the bond will be treated as capital gain. If the bond is held for a continuous period of three years or more, then such difference will be treated as long-term capital gain, and shall subject to income tax at a flat rate of 20 percent for individuals and HUF, 40 percent for companies, and 30 percent in the case of all others.

Analyzing a bond like the SIDBI deep discount bond, which has a put feature (that entitles the bondholder to sell the bond back to SIDBI at certain points of time) as well as a call feature (that entitles SIDBI to redeem the bond at certain points of time) is somewhat difficult.

The post-tax yield to maturity of such a bond is the value of r in the following equation:

$$\text{Cost of acquisition } (1 + r)^{25} = \text{Post-tax redemption value}$$

$$2{,}500\ (1 + r)^{25} = 82146^{9}$$

$$(1 + r)^{25} = 32.858$$

$$r = 15 \text{ percent}$$

ANALYSIS OF CONVERTIBLE BONDS

With the repeal of the Capital Issues Control Act and the enactment of SEBI Act in 1992, the rules of the game applicable to convertible bonds have changed. As per SEBI guidelines issued in June, 1992, the provisions applicable to fully convertible bonds and partially convertible bonds are as follows:

- The conversion premium and the conversion timing shall be pre-determined and stated in the prospectus.
- Any conversion, partial or full, will be optional at the hands of the bondholder, if the conversion takes place at or after 18 months but before 36 months from the date of allotment.
- A conversion period of more than 36 months will not be permitted unless conversion is made optional with 'put' and 'call' options.
- Compulsory credit rating will be required if the conversion period for fully convertible bonds exceeds 18 months.

From the SEBI guidelines it is clear that convertible bonds in India presently can be of three types:

a. Compulsory convertible bonds which provide for conversion within 18 months.

b. Optionally convertible bonds which provide for conversion within 36 months.

---

9 Post-tax redemption value can be calculated as follows:

Redemption value – [Redemption value – Indexed cost of acquisition] Tax rate

= 100000 – [100000 – 2500 $(1.06)^{25}$] 0.2

= 100000 – 17854

c. Bonds which provide for conversion after 36 months but which carry 'call' and 'put' features.

Valuation of Compulsorily Convertible (Partly or Fully) Bonds

One who holds a compulsorily convertible (partly or fully) bond will receive:

- A certain number of equity shares on part/full conversion.
- A certain stream of interest and principal repayments.

Hence the value of such a bond is equal to the sum of

- The present value of equity shares receivable on conversion.
- The present value of interest and principal payments receivable on the bond.

To illustrate the valuation of such a bond, let us consider an example.

Illustration 19

Kavya Alloys Limited has announced a rights issue of Partly Convertible Debentures (PCDs) to part finance its Rs.11 crore vertical integration program. As per the terms of this issue, 14% PCDs of Rs.100 each will be issued at par. The convertible part of the debenture (Part A) of Rs.40 each will be converted into two equity shares of Rs.10 each, 12 months from the date of allotment. The non-convertible part (Part B) of Rs.60 each will be redeemed after seven years. Interest will be paid semi-annually.

An equity investor of the company contemplating subscription to this issue seeks your advice. You are provided with the following data:

	Year Ended	March 31, 1998	March 31, 1999	March 31, 2000	March 31, 2001
Panel A	EPS (Rs.)Bonus (Ratio)	4	3.1 1:3	3.5	4.1

	Month	Jan., 2001	Feb., 2001	Mar., 2001	Apr., 2001	May, 2001
Panel B	Average P/E ratio	13	12.4	11.6	10.5	9.5

The investor requires a rate of return of 24% p.a. compounded half-yearly.

The intrinsic value of the above PCD is calculated as under:

A. Present value of interest payments

$7 \times PVIF_{(12,1)} + 7 \times PVIF_{(12,2)}$

$+ 4.2 \times PVIFA_{(12,12)} \times PVIF_{(12,2)}$

$(7 \times 0.893) + (7 \times 0.797) + (4.2 \times 6.194 \times 0.797)$

$= 32.56$

B.

Year Ended	1998	1999	2000	2001
Bonus Adjusted	4	4.13	4.67	5.47

Growth rate (g) implict in the bonus adjusted EPS can be obtained from the equation

$$4 (1 + g)^3 = 5.47$$

$$g = 0.11$$

Projected EPS (4.1 x 1.11) = 4.55

Average P/E ratio between (Jan. – May, 2001)

$$= \frac{(13 + 12.4 + 11.6 + 10.5 + 9.5)}{5} = 11.4$$

Projected market price after twelve months

= 4.55 x 11.4

= Rs.51.87

Present value of the market value of conversion after twelve months

= 103.74 x $PVIF_{(12,2)}$

= 103.74 x 0.797

= Rs.82.68

C. Present value of the non-convertible portion redeemed after seven years

= 60 x $PVIF_{(12,14)}$

= 60 x 0.205

= Rs.12.3

D. Intrinsic value of the PCD = A + B + C

= Rs.127.54

= Rs.128

As intrinsic value is Rs.128, the investor can be advised to subscribe to the issue.

Assumptions

i. All coupon and principal payments are made on schedule.

ii. The non-convertible part of the PCD is held to maturity.

iii. The coupon payments are fully and immediately reinvested at the interest rate equal to the coupon rate.

iv. The market price on the date of conversion is in line with the investor's expectation.

ANALYSIS OF TAX-SHELTERED FIXED INVESTMENT AVENUES

In addition to corporate bonds, a variety of other fixed income investment avenues are available to investors in India. The tax advantages associated with these fixed income avenues vary widely. At one end of the spectrum, we have provident fund (as well as public provident fund) contributions that enjoy initial as well as continuing tax advantages and at the other end of the spectrum, we have Indira Vikas Patras, which like the debenture issues of private sector companies, offer no tax advantage.

The post-tax rate of return may be calculated as follows:

Step 1 Find the net investment made of every hundred rupees of gross investment made. The net investment is simply100 – Tax saving on an investment of 100.

Step 2 Calculate the post-tax amount that would be receivable by the investor at the time of maturity of withdrawal after n years on every hundred rupees of gross investment. This is equal to:

$$100 \left[\begin{matrix}1 + \text{Interes} \\ \text{rate}\end{matrix}\right]^n \left[\begin{matrix}1 - \text{Tax rate applicable} \\ \text{on withdrawal}\end{matrix}\right]$$

Step 3 Compute the post-tax rate of return. This is equal to the value of r in the following equation:

Net investment $(1 + r)^n$ = Post-tax amount receivable at the time of maturity or withdrawal. ..... Eq.(23)

SUMMARY

- Bonds are the most important form of fixed income securities available to any investor. Generally, either the government or the corporate issue bonds for their different needs. One of the biggest advantages of issuing bonds is the tax deduction/rebates available to the issuer. Callable bonds, puttable bonds, convertible bonds, floating rate bonds, indexed bonds, junk bonds and international bonds are the different types of bonds available in the fixed income securities market.
- Investors who invest in bonds are entitled to receive periodic interest, capital gain or loss arising out of sale of the bond, cash realization on sale of the bond or redemption value of the bond by the issuer at a contracted value, if the bond is kept till maturity.
- The return to the bond investor can be measured by calculating the current yield, yield to maturity, realized yield and yield to call. Yield to maturity is the most popular and the correct way to calculate returns available from any bond. While calculating YTM, several assumptions are made.
- Bond price/yield relationship indicates the return and risk attached with any bond. For a bond, the relationship between the price and the required yield is opposite. This is because the price of the bond is present value of the prospective cash inflows. If the required yield increases, the present value of cash flow declines and hence bond value also declines and vice versa.
- Valuation of zero coupon bonds is different from a common bond because in zero coupon bonds, the investor gets payment only at the maturity of the bond. No intermediate cash flows come to the investor. Bond price volatility theorems give an idea about the effect of various factors like interest rate, time of maturity and required yield on the bond value. The yield on T-bills changes because of change in the level of interest rates.
- In any economy, different sectors play their own role in determining the level of interest rates and subsequent changes in the interest rates. The loanable fund theory and the liquidity preference theory are used to determine the level and changes in interest rates. The economic model is helpful in forecasting the interest rate trends. Term structure of interest rates is a static function where term to maturity is related to the yield to maturity for a sample of funds. It represents several bonds with similar features with different maturities.
- Riding the yield curve concept helps a portfolio manager to extract more returns by buying and selling bonds in anticipation of changes in interest rates. The expectation theory, liquidity preference theory and segmentation theory are different theories of interest rates and help in determining the shape of the yield curve.

Chapter XII

Risk Measurement Tools

After reading this chapter, you will be conversant with:

- Types of Risks
- Duration
- Immunization of Risk
- Convexity
- Term Structure of Interest Rates
- Term Structure Models
- Yield Spread Analysis
- Hedging
- Credit Risk
- Credit Rating
- Credit Analysis for Corporate Bonds

Introduction

We generally hear statements like "Stocks are risky and bonds are not risky," But bonds do have risk. The risks associated with bonds are different compared to those of stocks.

Before adopting any risk management strategy one should be able to measure it. Various tools are used for measuring the risks associated with bonds.

TYPES OF RISKS

The following are the types of risks associated with the bonds.

Price Risk

The extent to which price changes every day is known as price risk. Price risk is a combination of (a) Default Risk, and (b) Interest Rate Risk.

DEFAULT RISK

It is the risk which arises when the issuer is not able to satisfy the terms and conditions of the obligation with respect to the timely payment of interest and repayment of the amount borrowed. If a default occurs, the investor does not lose the entire amount invested. A certain percentage of the investment can be recovered. This is called recovery rate. The percentage of a population of bonds that is expected to default is called default rate. Given the default rate and the recovery rate, the estimated expected loss due to a default can be computed.

This is a risk associated with the corporate bonds unlike the treasury bonds since there is a risk of non-payment of principal and interest either partially or fully due to several factors. The difference between the investor's expected rate of return and the actual offered rate of return is known as risk premium. This includes the risk associated with a particular bond depending on the likelihood of default either partially or fully. This risk premium depends on the issuer's financial position and fundamentals. Normally, credit rating agencies rate the corporates for their issues on the basis of certain factors like capital structure, leverage ratio, earnings ratio, current ratio, the performance of the particular industry, etc., by giving necessary weightages to evolve the rating for the companies. Rating agencies like S&P, Moody's, CRISIL, ICRA, etc., give credit ratings for the issuing company. The companies with the higher rating will have lesser default possibility compared to the companies with lesser ratings.

INTEREST RATE RISK[1]

It is known that the price of a typical bond changes in the opposite direction with a change in interest rates or yields i.e., when interest rates rise, a bond's price will fall; and when interest rates fall, a bond's price will rise. Since the price of a bond fluctuates with market interest rates, the risk that an investor faces is that the price of a bond held in a portfolio will decline if market interest rates rise. This risk is referred to as interest rate risk and is the major risk faced by the investors in the bond market.

For example, if an investor subscribes to a bond issue at a coupon rate of 9.5% and if subsequently, i.e., after a week the coupon rate for another issue is 10%, then the investor would have got 0.5% extra had he waited for a week. If this investor wants to sell the bond subscribed, the price for this bond will be below par as it carries 9.5% coupon rate as against the current market rate of 10%. Therefore, this risk of losing the value for the bond on account of interest rate changes is known as interest rate risk.

1 This section draws from "Fixed Income Analysis for the CFA Program" by Frank J Fabozzi, published by *Frank J Fabozzi Associates*.

The other risks are:

i. Call Risk,

ii. Reinvestment Risk, and

iii. Marketability Risk.

Call Risk

In a callable bond, the investor faces the inconvenience of getting the bonds called back by the issuer in case of falling interest rates in the market. This option gives the issuer the opportunity to pay the debts before maturity date. Especially in the falling interest rate periods, the issuer uses this option as he can get funds at a cheaper rate. For example, if a company has issued bonds in 20x0 with a maturity of 10 years and a coupon of 16% p.a., it can call back those bonds in case the coupon rates are 14% p.a. in 20x8 and issue new bonds, thus saving 2% p.a.

Normally the issuers will fix a call premium to protect the investor to some extent; also callable bonds will be normally offered at slightly higher rates as compared to normal bonds.

Reinvestment Risk

At falling interest rate periods, the investor cannot reinvest at the same interest rates at which the earlier incomes were reinvested. In these situations, zero-coupon bonds are at an advantageous position as far as investors are concerned as the incomes are reinvested by the issuer. The higher the coupon on the bond, higher the reinvestment risk since the investors may go in for speculative investments.

Marketability Risk

This is due to the non-marketability of bonds as most of them are not traded in the secondary markets. This happens in the case of low rated bonds. For these bonds, the investor may have to lose substantially while selling them as the buyers expect a higher premium.

Bond Features that affect Interest Rate Risk: The degree of sensitivity of a bond's price to changes in market interest rates (i.e., a bond's interest rate risk) depends on various features of the issue, such as maturity, coupon rate, and embedded options.

i. **Impact of maturity:** All other factors remaining constant, the longer the bond's maturity, the greater the bond's price sensitivity to changes in interest rates.

ii. **Impact of coupon rate:** All other factors remaining constant, the lower the coupon rate, the greater the bond's price sensitivity to changes in interest rates.

iii. **Impact of embedded options:** The value of a bond that contains embedded options will change depending on how the value of the embedded options changes when interest rates change. The price of a callable bond can be decomposed as follows:

Price of a callable bond = (Price of option-free bond) – (Price of embedded call option)

When there is a fall in the interest rates, the price of an option-free bond rises. However, the price of the embedded call option also rises when interest rates decline because the call option becomes more valuable to the issuer. Though prices of both option-free bond and bond with embedded option rise when there is a fall in interest rate, the change in the price of the callable bond depends on the relative price change of the two components. When interest rates increase, the price of a callable bond will not fall to the same extent as an option-free bond. Similarly, when interest rates rise, the price of the option-free bond declines, but not as much as a callable bond. (Bonds with embedded options are discussed in detail in a later chapter.)

iv. **Impact of the yield level:** Owing to the credit risk, different bonds trade at different yields, even if they have the same coupon rate, maturity and embedded options. For a given change in interest rates, the price sensitivity is lower when the level of interest rates is high, and the price sensitivity is higher when the level of interest rates is low.

Components of Interest Rates for Bonds

The total return (yield) offered by a bond can be broken down as follows:

Return on risk-free bonds + risk premium + default premium.

For example, if the total return offered is 12%, the split may be 9% on risk-free bonds + 1% Risk Premium and 2% Default Premium.

Ratings given by the Credit Rating Agencies for Bond

	Highest Safety	High Safety	Moderate Safety	Inadequate Safety	High Risk
CRISIL	AAA	AA	BBB	BB	B
ICRA	LAAA	LAA	LBBB	LBB	LB

These ratings help the investors to know the relative risks of the bonds issued before deciding on investment. The regulatory authorities make it compulsory for the issuers to declare the rating by a standard rating agency at the time of offer. The rating agencies use several quantitative techniques by giving suitable weightages to the factors taken for analyzing the performance and decide the rating to be given.

To understand the significance of interest rate risk, let us look at a series of numerical illustrations. We begin by computing the price of the bond that we shall be analyzing in the subsequent illustrations.

Illustration 1

Consider a 12.5% bond with annual coupons redeemable on 1/7/20x8 at a premium of 5%. If the interest rate prevailing in the market on 1/7/20x3 is 15% (compounded annually), at what price will this bond be traded in the market on 1/7/20x3?

Solution

The market price of the bond will be Rs.94.11 which is the present value of the following sequence of cash flows.

Date	1/7/20x4	1/7/20x5	1/7/20x6	1/7/20x7	1/7/20x8
Cash flow	12.50	12.50	12.50	12.50	117.50
Present value of cash flows (at 15% compounded annually)	10.87	9.45	8.22	7.15	58.42
Net Present Value	94.11				

We next look at an investor who intends to hold the bond till maturity and compute the amount of money that he will earn on maturity.

Illustration 2

Consider what happens to an investor who needs money only after five years, and decides to hold the bond in Illustration 1 till maturity, and reinvest the annual interest payments. How much money will he have at the end of 5 years? What happens if immediately after he buys the bond, the interest rate drops to 14%? What will be the price if the interest rate rises to 16%?

Solution

Interest rate of 15%

At the current interest rate of 15%, he will have Rs.189.28 at the end of the 5 years.

Date	1/7/20x4	1/7/20x5	1/7/20x6	1/7/20x7	1/7/20x8	Total
Cash flow	12.50	12.50	12.50	12.50	117.50	
Terminal Value (at 15%)	21.86	19.01	16.53	14.38	117.50	189.28

Interest rate of 14%

Now assume that immediately after the investor buys the bond, the interest rate in the market falls to 14% (compounded annually). The terminal value that our investor will have at the end of 5 years now drops to Rs.187.63 because the reinvestment of the annual interest fetches a lower rate of interest.

Date	1/7/20x4	1/7/20x5	1/7/20x6	1/7/20x7	1/7/20x8	Total
Cash flow	12.50	12.50	12.50	12.50	117.50	
Terminal Value (at 14%)	21.11	18.52	16.25	14.25	117.50	187.63

Interest rate of 16%

Similarly, one can show that if interest rates rise to 16% (compounded annually), our investor will be better off having Rs.190.96 at the end of 5 years instead of Rs.189.28 when the rate was 15%.

Illustration 2 shows that the investor with a holding period of 5 years stands to gain from a rise in interest rates, and lose from a fall in interest rates; the important point is that he is exposed to risk due to changes in interest rates.

We now look at an investor who intends to hold the bond for only three years. In other words, he plans to sell the bond after three years.

Illustration 3

Consider an investor who has a holding period of only 3 years. He buys a bond of Illustration 1 on 1/7/20x3, reinvests all interest for three years and sells the bond on 1/7/20x6. How much money will he have at the end of 3 years?

Solution

At the end of 3 years (i.e., on 1/7/20x6), he will have to sell the bond. At that point, the cash flows from the bond will appear as follows:

Date	1/7/20x6	1/7/20x7
Cash flow	12.50	117.50
Present Value on 1/7/20x6 (at 15%)	10.87	88.85
Net Present Value	99.72	

Therefore, the bond can be expected to fetch Rs.99.72 when it is sold after 3 years. The 3-year investor can expect to receive a total of Rs.143.12 at the end of 3 years.

Date	1/7/20x4	1/7/20x5	1/7/20x6	1/7/20x7	Total
Cash flow	12.50	12.50	12.50	99.72	
Terminal Value (at 15%)	16.53	14.38	12.50	99.72	143.13

Illustration 4

What happens to the 3-year investor when interest rate rises to 16% immediately after he buys the bond?

Solution

It is reasonable to expect that bond prices drop when interest rates rise and vice versa. In this illustration, the price of the bond at the end of 3 years would drop to Rs.98.10.

Date	1/7/20x4	1/7/20x5
Cash flow	12.50	117.50
Present value	10.78	87.32
Net Present Value on 1/7/20x7 (at 16%)	98.10	

The investor can now expect to receive a total of only Rs.141.92 at the end of 3 years as against Rs.143.12 previously.

Date	1/7/20x4	1/7/20x5	1/7/20x6	1/7/20x7	Total
Cash flow	12.50	12.50	12.50	98.10	
Terminal Value (at 16%)	16.82	14.50	12.50	98.10	141.92

It is observed from the illustration above that the 3-year investor gains in the reinvestment of annual interest, but his gain is less than the loss in sale value of the bond. He, therefore, stands to lose from a rise in interest rates and gain from a fall. His position is the opposite of the 5-year investor. Both, however, are exposed to risk from changing interest rates. Is it possible that somewhere between 3 and 5 years there is a holding period for which there is no interest rate risk? Let us look at a 4-year investor.

Illustration 5

Consider an investor who has a holding period of 4 years. He buys the bond of Illustration 1 on 1/7/20x3, reinvests all interest for 4 years and sells the bond on 1/7/20x7. How much money will he have at the end of 4 years? What happens if immediately after he buys the bond, the interest rates rise to 16% (compounded annually)? What if interest rates drop to 14% (compounded annually)?

Solution

His sale value on 1/7/20x7 is simply the present value of Rs.117.50 receivable after one year at 15%. Therefore, he can sell the bond for Rs.102.17. His terminal value is:

Date	1/7/20x4	1/7/20x5	1/7/20x6	1/7/20x7	1/7/20x8	Total
Cash flow	12.50	12.50	12.50	12.50	102.17	
Terminal Value (at 15%)	19.01	16.53	14.38	12.50	102.17	164.59

Interest rates rise to 16%

The sale value of the bond will drop to Rs.101.29, but he gains from reinvestment of annual interest. The terminal value of the 4-year investor is left virtually unchanged as follows:

Date	1/7/20x4	1/7/20x5	1/7/20x6	1/7/20x7	1/7/20x8	Total
Cash flow	12.50	12.50	12.50	12.50	101.29	
Terminal Value (at 16%)	19.51	16.82	14.50	12.50	101.29	164.62

Interest rates drop to 14%

The 4-year investor gains from a higher sale price of the bond (Rs.103.07) but his reinvestment will fetch him less. Once again, his terminal value is unchanged.

Date	1/7/20x4	1/7/20x5	1/7/20x6	1/7/20x7	1/7/20x8	Total
Cash flow	12.50	12.50	12.50	12.50	103.07	
Terminal Value (at 14%)	18.52	16.25	14.25	12.50	103.07	164.59

Illustration 5 shows that the investor with a 4-year holding period is not subject to any interest rate risk at all. Whether interest rates rise or fall, he can be assured of the same value at the end of 4 years.

MEASUREMENT OF INTEREST RATE RISK

Interest rate risk is measured through duration analysis along with convexity (a concept discussed in detail later). Duration is a measure of the effective maturity of a bond, defined as the weighted average of the times until each payment, with weights proportional to the present value of the payment. This concept measures the interest rate risk. Interest rate risks can also be minimized through hedging instruments.

Hedging

The corporates issue bonds with several innovations in different market situations. With the expansion of bond markets worldwide, it is also necessary to protect the investors from the risks associated with bond price volatility, movements in interest rates, changing spreads, etc.

DURATION

Generalizing from the above illustrations, we can conclude that:

i. Investors are subject to interest rate risk on two counts – the reinvestment of annual interest and the capital gain/loss on sale of the bond at the end of the holding period.

ii. When interest rates rise, there is a gain on reinvestments and a loss on liquidation. The converse is true when interest rates fall.

iii. For any bond there is a holding period for which these two effects exactly balance each other. What is lost on reinvestment is exactly compensated by a capital gain on liquidation and vice versa. For this holding period there are no interest rate risks.

This holding period for which interest rate risk disappears is known as the duration of the bond. Fortunately, we do not need to try out various holding periods to determine the period for which the interest rate risk is eliminated. There is a simpler way of computing the desired holding period (duration). To do this, we go back to the present value computation of Illustration 1 in which we determined that the current price of the bond is Rs.94.11. We will do an additional calculation – we multiply each of the present values by the respective number of years left before the present value is received, sum up these products and divide by the present value to get the duration of the bond. This is illustrated below.

Illustration 6

Compute the duration of the bond of Illustration 1.

Solution

Date	1/7/20x4	1/7/20x5	1/7/20x6	1/7/20x7	1/7/20x8	Total
No. of years	1	2	3	4	5	
Cash flow	12.50	12.50	12.50	12.50	117.50	
Present Value	10.87	9.45	8.22	7.15	58.42	94.11
Year x PV	10.87	18.90	24.66	28.59	292.09	375.11

We divide the sum of the products (Rs.375.11) by the present value (Rs.94.11) to get the duration.

Duration = 375.13/94.11 = 3.99

The duration as computed in the above illustration agrees with the value of 4 years for which we found (Illustration 5) that the interest rate risk had disappeared. This method of computing duration also shows that the duration is the average time at which the present value is received (it is a weighted average of time with the present values as the weights).

For those who are mathematically inclined, the formula for duration (denoted by D) is as follows:

$$D = \frac{C_1 t_1 (1+r)^{-t_1} + C_2 t_2 (1+r)^{-t_2} + ... + C_n t_n (1+r)^{-t_n} + RVt_n (1+r)^{-t_n}}{P} \quad ...Eq.(1)$$

When $C_1 = C_2 = ... = C_n$ duration is given by,

$$D = \frac{1C \times PVIF_{r,1} + 2C \times PVIF_{r,2} + 3C \times PVIF_{r,3} + ... + n(C+F)\ PVIF_{r,n}}{P_0} \quad ...Eq.(2)$$

Where,

C = Coupon interest payments

r = Promised yield to maturity

n = Number of years to maturity

F = Redemption value

P_0 = Price of the bond.

When interest is payable semi-annually, the above formula is modified as

$$D = \frac{(1C \times PVIF_{r/2,1}) + (2C \times PVIF_{r/2,2}) + ... + 2n(C+F)\ PVIF_{r/2,2n}}{P_0} \quad ...Eq.(3)$$

Duration of a bond measures the weighted average time which elapses before all the cash flows are received. While the term to maturity of a bond reflects the length of time required to receive the final cash flows, duration reflects the timing of every cash flow received. Since the concept was first introduced by F Macaulay, duration as defined above is also called Macaulay's Duration.

For the case of bond with a constant half-yearly coupon, the above formula can be simplified to:

$$D = \frac{\frac{c}{2}\left(1+\frac{r}{2}\right) PVIFA_{\left(\frac{r}{2}, 2n\right)} + n\left(\frac{r}{2}+\frac{c}{2}\right)\left(1+\frac{r}{2}\right)^{-t_{2n}}}{\frac{c}{2}+\left(\frac{r}{2}-\frac{c}{2}\right)\left(1+\frac{r}{2}\right)} \quad ...Eq.(4)$$

Where,

C = Coupon rate expressed in percentage

r = Yield to maturity of the bond

n = Maturity period of the bond.

It is also possible to compute the duration of an entire portfolio of bonds; the portfolio duration is only a weighted average of the durations of the individual bonds. Using a computer, it is quite easy to determine the duration of any bond or a portfolio of bonds by employing the above formula.

An investor would regard a bond as risky if its duration is significantly different from his desired holding period. He would, therefore, be willing to invest in such bonds only if they offer a higher YTM.

Short-Cut Formula to Compute Duration

The formula given in equation (3) is cumbersome and time consuming to apply, particularly for bonds with longer term to maturity. We provide two simplified formulae to compute duration:

i. A simplified formula would be:

$$D = \frac{r_c}{r_d} \text{ x } PVIFA_{(r_d, n)} \text{ x } (1+r_d) + \left(1 - \frac{r_c}{r_d}\right) n \quad \text{...Eq.(5)}$$

Where,

r_c = Current yield of the bond computed as coupon interest/bond price

r_d = Yield to maturity

n = Term to maturity.

In case of bond selling at par, $r_c = r_d$

$\therefore$ Duration $D = PVIFA_{(r_d, n)} \text{ x } (1 + r_d)$ ...Eq.(6)

Illustration 7

A bond having Rs.1,000 face value and 8% coupon bond with 4 years to maturity is priced to provide a yield to maturity of 10%.

Method I

Given that the bond has been priced to yield a YTM of 10%, the price P_0 can be computed as,

$P_0 = 80\ PVIFA_{10,4} + 1{,}000\ PVIF_{10,4} = (80 \text{ x } 3.170) + (1{,}000 \text{ x } 0.683) = Rs.937$

The current yield r_c will, therefore, be

$$\frac{\text{Coupon}}{P_0} = \frac{80}{937} = 8.54\%$$

Substituting the values $r_d = 0.10$, $r_c = 0.0854$ and n = 4 years in equation (5), we get,

$$D = \frac{0.0854}{0.10} PVIFA_{10,4} \text{ x } (1 + 0.1) + \left[1 - \left(\frac{0.0854}{0.1}\right)\right] \text{ x } 4$$

$$= 0.854\ (3.170)\ (1.1) + (0.146) \text{ x } 4 = 3.564 \text{ years}$$

Method II

Equation (4) can also be expressed as follows:

$$D = \frac{i(1 + r)\ PVIFA_{r,n} + n(r - i)\ PVIF_{r,n}}{i + (r - i) PVIF_{r,n}} \quad \text{...Eq.(7)}$$

This simplification was derived by Prof. G Hawawini and provides a simpler approach to compute duration.

Let us compute duration for the bond illustrated above using the short-cut equation (6). The features of the bond are as follows:

Coupon interest rate (i) = 8%

Term to maturity (n) = 4 years

YTM (r) = 10%

Substituting the values in the above formula,

$$D = \frac{0.08(1 + 0.1)\ PVIFA_{10,4} + 4(0.1 - 0.08)\ PVIF_{10,4}}{0.08 + (0.1 - 0.08)\,PVIF_{10,4}}$$

$$D = \frac{0.08(1.1)\ (3.170) + 4(0.02)\ (0.683)}{0.08 + (0.02)(0.683)}$$

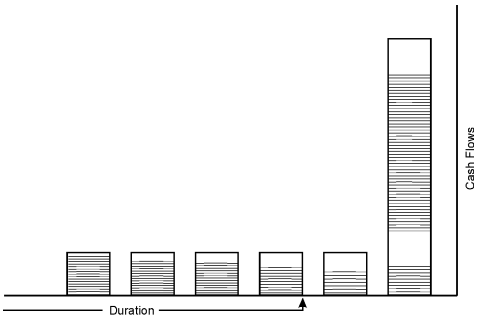
D = 3.57 years

It should be noted that the short-cut formula can be applied only in case of bonds redeemable at maturity. Duration of callable bonds, and bonds redeemable in installments should be computed using equation (2), since in both these cases, cash flows for each time period do not represent an annuity, but have to be defined individually.

The concept of duration can also be explained with a simple figure without resorting to mathematics.

The blocks in the figure can be looked upon as containers resting on a board or seesaw. The capacity of the containers represents the cash flow to be received at each point of time. The shaded area represents the extent to which each is filled in terms of the present value of the cash flow. If an investor has to evaluate the bond on the date of acquisition, the first container is one period away, the second two periods away, etc. Suppose the investor wants to balance the containers by placing a fulcrum, the distance from the investor to such a fulcrum is the duration.

Figure 1



Properties of Duration

i. For all bonds which pay periodic coupons, the duration is less than the term to maturity. This is because the investor recovers a part of his investment every year. When due weightage is given to the recoveries made in the intermediate periods, the bond's duration will be shorter than the term to maturity.

ii. A bond's duration will be equal to its term to maturity if, and only if it is a zero-coupon bond. When no intermediate recoveries are made by an investor, the duration will equal the term to maturity.

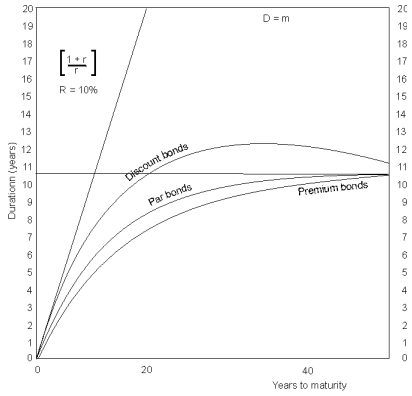
iii. The duration of a perpetual bond is equal to (1 + r)/r, where r = yield to maturity of the bond.

iv. As the maturity of a coupon-bearing bond is lengthened, the duration also increases, albeit at a slower rate. As the term to maturity increases, the number of coupon payments increases. At the same time, the redemption is extended, reducing the present value of the redemption payment. Thus, duration increases as the redemption payment is extended, but the weightage of the redemption decreases as term to maturity increases. Duration of a bond approaches the value (1 + r)/r, (r = ytm) as the years to maturity are increased. This property applies only to bonds selling at or above par.

Bonds selling below par, or discount bonds tend to increase with increase in term to maturity rates sharply like a zero-coupon bond, but turnaround to fall subsequently and bend towards the duration of a perpetuity.

The figure below illustrates the relationship between a bond's duration and term to maturity. A zero coupon bond's duration increases in proportion to increase in term to maturity (D = M) and has a slope of 1.

Figure 2



v. Longer a coupon-paying bond's term to maturity, the greater the difference between its term to maturity and duration.

vi. Duration and YTM are inversely related. An increase in YTM would reduce the present values of all the cash flows, and the cash flows that are farther away would be reduced the most. In other words, the early cash flows will enjoy proportionately more weightage than the later cash flows, thus increasing the distance between duration and term to maturity (the fulcrum in the figure will have to be moved to the left as weightage to earlier cash flows increases). Thus an increase in YTM will result in the reduction of the duration. When YTM decreases the effect will be the opposite, and duration will increase.

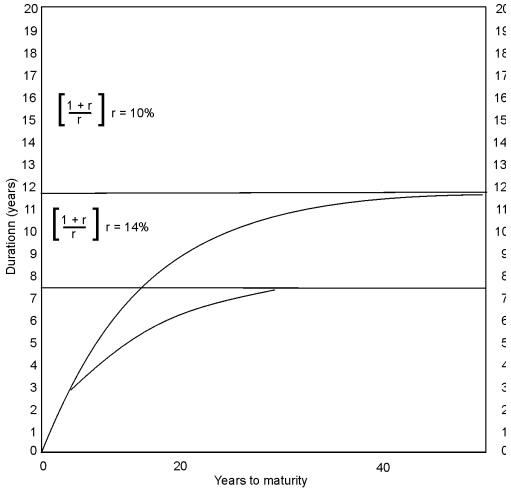
Table 1: Bond DurationTheorem

Theorem 1:	For Zero coupon and Single period coupon paying bonds, the duration equals its term to maturity.
Theorem 2:	A bond which pays interest for a finite period (more than one period) has its duration less than its term to maturity.
Theorem 3:	The duration of a perpetual bond equals (YTM + 1)/ YTM, regardless of its coupon rate.
Theorem 4:	When the market price of the bond is equal to or greater than its face value, the duration increases with increase in the term to maturity. Further, it tends to approach (YTM + 1)/ YTM, as the term to maturity approaches infinity.
Theorem 5:	The duration of a coupon bearing perpetual bond, being sold at discount, approaches the limit (YTM + 1)/ YTM after reaching a maximum value.
Theorem 6:	The duration of the coupon bearing bond, being sold at a discount, reaches its maximum value when the value of term to maturity reaches a value given by the equation below. $$T = \frac{1}{\log(1 + YTM)} + \frac{1 - YTM}{YTM - i} + \frac{YTM - i}{i(1 + YTM)\log(1 + YTM)}$$ Where 'i' is coupon rate and T is time to maturity.
Theorem 7:	The duration of an interest paying bond, being sold at a discount reaches a maximum value when its term to maturity is directly related to the bond's coupon rate and inversely to its yield to maturity.
Theorem 8:	The longer the term to maturity of a coupon bearing bond, the greater the difference between its duration and the term to maturity.

vii. Given the inverse relationship between YTM and market prices, and principle (vi) elaborated above, duration and price move in the same direction. An increase in prices reduces YTM and the duration increases. The converse is true for a decrease in prices.

viii. The limiting value for duration of bonds is (see principle (4) above). Since the value depends completely on the YTM, an increase in YTM would shift the limiting value downwards (see Figure 3). The maximum duration will be reached earlier than before.

Figure 3



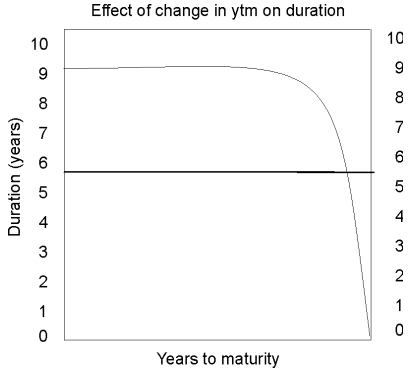
ix. Larger the coupon rate, smaller the duration of a bond. A bond with higher coupon rate pays higher cash flows every year, than the one with a lower coupon rate.

x. An increase in the frequency of coupon payments decreases the duration, while a decrease in frequency of coupons increases it. In terms of Figure 1, increase in frequency of coupons, say from annual to semi-annual payments, would shift one half of every container of cash flows by one half period to the left. This shift would move the balancing point to the left, which means a decrease in duration.

xi. Duration of a bond declines as the bond approaches maturity (YTM being held constant). Consider the behavior of duration for a 100-year 12% par bond of Rs.1,000. The duration of this bond would be 9.33 when it is issued and drop to 5.11 in the first 93 years of its life.

Duration of a hundred year 12% par bond (see Figure 4) and when the YTM changes the duration drops sharply, to touch zero on maturity.

Figure 4



The concept of duration has two important applications. Duration can be used as a measure of the responsiveness of a bond's price to changes in market yields. Another application deals with managing the trade-off that arises when interest rates change over the investment horizon of the investor. Duration is used to immunize a bond from such interest rate risk by setting the investment horizon equal to the bond's duration. These two applications are discussed subsequently.

The sensitivity of bond price to changes in interest rates is called *Bond Volatility*. We have seen that bond prices and YTM are inversely related. Therefore, instantaneous changes in market yields cause prices to change in the opposite direction. The extent of change in bond prices for a change in YTM measures the interest rate risk of a bond. The interest rate risk is a function of the interest rate elasticity. In this section, the concepts of interest rate elasticity and interest rate risk are discussed.

Interest Rate Elasticity

Interest Rate Elasticity (IE_{it}) can be defined as,

$$IE_{it} = \frac{\text{Percentage change in price for bond in period 't'}}{\text{Percentage change in yield to maturity for bond 'i'}}$$

$$\text{i.e., } IE_{it} = \frac{\frac{\Delta P_0}{P_0}}{\frac{\Delta YTM}{YTM}} \qquad \text{...Eq.(8)}$$

Illustration 8

Consider a bond with the following features:

P_0 = Rs.1,000; C = 10% p.a.; r = 10%; n = 10 years. For a change in r to 11%, the price would change to 100 $PVIFA_{11,10}$ + 1,000 $PVIF_{11,10}$ = 940.9

The interest rate elasticity of the bond is,

$$= \frac{-\frac{59.1}{1,000}}{\frac{0.01}{0.10}} = -0.591$$

This means that for any percentage change in YTM, the simultaneous change in price would be about six-tenths as large. In other words, a 10% change in YTM would cause a 5.91% change in price of the bond in the opposite direction.

Interest rate elasticity is always a negative number owing to the inverse relationship between YTM and bond prices.

Bond price elasticity can be computed directly as above, or with the help of the following mathematical relation between duration and elasticity:

$$IE = D_{it} \times \frac{YTM}{1 + YTM} \qquad \text{...Eq.(9)}$$

The above equation suggests that duration and interest rate elasticity of a bond are directly related. Anything that causes duration of a bond to increase, will also increase the bond's interest rate elasticity.

The duration of the bond (using equation 6) is,

$D = PVIFA_{10,10} \times (1 + 0.10)$

$= 6.145 \times 1.1 = 6.76$

The interest rate elasticity using equation (8) is,

$$IE = 6.76 \times \frac{0.10}{1.1} = 0.6145$$

Equation (9) provides only an approximate measure of interest rate elasticity. For very small change in interest rates, it would provide a value identical to the one derived using the equation.

Determination of Interest Rate Risk

Interest rate risk, defined as price fluctuation caused by simultaneous change in YTM, is determined by the interest rate elasticity of a bond. We may rewrite equation (9).

$$\left\{\frac{\Delta P_0}{P_0}\right\} = IE_{it} \times \left(\frac{\Delta YTM}{YTM}\right) \quad \text{...Eq.(10)}$$

Thus, a bond's elasticity measures its interest rate risk.

The bond, used as an illustration in this section, would have an interest rate risk,

$$= 0.591 \times \frac{0.01}{0.10} = 0.0591 \text{ or } 5.91\%$$

In other words, a 10% change in YTM would cause prices to fall by 5.91%. If we use equation (10), the fall in prices would be predicted to be 6.15%. Using duration itself as a measure of volatility would amount to further approximation of the price change expected for a change in YTM.

Modified Duration as a Measure of Bond Volatility

The modified duration of a bond is computed using the formula,

$$D_{Mod} = \frac{D}{1 + Y/f} \quad \text{...Eq.(11)}$$

Where,

D = Macaulay's Duration

Y = YTM (in decimal form)

f = Frequency of Discounting.

The percentage price volatility is measured using D_{Mod} as,

$$\frac{\Delta P}{P} \times 100 = -D_{Mod}.\Delta Y \quad \text{...Eq.(12)}$$

That is, percentage price change = Modified duration x Change in yield.

The D_{Mod} and volatility measures for the bond being used in this section as illustration, would be,

$$D_{Mod} = \frac{6.76}{1 + 0.10} = 6.15$$

$$\frac{\Delta P_0}{P_0} = 6.15 \times 0.01 = 6.15\%$$

LIMITATIONS OF MACAULAY AND MODIFIED DURATION[2]

i. Modified duration can estimate percentage change in prices only for small yield changes. This will lead to unequal price changes in two bonds of equal duration for large yield changes. This is because of the differences in their convexity.

ii. Whenever the yield curve experiences a non-parallel shift, it is not easy to determine the interest rate sensitivity of a portfolio of bonds for changes in the interest rates. When there is a non-parallel shift in the yield curve, there is

2 This and the next section draw from "Investment Analysis and Portfolio Management", 6th Edition, by Frank K Reilly and Keith C Brown, *The Dryden Press*.

no hard and fast rule to determine the yield that is to be used for explaining the change (whether or not to use short/intermediate/long-maturity yield). Two portfolios which would begin with the same duration would perform differently when there is a non-parallel shift in the yield curve and they will have different ending durations. This is referred to as yield curve risk. (To overcome this limitation, another concept called key rate duration is introduced, and is discussed later in this chapter.)

iii. Calculation of Macaulay or modified duration is based on the assumption that cash flows from the bond are not affected by the changes in the yield. Hence, it will not be a representative measure when we consider bonds with embedded options.

Duration is a measure of the interest rate sensitivity of an asset, and as for discussed in the limitations of Macaulay duration, it cannot be used for large yield changes, bonds with embedded options and for the assets that are affected by other variables besides interest rates. The alternative measure that was developed was "effective duration".

Effective Duration

This is useful to measure the sensitivity of a bond to the changes in interest rates. Here a pricing model is used to determine the market prices when there is a change in the interest rates. This measure makes it possible to arrive at negative duration and durations longer than the maturity of the asset both of which are not possible with Macaulay or modified duration. Another important feature of effective duration is that it takes into account the changes in cash flows of the bond when yield changes, and also those due to the embedded options in the bond. But this requires the use of an interest rate model and corresponding price model that will help in determining the prices for the asset when interest rates and cash flows change.

The formula for calculating effective duration is,

$$D_{Eff} = \frac{P_2 - P_1}{2P_0(\Delta y)} \qquad \text{...Eq.(13)}$$

P_2 = The estimated price of the asset after a downward shift in the interest rates

P_1 = The estimated price of the asset after an upward shift in interest rates

P_0 = The current price of the asset

Δy = The assumed shift in the yield.

The formula is implemented by assuming small changes in yield (both increase and decrease) and using a pricing model to estimate the expected market prices (both P_1 and P_2) at the new yields.

Illustration 9

Consider an option-free bond with the following details:

Par Value	Rs.100
Coupon	8%
Maturity	10 years
Initial YTM	8%
Initial Price (P_0)	100

Assume a change in yields of 20 basis points. Therefore, prices for the yields to maturity of 7.80% (P_2) and 8.20% (P_1) would be:

0.0780 (P_2) = 101.35

0.0820 (P_1) = 98.67

(P_2) – (P_1) = 2.68

$2P_0(\Delta y) = 2(100)(0.002) = 0.4$

$D_{Eff} = 2.68/0.4 = 6.7$

Since the bond considered is an option-free bond, the effective duration is equal to the modified duration, which can be derived on the basis of Macaulay Duration.

KEY RATE DURATIONS[3]

The major drawback of effective duration measure is that it is calculated based on the assumption of parallel shifts in the yield curve. But in reality, the spot curve does not shift in a parallel fashion. An alternative measure used for different types of yield curve shifts is "Key Rate Duration" popularly referred to as KRD.

Key rate durations are a duration vector representing the price sensitivity of a security to each key rate change. The sensitivity of a security or a portfolio to the change in the spot rate of a particular key maturity is measured keeping the spot rate for the other maturities constant. The rate of change of value of a security or a portfolio to the change in spot rate is termed "rate duration". Thus, we will not have a single duration but a vector of durations for each maturity on the spot rate curve. The concept of 'KRD' was first introduced by Thomas Ho and is used to quantify any type of key rate shifts.

Advantages of KRD

i. KRD can identify the price sensitivity of an option embedded bond to each segment of the spot yield curve.

ii. KRD can capture the influence of multiple market factors on the yield curve movement.

iii. Using KRD, a replicating portfolio of a bond with embedded options can be created using zero-coupon bonds.

KRD is not a single measure like effective duration, but a vector of numbers defining the price sensitivity of a security over the entire domain of possible movements of the yield curve. The sum of KRDs will be equal to the effective duration.

In order to quantify the level shift in the yield curves, all key rates are either increased or decreased by the same number of basis points, and the effect of the change on the value of the portfolio based on the corresponding key rate durations is determined. The effect of steepening of the yield curve is found by decreasing (increasing) the key rates at the short (long) end of the yield curve and determining the positive (negative) change in the portfolio's value using the corresponding key rate durations.

Illustration 10

Let us take the following three different key rates – 4 years, 12 years, and 20 years. The following two $100 portfolios comprise 4-year, 12-year, and 20-year zero-coupon bonds.

Portfolio	4-year issue	12-year issue	20-year issue
I	$50	$0	$50
II	$0	$100	$0

The three key rates can be represented by three different points on the yield curve (D(1), D(2), and D(3)), which can be defined as follows:

D(1) = key rate duration for the 4-year part of the yield curve

D(2) = key rate duration for the 12-year part of the yield curve

D(3) = key rate duration for the 20-year part of the yield curve.

3 This section draws from *"Duration, Convexity and Other Risk Measures"* by *Frank J Fabozzi*, published by *Frank J Fabozzi Associates*.

The key rate durations for the three issues and the duration are as follows:

Issue	D(1)	D(2)	D(3)	Duration
4-year	4	0	0	4
12-year	0	12	0	12
20-year	0	0	20	20

A portfolio's key rate duration can be expressed as the weighted average of the key rate durations of the securities of the portfolio. The key rate duration and the duration for each portfolio are calculated as follows:

Portfolio I

D(1) = (50/100) x 4 + (0/100) x 0 + (50/100) x 0 = 2

D(2) = (50/100) x 0 + (0/100) x 12 + (50/100) x 0 = 0

D(3) = (50/100) x 0 + (0/100) x 0 + (50/100) x 20 = 10

Effective duration = (50/100) x 4 + (0/100) x 12 + (50/100) x 20 = 12

Portfolio II

D(1) = (0/100) x 4 + (100/100) x 0 + (0/100) x 0 = 0

D(2) = (0/100) x 0 + (100/100) x 12 + (0/100) x 0 = 12

D(3) = (0/100) x 0 + (100/100) x 0 + (0/100) x 20 = 0

Effective duration = (0/100) x 4 + (100/100) x 12 + (0/100) x 20 = 12.

Thus, the key rate durations differ for the two portfolios. However, the effective duration for each portfolio is the same.

While calculating the key rate durations, it can be observed that only for parallel shift in the spot rates, the two portfolios have identical performance and their performance would not be the same for a non-parallel shift in the spot rates.

Illustration 11

In the above illustration, consider the following three scenarios:

i. All spot rates shift down by 10 basis points.

ii. The 4-year key rate shifts up by 10 basis points and the 20-year rate shifts down by 10 basis points.

iii. The 4-year key rate shifts down by 10 basis points and the 20-year rate shifts up by 10 basis points.

The 4-year key rate duration, D(1) for portfolio I is 2. For a 100 basis point increase in the 4-year key rate, the portfolio's value will decrease by approximately 2%. Therefore, for a 10 basis point increase in the 4-year key rate, the portfolio's value will decrease by approximately 0.2%. The 20-year key rate duration, D(3) for portfolio I is 10. For a 100 basis point decrease in the 20-year key rate, the portfolio's value will increase by approximately 10%. Therefore, for a 10 basis point decrease, the increase in the portfolio's value will be approximately 1.0%. Consequently, for portfolio I in scenario 1,

Change in portfolio's value due to 4-year key rate change = –0.2%

Change in portfolio's value due to 20-year key rate change = +1.0%

Change in portfolio value = +0.8%.

Similarly, the total return for both portfolios can be estimated for the three scenarios. The estimated total returns are shown below:

Portfolio	Scenario 1	Scenario 2	Scenario 3
I	1.2%	0.8%	–0.8%
II	1.2%	0%	0%

Thus, only for the parallel yield curve shift (scenario 1) the two portfolios have identical performance based on their durations.

Duration of Equity

The concept of duration has so far been understood in the context of bonds. It is useful essentially from the point of view of:

- immunization of interest rate risk, and
- estimation of price change due to interest rate change.

Considering the inputs required to compute duration, it is also possible to compute the duration of equity. The concept of duration of equity is still unfamiliar and the significance is still under study.

The price changes in a sovereign bond, which is risk-free, are predominantly due to interest rate changes and hence the duration will be able to explain most of the changes since there is unsystematic risk that can be attributed to government securities. However, the same is not true in case of corporate debentures where price changes can be attributed to company specific factors. This difficulty is all the more true in respect of equities. However, the change in the interest rates and the changes in return on equity are related though there are different arguments about the nature of the relationship.

Intuitively, one can argue that if interest rates go up resulting in an increase in the yields of bonds, the returns on equity are also likely to increase considering the risk profile. It is, therefore, possible to use duration to explain the changes in the value of equity though the change cannot be explained completely. There can, therefore, be a temptation to conclude that yields on bonds and equities are positively correlated. However, there is no empirical evidence to support it. Infact, it happened time and again in the US markets that when interest rates accelerated, the stock market went down. Such patterns occurred in 1969, 1974, 1981 and 1982. The logic which supports such a situation is that when interest rates move up, funds flow from equities to bonds in view of greater certainty and hence the supply pressure on equities brings down the market.

As stated earlier, the concept of duration is, relatively, evolving.

There are three different models used for computation of duration of equity.

a. i. **Duration of Equity based on Dividend Discount Model**

$$\text{Duration} = \frac{1}{k - g}$$

Where,

k = Return required by the equity holders

g = Constant growth rate of dividend.

This model is based on the dividend discount model of equity valuation. Therefore, the model is also subject to the various assumptions of the dividend discount model. Let us look at an example to understand the application of the model. Newfin Ltd.'s discount rate is 18% while its dividends are expected to grow at 10% forever. The duration of Newfin Ltd., will be,

$$\frac{1}{0.18 - 0.10} = \frac{1}{0.08} = 12.50 \text{ years.}$$

ii. **An Alternative Model**

An alternative model is also available for calculating the duration of dividend paying stocks. This is also based on the dividend discount model.

$$\text{Duration} = \frac{1}{\text{Dividend Yield}}$$

For Newfin Ltd., if the share price is currently Rs.100 and the dividend expected is Rs.8.00, the duration will be:

$$\frac{1}{8/100} = \frac{1}{0.08} = 12.50 \text{ years.}$$

b. **The Analytical Model**

This model takes into account the changes in the real interest rates, changes in the expected rate of inflation and the impact of change in inflation on the growth rate of dividends. The change in the price of the stock is calculated as two components:

i. One that is caused by the changes in the real interest rates; and

ii. The other that is caused by changes in interest rates resulting from changes in the expected rate of inflation.

The model may be represented as follows:

$$\frac{\Delta P}{P} = -D (1 - I) \Delta i - D (1 - r) \Delta I_r \quad \text{...Eq.(14)}$$

Where,

P = Price of the stock

D = Duration of the stock according to the dividend discount model

G = Growth rate to changes in real interest rates

i = Nominal interest rate

I = Sensitivity of growth rate to changes in expected rate of inflation

I_r = Inflation component of nominal interest rates

$\frac{\Delta P}{P}$ = Percentage change in the price of the stock.

Let us work out a numerical example to understand the application of the analytical model.

Let G = 11%

k = 15%

r = –0.3

I = 0.8

Δi = 100 basis points

ΔI_r = 50 basis points

$$D = \frac{1}{k - g} = \frac{1}{0.15 - 0.11} = \frac{1}{0.04} = 25 \text{ years}$$

$$\frac{\Delta P}{P} = -25 (1 - 0.8) 1.00 - 25 (1 + 0.30) 0.5$$

$$= -25 \times 0.2 \times 1 - 25 \times 1.30 \times 0.5 = -21.25\%$$

Principles of Bond Volatility

i. Bond price changes are an increasing function of maturity for any given difference between coupon rate and YTM.

All other factors remaining constant, the higher the volatility of a bond, the longer the remaining term to maturity. For a 1% decrease in YTM, prices increase by Rs.1.76 when 2 years remain to maturity, against Rs.14 when 60 years remain to maturity. The principle holds good for an increase in YTM also.

An important implication of this property is that, if interest rates are expected to increase, other things remaining constant, bond prices will decrease by a greater percentage for long-term bonds, than for short-term bonds. An investor would avoid long-term bonds under such a circumstance, from a purely capital loss perspective. Conversely, when interest rates are projected to fall, long-term bonds would be preferred to short-term bonds. (Note that this holds good from a capital gain (loss) perspective only and that total return has other components.)

Illustration 12

Consider a 12% bond of Apple Products Company maturing after 5 years and a 12% bond of Banana Chips Company maturing after 10 years, both selling at par. What would be the change in market price of these bonds if the market yield changes to 14% (assume semi-annual interest)?

Bond	n	Market Price		Price Change
		At 12%	At 14%	
Apple Products	5 years	1,000	930.96	69.04
Banana Chips	10 years	1,000	895.92	104.08

The drop in price for the Banana Chips bond which has a longer maturity is larger.

ii. The percentage change in the price of the bond (described in (1) above) increases at a diminishing rate as 'n' increases.

Illustration 13

Consider three 10% bonds, A, B, and C, the interest on all three bonds being payable semi-annually. The three bonds will mature after 5, 10 and 15 years respectively. If the market yield for the bonds of comparable risk changes to 12%, what will be the marginal percentage change in their price? The three bonds have a face value of Rs.1,000 and are currently selling at par.

Bond	n	Market price		Percentage change	Marginal percentage change in price
		At 10%	At 12%		
A	5 years	1,000	926.0	7.30	7.40
B	10 years	1,000	885.0	11.47	4.07
C	15 years	1,000	862.0	13.77	2.30

This example shows that the longer the time to maturity, the larger the percentage price change but the marginal percentage change diminishes as the maturity period increases.

iii. Given the term to maturity, the capital gains resulting from a decrease in interest rates is always higher than the capital loss resulting from a rise in interest rates. This property is the result of the convex nature of the price-yield curve.

Illustration 14

Consider the three bonds referred to in the previous illustration. Calculate their market prices if the yield is 10%. Compare the capital gains arising from a 2% decline in yield with the capital losses that will be sustained from a 2% increase in yield.

Bond	n	Market Price			Capital Gain	Capital Loss
		At 10%	At 12%	At 8%		
A	5 years	1,000	926.00	1,081.55	81.55	74.00
B	10 years	1,000	885.00	1,135.50	135.50	115.00
C	15 years	1,000	862.30	1,171.60	171.60	137.70

iv. Higher the coupon rate, smaller the percentage change in price resulting from a given change in yield. This principle is a corollary to the inverse relationship between duration and coupon rates.

Illustration 15

Consider a 9% of NCD of Blue Nose Company and a 14% NCD of White Elephant Company which are currently yielding 12%. If the yield were to change to 10%, what would be the percentage change in their prices? (Assume that both NCDs will mature after 5 years and have a par value of Rs.1,000.)

Bond	n	Coupon Rate	Market Price		Percentage change in price
			At 12%	At 10%	
Blue Nose	5 years	9%	891.45	962.19	7.94
White Elephant	5 years	14%	1,071.70	1,154.74	7.75

IMMUNIZATION OF RISK

As seen above, interest rate risk is a real concern of bond investors. A change in interest rate has two effects – reinvestment effect and price effect. If the interest rate moves up after the purchase of the bond, interest income from the bond will be reinvested at a higher rate and so interest earned on reinvestment of interest will be higher. But the rise in interest rate reduces the bond's price and hence the investor incurs a capital loss. Thus, a rise in interest rate has a positive reinvestment effect but a negative price effect (converse is also true). But these opposite effects may not offset each other for a given bond. The positive effect can outweigh the negative effect and vice versa. Consequently, the realized yield will be different from the promised yield.

This indeed is a serious problem for investors like LIC, GIC, and Provident Fund, which have large known liabilities maturing in future and which would like to ensure that their bond investments have predictable terminal values so that their liabilities can be exactly met. If interest rate was to change, this purpose would be served by holding a bond whose time to maturity exactly coincides with the maturity of a known liability.

So, how can investors get around this problem? Investors can protect themselves from the interest rate risk by resorting to bond immunization. Bond immunization is the strategy of matching the bond's duration (and not the term-to-maturity) with the time horizon of the investor. So assuming that an investor wants his investment in a bond to yield 6% (YTM) to cover a known liability maturing after 10 years, he would be better off choosing a bond with a duration of 10 years rather than a bond with a term to maturity of 10 years.

When the duration of a bond is set equal to the investment time horizon, any unexpected change in the market value of the unmatured bond at the end of the investment horizon (price effect) will be exactly equal in magnitude, but opposite in direction, to any unexpected change in the reinvestment income (reinvestment effect). Immunization will provide a compound rate of return over the period immunized that equals the bond's YTM, irrespective of changes in market rates.

Illustration 16

Suresh wants to realize a target rate of return (yield) of 9% on his bond investment over 7 years (investment horizon). He has two options: (1) buy a 9% bond maturing after 10 years which is selling at the par value of Rs.1,000; (2) buy a 9% bond maturing after 7 years which is also selling at its par value of Rs.1,000. What will be the terminal value and realized yield under each option if (a) interest rate declines by 1% after the bond's purchase (b) there is no change in interest rate, and (c) interest increases by 1% after the bond's purchase. Assume that the change in interest rate occurs before the first interest payment.

The duration of the first bond is given by,

$PVIFA_{9,10}$ x 1.09 = 6.995 years = 7 years (approx).

The realized yields under both these options are given in the following tables.

Table 2: Option 1 – Purchase a 9%, 10-year bond with D = 7 years

Purchase Price	Promised Yield	Reinvestment Rate Rs.	Coupon Amount Rs.	Interest on Interest of Year 7	Price at the end Rs.	Terminal Value	Realized Yield
a. 1,000	0.09	0.08	630	173.05	1,025.93	1,828.98	0.09
b. 1,000	0.09	0.09	630	198.04	1,000.00	1,828.04	0.09
c. 1,000	0.09	0.10	630	223.85	975.12	1,828.97	0.09

Table 3: Option 2 – Purchase a 9%, 7-year bond

Purchase Price	Promised Yield	Reinvestment Rate Rs.	Coupon Amount Rs.	Interest on Interest of Year 7	Price at the end Rs.	Terminal Value	Realized Yield
a. 1,000	0.09	0.08	630	173.05	1,000	1,803.05	0.082
b. 1,000	0.09	0.09	630	198.04	1,000	1,828.04	0.090
c. 1,000	0.09	0.10	630	223.85	1,000	1,853.85	0.092

From these tables, we find that under option (i) the bond is perfectly immunized against interest rate risk, whereas under option (ii) the realized yield and terminal value of the bond are susceptible to interest rate change. So Suresh has to choose option (i).

Illustration 17

Coupon Rate = 13% p.a.
Face Value = Rs.200
Purchase Price = 191.5
Term to Maturity = 5 years
YTM = 15%

Duration of the bond (using equation 5)

$$D = \frac{0.136}{0.15} \text{ PVIFA}_{15,5} \text{ x } 1.15 + \left(1 - \frac{0.136}{0.15}\right) \text{ x } 5$$

$$= 0.907\ (3.352)\ (1.15) + (0.093) \text{ x } 5 = 3.496 + 0.465 = 3.96 \text{ years}$$

Suppose that the interest rate decreases to 12%. Then we find that realized yield is equal to the promised YTM when the bond is held for a period equal to its duration, namely 4 years, immunizing the investor from a fall in interest rates from 15% to 12%.

Though we have so far suggested that bond immunization offers complete protection against interest rate risk, it has to be noted that perfect immunization of investment is possible only if the following conditions exist: (a) the investment is made in a default-free bond or portfolio of bonds; (b) the buy-and-hold strategy is adopted; (c) there is only a time change in interest rate during the investment horizon; (d) the term structure is flat; and (e) the duration of a bond or a portfolio of bonds is matched with the investment horizon.

These conditions hardly exist in reality. Frequent changes in interest rate is a normal phenomenon rather than an exception. Term structure is normally upward sloping or humped. Only government dated securities are default-free: other bonds have varying degrees of default risk. So, complete immunization may not be possible even if the investment horizon is matched with the bond's duration and the investor adopts a buy-and-hold strategy.

Duration Wandering

In the real world, it does not suffice if we calculate the duration of a portfolio once and hold that portfolio over the period of the duration. This is because, the duration of a portfolio does not move in a particular way with the passage of time. Assume that an investor has a liability maturing after eight years. Therefore, his portfolio should have a duration of eight years. Now after one year, the remaining planning period for the investor is seven years. At this stage, the duration will not be seven years. Recall in that duration is always less than the time to maturity. Duration "wanders" due to the passage of time.

It is quite common, that the investors design their portfolios in such a manner that the returns from the portfolio are available on certain future dates so that they can act as a hedge against liabilities – like paying for a child's education or paying an installment on a loan. This makes it obligatory on the part of investors to monitor and adjust the duration annually or at intervals suitable to them by rebalancing the portfolio.

Rebalancing a portfolio means that the investors have to sell a part or the whole of their portfolio and buy other securities so that the duration of the new portfolio coincides with the investor's investment horizon.

By this method, an investor's total realized yield will be equal to the yield expected at the beginning of the investment horizon.

Illustration 18

An investor bought a 13% bond at par (Rs.1,000) that matures in five years. Calculate the duration for this bond, if the interest rates are expected to remain the same in the foreseeable future.

Solution

Year	Cash Flow	PV of Re.1 at 13%	PV of Cash Flow	PVs of Price	(6) = (1).(5)
(1)	(2)	(3)	(4) = (2).(3)	(5) = (4)/Σ(4)	
1	130	0.885	115.05	0.115	0.115
2	130	0.783	101.79	0.102	0.204
3	130	0.693	90.09	0.090	0.270
4	130	0.613	79.69	0.079	0.316
5	1130	0.543	613.59	0.613	3.065
Total			1,000.21		3.970

We find that the duration is 3.97 years.

What will be the duration after one year? This is shown below.

Year	Cash Flow	PV of Re.1 at 13%	PV of Cash Flow	PVs of Price	(6) = (1).(5)
(1)	(2)	(3)	(4) = (2).(3)	(5) = (4)/Σ(4)	
1	130	0.885	115.05	0.115	0.115
2	130	0.783	101.79	0.102	0.204
3	130	0.693	90.09	0.090	0.270
4	1130	0.613	692.69	0.693	2.772
Total			999.62		3.361

We find that the calculated duration has changed to 3.361 years or say 3.36 years.

We will find that the passage of time is one year while the change in duration is 3.97 – 3.36 = 0.61 years. This unequal change in the time lapse, and duration call to rebalance portfolios built is based on duration.

CONVEXITY

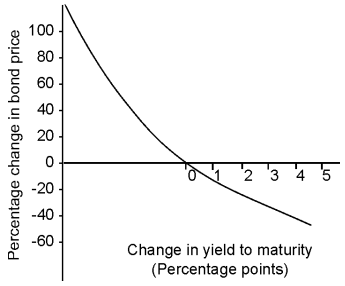
We know that there exists an inverse relationship between bond prices and yields. If we draw a graph between bond prices and yield, the shape of the graph is in the form of a convex curve. This is because an increase in the interest rate results in price decline which will be smaller compared to the price gain on account of decrease in the interest rate with equal magnitude. This property is indicated in the convex shape of the graph. It is plotted between yield and price of bonds.

Figure 5

This price curve becomes more flat at higher interest rates. Convexity is the curvature of price-yield relationship of a bond. Convexity is an important tool to study the bond characteristics. Prices of bonds with greatest curvature will increase more when yields decrease and will fall less when yields increase.

According to the 'duration' measure, the approximate percentage change in prices is same, regardless of whether the interest rates increase or decrease. Though this approximation is true for small changes in the required yield, for large changes in required yield the percentage price change is not the same for an increase in required yield as it is for a decrease in the required yield. Thus, 'duration' serves as an approximation of the percentage price change for small changes in yield. This is because duration is a first (linear) approximation for a small change in yield. The second approximation, which is referred to as "Convexity" is used for capturing the changes in prices for both large and small changes in the required yield. Changes in price, which are not explained by duration, can be explained by using the convexity measure. The following figure depicts the change in bond price for the changes in yield to maturity.

Figure 6



Determinants of Convexity

Convexity as a measure of the curvature of the price-yield relationship also indicates changes in duration. Mathematically, convexity is the second derivative of price with respect to yield (d^2P/di^2) divided by price i.e., convexity is the percentage change in dP/di for a given change in yield.

$$\text{Convexity} = \frac{\left[\frac{d^2P}{di^2}\right]}{P} \qquad \text{...Eq.(15)}$$

From the above formula, it can be inferred that convexity is a measure of the curvature of the price-yield relationship. The relationship between the convexity, coupon, maturity and yield of a bond can be written as follows:

i. The coupon of a bond and convexity (when coupon and maturity are constant) are inversely related i.e., lower coupon, higher convexity.

ii. The maturity of a bond and convexity (when yield and coupon are constant) are directly related i.e., longer maturity, higher convexity.

iii. The yield of a bond and convexity (when coupon and maturity are constant) are inversely related. The price-yield curve is more convex at its lower yield.

The determinants of the duration and convexity for option-free bonds are similar and the direction of impact is also similar. Therefore, higher the duration of the bond, higher their convexity.

Modified Duration – Convexity Effects[4]

Two measures are available to measure the change in a bond's price from a change in yield (i) a bond's modified duration, and (ii) its convexity. The impact of these two factors on the price change is based on the characteristics of the bond i.e., its convexity and the magnitude of change in the yield. For a large change in the yield, the convexity effect on the price change will be higher for bonds with higher convexity and for a small change in the yield, it will be lower.

For bonds with lower convexity, a large change in the yield will result in a lower convexity effect and a small change in the yield will lead to a higher convexity effect. Thus while modified duration helps in capturing bond price changes for a small change in yield, convexity helps in capturing the same for large changes in yield.

Computation of Convexity

We know that

$$\text{Convexity} = \frac{\frac{d^2P}{di^2}}{P}$$

and,

$$\frac{d^2P}{di^2} = \frac{1}{(1+i)^2}\left[\sum_{t=1}^{n}\frac{CF_t}{(1+i)^t}(t^2+t)\right]$$

Where,

i = Yield to maturity of the bond

CF_t = Cash flow in year 't'

n = Maturity of the bond.

Therefore,

$$\text{Convexity} = \frac{1}{P(1+i)^2}\left[\sum_{t=1}^{n}\frac{CF_t}{(1+i)^t}(t^2+t)\right] \qquad \text{...Eq.(16)}$$

For example, consider the calculation of convexity for a 4-year bond with a 14% coupon and 10% YTM, with annual flows.

Year	CF_t	PV@10%	PV(CF)	$t^2 + t$	(4) x (5)
(1)	(2)	(3)	(4)	(5)	(6)
1	140	0.909	127.27	2	254.54
2	140	0.826	115.70	6	694.20
3	140	0.751	105.18	12	1262.16
4	140	0.683	95.62	20	1912.40
5	1,000	0.683	683.01	20	13660.2
Total			1126.78		17783.5

4 This section draws from "Investment Analysis and Portfolio Management" by Frank K Reilly and Keith C Brown, 6th Edition, *The Dryden Press*.

$$\frac{1}{(1+i)^2} = \frac{1}{(1.10)^2} = \frac{1}{1.21} = 0.826$$

Rs.17,783.5 x 0.826 = Rs.14,697.11

Convexity = 14,697.11/1,126.78 = 13.04.

The convexity of the bond considered in the above example is very low because it has a short maturity, high coupon, and high yield. The convexity of a bond will vary along the price-yield curve. In the above example, the convexity would have been different for a higher yield, the maturity and the coupon remaining the same. The price change owing to the convexity effect can be found out by using the following equation:

Price change due to convexity = 1/2 x Price x Convexity x (Change in Yield)².

EFFECTIVE CONVEXITY

Effective convexity can be calculated from the following formula.

$$C_{Eff} = \frac{P_2 + P_1 - 2P_0}{P_0(\Delta y)^2} \quad \text{.....Eq.(17)}$$

Where P_0, P_1, P_2, and Δy have the same meaning as in the effective duration.

Continuing with Illustration 9,

$$C_{Eff} = \frac{101.35 + 98.67 - 200}{100(0.002)^2} = 50$$

Bonds Embedded with Call Options: Now, consider a bond, which is trading at par and is callable at Rs.106 after 5 years. Let us estimate the prices for this bond at a yield of 5%. We derive the following prices.

$$0.0490(P_2) = 105.1488522$$

$$0.0510(P_1) = 104.2279125$$

$$0.05(P) = 104.6891904$$

$$D_{Eff} = \frac{105.1488522 - 104.2279125}{(2)(104.6891904)(0.001)} = 4.398$$

Because of the embedded call option, the duration value (4.398) is lower than the duration for option-free bond (6.7). In contrast, the effective duration for callable bonds at higher yields would be equal to the durations for option-free bonds because the value of the option approaches zero.

The effective convexity of this callable bond at 5% would be,

$$C_{Eff} = \frac{105.1488522 + 104.2279125 - [2(104.6891904)]}{(104.6891904)(0.001)^2} = -15.437$$

The effective convexity is negative because the price increase is limited owing to the increasing value of the call option. Moreover, both duration and convexity are inversely related to each other.

Puttable Bonds: A puttable bond is one in which the bondholder has the right to force the issuer to pay-off the bond prior to the maturity date.

The value of a puttable bond = Value of option-free bond + Value of put option

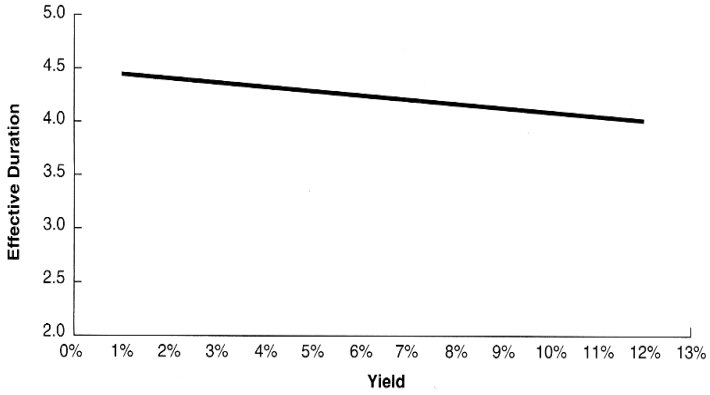
In this case, as the investor owns the option, it has a positive impact on the value of the bond and this option increases in value when interest rates increase. Thus, when rates increase, the price of the bond does not decline as much as an option-free bond, but when rates decline, its price pattern is similar to that of an option-free bond because the value of a put-option approaches zero.

The following graphs show the effective duration and convexity for an option-free bond, callable bond and a puttable bond.

Figure 7: Effective Duration Yield Curves

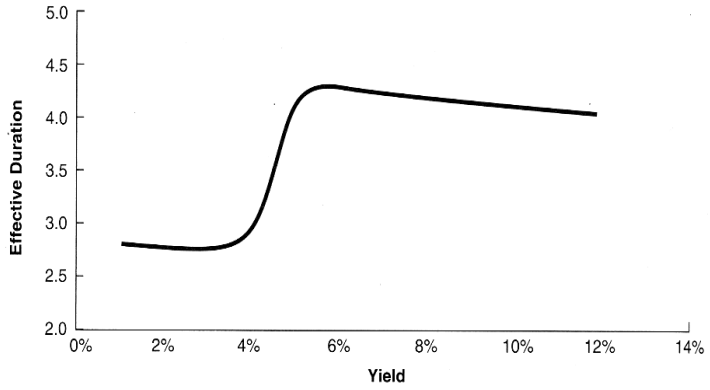
(a). Effective Duration-Yield Curve for 8-Year,

6% Option-Free Bond



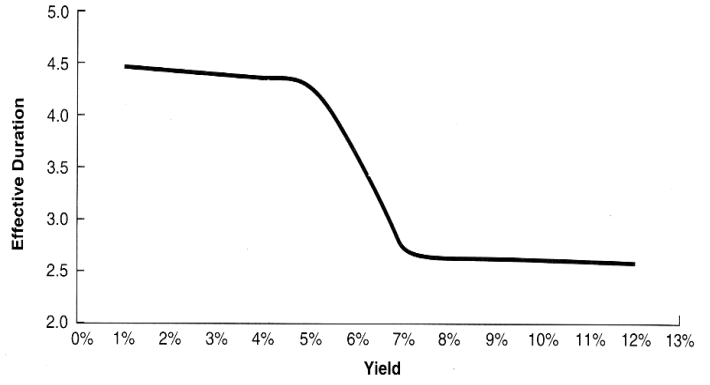
(b). Effective Duration-Yield Curve for 8-Year,

6% Callable Bond After 3 Years



(c). Effective Duration-Yield Curve for 8-Year,

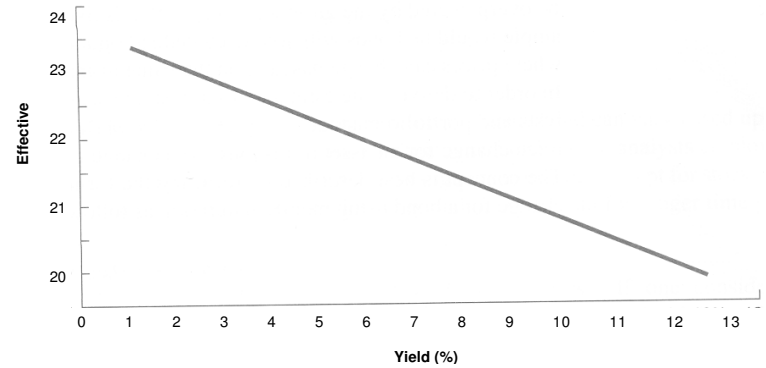
6% Bond Putable After 3 years



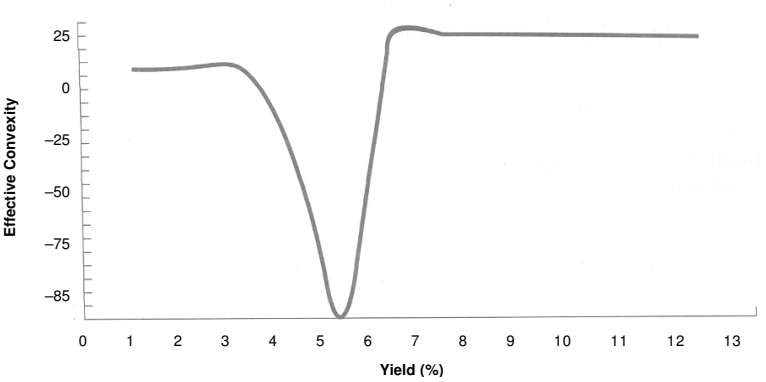
Source: "Investment Analysis and Portfolio Management", by Frank K Reilly and Keith C Brown.

Figure 8: Effective Convexity Yield Curves

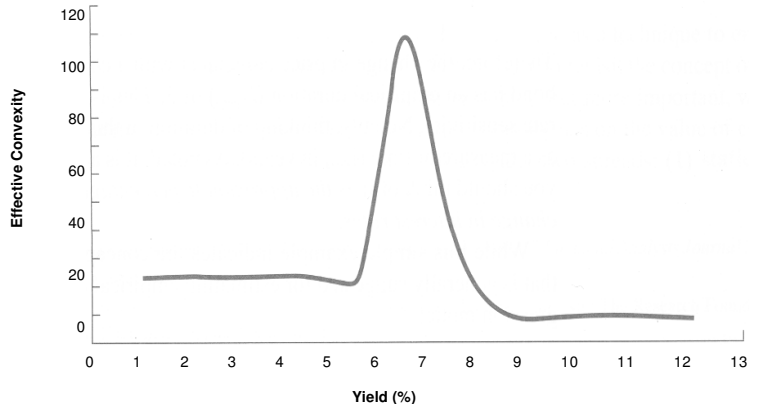
(a). Effective Convexity-Yield Curve for 8-Year, 6% Option-Free Bond



(b). Effective Convexity-Yield Curve for 8-Year, 6% Callable Bond After 3 Years



(c). Effective Convexity-Yield Curve for 8-Year, 6% Puttable Bond After 3 Years



Source:"Investment Analysis and Portfolio Management", by Frank K Reilly and Keith C Brown.

Effective duration greater than maturity: Since effective duration is a measure of interest rate sensitivity, it is possible to have an asset that is highly levered such that its interest rate sensitivity exceeds its maturity. For example, if the price of a 5-year bond changes by 15-20%, when interest rates change by 100 basis points; then the effective duration will be greater than the maturity of the bond.

Negative Effective Duration: According to the formula for Macaulay Duration, it is not possible to compute a negative duration. But in the calculation of price volatility, modified duration is used as $-D_{Mod}$ to reflect the negative relationship between the price changes and interest rate changes for option-free bonds. If bonds with embedded options are considered, it can be observed that bond prices move in the same direction as yields, implying negative duration. For example, in mortgage-backed securities, a decline in interest rates will cause a substantial increase in refinancing prepayments by homeowners, which will reduce the value of these bonds to holders. Thus in this case, a decline in the interest rates and a decline in the price of the bonds can be seen, which implies a negative duration.

This can also be explained by using the value formula i.e., with lower interest rates, the value of the call option increases in value by more than the value of the non-callable bond, which implies a decline in the value of the callable bond.

EMPIRICAL DURATION

The calculation of effective duration and convexity considered cash flow changes when yields change based upon market price estimates that were inputs to the effective duration and effective convexity formulas. There may be cases where it is not possible to generate well-specified market price estimates in response to yield changes. For instance, in the case of common stocks, there is an impact on price when interest rates change, but the interest rate effect can be overpowered by the growth rate effect that is unknown. Another example would be the bonds with exotic embedded options, where the prices may change based upon the value of the exotic option that is difficult to price. In order to derive some estimate of interest rate sensitivity under such circumstances, the concept of empirical duration can be employed.

Empirical duration is the actual percentage price change for an asset in response to a change in yield during a specified time period. The concept can be best described by recalling the formula to determine the percentage price change for a bond using modified duration as follows:

$$\%\Delta \text{ Price} = -D_{Mod} \times (\Delta y)$$

Where,

D_{Mod} = the modified Macaulay Duration

Δy = the change in interest rates in basis points divided by 100.

It is assumed that D_{Mod} and Δy are known and so we can solve for approximate percentage price change. Given this relationship, D_{Mod} can be written as follows:

$$-D_{Mod} = \frac{\%\Delta \text{ Price}}{\Delta y}$$

When solved in this manner, D_{Mod} becomes empirical duration. If there is a simultaneous change in the price of an asset and the interest rates during the same period, empirical duration can be calculated.

Illustration 19

Suppose interest rate declines by 200 basis points and the price of a bond increases by 10%.

$$D_{Emp} = \frac{10}{-200/100} = -5$$

Therefore, the change in price coincident with a change in interest rates indicates that this bond has an empirical duration (D_{Emp}) of 5. This is a direct measure of the bond's interest rate sensitivity. So, this duration cannot be described as a measure of time. As it is a measure of interest rate sensitivity, it can be described as the approximate percentage change in price for a 100-basis-point change in interest rates.

The following regression model can be employed for estimating the empirical duration.

$$\frac{\Delta P}{P} = \alpha + D^{**}\,\Delta Y + u \qquad \text{...Eq.(18)}$$

Where,

$\frac{\Delta P}{P}$ = Percentage change in price

α = Constant term

D^{**} = An estimate of D_{Emp}

ΔY = Change in yield in basis points

u = Random error term.

The time interval for the data and the time period considered can vary from asset to asset depending upon the purpose of the analysis.

TERM STRUCTURE OF INTEREST RATES

A static function that depicts the relationship between the maturity and the yield-to-maturity of a bond is referred to as term structure of interest rates. It is also referred to as yield curve. Yield curve do not have the same shape. The possible shapes of the yield curves are shown below.

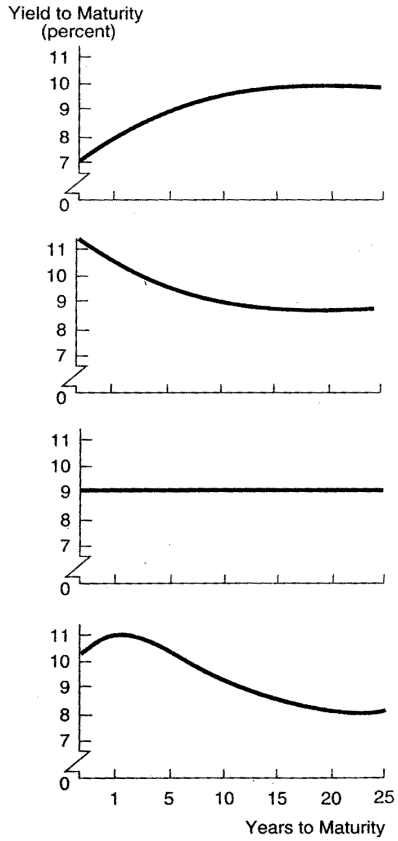
Figure 9: Types of Yield Curves

A Rising Yield Curve is formed when the yields on short-term issues are low and rise consistently with longer maturities and flatten out at the extremes.

A Declining Yield Curve is formed when the yields on short-term issues are high and yields on subsequently longer maturities decline consistently.

A Flat Yield Curve has approximately equal yields on short-term and long-term issues.

A Humped Yield Curve is formed when yields on intermediate-term issues are above those on short-term issues and the rates on long-term issues decline to levels below those for the short-term and then level out.



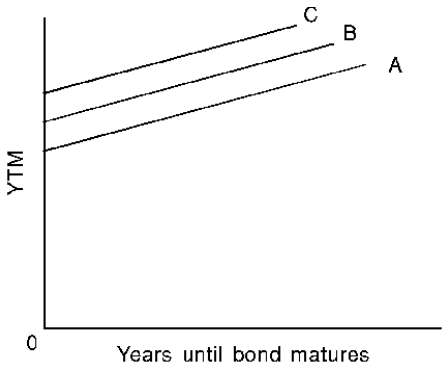
Source: "Investment Analysis and Portfolio Management", 6th edition by Frank K Reilly and Keith C Brown.

Most commonly observed yield curve pattern is the rising yield curve. It is observed when interest rates are at low or modest levels. Declining yield curves are observed when interest rates are relatively high. It is uncommon to find a flat structure of yield curve. When there is a sudden drop from high interest levels, a humped yield curve is observed.

In the valuation of fixed income securities, the portfolio manager is aware that spot rates will be different for different terms of the security. On study, it is observed that the one year spot rate is less than the two year spot rate and so on which implies that the spot rate is directly proportional to 't'. Sometimes, the one year spot rate is greater than the two year spot rate and so on, which implies that the spot rate is inversely proportional to 't'. To keep track of the relationship between the YTMs of securities and the terms to maturity, a 'yield curve' is drawn. Yield curve is a graph wherein the YTM is represented on the vertical axis and the various maturities of the security on the horizontal axis. It shows the daily changes in the term structure of interest rates as the YTM changes.

Yield curves for various bonds differ. Owing to the factor of "default risk premiums", the yield curves for risky bonds are at a higher level than the yield curves for the comparatively safe bonds.

Figure 10



In Figure 10, the yield curve of bond C being at a higher level indicates that it is more riskier than bond A and bond B. It can be deduced that bond A, which offers the least risk can be a treasury bill issued by the government.

An upward sloping yield curve is typical of a recession period/early economic recovery, wherein the long-term interest rates exceed the short-term rates and the spot rates increase. Conversely, during the boom period, the yield curve tends to slope downwards indicating that the long-term interest rates are less than the short-term rates and that the spot rates are on the decline.

RIDING THE YIELD CURVE

Certain portfolio managers anticipate to make capital gains in the process of buying and selling bonds. They resort to 'riding the yield curve'. It is a buy-and-hold strategy, where the manager purchases a medium- or long-term bond, when the yield curve is upward sloping and sells it at a later date, (before its maturity) so as to make capital gains.

Two major assumptions are necessary if the portfolio manager has to be successful. They are:

- Yield curve should be upward sloping (i.e., long-term securities have high yields).
- A belief that the yield curve remains upward sloping.

Illustration 20

Mr. Vimal is a portfolio manager of his company and he has the option of investing in a 91-day T-Bill and 180-day T-Bill, so that he can ride the yield curve. The following data is given to him:

		Rs.
91-day T-Bill:	Current selling price	= 98.25
	Face value	= 100.00
	180-day T-Bill: Selling price	= 96.00
	Face value	= 100.00

Therefore, the yield for the 91-day T-Bill $= \frac{100 - 98.25}{98.25} \times \frac{365}{91} = 7.14\%$

The yield for 180-day T-Bill $= \frac{100 - 96}{96} \times \frac{365}{180} = 8.313\%$

If he buys and holds the 180-day T-bill and sells them after 91 days, the expected selling price will be Rs.98.25 (this is the same as the current price of the 91-day T-bill because it is assumed that the yield curve has not changed after 91 days also). Therefore, the expected return will be,

$$= \frac{\text{Rs.}98.25 - \text{Rs.}96.00}{\text{Rs.}96.00} \times \frac{365}{91} = 9.385\%$$

Therefore, it can be concluded that riding the yield curve will give a higher return.

Note: In the money market, one year is considered to have 365 days, whereas in the forex market, one year is taken as 360 days. (All the calculations are done accordingly.)

However, this theory has the following its drawbacks too.

- As long as the yield curve is constant, an investor can expect to make profits. If the yield curve changes, there is more risk in riding the yield curve. This can be caused if the level of interest rates rises or the short-term end of the yield curve rises upward.
- It should also be noted that while riding the yield curve, larger transaction costs are involved (since it involves buying and selling the security), whereas the maturity strategy involves only costs for buying the security.

Limitations on Yield-to-Maturity

The rate at which the present value of future cash flows is equal to the current price of the bond is the yield-to-maturity. Yield-to-maturity (YTM) can be used as an estimate of a bond's expected return. But using a single rate to discount the cash flows occurring at different points of time would be unrealistic since it is based on the assumption that the yield curve is flat.

Major drawbacks of YTM are:

i. All the cash flows associated with a given bond are discounted at the same rate even though cash flows occur at different dates and different rates would exist at those dates if the yield curve is not flat.

ii. It is assumed that the cash flows are reinvested at the rate equal to the YTM. This may not be true always.

Any coupon paying bond can be broken into a series of zero-coupon bonds (called zeros) with different maturities. Then each of these zero-coupon bonds can be valued separately. These zeros can again be grouped into a single complex bond with price equal to the sum of the individual prices of the zeros. Spot rate is

defined as the discount rate of a single future cash flow. The following equation explains the relation between the n-year zero's price P_n and the n-year spot rate s_n.

$$P_n = \frac{100}{(1+s_n)^n} \quad \text{...Eq.(19)}$$

The n-year spot rate can be broken down into a product of one-year forward rates. For instance, with m-year and n-year spot rates, the annualized forward rate between maturities m and n, $f_{m,n}$ is calculated using the following equation,

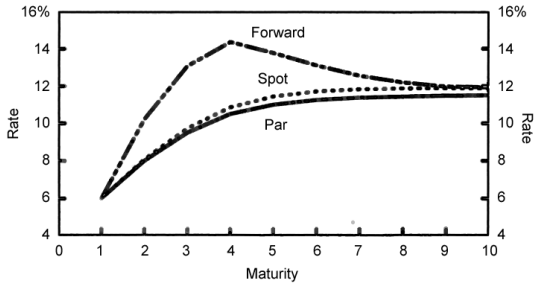
$$(1+f_{m,n})^{n-m} = \frac{(1+s_n)^n}{(1+s_m)^m} \quad \text{...Eq.(20)}$$

In the above equation, if we substitute m = n – 1, then we would get one-year forward rate. [A forward rate is the interest rate on a loan to be borrowed in future but agreed today.]

One should be able to distinguish among par rate, forward rate and a spot rate. A spot rate is used to discount a single future cash flow to the present. A par rate is the discount rate used to discount a set of future cash flows to the present. A forward rate is the discount rate used to discount a single future cash flow to another future date.

Figure 11 depicts the par, spot and one-year forward rate curves.

Figure 11: Par, Spot and One-year Forward Rate Curves



As can be seen in Figure 11, the par and spot curve rises at a constant rate while the forward rate curve first slopes upward and then falls steeply. The spot rate lies above the par rate and forward rate curve lies above the spot rate curve. This pattern is always followed if the spot rate is upward sloping. However, in the opposite case i.e., when the spot rate is below the par value curve, the forward rate curve will lie below the spot rate curve. The forward rate curve magnifies any variation in the slope of the spot rate curve as it measures the marginal reward earned by increasing the duration of the bond. The spot rate measures an investment average reward till maturity n.

Forwards as Break Even Rates

The forward rates can be regarded as the break even rate for valuing the bond. It is the minimum investment rate that investor seeks to earn to be indifferent between the choice of period of investment. For example, the spot rate (s_2) for two years zero-coupon bond depends on its selling price in one year's time. The implied one-year spot rate one-year forward ($f_{1,2}$) is computed as the selling rate that would make the two years zero-coupon bond return equal to one year spot rate,

$$(1 + s_2)^2/(1 + f_{1,2}) = 1 + s_1 \quad \text{…Eq.(21)}$$

Where,

s_2 = Annualized 2-year spot rate

s_1 = Annualized 1-year spot rate

$f_{1,2}$ = Annualized forward rate between maturities 1 and 2.

Table 4

Par Rate	Spot Rate (A)		One-Year Forward Rate (B)		Implied Spot Rate One-Year Forward (C)		Implied Change in the Spot Rate D = C – A
5.00	s_1	5.00	$F_{0,1}$	5.00%	$F_{1,2}$	7.00	2.00
6.00	s_2	6.02	$F_{1,2}$	7.05%	$F_{1,3}$	9.46	3.44
7.85	s_3	7.95	$F_{2,3}$	9.92%	$F_{1,4}$	14.07	4.12
8.50	s_4	11.77					

In the above example, one-year spot rate (s_1) is 5% and the two-year spot rate is 6.02%. The implied one year forward rate is 7.05%. If this implied forward rate is exactly realized one year hence, today two year zero will be 100/1.0705 = Rs.93.41. Currently this zero is worth $100/(1.0602)^2 = 88.99$; thus, its return over the next year would be 93.41/88.99 – 1 = 5%, exactly the same as the current spot rate. Thus, 7.05% is the break even level of future one-year spot rate. In other words, the one-year rate has to increase by more than 1.03% (7.05 – 6.02) before the two-year zero underperforms over the next year. If the one-year rate increases by less than 1.03%, the capital loss of the two-year zero will not be fully offset by its initial advantage over the one year zero.

If the yield changes implied by the forward rates are subsequently realized, all investors will earn the same holding period return irrespective of their maturity period. In other words, investors would have no arbitrage opportunity, that is they break even. It can also be interpreted that if the yield curve remains unchanged over a year, each n-year zero-coupon bond earns the corresponding one-year forward rate $f_{n-1, n}$.

In Table 4, column C calculates the implied spot one-year forward. The curve of one-year forward rate in column B is different from the implied spot rate one-year forward rate in column C. The implied spot rate one-year forward signifies the magnitude of the change in bond yield which would make all bonds earn the same holding period return. For instance, if the investors earn 7.00% after the end of second year, then there will not be any incentive for the bondholders to reinvest the bond after one year as there is no arbitrage opportunity for them. Investors will earn the same return i.e., 5% irrespective of the fact whether they invest now i.e., in year 0 or after two years, year 2. So, implied spot rates one-year forward are such future spot rates that would make all bonds earn the same holding period return.

The implied spot rate one-year forward in column C can be calculated from equation below,

$$(1 + s_n)^n/(1 + f_{1,n})^{n-1} = 1 + s_1 \qquad \ldots\text{Eq.(22)}$$

Where,

s_n = Annualized n-year spot rate

s_1 = Annualized 1-year spot rate

$f_{1,n}$ = Annualized forward rate between maturities 1 and n.

The spot rate i.e., s_n is the rate at which the investor can buy the bond, and $f_{1,n}$ is the selling rate of the n-year zero-coupon bond. The left hand side of the equation represents the return an investor earns by buying the bond at the spot rate (s_n) and selling it a year later at the forward rate ($f_{1,n}$). The return earned by the investor is equal to the initial return on investment; therefore, the forward rate is the break even rate. In the above example, the spot rate for one and two years are 5% and 6.02%. Over the next year the return on a one-year zero-coupon bond is 5%.

However, the total return of a two-year depends on the selling rate at the end of the year, when its remaining maturity is one year. The selling rate to make the investors indifferent to the holding period and earn the same holding period return i.e., 5% is 7.00%. At this selling rate, the longer zero's price rise from 88.97 [=100/(1.0602)^2] to 93.46 [=100/1.07], earning 5% [93.46/88.97 – 1]. Thus, the implied one year spot rate one year forward ($f_{1,2}$) = 7%.

To interpret it differently, forwards indicate the required change in the yield of a given security (long-term) to offset an initial yield spread over the short-term rate. In other words, forwards signify what should be the change in the spot curve to equate holding period returns across bonds. In the above example, the two-year zero-coupon bond had to rise by 1.02% and the constant maturity one-year spot rate had to rise by 2%.

Relationship between Initial Yield Spread and Changes in Break Even Yield

Now we will present a simple relation between initial yield spreads and break even yield charges. The implied two-year spot rate one-year forward ($f_{1,3}$) is computed by equating the holding period returns of the three year zero and the one year zero over the next year.

Consider the following equation:

$$s_3 - Dur_2 \times (f_{1,3} - s_3) = s_1 \quad \text{... Eq.(23)}$$

Where,

s_3 = Buying Rate

$f_{1,3}$ = Selling rate

$f_{1,3} - s_3$ = Capital Gain/Loss.

The left hand side of the above equation is the approximate holding period return of the three-year zero and the right hand side is the holding period return of the one-year zero. After rearranging the above equation, the break even yield change for a three-year zero equals the yield spread divided by the bond's duration:

$$f_{1,3} - s_3 = (s_3 - s_1)/Dur_2$$

$f_{1,3} - s_3$ is not the actual yield, but it is the break even yield implied by the forward rates for current year. So, the above equation shows that the break even yield change for three-year zero equals the yield spread divided by bond's duration.

In the above equation, the three-year zero is financed through the sale of a one-year zero. If the yield spread is large, then the position is said to have a large positive "carry" i.e., the current yield earned is greater than the financing cost. The profit of this position is the sum of the yield carry ($s_3 - s_1$) and the capital gains or losses caused by the longer zero yield changes. The investor will make profit from falling rates i.e., when the spot prices are falling and they will lose when the rates are increasing. However, in the scenario of rising rates, the positive carry provides a cushion against rising rates. The trader will only lose money when the two-year spot rate rises above $f_{1,3}$ in one year because in that case yield will become negative.

The break even yield changes ($f_{1,3} - s_3$) signify the level to which the three-year zero coupon yield can rise before its carry advantage is nullified. If an upward sloping yield curve remains unchanged, the zero's yield will fall as it rolls down the curve (from s_3 to s_2). The capital gains from this roll down tendency provide the three-year zero with additional cushion against rising rates. The roll down along with the yield spread signifies the level of change in constant maturity two-year spot rate in the next year so that the three-year zero and the one-year zero earn the same return.

Required change in $f_2 = (f_{1,3} - s_3) + (s_3 - s_2) = f_{1,3} - s_2$.

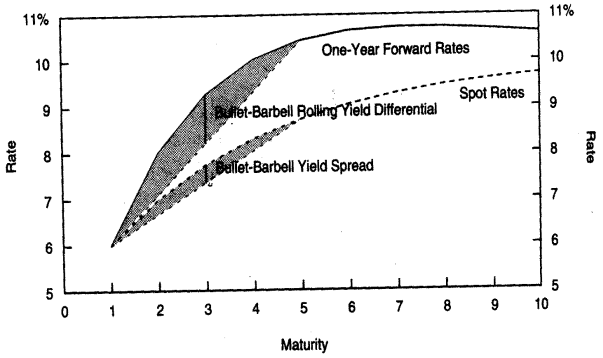
In the above example, s_1, s_2 and s_3 are 5%, 6.02% and 7.95%, respectively, the yield advantage is 1.48% [(7.95 – 5)/2] and the roll down component is 1.93% [7.95 – 6.02]. Thus, change in f_2 is 3.47% [1.48 + 1.93] and $f_{1,3}$ = 9.49% [6.02 + 3.47].

Break Even Yield Changes for Curve-Flattening Positions

As already discussed, if the implied spot rates one-year forward are realized, then there will not be any gain or any loss to the investors, in other words, investors will break even. To break even, any position having a positive carry would have to suffer capital loss and any position having negative carry would have to earn capital gains i.e., forwards would show that large spread changes over the next period would result in capital losses that in turn would offset the positive carry. Similarly, any position with a negative carry will earn capital gains to break even. For instance, suppose the investor has a strong view on one-year spot rates that the curve will flatten i.e., spot rate will go down (as already discussed above if the rates fall investors will make profit) between one and three-year maturities. The investor would hence sell two-year zero and will purchase four-year zero from the sale proceeds. The trade will have a negative carry as the yield loss of moving from a four-year zero to one-year zero will be greater than the yield gain of moving from the three-year zero to the five-year zero. The negative carry in the above example is 120 basis points [(5 – 7.95)/2 + (8.5 – 7.95)/2]. So, for the trade to break even, the rates should fall to such a level that the negative carry is offset. The more the curvature in today's spot curve, the less the attractive terms for a flattening trade, the more the implied flattening by the forwards. If today's spot curve is linear, the flattening trade will not give any yield and hence the forwards too will imply that there is no flattening of the spot curve. On the other hand, if today's spot curve is convex, the flattening trade would actually pickup yield and the forwards would imply steepening of the spot curve.

The figure 12 shows a spot and the corresponding curve of forward rates. To analyze the degree of curvature in these curves, a straight line is drawn between a pair of zeros with different maturities. Each point on these lines will represent barbell portfolio of the two zeros. The vertical distance between a barbell portfolio and a duration-matched bullet bond gives the curvature. The curvature of the spot curve indicates the bullet-barbell yield spread whereas the curvature of the curve of one-year forward rates indicates the bullet-barbell rolling yield differential. The larger the vertical distance, the larger should be the flattening of the curve for the trade to break even.

Figure 12: Measuring the Degree of Curvature



Forwards as Break Even Rate for Active Yield Curve Views

The forward rates as break even rates facilitate investors to take adequate investment decisions. The expectation on the change in prices and yields with respect to the forward rates directly affects the profitability of the investors. For instance, if the rates are expected to rise by more than the forward rates, then the investors should take bearish position. On the other hand, if the rates are expected to fall more than the forward rates, then the investors should take a bullish position as falling prices are marked by an increase in yields on the bonds.

The forward rates as break even rates do not depend on assumptions regarding expectations, risk premia and convexity bias. Ground rule for investment is:

1. If forward rates move as expected, then all the investors will earn the same returns irrespective of their maturity profile.
2. If yields rise more than the forward rates – bearish position is profitable and bullish position loses money.
3. If yields rise less than the forward rates – bullish position is profitable and bearish position loses money.

Forwards as Relative Value Tools for Yield Curve Trades

Another method of estimating the cheapness of the bond is on the basis of duration on the bond.

When the yield curve is upward sloping, it is more profitable for the investors to invest in longer duration bonds against the riskless short-term bonds as they provide a cushion against the rising yields. Investors investing in bonds with longer duration lose money only when the capital loss as a result of falling bond prices, is more than the initial yield advantage i.e., more than the coupon payments. The one-year forward rate ($f_{n-1, n}$) is equal to the 'n' year zero's rolling yield. Thus, it is a direct measure of the n-year zero's rolling yields advantage.

Because one-period forward rates measure zero's near term expected returns, they can be viewed as indicators of cheap maturity sectors. The use of such cheapness indicators does not require any subjective interest rate view. Instead, it requires a belief motivated by history that an unchanged yield curve is a good base case scenario. If this is true, long-term bonds have lower near term expected returns than short-term bonds when the forward rate curve is upward sloping. In the long run, a strategy that adjusts the portfolio duration dynamically based on the curve shape should earn higher average return than constant duration strategies.

Convexity Bias

Convexity characteristics differ across bonds of varying maturities. This difference in convexity explains the yield differences in them. To be more specific, long-term zeros have very high convexity which results in lower yields. The term convexity bias refers to the impact of these convexity differences on the shape of the yield curve. The concept of convexity explains the non-linear nature of the bond price-yield relationship. Non-callable bonds have positive convexity in that their prices rise more for a given fall in yield than the fall in the price for an increase in yield of the same magnitude. Thus, positive convexity implies a higher return on the bond. As a result, investors are observed to demand less yield when there is a chance of improving their returns because of convexity. High convexity bonds can offer a given expected return at a lower yield level.

Spot Rate Curves

Spot rate is the discount rate at which the maturity value of a zero-coupon bond of a given maturity is discounted. The yields on bonds will vary with maturity, as investment in long-term bonds are perceived to be more risky than that in short-term bonds. Therefore, using a single rate to discount cash flows occurring at

different points of time is considered to be inappropriate. Each cash flow is hence required to be discounted at spot rates that prevail at the time of these cash flows. The appropriate valuation formula can be expressed as follows.

$$P = \sum_{t=1}^{2n} \frac{C_t}{\left[1+\frac{i_t}{2}\right]^t} \quad \ldots \text{Eq.(24)}$$

Where,

P = Market price of the bond

C_t = Cash flow at time t

i_t = Spot rate for treasury/government securities at time t

n = Maturity period of the bond.

This method of determination of the value of a bond is complex particularly for long-term bonds (say 20-25 years' maturity bonds).

An alternative approach is to construct a theoretical spot rate curve from the observable yield curve based on the existing yields of treasury bills and the latest treasury coupon securities. (These latest treasury coupon securities are called 'On-the-run treasuries'). However, the theoretical spot rate curve and the spot rate curve constructed from the series of zero-coupon bonds will not be identical. This is because of the illiquid nature of the stripped zero-coupon bonds constructed out of treasury coupon securities. The difference between these two are explained by the term structure interest rate theories that are discussed later in this chapter.

(**Note:** Construction of a theoretical spot rate curve from coupon securities is called "bootstrapping".)

Illustration 21

Bond A and bond B are pure discount securities. Bond A matures in one year at which time the investor receives Rs.1,000.00. The current market price of this bond is Rs.934.58. Bond B matures in two years at which time the investor receives Rs.1,000.00. The current market price of the bond B is Rs.857.34. Calculate the spot rates.

Substituting in equation (24),

Bond A: $934.58 = \frac{1,000}{(1+r_A)^1}$

or $(1 + r_A) \times 934.58 = 1,000$

or $r_A = 7\%$

Bond B: $857.34 = \frac{1,000}{(1+r_B)^2}$

or $(1 + r_B)^2 \times 857.34 = 1,000$

or $r_B = 8\%$

If only coupon bearing bonds are available for investment, equation (24) can be modified as,

$$P_t = \frac{C}{(1+r_t)^t} + \frac{M}{(1+r_t)^t} \quad \ldots \text{Eq.(25)}$$

Where,

C = Coupon payment.

r_t = Spot rate at time t.

Illustration 22

Suppose a six-month T-bill spot rate = 0.189 and one year T-bill spot rate = 0.14. This implies that $s_1 = 0.094$ and $s_2 = 0.07$.

Substituting the above information in equation (16) we get,

$$f_{t+0.5,\,0.5} = \frac{(1+0.07)^2}{(1+0.094)} - 1 = 0.046$$

Therefore, the forward rate 6 months from now (t + 0.5) on a 6-month T-bill quoted annually is 9.2%. The price of a 1-year T-bill worth Rs.100 at maturity is,

$$\frac{100}{(1+0.07)^2} = 87.34$$

If Rs.87.34 are invested for 6 months at the 6-month spot rate of 9.8%, the amount at the end of 6 months would be,

87.34 (1.098) = 95.90

If Rs.95.90 is reinvested for another 6 months in a 6-month T-bill offering 4.6%, the amount at the end of one year is,

95.90 (1.046) = 100

Both alternatives will have the same Rs.100 pay-off if the 6-month T-bill yield 6 months from now is 4.6% (9.2% on a bond equivalent basis). This means that an investor is guaranteed a 4.6% yield on a 6-month T-bill 6 months later, and he will be indifferent between the two alternatives.

The theoretical spot rates are used to compute the forward rate. The resulting forward rate is called the *implied forward rate*. The yield curve can be used to calculate the implied forward rate for any time in the future for any investment horizon.

TERM STRUCTURE MODELS

Statistical procedures like factor analysis or principal components analysis are used to identify the factors and to measure the factor returns. In these factor models, the factor returns are expressed as linear combinations of individual stock returns (principal components) and the factor exposures are the multiple regression coefficients of individual stock returns with these principal components.

Advantages of the statistical models are: (1) It is possible to eliminate as much of the correlation in residuals by including as many principal components as required and (2) Returns are the only inputs and thus the model can be estimated with any frequency for which the individual stock returns are available.

A disadvantage is that the factors are not easily observable and the factor returns cannot be easily measured independent of the stock returns themselves. The factors need not always correspond to quantities that can be associated with stock returns. Another major disadvantage is that it is difficult to accommodate new securities in a portfolio because of the absence of historical information to arrive at the exposures.

Types of Term Structure Factor Models[5]

The sources of risk for the investment grade fixed income securities are related to the level and shape of the yield curve. In each term structure factor model, there is a characteristic yield curve shift related to each factor.

5 This section draws from "Term Structure Factor Models" by Robert C Kuberek, Handbook of Portfolio Management, edited by Frank J Fabozzi, published by *Frank J Fabozzi Associates*.

There are four types of term structure factor models. They are:

1. Arbitrage Models
2. Principal Components Models
3. Spot Rate Models
4. Functional Models.

All the term structure models share the property that the factor returns in the models represent both magnitude and direction of each characteristic yield curve shift allowed in the model. The exposures are nothing but the durations of the bonds with respect to the yield curve shifts. One way of differentiating between the models is in the number of characteristic yield curve movements implied by each model and in the form of these characteristic yield curve movements.

ARBITRAGE MODELS

The model which we are going to discuss is developed by Cox, Ingersoll and Ross and is called CIR model. The model accommodates stochastic production possibilities and uncertain technological change. The model can also be developed using arbitrage arguments provided that the specification of the equilibrium condition for expected bond returns is consistent with their general equilibrium formulation.

With the assumption of only one factor represented by the short-term interest rate 'r' and the rate evolving according to the process,

$$dr = k(\mu - r)dt + \sigma\sqrt{r}dz \qquad \text{...Eq.(26)}$$

Where,

μ = Long-term average value of the short-term interest rate 'r'

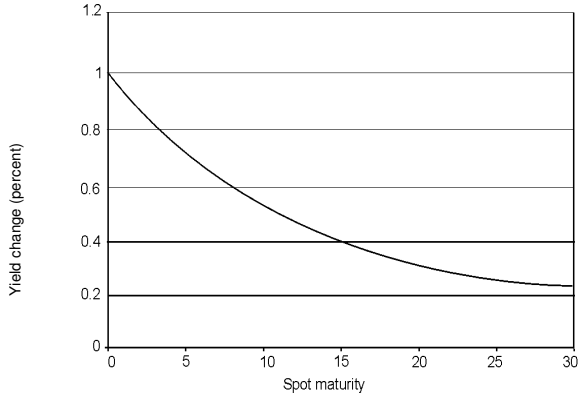
k = Rate of reversion of the short-term interest rate 'r' towards its long-term average value

$\sigma\sqrt{r}$ = Standard deviation of the unexpected changes in the short-term interest rate

dz = A standard Brownian motion.

The above equation is interpreted as follows. The change in the short-term interest rate 'r' over the period 'dt' is the sum of two components. (1) A drift component representing the expected reversion of the short-term rate towards the mean. (2) A surprise term representing unexpected changes in interest rates. This way, the future behavior of the interest rate is found to depend only on its current value and not on the history of movements. Characteristic yield shifts as per CIR model are given below.

Figure 13: Characteristic Yield Shifts – CIR Model



Source: Handbook of Portfolio Management – Edited by Frank J Fabozzi.

We observe that CIR model produces a single characteristic yield shift. The shift resembling a twist at the short end of the curve describes the yield curve behavior when yield changes are perfectly correlated and when short-term yields tend to move more than long-term yields. Short-term interest rates tend to be more volatile than long-term rates because of the mean reversion in the short rate assumed for the model.

Advantages of CIR Model

- It is consistent with the valuation of fixed income securities i.e., it produces both prices and returns.
- Because of continuously defined maturities in the model, exposures can be calculated for zero-coupon bonds of any maturity without recourse to approximation or interpolation.
- Mean and variance of the factor return can be estimated directly by observing the time series of factor returns.

Disadvantages of CIR Model

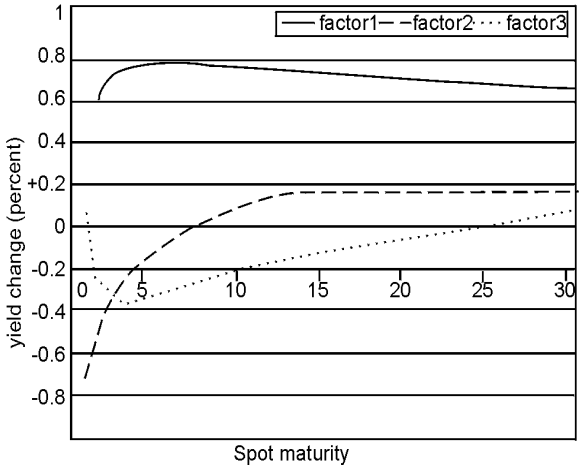
- It allows only one type of yield curve shift and hence has limited application.
- The coefficients in the factor model depend on the level of interest rates. This implies that this model cannot be implemented by regressing cross-sections of bond returns on their durations.

PRINCIPAL COMPONENTS MODEL

In this model, the returns of zero-coupon bonds of varying maturities are analyzed to extract a set of characteristic yield curve shifts which are defined at each maturity. These characteristics explain a large proportion of the total variance of returns in the sample. Thus, it can be seen that the factors are combined to explain the returns of a cross-section of bond returns for a given performance period.

Characteristic yield curve shifts under principal components model are shown in Figure 14.

Figure 14: Principal Components Model Characteristic Yield Curve Shifts



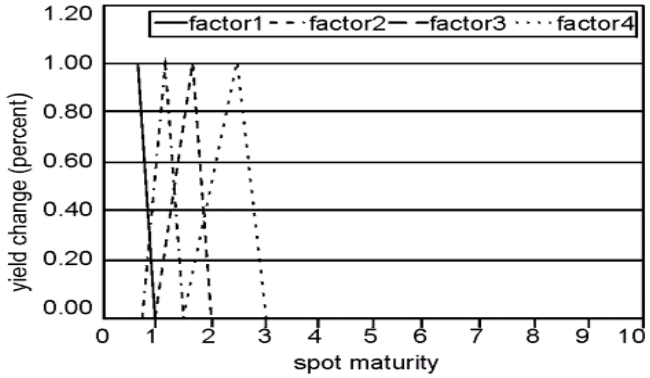
Source: Handbook of Portfolio Management – Edited by Frank J Fabozzi.

In the principal components model, factor returns are estimated by regressing the returns of cross-sections of zero-coupon bonds on the implied durations of the characteristic yield shifts produced by the principal component analysis. The main advantage of this model is that the actual data itself provides guidance in defining the factors. The disadvantage is the requirement of a large number of parameters. Another disadvantage is that the model is not defined continuously on maturity.

SPOT RATE MODELS

In this model, factors with the durations of zero-coupon bonds at several points on the yield curve are identified. The factors can then be interpreted as changes in the yields of these hypothetical zero-coupon bonds. Spot rate models require less number of parameters compared to the other models. One of the commonly used spot rate models is J P Morgan's Risk Metrics Model. This model finds wide application in measuring value-at-risk. There are two methods of estimating spot rate models. By measuring the yield changes at each yield curve point in the model, the time series of factor returns can be estimated. In another method, the durations of the bonds may be calculated with respect to the spot rate changes and regress bond returns cross-sectionally on these durations to create a time series of factor returns. The characteristic yield curve shifts under a spot rate model are shown in Figure 15.

Figure 15: Characteristic Yield Shifts – Spot Rate Model



Source: Handbook of Portfolio Management – Edited by Frank J Fabozzi.

The major advantage of spot rate models over principal components models is that the former requires fewer parameters. Furthermore, the factors in spot rate models need not be orthogonal. The disadvantage is that the characteristic yield curve shifts in the spot rate model do not correspond with the yield curve movements that actually take place. Yield curve shifts are not defined continuously on maturity. Therefore, some interpolation of yield changes is required to apply the model to bonds with cash flows at times other than the points defined in the model. Moreover, a large number of factors are required to model yield curve risk accurately. Hence, a large number of durations is required to manage interest rate risk effectively using this approach.

FUNCTIONAL MODELS

These models combine the advantages of arbitrage models and principal components models. These models assume that zero-coupon yield changes are defined continuously in maturity. Consider the shift function f(T),

$$f(T) = \Delta y\ (T) \qquad \text{...Eq.(27)}$$

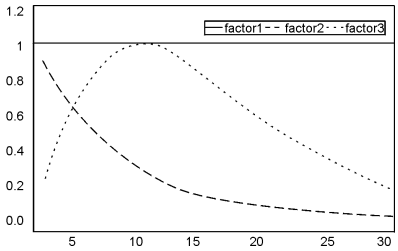
Where, $\Delta y\ (T)$ is the change in the zero-coupon yield at maturity T. A Taylor series or some approximating function can be applied to the function f(T) while maintaining the number of terms, to be sufficient to describe actual yield curve movements adequately. Durations are calculated from the approximating function.

$$f(T) = c_0 + c_1T + c_2T^2 + \ldots \qquad \text{...Eq.(28)}$$

The factors are identified with the resulting durations which are derived from equation (28).

Similar to the arbitrage and spot rate models, the factors in functional models need not be orthogonal. The characteristic yield curve shifts under functional model are given in Figure 16.

Figure 16: Characteristic Yield Curve Shifts – Functional Model



Source: Handbook of Portfolio Management – Edited by Frank J Fabozzi.

The different approaches to term structure factor models differ mainly in the identification of the factors and in the method of measurement of factor exposures and factor returns.

YIELD SPREAD ANALYSIS

Yield spread analysis is one of the important techniques used in the bond investment decisions. Yield spreads are the differences in the promised yields between bond issues or segments of the market at any point of time. These differences are specific to the issues or segments of the bond market. These spreads will be added to the interest rates as decided by the economic forces that comprise risks of risk-free rate of interest (RFR), expected rate of inflation (I) and the risk premium (RP)

i.e., i = (RFR + I) + RP

There are four types of yield spreads:

i. Different segments of bond market will have different yields. For example, Government bond market, PSU bond market, Corporate bond market.

ii. Bonds of the same market but in different sectors may have different yields. For example, State Government bonds, Power bonds, Public Utilities bonds, etc., may have different yields.

iii. Bonds in the same market and in the same sector may have different yields with different maturities.

iv. Different coupons within same market and sector may have different yield spreads depending upon the currency of payment of coupons.

The differences in various bonds lead to different yield spreads which are either positive or negative. It is important to note that the quantum and direction can change over the time-frame and the changes may result in profits. These spreads narrow down whenever the yield differences are smaller and these spreads widen whenever the yield differences are larger.

Table 5: Yield on Government of India Securities based on SGL Transactions

	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003
5 years' maturity	10.510	11.02	10.53	8.31	6.52
10 years' maturity	12.040	11.12	10.76	8.86	6.05
15 years' maturity	10.625	11.31	10.82	9.28	6.23
20 years' maturity	12.540	11.88	11.02	8.91	7.27

Source: RBI Bulletin.

Note: Yield spread is equal to the yield on the first bond minus the yield on the second bond. For example, the yield on long governments – the yield on short governments.

For the investor in bonds, it is necessary to evaluate the changes in the yield spreads as these changes influence the bond prices. The investor should observe whether there is any abnormal shift in the spreads, i.e., from narrow spread to wide

spread or vice versa due to the sharp changes in the interest rate. It is also necessary to observe when the abnormal situation becomes a normal situation. It is possible to estimate or predict the changes in the spreads by observing the economic and other factors and also observing the historical movements.

Yield Spreads with Embedded Options

As mentioned above, yield spreads are useful in bond investments. If we use the term structure of interest rates along with the interest rate volatility, there is a significant impact on embedded options in bonds. In this analysis, two spreads are considered namely (1) Static yield spreads and (2) Option adjusted spreads.

STATIC YIELD SPREADS

In the normal yield spread analysis, the investor compares the YTM of a bond to that of a treasury bond with similar maturity, i.e., we compare the YTM of a 25-year zero-coupon bond and a 10% 25-year corporate bond with a benchmark 25-year treasury bond/security. It makes little sense as both types of bonds have different characteristics that include cash flows. It is proper to compare the bonds with treasury bonds of same characteristics. The corporate bond's price will be less than the package of zero-coupon treasury securities since the price of a corporate bond rises compared to that of a treasury security and the investors require yield premium for the risk associated with it.

The investor realizes the static spread over the entire treasury spot rate curve if the bond is held to maturity. It is a spread for all the points of treasury curve and the cash flows will be discounted at treasury spot. These discounted total cash flows plus spread is equal to bond's price. The static spread is to be measured by a trial and error method.

To calculate the static spread, we have to calculate the present value by adding different spreads to the treasury spot rate and this resultant present value for the term is to be compared with the bond's price. The present value which is equal to the bond's price is taken for consideration. The basis points added to the treasury spot rate, which gives the present value equal to the bond's price is known as the static spread.

For example, let us say the bond's price is Rs.88. If we calculate the present value based on the treasury spot rate plus 100 basis points, then the present value is Rs.89.32.

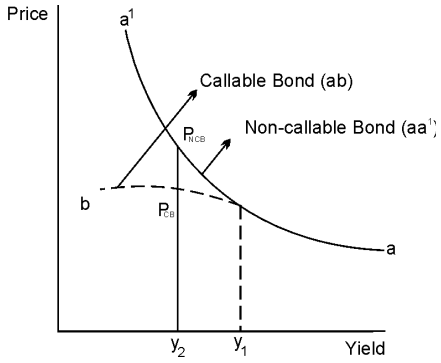
If we calculate the present value based on treasury spot rate plus 120 basis points, the value is Rs.88.15 and if we calculate the same at a spread of 130 basis points, the present value comes to Rs.87.60. We can conclude that the static spread is 120 basis points as the present value at a spread of 120 basis points over treasury spot comes to Rs.88.15 which is almost equal to the bond's price. The shorter the maturity of the bond, the lesser the difference between static spread and the traditional yield spread. The difference between the traditional yield spread and the static yield depends on the shape of the yield curve. The steeper the yield curve, the more the difference.

Option Adjusted Yield Spreads

To analyze the yield spreads of an option embedded bond, we have to split the bond price into two parts i.e., call option price and non-callable bond price.

Callable Bond Price: Non-callable bond price – Call option price for the difference between the non-callable bond price and the callable bond price is known as embedded call options price. The split of the bond price into callable and non-callable parts can be illustrated through the graph given.

Figure 17



At y_2, P_{NCB} = Price of non-callable bond

P_{CB} = Price of callable bond

$P_{NCB} - P_{CB}$ = Embedded option price.

Option Adjusted Spread (OAS) is developed as a measure of the yield spread to be used to exchange money value and price of the bond. OAS is a spread over the benchmark or spot rate curve used in the valuation. This spread is known as option adjusted spread as the cash flows of the security to seek value are adjusted to calculate the portion of embedded option. Option value is calculated on the basis of static spread and OAS.

Option value = Static spread – OAS

OAS is influenced by the interest rate volatility. The higher the interest rate volatility expected, the lower the OAS. Conversely, the lower the expected interest rate volatility, the higher the OAS.

In the above paragraphs, different types of risks and the measures to overcome those risks were discussed. Hedging is being used as one of the modes of dealing with the different kinds of risks for some time in the past. In the scenario of bonds, let us see how hedging works.

HEDGING

Fixed income securities also experience price fluctuations due to several factors such as interest changes, inflation, etc., and it becomes a necessity to protect them from these risks. Hedging strategies aim at covering the risks and are very much useful to the market players. Hedgers protect themselves against price movements by using futures markets. In a perfect hedge, the net profit or loss from the positions the hedger takes will be exactly in tune with expectations. But normally, the profits or losses from the positions may not be matching the expectations. This depends upon the relationship between the spot price and the future prices. The difference between the spot price and future price is known as basis.

The basis changes due to several factors. There is a risk associated with the basis which is known as basis risk. Thus basis risk replaces price risk in the hedging operations. If a decline in cash price of a bond is expected, a short hedge is used to cover the risk. The strategy that can be adopted is to sell a futures contract. In this process the hedger fixes a future price and the buyer of the futures contract faces price risk. For example, consider a pension fund manager who has to encash the bonds in the market to pay an amount of Rs.10 million to the investors of the pension fund after 60 days. Suppose the interest rates rise in this period, then the existing bond prices will decline. To meet the payment obligation, the fund manager has to liquidate more bonds to receive Rs.10 million. To protect against this situation, the fund managers can sell the bonds in the futures market maturing in 60 days' time. In this process, the fund manager can protect against price decline of the bonds. If the bond price is expected to rise, then the hedger would

like to go for a long hedge (bull) by purchasing a futures contract to protect himself against future price rise. A pension fund manager who expects large inflow of funds in future may go for a long hedge if the interest rates are expected to fall. If the funds are maturing in the futures market and if the interest rates are expected to fall, the fund manager may go in for a long hedge to reinvest the maturity proceeds.

Hedging Strategy

The hedging strategy includes the following components:

a. Identification of the factors responsible for the volatility of the prices.

b. Measurement of acceptable price volatility.

c. Selecting a hedging instrument as per the requirement.

d. Estimating the maximum position in the hedge instrument.

e. Analysis of the hedging strategy to arrive at the cost and its effectiveness.

FACTORS RESPONSIBLE FOR PRICE VOLATILITY AND ITS IDENTIFICATION

The initial step in the hedging process is to identify the factors which lead to price fluctuations. Interest rate changes are the most important factors responsible for price volatility. If the interest rates fall, the bond prices will go up. Credit spreads also contribute to price fluctuation. For option embedded bonds, changes in the interest rates will influence the bond price. In these bonds, both bond component and option component get affected. When interest rates rise, the price of a callable bond declines and both the bullet bond value and option value decline. After identifying the factors affecting price volatility, the next step is to decide the quantum of protection required against price change through the hedging strategy. Hedging strategy is supposed to eliminate the price risk in full. But practically it is not possible to eliminate all the price risk. In these circumstances the better strategy through hedging can be to get some additional return instead of aiming for total elimination of price risk.

DECIDING THE EXACT HEDGING STRUCTURE

After identifying the factors for the price risk, we have to decide the more suitable hedging position to cover the price risk. The hedging position is released to the Rupee Value of a Basis Point (RVBP) of the security to be hedged and the hedging instrument which is used. The rupee value of a basis point of security is the price change of a security for a unit change in the interest rate. This can be measured through the formula given below.

For a normal bond, rupee value of a basis point

$$= \frac{\text{Par value of the bond x (Price + Interest) x Modified Duration}}{10,00,000}$$

For example, Price of a bond = Rs.110 for an issue of Rs.10,00,000

Interest = Re.1

Modified duration = 5.934

Par value = Rs.1,000

$$\text{RVBP} = \frac{10,00,000 \text{ x } (110 + 1) \text{ x } 5.934}{10,00,000}$$

For option embedded bonds and other bonds, the general formula to calculate rupee value of a basis point based on yield curve shift and related price changes is:

$$= \frac{\text{Rupee par amount x Constant Price} - \text{OAS Price}}{\text{Yield} - \text{Curve Shift x } 100}$$

For example, Rupee par value for a bond issue = Rs.10,00,000

Yield curve shift = 50 (25 basis points up and 25 basis points down)

Change in constant price – OAS Price = 100.1 – 98.6 = 1.5

$$\text{Then RVBP} = \frac{10,00,000 \text{ x } 1.5}{50 \text{ x } 100} = \text{Rs.}300$$

(OAS = Option Adjusted Spread)

Note: In the calculation of RVBP, we assumed a constant OAS pricing to get the prices.

Hedge Ratio

After calculating RVBP of the security to be hedged, we have to decide about the hedging instrument and its position. The hedge ratio is a useful tool to measure the volatility of the bond hedged in comparison with the volatility of the hedging instrument.

$$\text{Hedge ratio} = \frac{\text{RVBP of security to be hedged}}{\text{RVBP of hedge instrument}}$$

The hedge ratio is normally calculated for Rs.10,00,000 par amount. If many units of a security are to be hedged then we have to multiply the hedge ratio by the number of units of 10,00,000. Then we can decide the position necessary for the hedging instrument.

Given the hedge ratio, we can calculate the number of contracts to be entered into for hedging as follows:

$$\text{No. of contracts} = \text{Hedge ratio x } \frac{\text{Par value to be hedged}}{\text{Par value of contract}}$$

For example, Amount to be hedged is Rs.1,00,00,000

Each contract value = Rs.1,00,000

Hedge ratio = 1.5

$$\text{Then no. of contracts} = 1.5 \text{ x } \frac{1,00,00,000}{1,00,000} = 1.5 \text{ x } 100 = 150 \text{ contracts.}$$

Types of Hedging Instruments

There are different types of hedging instruments which are in use for the corporate securities. They are:

i. Cash market securities

ii. Futures

iii. Interest rate swaps.

CASH MARKET SECURITIES

Treasury securities are mostly used for hedging in the cash market. As treasury securities do not have credit risk or bonding risk, these are normally taken as hedge instruments. But there are certain disadvantages. Suppose a treasury note is special then there is a likelihood of short supply that may become extensive. Another disadvantage is unlike other hedging instruments like futures contracts, swaps, these are balance sheet items that may have capital structure implications. Third disadvantage is these instruments cover only interest rate risk but not spread risk. Despite these disadvantages, these instruments are the most sought after hedge instruments.

FUTURES CONTRACTS

Treasury futures are traded and widely used. These contracts are the most liquid ones. Treasury future contracts because of their several options of timing and maturity, have complicated pricing. Treasury futures are supposed to have physical delivery on due date. Hence, the seller delivers any one of the securities within the given time. This results in futures contract going for CTD (Cheapest To Deliver) against the contract. Normally low duration securities tend to be CTD when rates are on the low, and high duration securities tend to be CTD when rates are on the higher side. The convexity will be negative for future contracts as these contracts lose duration in a bullish market and gain duration in a bearish market.

INTEREST RATE SWAP

Different borrowers have different borrowing requirements. To be more specific, some borrowers such as manufacturing companies normally prefer fixed rate borrowing. On the other hand, financial market players such as banks often need floating rate funding.

In addition, it is often the case that a borrowing entity wants to access the market where it does not have a comparative advantage. Under such conditions, an interest rate swap can be used profitably.

Before we go further, we need to understand the principle of comparative advantage.

Suppose the interest rates applicable to two parties, A & B are as follows:

	Floating	Fixed
A	PLR	8%
B	PLR+1%	10%

In this case, A enjoys an absolute advantage in both the markets but has a comparative advantage in the fixed rate markets where the interest differential is 2%. Now, if A wants fixed rate funding, there is no possibility of an interest rate swap. However, A might prefer floating rate funding and B might want a fixed rate loan. Thus, if A borrows in the fixed rate market and B in the floating rate market, the net benefit is 2% – 1% = 1%. This benefit can be shared between A & B to reduce the cost of fixed rate funds for B and floating rate funds for A.

In an interest rate swap, only the interest payments are exchanged. The principal amounts are not exchanged. However, a notional principal is used to calculate the interest payments.

CREDIT RISK

Industry Consideration

There are certain basic risks in running the industry/business. The important risks are:

i. Default risk or credit risk

ii. Liquidity risk

iii. Exchange rate risk

iv. Inflation risk

v. Market risk.

All the above mentioned risks are to be properly addressed to maintain sound financial positions of the company/industry/firm. Credit risk/default risk is one of the important risks the company/industry faces. The same risk is experienced by the creditors of the company/industry. This risk is due to default of principal or interest or both by the borrowers. The creditors of the company may experience the same from the side of the company where the company may fail to make payments of principal and interest due to the lenders/creditors. The other risks like liquidity risk, exchange rate risk, inflation risk and market risk may be experienced

by the company/industry due to mismatching of assets and liabilities resulting in liquidity risk. The adverse changes in exchange rates causing exchange risk, changes in inflation rate resulting in the market conditions due to changes in government policies, etc., bring about market risk.

When we are analyzing the industrial performance in general and within the industry the performance of individual companies in particular, we have to take several factors into consideration. Sources of important performance indicators are position of the industry in the life cycle approach, growth rate in the sales, profitability, etc. In addition to these industry specific factors, we also take other macroeconomic indicators into consideration for analyzing the broad economic situations such as economic growth rate, industrial growth rate, inflation rate, capital market indexes, GDP growth rate, technological trends, etc.

First of all, we have to study the general growth rate of the total industries production and also the growth rate in earnings. Then we have to study the performance of the individual industries sector-wise. We have to compare the sector-wise performance with cross-sectoral performances and analyze the factors for variance in the relative performance. After this, we have to study the individual company's performance within a particular sector to compare the performance with other companies within the same sectors. We have to study the relative risks of the industries in various sectors. Once we are able to come out with risk factors, we can also arrive at the expected rate of returns as the risk is related to return. For an investment decision, we also have to find out the relative stage of the particular sector in the life cycle like whether the particular industry is in the pioneering stage or in the growth stage or in the maturity stage. Depending on the stage of the particular industry, we can estimate the relative risk and return. All this analysis is to be done for a particular period so that we can make relative comparison.

The existence of these risks demands credit rating of bonds.

CREDIT RATING

As the number of companies borrowing directly from the capital market increases, and as the industrial environment becomes more and more competitive and demanding, investors find that a borrower's net worth or name is no longer sufficient to ensure successful raising of funds from the market. In such a scenario, to enable the investors to take informed decisions, 'Credit Rating' has emerged as one of the most important financial services. Offering this service is a credit rating agency which provides an impartial and objective opinion on the credit quality of debt obligations of different companies and assists investors, individuals and institutions in making investment decisions.

Rating is defined by some well-known credit rating agencies in various ways.

Credit Rating Information Services of India Ltd. (CRISIL) Rating: "Credit rating is an unbiased, objective and independent opinion as to an issuer's capacity to meet its financial obligations. The CRISIL rating symbols indicate its current opinion in a summarized manner as to the relative safety of timely payment of interest and principal on a debenture, preference share, fixed deposit or short-term instrument."

Moody's Investor Service (USA): "Rating is designed exclusively for the purpose of grading bonds according to their investment qualities."

Standard and Poor's (USA): "A Standard and Poor's corporate or municipal debt rating is a current assessment of the creditworthiness of an obligor with respect to a specific obligation."

Australian Ratings: "A corporate credit rating provides lenders with a simple system of gradation by which the relative capacities of companies to make timely repayment of interest and principal on a particular type of debt can be noted."

Thus, a credit rating is not a general evaluation of the issuing organization. It essentially reflects the probability of timely repayment of principal and payment of interest by a borrower company. The credit rating is not a one-time evaluation of credit risk of a security. The rating company may change the rating periodically considering the changes from time to time.

Table 6: Rating Service

Rating is	Rating is not
• A reflection of the borrower's accountability, expected capability and inclination to pay interest and principal in a timely manner.	• A general purpose evaluation of the issuer.
• An isolated function of a credit risk evaluation.	• A recommendation to buy/sell/ hold a security.
• Useful in differentiating credit quality.	• An extensive audit of the issuing company.
• Involved in issue-specific evaluation.	• A one-time assessment of creditworthiness valid over the future life of the security.

Need for Credit Rating

Different parties viz., investors, issuers, intermediaries and the regulatory authority have different credit needs depending on the benefits offered.

INVESTORS

a. Supplement the investors' credit evaluation process.

b. Facilitate comparison of relative value between competing securities.

c. Recognition of risks involved in investment.

ISSUERS

a. A company with highly rated instruments has the opportunity to reduce the cost of borrowing by quoting less interest rates.

b. A company with high rating can approach a wider section of investors for resource mobilization.

c. Companies with rated instruments can avail of the rating as a marketing tool to create better image in their dealings with customers, lenders and creditors.

d. Rating encourages the companies to disclose their accounting system, financial reporting and management pattern.

e. Smaller and not so well-known companies can access markets.

f. Rating Encourages financial discipline as borrowers attempt to obtain better ratings by improving financial structure and reduce operating risks.

FINANCIAL INTERMEDIARIES

a. Rating helps in pricing debt.

b. Shifts burden of establishing credit quality from intermediary to the rating agency thereby easing the due diligence requirement.

c. With high credit rating brokers can convince their clients to select a particular investment proposal. This saves their time, cost and manpower in convincing their clients.

REGULATORY AUTHORITY

a. By identifying the risks, rating helps in channelizing savings into productive investments.

b. Credit rating subserves the objective of the regulator in protecting investors' interest.

Essentials of Rating Service

Critical investment decisions may be taken based on the ratings offered by the credit rating agency. In order to ensure that the rating leads to good investment decisions, it is essential that the rating service has the following two important features:

- The quality of rating should be such that it wins the confidence and trust of the users.
- Rating agencies should be unbiased to both the investors and the corporates.

Rating Elements

A rating agency earns its reputation by assessing the client's operational performance, managerial competence, management and organizational set-up and financial structure. It should be an independent company with its own identity. It should have no government interference. Rating of an instrument does not give any fiduciary status to the credit rating agency. It is desirable that the rating is done by more than one agency for the same kind of instrument. This will attract investors' confidence in the rating symbol given.

Rating Symbols

Since the ratings of the agencies will be used even by lay investors, the outcome of the rating should be delivered in an understandable manner. To facilitate this, rating symbols are provided. These rating symbols must be easily comprehensible to the investors to enable them to take investment decisions. The investor will not have to depend wholly on the broker's advice as the rating symbol gives a clue to the credibility of the issuer. Different rating agencies use different symbols and distinct symbols will be assigned to different securities. The rating symbols, however, will have to be clear and definite without any ambiguity or scope for misinterpretation.

THE RATINGS SCALE

Ratings denote an issuer's ability to respond to adverse changes in circumstances and economic conditions. The rating scale is generally differentiated into various levels of credit quality viz., high investment grade, investment grade and speculative grade. The scale and corresponding definitions are as follows:

High Investment Grades	
AAA Highest Safety	Debentures rated 'AAA' are judged to offer highest safety of timely payment of interest and principal. Though the circumstances providing this degree of safety are likely to change, such changes as can be envisaged are most unlikely to affect adversely the fundamentally strong position of such issues.
AA High Safety	Debentures rated 'AA' are judged to offer high safety of timely payment of interest and principal. They differ in safety from 'AAA' issues only marginally.
Investment Grades	
A Adequate Safety	Debentures rated 'A' are judged to offer adequate safety of timely payment of interest and principal; however, changes in circumstances can adversely affect such issues more than those in the higher rated categories.

BBB Moderate Safety	Debentures rated 'BBB' are judged to offer moderate safety of timely payment of interest and principal for the present; however, changing circumstances are more likely to lead to a weakened capacity to pay interest and repay principal.
Speculative Grades	
BB Inadequate Safety	Debentures rated 'BB' are judged to carry inadequate safety of timely payment of interest and principal; while they are less susceptible to default than other speculative grade debentures in the immediate future, the uncertainties that the issuer faces could lead to inadequate capacity to make timely interest and principal payments.
B High Risk	Debentures rated 'B' are judged to have greater susceptibility to default; while currently interest and principal payments are met, adverse business or economic conditions would lead to lack of ability or willingness to pay interest or principal.
C Substantial Risk	Debentures rated 'C' are judged to have factors present that make them vulnerable to default; timely payment of interest and principal is possible only if favorable circumstances continue.
D In Default	Debentures rated 'D' are in default and in arrears of interest or principal payments or are expected to default on maturity. Such debentures are extremely speculative and returns from these debentures may be realized only on reorganization or liquidation.

Table 7 indicates the rating symbols and their meaning.

Table 7: Rating Symbols

Rating Symbol	Capacity for Timely Repayment	Rating Symbol	Capacity for Timely Repayment
High Investment Grades:			
AAA (Triple A)	Highest Safety	1	Very Strong Capacity
AA (Double A)	High Safety	2, 3, 4	Strong Capacity
Investment Grades:			
A	Adequate Safety	5, 6, 7	Adequate Capacity
BBB (Triple B)	Moderate Safety	8, 9, 10	Inadequate Capacity
Speculative Grades:			
BB (Double B)	Inadequate Safety	11, 12, 13	Poor Capacity
B	High Risk	14	Default
C	Substantial Risk		
D	In Default		

To reflect comparative standing within a category, a '+' (plus) or a '–' (minus) sign will be suffixed to the symbols given above.

Rating Process

The following steps indicate the credit rating process.

i. The rating process commences when a client approaches the credit rating agency to analyze and provide a rating symbol/report to a security/ individual/borrower, etc.

ii. The rating agency then assimilates all the necessary information required for this by meeting the management of the company/borrower. The information provided for the rating process will be highly confidential and will not be used for any other purpose.

iii. The rating will be decided based on the analyses of the report.

iv. The rating will then be communicated to the client along with the reasons supporting it. If this rating is not agreeable, the client may appeal to review it for which additional/new information will have to be provided.

v. If the rating is accepted by the client, it will then be declared to the public by the credit rating agency.

vi. Since rating is not a one time process, there will be a continuous monitoring of the client's performance and its operational environment. Based on this information, the rating may be affirmed, upgraded or downgraded. Any changes, however, will be informed to the public.

Types of Ratings

The rating services in the international markets can be classified into Shadow Rating and Formal Rating.

The basic distinction between these two types of ratings is that the shadow rating is an indicative rating and will give the issuer an idea of its formal rating and suggest if it would be beneficial to go for a formal rating.

SHADOW RATING

The issuer will not have to disclose the rating to the public.

The firm can, either independently or with the help of its investment banker, assess its shadow rating by proceeding in the following manner:

i. After collecting the relevant information, various financial ratios used by rating agencies can be computed.

ii. Companies with similar projects having published ratings are identified. The financial ratios of these companies can be used for comparison.

iii. Apart from these financial ratios, the management quality, performance of parent/group companies are assessed.

iv. More weightage should be given to those factors/information that have a major impact on the performance of the company. Based on this also the strengths and limitations of the firm are identified.

v. The ratings of the industry averages, and other companies with similar projects may be used and assigned an indicative rating.

vi. To this indicative rating, the sovereign limitations may be applied to get the final indicative rating. This rating should preferably be in the form of a range and not be specific.

FORMAL RATING

The issuer will have to announce the rating assigned in the Formal Rating to the public.

The process involved in formal rating will be more detailed than the shadow rating process, since there will be a need for more disclosures, and sometimes even plant visits may be involved in it. Further, the shadow rating will not require any annual fee and meetings. While on the other hand, there will be an annual fee for such ratings since formal rating will involve monitoring.

The information that a rating agency would be looking for while providing formal ratings will include the following:

- **Financial Data:** Here the agency would focus on both the current performance and historical data. With the latest information, key ratios that indicate the credit position of the company will be assessed and compared with the industry averages. Supplementing this information will be the financial track record of the company. This helps in identifying key factors that influence the business.
- **Financial Projections:** By projecting the future financial performance of the company, the rating agency will be able to assess the credibility of the company.
- **Financial Support:** The extent of support obtained from outside sources, including parent company, helps in assessing the strength of the company.
- **Market Position:** The rating agency assesses the market position of the company within the industry and studies its plans to maintain or expand its market share.
- **Management:** Information relating to the role and responsibility of senior management and their background will also be sought.
- **Business Environment:** The rating agency collects information on the industry outlook and assesses the factors influencing the business environment.

In addition to the above classification, depending upon what is rated, the ratings can also be classified into the following types:

SECURITY RATING

Debt/Bond Rating: Rating the bonds or debt securities by a company, governmental or quasi-governmental body is called bond rating. This occupies the major business of credit rating agencies.

Equity Rating: The rating of equity issued in the capital market is called equity rating.

INDIVIDUAL/BORROWER RATING

This includes rating a borrower to whom a loan/credit facility may be sanctioned.

SOVEREIGN RATING

This includes rating a country as to its creditworthiness, probability of default, etc.

DEBT RATING

Based on the period involved in repayment of the debt obligations, the debt instruments could be classified into long-/medium-/short-term debt instruments.

i. **Long-term Debt Instruments:** Debt obligations for a period of more than three years are known as long-term debt instruments. They are Debentures/Bonds and Preference shares.

ii. **Medium-term Debt Instruments:** Medium-term obligations range for a period between 1-3 years. The method of raising such funds will either be a debt issue or through the "Fixed Deposit" program of the companies.

iii. **Short-term Debt Instruments:** Debt obligations for a short period payable within one year or less than one year are covered under money market instruments. They are Commercial Papers and Certificates of Deposits.

REGULATORY REQUIREMENTS

The following guidelines are applicable for the issue of Fully Convertible Debentures (FCDs), Partly Convertible Debentures (PCDs) and Non-convertible Debentures (NCDs):

a. Compulsory credit rating is required if conversion is made for FCDs after 18 months.

b. In case of NCD/PCD, credit rating is compulsory where maturity exceeds 18 months.

c. Before the NCDs or non-convertible portion of PCDs are rolled over, fresh credit rating shall be obtained within a period of 6 months prior to the date of redemption and communicated to the debenture holders before the rollover.

d. The rating of commercial paper and fixed deposit is also compulsory.

The rating process of debt instruments commences at the issuer's request. Based on the tenure of the instruments, the rating agency will gather the requisite data. The rating methodologies of long-/medium-/short-term debt securities are discussed here.

The key parameters taken into account while rating a debt instrument are as follows:

I. **Industry Evaluation** – This involves an evaluation of the following:

- General profile of the industry, major competitors, extent of competition, growth potential and trend of both domestic and international development.
- Demand and supply position of the product, existing installed and licensed capacities, capacities in the pipeline.
- Position of import and export, technological developments, price trends, availability, source, quality and prices of major inputs.
- Government policies and regulations affecting the industry and other major problems and constraints.

II. **Unit Evaluation** – This company level evaluation involves an assessment of the following:

- Position of the unit in the industry, market share, competitive edge, major strengths and weaknesses.
- Product range and quality, market segmentation and seasonality of the market, marketing strategies, channels and network.
- Future program, goals and targets. Product range and portfolio diversification, need, scope and prospects of diversification and expansion.
- Group/associate company performances, support and synergy.

III. **Technical Evaluation** – The technical competence of the company is assessed by focusing on the following:

- Level of technology, operative efficiency of the plant, vintage of the plant and level of maintenance.
- Need and plan for modernization and debottlenecking.
- Competence and support of technical collaborators, terms of collaboration, royalty and buy-back.
- In-house expertise and expertise for absorption of technology.
- Efforts for skill development and productivity improvement.
- Locational advantages and disadvantages, and infrastructural facilities.

- Yield analysis, extent of rejection at different stages including quality complaints by the customers.
- Protection against hazards and other natural calamities.

IV. **Financial Evaluation** – The financial strength of the client is assessed by examining the following aspects:

- Accounting policies, extent of disclosures, inventory valuation, depreciation and other provisions, revaluation of assets, management of assets and liabilities, asset quality, contingent and off balance sheet liabilities.
- Auditor's reports and Director's report.
- Capitalization trends and policies.
- Cash flow trends and potential, future projections and underlying assumptions in respect of profitability and liquidity management.
- Return on capital employed, interest coverage, debt-service coverage and fixed assets coverage.
- Practice of debt servicing, requirement of future debt servicing, major fund commitments and overall liquidity.
- Financial flexibility, unutilized borrowing potential, standing in the capital market, capability to raise resources and to absorb debts.
- Working capital management, control over receivables and inventory.
- Budgeting and cost control system.
- Sensitivity to changes in interest rates, tax rates and exchange rates, hedging of risks.

V. **Statutory Evaluation** – The statutory status of the company will be evaluated in the following manner:

- Compliance status in respect of Government regulations and directives affecting the industry/unit, position of obtaining approvals and no objection may be necessary.
- Terms of issue, debenture trustees, and trust deeds. Securities and charges created over assets.
- Pending disputes by and against the concern.
- Practices regarding payment of statutory dues.

VI. **Management Evaluation** – The evaluation of the company's management will aid in assessing the willingness of the borrower to repay. The aspects involved in such evaluation are:

- Shareholding pattern and controlling interest.
- Composition of the Board of Directors.
- Organizational profile, adequacy and quality of organizational set-up, extent and effectiveness of delegation.
- Competence and integrity of management and its capability to face crisis.
- Policies and practices regarding recruitment, training, motivation and career planning of employees.
- Style of management functioning, approach and outlook, organizational culture, employee morale and industrial relation.
- Management information and monitoring system.

In addition to the above mentioned parameters, the rating analysis of debt instruments issued by finance companies may include the following parameters:

i. ***Regulatory and Competitive Environment Analysis*** – Effect of changes in regulatory structure on the operations of the finance company.

ii. ***Fundamental Analysis*** – The fundamental issues that need to be evaluated are:

- Assessment of the net worth and the capital adequacy of the finance company.
- Details relating to the sources of finance, cost of funds, maturity of the sources, etc.
- Analyzing the credit exposures of individuals/corporates, etc., and examining the quality of credit risk management.
- Maturity matching process of assets and liabilities and the liquidity management techniques.
- Track record of profits, spreads maintained, non-interest income, etc.
- Exposure to interest rate fluctuations and hedging mechanism.
- Revision of tax laws and the sensitivity of the company to such changes.

While the above credit analysis generally applies to long- and medium-term debt paper, the criteria for short-term debt paper will be slightly different.

CREDIT ANALYSIS FOR CORPORATE BONDS[6]

Traditionally, credit analysis of corporate bonds always placed emphasis on default risk associated with bonds i.e., the risk that the issuer will not honor its commitments on repayment of principal and/or payment of interest. Thus it is skewed and it is often combined with ratio analysis. Such an analysis worked well when investors were in the habit of purchasing bonds with an intention of holding it till maturity and interest rates were relatively stable. In a stable interest rate environment, changes in the bond prices are minimal and the fluctuations due to changes in the credit rating of the issuer are also minimal because the bondholder intends to hold till maturity. Now the investors are willing to trade in bonds with the purpose of making some gains when interest rates change in their favor. The other dimension of credit analysis of bonds deals with the purpose of buying a bond. It deals with the possibility of change in the price of the bond in relation to the change in the credit quality. To assess this scenario, profitability ratios and turnover ratios commonly associated with stock valuation are analyzed. Both dimensions are equally important in corporate bond analysis.

Now both the areas of common stock and bond research are viewed complementarily with the development of options theory. The value of an option is determined primarily based on the corresponding equity valuation. The market value of an option is directly proportional to the market value of equity. The implication of this theory is that it is imperative to analyze both the markets at a time to arrive at a final judgment on the credit rating for the firm being considered. When the relative valuation of the bond as measured by the rating is low compared with the equity valuation as measured by the market/book, one or both the markets may be incorrectly viewing the company. Three major segments are identified as issuing bonds frequently viz., Industries, Utilities and Finance Companies.

6 This section draws from "Credit Analysis for Corporate Bonds" in the Handbook of Fixed Income Securities, 5th Edition, by Frank J Fabozzi, *McGraw Hill*.

Industry Analysis

Bonds can be valued only after a thorough company analysis. Industry Analysis should precede company analysis. For example, a company growing at the rate of 20% annually may appear to be attractive. However, if the industry is growing at the rate of 60% annually, then such a company is competitively weak. However, growth of the industry cannot be the only criteria for bond valuation and there are other factors to be given importance to get an insight about the company's prospects.

Other factors that affect bond valuation are economic cycle, growth prospects, research and development expenses, competition, sources of supply, degree of regulation, labor and finally the accounting principles. All these variables should be considered in a global context for valuation.

ECONOMIC CYCLE

The economic cyclicality of an industry is the first variable an analyst should consider when reviewing an industry. Industries are sensitive to many economic variables like GNP, NNP, etc. The growth in earnings per share of a firm should be measured relative to the growth trend of the industry to which the firm belongs. Some industries may be dependent on general growth of the economy and some on demographic factors. Industries such as nursing home industry are dependent on the composition of the population, whereas industries like banking industry are dependent on the movement of interest rates.

Also, many a times, various segments within a company or industry move counter-cyclically or at least with different lags in relation to the general economy. For instance, an industry can be divided into various segments, say the IT industry; it can be divided into various segments like hardware, software and IT enabled services, etc. Each of these segments may respond differently to economic factors. In analyzing the IT sector, each segment must be compared with the performance of the sub-industry.

Growth Prospects

The growth prospects are analyzed for an industry as a growing industry tends to have a positive impact on the earnings of the company which in turn helps the company to have a better potential for credit improvement than does a company whose industry growth prospects are below average. However, the importance of barriers to entry and the sustainability of growth must not be ignored while the growth prospects are being studied for an industry, since a growing industry tends to attract many new participants to enter the business, which leads to excess supply of the products, declining margins and possible bankruptcies.

Research and Development Expenses

The research and development expenditure required to maintain or expand market position is also one of the factors that affects the credit rating analysis of the bond. In this Information Age, companies should incessantly work towards keeping themselves up-to-date and bring about innovation in the company through adequate spending on research and development. Even if a company enjoys a comfortable position in the industry, if it does not have the financial resources to maintain a technological lead or at least expend sufficient amount of money to keep itself technologically up-to-date, its position is likely to deteriorate in the long run. In the short run, if a company is not spending adequately on R&D, it may still produce above average results in the form of expanded margins. Evaluation of R&D is not as easy as it appears to be. Adequate spending is not the only way to improve profits but spending in the right direction determines the sustainability of the above average results. Channelizing the funds in the right direction is another important factor to be considered. When unduly excess amount is spent on a short lived technology, then credit quality may deteriorate in the long run.

Competition

Staying in the race is more important in this highly competitive world. Competitive factors differ across industries. Competition is most often based on quality and price. All forms of competition are influenced by fluctuations in relative currency values either directly or indirectly. Incidentally, companies that perform well are those that compete successfully on a global basis and concentrate on the regions with highest growth potential. As long as high quality is delivered at a reasonable price, consumers are not very much inclined in knowing the origin of the product or service. Competition within an industry directly relates to the market structure of an industry and has implications for pricing flexibility. Monopolistic market enjoys the discretion of fixing the prices with a view to maximize their profits since there is no threat of competitive price. However, in an oligopolistic industry structure, the prices are decided by the industry leaders and the rest of the small players have to follow though their costs of production may be much higher than the large players in the industry. In the worst case, small players may have to pull themselves out of the market because of their inability to remain competitive.

Another major problem that may be encountered is overcapacity of the industry. Overcapacity triggers price wars. Price wars in turn lead to financial deterioration in the entire industry as battles for market share are accompanied by declining profits or losses.

Sources of Supply

Sources of supply are strongly affected by the market structure of an industry and its competitive forces. A company having its own internal sources of supply is definitely better positioned than one which relies on outside sources. But a company which has adequate powers to pass along the increased costs can be considered to be in an enviable position though it may not be self sufficient in its factors of production.

Degree of Regulation

The best example of the industry that is highly regulated is the electric utility. All phases of this industry are subject to regulation. The focus of the analysts should be on the direction of regulation and the effect it has on the profitability of the company and not on the existence or absence of the regulations. The degree of regulation affecting a particular industry has an impact on the profitability of the companies in that industry, which, in turn, determines the number of players in the industry.

Labor

The labor situation of an industry should also be analyzed. Strike history, unionization of the industry labor, flexibility of the management in reducing the labor force, etc., are to be analyzed. Labor situation assumes significance particularly in a labor intensive industry. Contrary to the common perception that the power of unions has weakened, it is observed that the unions are able to disrupt production because of “just-in-time” inventory management.

Accounting

The principles and practice of accounting are very important for industry analysis. Familiarity with specific industry practices in accounting is a prerequisite to proceed with a company analysis. The degree of conservatism on the part of the company in applying the generally accepted accounting principles should also be analyzed. The norm of an industry should be confirmed for comparing the company norms with those of the industry. Some companies adopt the practice of hiding the poor performing divisions and highlighting only good performing ones. Both adjusted and unadjusted results are to be analyzed to have a fair view of the overall trend.

Financial Analysis

The next step in the credit analysis is financial analysis. Such an analysis involves three phases:

i. Traditional Ratio Analysis

ii. Return on Equity (ROE) Analysis

iii. Analysis of Non-financial Factors.

TRADITIONAL RATIO ANALYSIS

There are nearly eight ratios that are most often used in financial analysis. These ratios have a wide degree of applications. But some ratios may be industry specific and they assume significance for only a particular industry and may be irrelevant in any other industry.

Pre-tax Interest Coverage

This ratio measures the number of times interest charges and fixed obligations, of the company if any, are covered on a pre-tax basis. If interest coverage is less than 1, then the company may have to borrow cash or use cash flow or sale of assets to meet its interest payments. The higher the ratio, the safer the credit. The utility of the pre-tax coverage ratios is dependent on the company's other fixed obligations. If a company has other fixed obligations such as lease rentals, then coverage should include these lease obligations too.

Pre-tax Interest Coverage = (Pre-tax Income from continuing operations + Interest expenses)/Gross interest

Pre-tax Interest Coverage including fixed obligation (Rent) of the company = (Pre-tax Income from continuing operations + Interest expense + Rent)/ (Gross interest + Rent)

Once pre-tax interest coverage and fixed coverage are calculated, it is necessary to analyze the ratios' absolute levels and the numbers relative to those of the industry.

Standard & Poor's 1992-94 median ratios of pre-tax coverage ranges for the senior debt of industrial companies were as follows:

Rating Classification	Pre-tax Interest Coverage
AAA	17.39
AA	9.74
A	5.35
BBB	2.91

Leverage

Leverage can be expressed in terms of long-term debt as a percentage of total capitalization. When debt is higher, higher percentage of operating income needs to be used to meet fixed obligations. For a highly leveraged firm, margin of safety is an important factor to be considered. Margin of safety is defined as the percentage by which operating income could decline and still be sufficient to allow the company to meet its fixed obligations.

Standard & Poor's 1992-94 median ratios of leverage for the senior debt of industrial companies were as follows:

Rating Classification	Long-term Debt/ Capitalization
AAA	13.5
AA	19.7
A	33.2
BBB	44.8

A firm's capitalization structure as stated in the recent balance sheet is used to compute leverage of a firm. The analyst should also calculate capitalization using an approximation for the market value of the common stock. When the book value of common stock of a firm is higher than its market value, then leverage is understated by the traditional approach of measuring leverage.

When a firm is engaged in repurchasing its own stock in a leveraged recapitalization, there is a possibility of stockholder's equity being negative. There is a wide variation across industries in the degree of leverage and margin of safety. Finance companies have been highly leveraged with their debt to equity ratios in the range of 10:1. Analyzing the absolute and relative levels of leverage is not sufficient and the debt itself needs to be evaluated. If a firm's debt is tied to the prime rate, then its margins may be squeezed when the interest rates rise without any compensating increase in the price of the goods or services offered by the firm. However, such a debt structure is favorable under certain circumstances. Whatever be the situation, it is not possible to precisely estimate the interest obligation for the firm in any particular year. Hence a company with a small percentage of floating rate debt is preferable to a leveraged firm with a high percentage of floating rate debt.

The next component of debt that needs to be evaluated is its maturity structure. The analyst should consider the full face value which is due at maturity while maturity structure and the refinancing plans of the company are being evaluated. If the company has signed any operating lease agreement, then its leverage is understated. Capitalization of operating leases is required to get a true measure of leverage. The next important factor to be focused is the firm's bank lines of credit since it comprises a significant portion of a firm's long-term debt. These lines should be evaluated in terms of undrawn capacity and security interests granted.

Cash Flow

Cash flow as a percentage of total debt is the next ratio. Cash flow or cash from operations is defined as net income from operations plus depreciation, depletion, amortization and deferred taxes minus the non-cash contribution from subsidiaries (if any). Any abnormal sources and uses of funds should be excluded when determining the overall trend of cash flow coverage. Cash dividends from subsidiaries should also be evaluated in terms of its appropriateness and also in terms of parents company's control over the limiting of dividends.

Standard & Poor's 1992-94 median values of cash flow ratio for the senior debt of industrial companies were as follows:

Rating Classification	Long-term Debt/ Capitalization
AAA	97.5
AA	68.5
A	43.8
BBB	29.9

Net Assets

This provides emphasis on the liquidity value of the firm. It is expressed as net assets to total debt. Liquidation value will often differ dramatically from the value stated on the balance sheet. An analyst should aim to analyze this real value of the firm. Liquidation value is the value realized when a going concern is sold. For instance, if the operations of a nuclear generating plant are affected due to some technical problems and the chance of getting an operating license for the same is not assured, then such an asset is probably overstated in the balance sheet. A bondholder should be cautious of such an asset being offered as security. This leads to the importance of the liquidity of the asset apart from its market value. A company with a high proportion of its assets in the form of cash and marketable securities is said to be in a much stronger position than a company which primarily deals with illiquid real estate.

Increased events of takeovers, recapitalizations and other restructurings have increased the importance of asset coverage position. The bondholders may be forced to be in an unfavorable situation in the event of some takeovers whereby their position becomes subordinate to other new debtholders who assume seniority

from the takeover. Though it may be difficult for the analysts to predict takeovers in advance, they can still evaluate the degree of protection from takeovers and any other forms of restructures that the bond indenture offers.

In the worst case, the analyst should be able to assess the asset coverage available in the case of bankruptcy. This assumes significance especially when the firm is exposed to lease obligations because the debtor generally has the tendency to reject leases in bankruptcy. In the case of lease rejections, the resulting asset protection may depend on a legal determination of whether the underlying lease is a true lease or just a financial arrangement. The complexity arises even if the lease is found to be a true lease, since there is no way to find out if the lease is related to a non-residential real property or to personal property. The difference is in security in that the damages under a lease of non-residential real property are limited to three years of lease payments. Damages under a lease of personal property are all due under the lease.

Intangibles

Intangibles often represent a small portion on the asset side of the balance sheet. But in some special cases like active acquisition programs, intangibles can form a marked portion of assets. In such cases, an analyst should estimate the actual value of the intangibles and determine whether this value is in conformity with the market value. A carrying value higher than the market value indicates a potential for write down of assets. The actual write down will occur only when the firm sells the subsidiary with which the intangibles are identified. And if the value is not in consonance with market value, an appropriate adjustment to the capitalization ratios should be done.

AGE AND CONDITION OF PLANT

If the age of a company's plant is significantly different from the industry standards, then it plays a vital role in credit analysis as it may signal ineffective utilization of the assets. In the long run, serves as an indication capital expenditure of any requirement in the future to replace the worn out asset. Inadequate depreciation provisions for the old plant increase the reported earnings.

The Financial Accounting Standards Board Statement 33 mandates adequate information from the companies to explain the effect of changing prices. This information provides the analyst an indication of the magnitude of the effects of inflation on a given company. But the effects differ from industry to industry.

WORKING CAPITAL

Working capital is an important tool used for defining the financial stability and sustainability of the firm in short-term. Working capital is defined as current assets minus current liabilities. Working capital is considered a primary measure of a company's financial stability. The stronger the company's liquidity measures, the better it can manage a downturn in business and cash flow. Other similar measures used for assessing the stability of a firm are current ratio and the quick ratio. In assessing the working capital, an analyst should look at the normal working capital requirements of the company. This is important in seasonal industries, where working capital requirements fluctuate widely.

ANALYSIS OF COMPONENTS OF RETURN ON EQUITY

After the financial analysis, a bond analyst needs to focus on the movement of earnings of a company and its historical Return on Equity (ROE) because it gives him/her the necessary insights into the components of ROE and an indication of the sources of future growth. Return on Equity is Profit After Tax (PAT)/Equity. It can be further broken down as:

= (PAT/Equity) x (Sales/Assets) x (Assets/Equity)

In analyzing these three components of ROE, an analyst should examine the progress of each variable over a period of at least 5 years and through at least one business cycle. The progression of each variable should be compared with that of the industry and any deviations observed should be analyzed separately.

For instance, consider two companies having same ROE. One company may have higher level of leverage and another may have a higher asset turnover ratio. Since the degree of leverage is decided by the management, the analysts' focus should be on asset turnover. If this ratio is low, it may be either because of lower level of sales or because of higher level of assets as the company may be engaged in deploying more new assets. On the other hand, if the ratio is high, then it may indicate a need for more capital. In this case, the analyst should view from the point of the opportunities available for the firm to enhance its growth. If growth measures are adopted by inducting more capital, then the effect on the cost of capital of this new source of capital should also be analyzed.

An astute analyst would understand that a similar pattern of ROE cannot be expected across different companies in a particular industry as it is largely a management phenomenon. For example, the emphasis may be on the net profit margin or asset turnover and it varies as per the perception of the management concerned. The trend of the components is equally important as the absolute levels. Any analyst interested in financial ratios for any particular industry can contract the services of a suitable rating agency to help them in their analysis of individual firms in the industry.

NON-FINANCIAL FACTORS

Following the traditional bond analysis based on financial factors is the non-financial analysis. Some important non-financial factors are the degree of foreign exposure and the quality of management. Annual report should specify the amount of foreign exposure. Specific country exposure at times is not clear enough because the annual report normally lists foreign exposure by broad geographic divisions. If there is any indication of a major portion of revenue and income coming from potentially unstable areas, then the analyst should be careful in interpreting the total revenue and income coming from that area. Other parameters to be considered are nationalization of assets, degree of currency exposure, hedging strategies, if any, adopted by the management to deal with currency exposure, etc.

A clear comprehension of the effect of currency risks gains importance in lieu of increased globalization of the bond markets. However, the parameters that are difficult to assess are the quality and depth of management as it is difficult to quantify them. One of the best ways to assess the quality of management is to spend some time with management and get an understanding of their functioning. Progressive earnings is another representative of good quality management. Some of the negative aspects are numerous changes of management and philosophy, excessive stability (as it implies absence of plans for growth), conservative attitude towards changes in markets, inflexibility in operations due to changes in management, etc. Indicative traits of a good management team are depth, a clear line of succession in a situation of retirement of the chief officers and a wide variation in age composition in the team.

Indenture Provisions

Rights and obligations of the borrower and lender with respect to a bond issue are specified in a legal document termed "Indenture" Indenture analysis should form a part of a credit review because the provisions stated in an indenture establish rules for various spheres of operation for the borrower. Though these provisions are considered to provide safeguards for the lender, an indenture also covers other aspects like the limitation on the issuance of additional debt, sale and leasebacks and sinking fund provisions.

Within an industry, the indentures of the bonds look similar. There is no perfect correlation between the quality rating of the senior debt of a company and the stringency of indenture provisions. Provisions are less restrictive in the case of subordinated debt of one company compared to the senior debt of the same

company. When a company's indenture is being analyzed, standard industry provisions should be compared with those of the industry. A careful examination of any deviation is imperative on the part of the analyst. A more restrictive nature is not preferable, if the provisions are so restrictive that it hinders the efficient operation of the company.

Bond indentures should be analyzed and compared with the covenants of bank lines. Bank lines tend to be more restrictive than bond indentures. Some of the common provisions found in most indentures are discussed here. These provisions can be categorized based on industry as the basic provisions are fairly uniform within an industry. Definitions in indentures should be carefully interpreted as they tend to vary marginally from one indenture to another.

UTILITY INDENTURES

Security

It is the first provision specified in a utility indenture. Specifications in this provision include the details of the mortgaged property, ranking of the new debt relative to outstanding debt, etc. Ranking is important because all bondholders must be considered equal and companies must often retain antiquated provisions in their indentures. If structural changes occur in the industry after the initial writing of the indenture, then these provisions act as hurdles for efficient running of a company. Though appropriate changes can be subsequently introduced in the provisions to suit the changed requirement, most often it takes time for these changes to become effective, as they require approval from the associated parties to the indenture. A company may also retire certain old issues in order to eliminate a covenant that has not been included in the recent offerings.

Issuance of Additional Bonds

This provision specifies the conditions under which a company may issue additional first mortgage bonds. This provision normally has one or both of the following: (i) Debt test and (ii) Earnings test. The debt test poses a restriction on the amount of bonds that may be issued under the mortgage to a certain percentage of net property or net property additions, the principal amount of retired bonds and deposited cash. The earnings test limits the issuance of additional bonds under the mortgage unless earnings for a particular period cover interest payments at a specified level. The definitions mentioned in these tests are more important. According to accounting standard SFAS 90, utilities should record a loss against income for any part of an investment in an abandoned plant for which recovery has been disallowed. All costs not allowed for ratemaking (deciding the rate of depreciation) purposes are to be recognized as a loss against income as soon as the loss becomes possible with respect to disallowances of new plant costs arising from a limit posed on expenditures. These losses may be reported either by recording the cumulative losses till the year of adoption of SFAS 90 or by restating financial statements for prior fiscal years.

Maintenance and Replacement Fund (M&R Fund)

The main objective of this fund is to ensure that the mortgaged property is maintained in good working condition. Because of this requirement, a certain percentage of gross operating revenues, a percentage of aggregate bonded indebtedness, or a percentage of the utility's property account would be paid to the trustee for the M&R fund. Normal maintenance expenditures are usually met by the fund and if there is any excess requirement, a company may contribute cash, or pledge unbonded property additions, or bonds.

Of late, M&R fund requirements are being made formula determined and exclude the large portion of operating income attributable to an increase in fuel costs. But many companies are not willing to use M&R funds for calling bonds as they opine that this would generate unfavorable situation to bondholders.

Redemption Provisions

The redemption or call provision specifies the time and the price at which a company calls its bonds. It may include refunding whereby a company may replace outstanding bonds with another debt issue sold at a lower interest expense. It acts as a protection to bondholders from being pushed to unfavorable or disadvantageous situation in an inappropriate time. Most often, corporate treasurers try to explore all possibilities of redeeming high-coupon debt. An analyst should check for any possibility of untimely and unfavorable redemption provision.

Sinking Fund

A fixed amount is paid annually by a company towards a sinking fund to make the fund amount on maturity adequate to meet the bond retirement obligations. For electric utilities, normal sinking fund provision is 1%, which commences at the end of the refunding period. An analyst should be familiar with various types of provisions for sinking fund because they have a direct impact on the possibility of bonds being called for sinking fund purposes. Some types of sinking funds provide for a 1 or 1.5% of the total requirement of redeeming all outstanding bonds. The obligation may be met by the specified percentage of each outstanding issue, by cash or by applying the whole requirement against one or several issues.

Other Provisions

An indenture also covers the events of default, modification of the mortgage, security, limitations on borrowings, priority, and the powers and obligations of the trustee. Though there is some standard format for these provisions, any deviations observed should be evaluated carefully. In particular, the ability of a company to eliminate assets from its mortgage indenture should be analyzed/scrutinized carefully. Assets can be eliminated either at fair market value or the value at which it is done may not be specified in the indenture at all.

INDUSTRIAL INDENTURES

Provisions of an industrial indenture are more or less similar to those of a utility's indenture. However, there are a few specific items that are to be included in an industrial indenture. Five important provisions identified thus are:

i. Negative Pledge Clause

ii. Limitation on Sale and Leaseback Transactions

iii. Sale of Assets or Merger

iv. Dividend Test

v. Debt Test.

Negative Pledge Clause

The negative pledge clause states that the company is not allowed to create or assume liens to the extent that more than a percentage of Consolidated Net Tangible Assets (CNTA) is secured without providing the same security to the bondholders. This gives an assurance for the bondholders regarding the security in the form of specific assets of the company. A specific percentage of CNTA that is not included in this provision is referred to as exempted indebtedness. This exclusion serves as a flexible alternative for the company.

Limitation on Sale and Leaseback Transactions

The difference between this provision and the negative pledge clause is that it provides protection to the bondholders against the use of assets provided as security for selling and leasing purposes. In general, this provision states that the proceeds of sale or leasing back of the assets are used for the retirement of the debt under consideration or used for acquisition of another property which would serve as a security of the bondholders.

Sale of Assets or Merger

This provision acts as a safeguard to the bondholders in the event of substantial sale of assets by the company or merger of the company with another. This provision states that the debt may be retired or be transferred to the merged company. The important point to be remembered is that the merged company to which the debt is transferred may not have the same credit rating as that of the original company.

Dividend Test

Rules for the payments of dividends are mentioned in this provision. Generally, a company is allowed to pay dividends to the extent that they are less than the sum of net income of the previous year and the earnings of a year or two previous years. It ensures that though a company is entitled to pay continuous dividends, the bondholders will not be deprived of the fulfillment of the firm's obligations towards them.

Debt Test

It specifies an upper limit for debt/assets ratio to limit the amount of debt that may be issued by a firm. Though this provision does not form a part of indenture accompanying public offerings, private placements often include it. The maximum limit on debt is normally specified as a percentage of total assets.

FINANCIAL INDENTURES

Sinking Fund and Refunding Provisions

Finance issues of short maturity are non-callable and those of longer maturity provide some call protection. When the receivables are seen to be slowing down there is a possibility of an issue being called. However, sinking fund is not very common in finance issues as they are in industrial indentures.

Dividend Test

A dividend test provision in a financial indenture limits the amount of dividends that can be ploughed back from a finance subsidiary to the parent and thereby protects the bondholder against a parent siphoning off the funds from the subsidiary.

Limitation on Liens

This provision limits the extent to which a company can pledge its assets without an appropriate matching protection to the bondholder.

Restriction on Debt Test

It is similar to the debt test provision of an industrial indenture in that it also limits the amount of debt that a firm can issue.

Equity Rating

Risk is an integral element of the financial business. While there can rarely be a zero risk situation, there can, however, be several ways in which risk minimization or even risk credit rating comes to play an important role as a signal for risk assessment. Ratings are used primarily by investors to assess the risk level and hence to optimize risk-return trade-off, while credit rating is primarily assigned to identify risks which may be worth avoiding.

However, one professional debt rating agency, Investment Information and Credit Rating Agency (ICRA), has ventured into rating equities, which it prefers to call equity grading.

A separate division within ICRA, christened as Earnings Prospects and Risk Analysis (EPRA) Group, has been set-up to perform two not entirely unrelated tasks – grading the primary market and assessing the secondary market. Grading is undertaken at the instance of the issuer and assessment at the instance of the investor – the latter is better known as equity research.

ICRA's grading is grouped into four categories – ERA, ERB, ERC and ERD – in descending order of earnings prospects viz., excellent, good, moderate and poor. Each has three sub-grades correlated with a degree of risk, measured as high, moderate and low. These gradings are depicted in Table 8.

Table 8: ICRA's Equity Grades

Grade	Earnings prospects in medium-term	Risk	Changes in Economics/Business Circumstances
ERA 1	Excellent	Low	Unlikely to significantly impair the underlying fundamentals
ERA 2	Excellent	Moderate	May adversely affect the underlying fundamentals
ERA 3	Excellent	High	Can significantly impair the underlying fundamentals
ERB 1	Good	Low	Unlikely to significantly impair the underlying fundamentals
ERB 2	Good	Moderate	May adversely affect the underlying fundamentals
ERB 3	Good	High	Can significantly impair the underlying fundamentals
ERC 1	Moderate	Low	Unlikely to significantly impair the underlying fundamentals
ERC 2	Moderate	Moderate	May adversely affect the underlying fundamentals
ERC 3	Moderate	High	Can significantly impair the underlying fundamentals
ERD 1	Poor	Low	Unlikely to significantly impair the underlying fundamentals
ERD 2	Poor	Moderate	May adversely affect the underlying fundamentals
ERD 3	Poor	High	Can significantly impair the underlying fundamentals.

Certainly, the concept of equity rating is not new, since many investment magazines have been doing it by way of assigning scores to capital issues. But what is new is that a professional rating agency has undertaken the task.

In debt rating, one is naturally concerned with the ability of an enterprise to service its debt. But with that logic, it should be able to predict the default risk. Such a concept does not hold true for equity, as expectations of earnings will vary between the investors depending on their risk profile. But ICRA has strongly defended this criticism saying that its range of twelve grades would effectively take care of different risk profiles and in any case, it is not an invitation to subscribe, but an information, which can be used at the discretion of the investor. To further substantiate through an example, ERA 3 categorizes an issue as follows: investors can avail of a solid professional opinion on the risk related earnings potential of an issue. So, the investor can at least know what he is getting into. He has at his disposal the opinion of a professional body.

According to ICRA, the information it disseminates to the investors is superior to any other, as it does not take a 'position', in the issue. It has no axe to grind. Apart from this, ICRA does not target 'buy today, sell tommorrow', kind of investors, but those who look for long-term returns. Though the grading is done at the instance of the issuer, the merchant banker may well insist on it. In the absence of the Controller of Capital Issues and the obsession with high premium, equity grades could well serve as benchmarks. This can probably improve the negotiating skills of the merchant banker with the issuer who may insist on a higher price than what the merchant banker feels comfortable about. It can, thus, definitely improve the comfort level of the merchant banker. If the merchant banker can ask for the grading before accepting the assignment, it can be an extremely useful piece of information for obvious reasons.

Another reason for accepting EPRA is that the merchant banker himself cannot undertake a comparable task. The reason is that the kind of research which is at present undertaken by merchant bankers relates basically to marketing an issue and there are only a handful of merchant bankers with a good research base. They too would prefer to use equity grading as a second opinion, which either confirms their own analysis, or adds value to it.

Equity Grading Process

The Equity Grading process commences at the request of the prospective issuer and on receipt of the required information from the issuer and culminates in an opinion from CRA expressed symbolically as an equity grade. A team of analysts collect data and information from the books and records of the company and meet its executives. One of the goals of these meetings is to provide the management the opportunity to explain its business and strategies to the analysts. The support of in-house research and database of the CRA as well as industry studies of reputable agencies are also availed of.

After interacting with management and analyzing the data, the analysts present their findings to a Committee which then takes a decision on the relative Equity Grade of the issuer. The process normally takes three to four weeks from the time of receiving the required data from the management. The information which is provided by the company to the CRA is on a confidential basis and shall not be publicly shared. The issuer also has an option regarding use of the grade. However, once the issuer decides to use the grade, the CRA monitors the working of the company on a continuous basis. Based on the information obtained from the company, or collected by the CRA on its own, during that period, the Equity Grade may be changed suitably. The CRA reserves the right to make such Equity Grade/change in Equity Grade, public.

Equity Assessment

The equity assessment process commences at the request of an investor and the consent of the company being assessed. The CRA may or may not disclose the investor's identity to the company depending upon the investor's preference. The rest of the assessment process is similar to the Equity Grading process, except that the end result is not in the form of a symbol but an assessment report specific to the investor's need and intended to be used only by the investor.

METHODOLOGY

The CRA analyzes and appraises all relevant factors that have a bearing on the equity quality of the issuer/company. The key factors looked into depend on the nature of the issuer company.

The opinions are based on an in-depth study of the economic and industry/business environment, competence and effectiveness of management, promoters' profile, marketing strategies, size and growth of revenues, competitive edge, state of technology, operational efficiency, liquidity, financial flexibility, asset quality as also the accounting quality, profitability and the hedging of risks. These factors further suggest the level, growth and composition of earnings as also the financial strength which may be expected in the future.

Benefits to Issuers

The CRA's opinions help the issuing company to broaden the market for their equity. As the company's brand image is replaced by objective opinions, the lesser known companies are also able to access the equity market. Moreover, Equity Grading/Equity Assessment may help in stabilizing issuers' access to the equity market in unfavorable market conditions.

Value to Investors

Equity Grading/Equity Assessment gives to the market participants a timely access to independent, unbiased and dependable opinions on equity quality in a user-friendly manner and therefore, help investors design their portfolios by choosing investment options in the equity market according to their profile and preferences.

In a country like India where quantitative obsessions like EPS and P/E factor are given more weightage, the CRA's qualitative indicator could bring in a degree of freshness. But the task of elaborating and explaining the system of grading may involve a lot of time making the average investor become aware of its meaning and be convinced of a practice which is not prevalent.

Grey Areas in Equity Grading

Large or small, if merchant bankers more than issuers warm up to equity grading offered by ICRA, we could be in for a totally different retailing of equity. SEBI has passed on the responsibility of vetting the prospectus to the merchant banker. Equity Grading could then be in a better position.

However, there appear to be certain issues which equity grading may highlight. Some of them are:

- Equity grading should be done. But who should do it? Many experts argue that it should not be done by a credit rating agency, but by merchant bankers.
- Another question is that of the issue price. Is the grading a qualification of the issue price? In which case, does it not amount to an encroachment on the merchant banker's territory?
- In the case of projects, which have been appraised by the financial institutions, what specific value addition can equity grading provide? Considering that financial institutions make their own assessment of business projections, can the CRA still make a contribution?
- As the issue has to be understood as being determined by the market, can the market conditions be ignored? Will the merchant bankers welcome equity rating and make use of it?
- Considering the fact that small issues are not cost-effective, will the smaller issues be graded? Only large issues can go for grading, which means that only large merchant bankers will make use of it.

Due to the issues raised above, the market perception towards equity grading did not seem to be positive. The sole equity grading service offered by ICRA could not take-off due to this.

Indian Credit Rating Agencies

The Indian economy has come a long way from the crisis years of 1990 and 1991. Perhaps, the most impressive aspect of the turnaround has been in relation to the external sector. The substantial improvement both in the trade account and the invisible account of India's balance of payments needs special mention. The fairly substantial inflow of funds under the various investment channels, reflects the growing confidence of the foreign investors in India. On the whole, the reform process has begun to yield results. GDP is expected to grow beyond 5%. The role of the credit rating agencies is becoming increasingly important in the volatile scenario.

In India, the credit rating service is offered by four agencies which include:

i. The Credit Rating Information Services of India Ltd. (CRISIL)

ii. Credit Analysis and Research Ltd. (CARE)

iii. Investment Information and Credit Rating Agency of India Ltd. (ICRA)

iv. FiTCH Ratings India Pvt. Ltd. (Previously DCR India).

The services offered by CRISIL are given below.

CREDIT RATING INFORMATION SERVICES OF INDIA LTD. (CRISIL)

CRISIL was the first credit rating agency established in India in 1987. It was promoted initially by ICICI, UTI, HDFC and its shareholders include ADB, LIC, GIC and some nationalized and foreign banks. In 1993, CRISIL made its first public offer of equity.

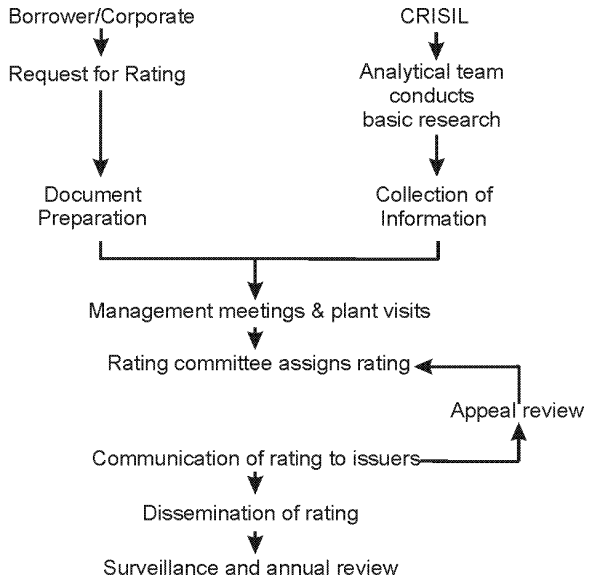
Objectives of CRISIL

- To assist both individual and institutional investors in making investment decisions in fixed income securities.
- To enable corporates to raise funds in large amounts and at fair cost from a wide spectrum of investors.
- To enable intermediaries in placing their debt instruments with investors by providing them with an effective marketing tool.
- To provide regulators with a market-driven system for bringing about discipline and healthy growth of capital markets.
- Rating Services

Services offered by CRISIL as a credit rating agency include:

- Corporate bond ratings
- CP ratings
- Rating municipal debt
- Infrastructural bond ratings
- Utilities ratings
- State government ratings
- Rating of asset backed securities
- Ratings of structured obligations
- Rating of toll road bonds
- Rating of debt instruments of cellular service providers
- Mutual funds ratings.

Figure 18: CRISIL'S Rating Process



Rating Methodology and Rating Process

CRISIL's rating methodology includes an analysis of the following risk exposures of the corporate/borrower:

a. Industry Risk Analysis

b. Business Risk Analysis

c. Financial Risk Analysis

d. Management Risk Analysis

e. Fundamental Risk Analysis.

Table 9: CRISIL Ratings

Capacity for timely repayment of interest and principal	Debentures/ Bonds	Fixed Deposits	Short-term Instruments	Developers' Projects	Structured Obligations	Bond Fund Portfolios
Highest Safety	AAA	FAAA	P-1	PA1	AAA(so)	AAAf
High Safety	AA	FAA	P-2	PA2	AA(so)	AAf
Adequate Safety	A	FA	P-3	PA3	A(so)	Af
Moderate Safety	BBB	–	–	–	BBB(so)	BBBf
Inadequate Safety	BB	FB	P-4	PA4	BB(so)	BBf
High Risk	B	FC	–	–	B(so)	–
Substantial Risk	C	–	–	–	C(so)	–
Vulnerable to default	–	–	–	–	–	Cf
In Default	D	FD	P-5	PA5	D(so)	–

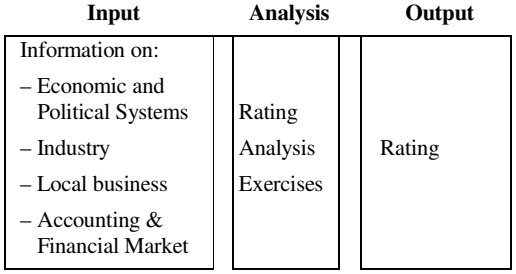
International Credit Rating Practices

The prime function of a rating agency is to serve investors' needs while extending credit. The rating agencies provide them the information on creditworthiness of issuers of credit instruments in symbolic forms which are the conclusions of their detailed analysis. Course of action followed by rating agencies in rating an obligation associated with any credit instrument is similar.

All over the world, rating process is similar and is based on the practices established by the internationally known CRAs in particular, the Standard and Poor's Corporation and the Moody's Investment Services. No doubt, methodology might differ for different credit instruments, but there is no significant difference in the rating process.

Both Standard and Poor's and Moody's follow more or less the same rating process for rating new cases or reviewing the rated cases. Steps taken in completing rating with practices followed by CRAs is as shown in the Flowcharts 1-3.

Chart 1: Rating Process



Note: Rating process given in the chart is followed by all CRAs with suitable adjustments to the conditions of each issuer.

Chart 2: New Issue Rating

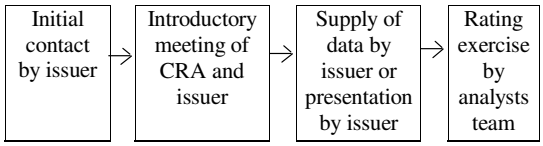
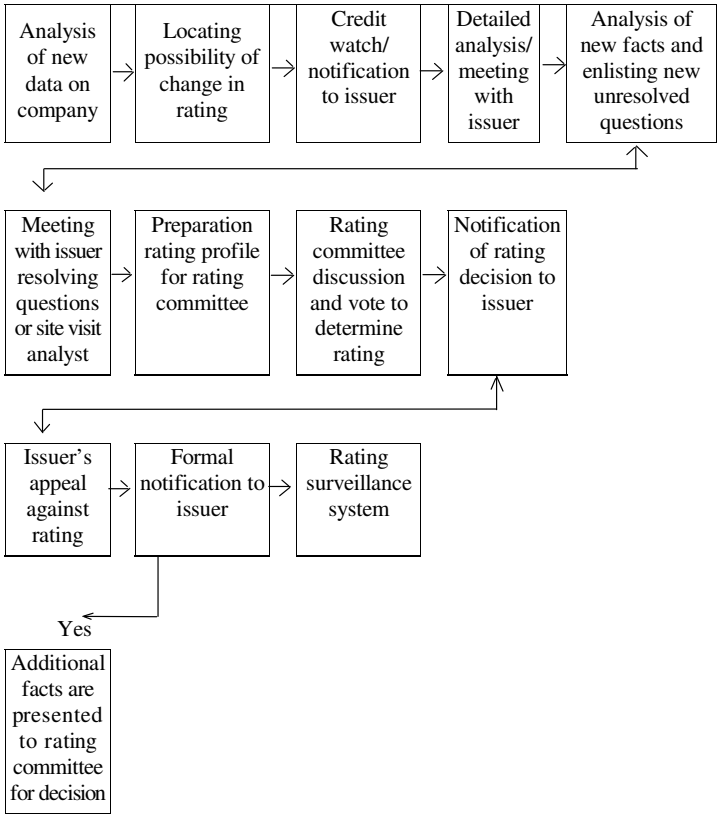


Chart 3: Review of Existing Rating



Box 1: Key Factors in Credit Analysis

Some of the key factors generally considered by the Credit Rating Agencies for the purpose of rating are:

Business Analysis

- Industry risk
- Market position of the company
- Operating advantages of the company
- Legal position.

Financial Analysis

- Accounting quality
- Financial ratios
- Adequacy of cash flows
- Financial flexibility.

Management Evaluation

- Track record of management
- Crisis management
- Goals, philosophy and strategies.

Regulatory and Competitive Environment

- Structure and regulatory framework of the financial system
- Trends in regulation/deregulation and their impact on the company.

Fundamental Analysis

- Capital adequacy
- Liquidity management
- Financial position
- Interest and tax sensitivity.

Source: Chartered Financial Analyst, December, 1994.

RATING SYSTEM

The rating system of the CRAs consists of the instruments they rate and the grades they assign to the obligations attached thereto.

Credit rating agencies throughout the world have their own rating systems. Credit Rating Agencies (CRAs) have classified debt obligation for rating purposes according to their convenience. Given below are the types of rating and classification of debt obligation of world renowned credit rating agencies viz., Standard & Poor's and Moody's.

Rating Grades

Rating agencies adopt two basic grades adopted internationally as well as domestically by the to demarcate the risk prone and risk-free securities viz.,

a. Investment Grade, and

b. Speculative Grade.

a. Investment Grade

Securities which are judged the best in terms of quality are assigned investment grade and rated high. Such securities carry smallest degree of investment risk, i.e., interest payment is protected by exceptionally stable margin and principal is secure and any change in the issuers' conditions will not disturb the fundamentally strong positions of such issues and default is deemed to be unlikely.

According to Standard & Poor's, the issues rated in the four highest categories "AAA", "AA", "A" and "BBB" are generally recognized as being investment grade. Securities rated below "BBB" are generally referred to as speculative grade. These grades are enhanced with plus (+) or minus (–) symbols.

According to Moody's rating, "Aaa" indicates best quality with smallest degree of investment risk i.e., interest payments are protected by a large or by an exceptionally stable margin and principal is secure. Changes in the issuer company are most unlikely, to impair the fundamentally strong position. Similarly, "Aa" creates a difference by "degree" i.e., lower than the best rating because margin of protection may not be as large as in "Aaa" securities. Designations 1, 2 and 3 attached to rating symbols "Aaa", etc., would indicate the degrees of difference i.e.,

1 – rank higher,

2 – mid-range ranking, and

3 – a lower end rank of the category grade. S&P's "AAA"+ would be equal to "Aaa" of Moody's grade for the same debt instrument.

b. Speculative Grade

Instruments which have speculative features are given different grades to distinguish them from investment grade. Their features are different, offering lesser protection to payment of interest and principal and thus are not so well placed to safeguard the interest of the investors. High risk and future uncertainty is reflected in speculative grade. There are different symbols to mark speculative grade. There are downgrade symbols further to indicate comparatively more risky investment proposals.

According to the practices followed by S&P, debt rating of BB, B, CCC, CC and C are regarded as having predominantly speculative characteristics with regard to payment of interest and principal. Major uncertainties and mass risk exposure and adverse conditions are reflected through different symbols with difference in degrees escalated by use of plus and minus signs.

Sovereign Credit Ratings[7]

As any other credit rating agency, Standard and Poor's sovereign credit rating agency also rates the future debt service capacity. The credit rating is done both on local and foreign currency debt, issued by governments in 69 countries and territories. Each government's capacity and willingness to repay debt is evaluated by the credit rating agency. Assessment of government's capacity comes under the overview of quantitative aspects and the government's willingness to repay debt according to its terms comes under the qualitative aspects of the analysis. A number of measures of financial and economic performance are considered to appraise the qualitative aspects of the entity being credit rated. The importance of political and policy developments is also studied carefully to rate future debt service capacity besides other qualitative aspects.

Eight categories of parameters are identified as contributing to sovereign default. Within each category two main aspects are analyzed: economic risk and political risk. While economic risk refers to the government's ability to repay its obligation on time and are a function of both quantitative and qualitative factors, political risk addresses the sovereign's willingness to repay the debt.

It is a common observation that high political risk, i.e., a sovereign's unwillingness to pay is usually followed by high economic risk. Unwillingness to repay implies that the government defaults on some or all of its obligations for political reasons even when it possesses the financial capacity for timely debt service. A government that is unwilling to repay debt usually is seen to pursue economic policies that weaken its ability to do so. Thus, willingness to pay is dependent on a range of economic and political factors influencing government policy.

Each government is ranked on a scale of one (the highest) to five (the lowest) for each analytical category. Though the analytical variables are interrelated there is no definite formula for combining the different ratings to arrive at a composite rating. There is a significant difference between the default frequencies of local currency and foreign currency and both have to be analyzed separately. Even though the same political, social and economic factors affect the government's ability and willingness to service local currency debt and foreign currency debt, they do so in varying degrees. This is because, a sovereign government's ability and willingness to service local currency debt is supported by its taxing power and control of the domestic financial system, which gives it potentially unlimited access to the local currency resources.

However, servicing foreign currency debt requires foreign exchange which a sovereign normally acquires in the currency markets. Standard & Poor's local currency credit analysis focuses mainly on the fiscal, monetary, and inflation outcomes of government policies that support or erode incentive for timely debt

7 This section draws from "Behind the Ratings: Sovereign Credit Ratings: A Primer" from Standard and Poor's Credit Analysis Services, April 16, 1997.

service. The main emphasis is placed on the interaction between fiscal and monetary policies and the balance of payments, the impact of these policies on the growth of public external debt, and the degree of each country's integration in the global financial system, while assessing a sovereign's capacity and willingness to honor foreign currency debt.

LOCAL CURRENCY DEBT RATING FACTORS

Following are some of the key factors considered by Standard and Poor's while a sovereign is rated for its debt.

- The stability of political institutions and the degree of popular participation in the political process.
- Income and economic structure.
- Fiscal policy and budgetary flexibility.
- Monetary policy and inflation pressures.
- Public debt burden and track record of its debt service.

These factors are considered to have a direct influence on the ability and willingness of government for timely service of its debt. The parameters are set based on the stability and legitimacy of the form of government of the country being rated since the government is responsible for economic policy-making. A country's economic structure is significant because the decentralized decision-making in a market economy is found to be less prone to policy error than a dominating state economy. When a country has an increasing level of standard of living and increasing and equitable distribution of income, then it is considered to be capable of supporting high levels of public debt. Such a government has the capacity to withstand unexpected economic and political shocks. But if any country is reported to have defaulted recently, then it is advised to manage with lower levels of leverage to rebuild credibility.

The above mentioned factors influence a country's fiscal and monetary policies and their impact on future changes in the public debt burden. When a country's fiscal policy is being evaluated, the rating agency focuses on:

i. The purpose of public sector borrowing,

ii. Its impact on the growth of public debt, and

iii. Its implications for inflation.

The role of deficit financing cannot be underestimated as it is an important policy tool for any government. The government seeks finances for its infrastructure projects either through external borrowing or through enhanced tax collection which is sufficient to cover future debt service.

Governments tend to borrow for various forms of investment and consumption. This borrowing leads to an increase in public debt. Since the monetary and fiscal policies are unique to each government, a general approach to analyze public finance factors becomes difficult. Furthermore, these policies tend to vary more with varying levels of debt over time. Though the political power enjoys the discretion of raising taxes at its will, a growing tax burden is sure to have an adverse impact on the country's economic growth prospects. In addition, there is a threat to the government if it raises the tax burden as it is against the public's wish. An alternative is to cut spending which does not come easy for a government. Because of these constraints, the government generally resorts to printing money as it enjoys monopoly over the currency and has control of the banking system.

INFLATION AND PUBLIC DEBT

Monetization of budget deficits escalates price inflation which results in weakening support to the government. Hence, the policy makers are very conscious and cautious in adopting such measures. When they fail to do so, the country's economy faces a possibility of severe damage and the political institutions are

likely to lose public trust they have been enjoying. These conditions tend to foster sovereign default. Because of the high degree of damaging effect price inflation has on an economy, Standard & Poor's regards the rate of inflation as the single most important leading indicator of sovereign local currency credit trends.

To study the impact of price pressures in each country, Standard & Poor's considers their behavior in past economic cycles. The level and maturity structure of the general government debt burden – total borrowings of central, regional, and local governments in relation to GDP – along with the expected level of future borrowing are analyzed. The contribution of off-balance sheet, public sector pensions, and contingent liability items such as banks and other enterprises to inflation are also carefully analyzed. Other related indicators are rates of money and credit expansion. Standard & Poor's makes a conservative assessment of average inflation over the next cycle by considering the above mentioned factors.

The institutional structure in a particular country can also affect the level of price inflation. For instance, an autonomous central bank with a public mandate has the discretion to decide the control measures to correct fiscal imbalances as opposed to the central bank that is tied closely to the government or that controlled by the government.

Independent central banks in Germany and the US help these countries acquire an AAA rating when compared to the developing countries like Chile whose central bank is controlled by the government and has an AA rating.

The capital markets of a particular country also play a significant role in checking price inflation. The depth and breadth of a country's capital markets is also important as any country will have lower incentives to default on local currency obligations when the investors are broadly based than concentrated on a few local banks. Even when public debt mounts to huge levels, creditworthiness can still be sustained if policy makers are responsible enough to safeguard the value of money.

FOREIGN CURRENCY DEBT RATING FACTORS

The political and economic factors which affect local currency debt rating also affect the foreign currency debt rating. But these factors contribute to a greater degree as these factors have an effect on the balance of payments of the country. So Standard and Poor's focuses on the extent of influence of government economic policies on the level of public external debt over time. Besides, the extent of each country's participation in the global trade and financial systems must be given due importance as it provides strong incentives to meet its external obligations because it involves high political and economic costs of default.

The relations with neighboring countries should also be analyzed thoroughly to check for any potential security risks. National security assumes significance as the possibility of military threats would place burdens on fiscal policy, reduce the flow of potential investment and put the balance of payments under stress.

BALANCE OF PAYMENTS FLEXIBILITY

While analyzing the balance of payments, the focus is on the impact of economic policy on the external sector and its structural characteristics. The ability of the policy makers to manage financial pressures from abroad partly depends on the structure of merchandise trade, services, transfers, etc. But balance of payments pressures take some time to be known. However, any such pressure can be related to be caused by inappropriate economic policies.

A country's current account deficit or surplus may not be the major criterion to decide on rating. Some countries deliberately insist on maintaining current account surplus or deficit by their choice. Current account balance is a product of many factors and all those factors are not related to government policies. For instance, Singapore was able to manage current account deficits as it was not related to fiscal mismanagement. But in the case of Mexico, current account deficit was a major issue of concern since government policies resulted in a public external debt structure that had a severe impact on the investor sentiment.

EXTERNAL FINANCING POSITION

A sovereign's external balance sheet is a presentation of assets and liabilities *vis-à-vis* non-residents. Standard & Poor's analyzes each sovereign's external balance sheet in relation to its balance of payments. The main focus of the rating agency is on trends in the public external debt position, the magnitude of contingent liabilities of the government, and the adequacy of foreign exchange reserve to service the country's external obligations. Standard & Poor's also analyzes an international investment position as it is considered to be the broadest measure of a country's external financial position. The value of the private sector's debt and equity liabilities is added to the public sector's external indebtedness denominated in local and foreign currencies.

Four primary variables considered to evaluate a country's external financial position are:

- Net public external debt
- Net external debt of financial institutions
- Net external debt of the non-bank private sector
- Total debt service.

Public sector external debt includes non-resident holdings of the direct and guaranteed debt of the central government, obligations of regional and local governments, and the non-guaranteed debt of the other public sector entities. When we deduct the sum of public sector financial assets and central bank reserves from total public sector debt, we get net public sector debt. Regional debts within the country are also analyzed and they are considered along with that of national level particularly when legal and political circumstances expose the sovereign to internal and external financial risks from this source.

Standard & Poor's compares annual flows of exports of goods and services with public sector debt to assess the latter's magnitude. Financial institutions' net debt equals their total external liabilities minus total external assets. Net debt of non-financial private sector equals its external debt minus deposits and non-equity investments abroad. Debt of the private sector is examined as it is likely to become a liability of the state. When the failing banks are revived by government sponsoring, a sovereign's credit rating may be affected.

Sovereign external debt is also evaluated based on its maturity profile, currency composition and sensitivity to changing interest rates. These factors also influence the size of future interest and amortization payments in addition to new borrowings. Hence, debt service including interest schedule of long-term debt and outstanding short-term debt is compared with projected exports.

INTERNATIONAL LIQUIDITY

When there is balance of payments crisis, the government can seek central bank reserves. What are the constituents of these reserves? They constitute foreign currency and gold holdings with gold valued at market prices. Reserves should be adequate to meet imports, projected current account deficits and total debt service. The adequacy of reserves is measured in relation to the government's financial and exchange rate policies. Many high investment grade sovereigns with floating currencies and little foreign currency debt require relatively modest reserves.

International liquidity is more crucial and most of the government debt is denominated in foreign currencies. Consequently public finance setbacks and other economic or political shocks can impair financial market access. Many Latin Sovereigns henceforth maintain above average reserves.

LOCAL AND FOREIGN CURRENCY RATING DISTINCTIONS

Any deviation between a sovereign's local and foreign currency ratings reflects the unique credit risks associated with each type of debt. For example, if a local currency debt has to be rated AAA, then a sovereign should have a longstanding political stability and fiscal and monetary policies which would keep a low

inflation level. Such a sovereign would have manageable public sector external debt burdens and a high degree of international economic integration that would keep their foreign currency debt rating at a comfortable level.

When there is a discrepancy between the local currency debt rating and the foreign currency debt rating, then sovereigns fall into two categories.

i. They may have strong records of timely service on both local currency and foreign currency debt. Inflationary pressures are moderate, public finances are relatively sound, but foreign currency indebtedness may be comparatively high or more likely to become so in the near future, or

ii. They may have a clean record in serving local currency debt but comparatively recent histories of default in the case of foreign currency debt. The local currency and foreign currency debt ratings assigned to them tend to balance remarkable improvements in inflation and public finances with the risks inherent to even heavy foreign currency debt burdens.

At the bottom of the rating scale, such differences tend to narrow. The countries in this category generally would have recovered from a default position either in local currency or foreign currency default recently and still may carry the risk of policy reversals that can result in renewed default. Some other countries falling in this category would not have defaulted but might face high inflation and other forms of political stress that carry a material risk of local currency default after payment of foreign currency debt can no longer be assured.

SOVEREIGN CREDIT RATING CHANGES

In the beginning of the 80s, Standard and Poor's rated debt of only 14 countries. All those sovereigns were rated AAA. Throughout that decade, downgrading in the rating was very rare and even if it was there it was very moderate. But now the rating has extended to a larger domain and the countries being rated fall under different categories. They carry ratings between AAA and B. Changes in the rating also occur quite frequently.

Volatile economic and financial indicators are not the only determinants of ratings. Sovereign rating serves as a measure of future debt service capacity of a country. As future is not certain and predictable, S&P's sovereign rating committees consider reasonable worst case scenarios over a three to five year horizon to gain an insight of future downside risks. The government's medium-term financial program and independent forecasts are analyzed simultaneously. Then the interaction between public finances, external debt and other variables such as export growth and changes in overseas interest rates are analyzed by the rating agency.

With the availability of new information, the rating changes can occur as the rating agency begins to anticipate different future developments based on them. It is a very common observation that the impact of public finances on external debt is usually a key factor bringing about the changes in foreign currency credit ratings. Similarly, significant changes in the inflation outlook are responsible for changes in the local currency credit rating.

SOVEREIGN RATING AND CORPORATE CREDIT RISK

In the assessment of credit standing of banks and corporates, a key consideration is the sovereign credit risk. The unique, wide-ranging powers and resources of each national government affect the financial and operating environments of entities under its jurisdiction, which, in turn, makes sovereign risk important. There are several instances to prove that any default from creditworthy borrowers is related to sovereign default.

When there is foreign currency debt, a sovereign has the first claim on available foreign exchange, and it controls the ability of any resident to obtain funds to repay creditors. For purposes of local debt servicing, a sovereign can exercise its

powers to tax, or to control the domestic financial system or even to issue local currency in potentially unlimited amounts. With these constraints, the credit ratings of non-sovereign borrowers are often at or below the ratings of the sovereign concerned. When obligations of issuers are rated higher than the sovereign's, then it reflects their standalone credit characteristics and other factors mitigating sovereign credit risk.

SUMMARY

- In the financial world, nobody can escape from certain risks attached with various instruments and strategies. It is almost impossible to eliminate risk completely. However, using certain risk hedging techniques the interest of investors and others can be protected. Price risk, interest rate risk, default risk, reinvestment risk and marketability risk are some of the prominent risks attached with any bonds or fixed income instruments.
- Interest rate risk is measured through duration analysis along with convexity. If any bond is held to a period equal to its duration, interest rate risk can be eliminated. The sensitivity of bond price changes in interest rate is called volatility.
- Canceling the interest rate effect and reinvestment effect by offsetting each other is known as immunization. Convexity is the curvature of price-yield relationship of a bond. This is an important tool to study the bond characteristics.
- Different credit ratings indicated by bond instruments indicate the financial strength of the firm issuing it. In the last decade, credit rating has emerged as one of the most important financial services. Moody's investor services and Standards Poor's are two very popular international credit rating agencies. CRISIL, CARE and ICRA are the Indian credit rating agencies, which rate various fixed income securities available in the Indian market.
- Different rating agencies assign different symbols to the same bond according to their specification and study.
- In the term structure model, the factors in the model explain the risk, and yield changes; and each model will have a yield curve shift in respect of each factor in the model.

Chapter XIII

Derivative Markets

After reading this chapter, you will be conversant with:

- Futures Contracts
- Interpretation of Futures Price Quotations
- Trading Mechanism of Futures
- Clearing and Settlement of Futures
- Interest Rate Derivatives in India
- Motives behind using Futures
- Commodity Futures in India
- Options Markets
- Options Terminology
- Trading in Options
- Options Markets in India
- Settlement of Options Contracts
- Swap Markets

Forward Contracts

GENESIS

The origin of forward contracts is lost in history. Some authors suggest that, it was India where these contracts took birth, while some others suggest that Roman emperors employed forward contracts to procure foodgrains from Egypt. Irrespective of this fact, they are serving important social objectives in the present age. It is estimated that forward contracts worth $500 billion are being entered into every year.

Before the industrial revolution, it was not an easy task to transport commodities from one country to another. The probability that the price could change drastically during the period the commodities were being transported, was high. Under these conditions, the traders required a mechanism where they could protect their price and the profits. One of the viable methods to achieve this objective was to enter into a forward contract with the other trader. That is, the trader had to search for another trader who was willing to take position in the contract as a buyer. This created the first real problem. In the real world, it is quite difficult to find two traders with similar requirements.

In forwards, both the traders negotiate the details of the contract privately without the intervention of a third party. No doubt, this facilitates the traders to draw the details of the contract according to their needs, but this also increases the probability that one of the traders might default on fulfilling his obligation. This characteristic of the forwards contract changes the very nature of risk, as the fulfillment of the contract depends on the worth of the counterparty. This is the second real problem that one has to put-up with, if he wishes to deal in forwards.

In forward contracts, since the producers are not in direct contact with the purchasers, they have to route their contracts through middlemen. Middlemen play a crucial role in forward markets, as they purchase the produce from the producer by entering into a contract and then enter into a second contract with the other purchaser regarding the supply of the same. They bear the risk and have to perform the other part of the contract even when one of the parties default.

Therefore, they should not only be paid for their services, but also for credit risks they bear.

Although this may not be a problem on the face of it, the presence of an institution will bring much more stability to the whole process. This is a prerequisite for the retail investors to participate in forward markets. The other positive effect of this arrangement will be that the transaction costs will be lowered to a great extent. If we assume that a baker and a farmer (who enter into a mutual understanding on their trades) negotiate the same somewhere outside the exchange, without any of the exchange rules regulating them, then it would be a perfect example of a forward contract.

Although forward markets have been serving the society at large, they are not without their pitfalls as seen above. Now, we shall look at futures and how they were structured to overcome these problems.

FUTURES CONTRACTS

Futures on bonds started trading on stock exchanges in 1975 and futures on equity were introduced in 1982. Prior to this, organized futures market in commodities had existed in the Chicago Board of Trade since 1848. Over the years it has experienced rapid growth in terms of volume and turnover. Today, it is the oldest and the largest futures exchange in the world. It was established as a voluntary, non-profit association by its members. Another exchange to reckon with is the Chicago Mercantile Exchange. These two exchanges between themselves account for about 80% of the total volume traded in future contracts in the US.

Box 1: What are Stock Futures in Comparison to Badla?

An individual stock future's price is basically the price of the underlying security with interest (net of dividends) added to it. As the futures price essentially represents a price at which one can buy (or sell) the scrip at a later date, that price must compensate for the cost in terms of the interest foregone on the purchase of the security and recognize the benefit in the dividends received until the delivery date. The daily change in the futures price constitutes a gain or loss to the futures trader and is settled in cash – this is sometimes called the daily mark-to-market. By reversing the futures position, a trader will incur a cumulative gain or loss on the futures, which would have been settled in daily mark-to-market gain or loss, along the way.

The badla market developed in order to facilitate carry-forward transactions, whereby investors who bought or sold securities could, for a fee, either borrow the cash to pay for the security or borrow the security in order to effect delivery.

However, the futures market is similar to badla in a number of ways. Stock futures will work like the badla mechanism with the following differences:

Badla was done for a week. Therefore, if someone wanted to carry one's trade beyond a week, one would have had to do badla every week till the time one wanted to reverse, or offset, one's position. The proposed futures on an individual stock would be available for maturities up to a month (it could go up to a year). If someone wanted to carry one's position beyond a month (assuming that the contract was for one month), one would have to do a spread trade – by rolling forward the transaction into the next available maturity, say, a month, which is similar to a badla trade that rolls over the transaction to the next week.

There is asymmetry between long and short positions in the badla mechanism whereas they are symmetrical in the case of the futures market. This essentially means that for every short position, you do not have a long position under the badla mechanism. This is sometimes seen as the harshest criticism against the badla mechanism and it results in stock prices moving upwards or downwards, depending on whether there is excessive long positions or short positions. This "flaw" is addressed under the stock futures mechanism because the long and short positions always match.

The cash and futures market are separated in the stock futures mechanism whereas they are combined in the badla mechanism. This will lead to better price discovery. Put very simply, the cash price and the futures price will be separately observable and linked by the forces of arbitrageurs who will end up supplying liquidity to both markets.

Badla is prone to backwardation charges whereas the concept of negative interest in financial futures only arises when the cost of carrying is negative – i.e., when the interest rate is less than the dividend yield on the stock. This is when futures trade at a discount to the cash market. One would expect that the forces of arbitrage would maintain the price of the futures at a premium to (be above) cash prices; and that discounts to the cash price would be in an efficient market rare occurrences – aberrations that would be arbitraged away in a short time.

Economic Benefits of Stock Futures

It will inject the liquidity that has crashed under the rolling settlement regime. Institutional investors who want to buy or sell a particular stock can transact first in the futures market. Subsequently, they can leisurely buy or sell the stock in the cash market and reverse the position in the futures market. Therefore, fund managers can utilize stock futures to create an orderly move in or out of a stock even where they may find liquidity problems in the underlying cash market.

It will reduce volatility and risk in the market. Shorting any stock will become simple again. This will allow investors to use it as a hedging tool. In the Indian context, hedging in individual stocks is more relevant because the non-systematic risk is much higher. A capital market cannot be efficient without well-functioning, risk-hedging mechanisms.

It will help in faster and more efficient price discovery. Though the process of price discovery is dependent on various expectations and factors, the ease of trading provided by stock futures will hasten the process.

To summarize, the notion that stock futures will make the world a riskier place is totally misplaced. The fact of the matter is that derivative products actually help everybody to manage risks rather than adding to the risks *per se*.

Source: "Futures: The Need of the Hour" by Mr. Ajit Surana from Portfolio Organizer, September 2001.

Futures, like options, possess certain characteristics which make them quite popular. From farmers to financial institutions, all categories of people employ these instruments to hedge their risks. A farmer, who produces wheat, in order to realize a better price for his produce may go to an exchange and sell a futures contract. Similarly, a baker who is uncertain about the future price of the wheat may also go to an exchange and buy a futures contract. In these cases, neither the producer nor the buyer possess exact information about the future price of wheat and face the risk of the future price moving unfavorably. In order to reduce the magnitude of this risk, a futures contract proves to be invaluable. A futures contract also serves as an instrument, for some of the market participants to speculate on.

Futures contracts owe their origin to forward contracts. In other words, futures contracts are refined forward contracts.

A futures contract is an agreement between two parties to exchange a commodity or a financial asset for certain consideration after a specified period. As we have stated before, a futures contract is a refined forwards contract. The main differences between forwards and futures contract are:

i. A futures contract is standardized in terms of quantity, the quality and terms of delivery, etc.

ii. The futures contracts are traded in an organized exchange, where a large part of the process is regulated.

Differences between Futures and Forward Contracts

From what we have seen above, listing the differences should not be a problem. They are as follows:

Table 1: Differences between Futures and Forward Contracts

	Futures contracts	Forward contracts
1.	These are traded in organized location known as exchange.	It is an over-the-counter product.
2.	The terms of the contract are highly standardized.	Terms are structured to suit both the contracting parties.
3.	Contracts are cleared by a separate clearing house.	No such facility exists.
4.	Clearing house guarantees the performance of the contract.	No organization guarantees the performance of the counterparty. Depends on the worth of the counterparty.
5.	Traders have to deposit initial margin irrespective of their trading position.	No compulsion to make such deposits.
6.	Traders have to pay daily settlement margin depending on the movement in the price of the underlying stock.	No such provisions are in vogue.
7.	Futures contracts can be easily closed.	Quite difficult to do so.
8.	Futures markets are monitored and regulated by special agencies.	Regulation is not as tight as in futures markets.
9.	Marking to market is done at the end of every trading day.	No such adjustments are carried out.

Standardization of the Contracts

Standardization of contracts facilitates trading on the exchange. When a group of traders come together they will be able to trade only if all of them know for sure what a contract carries with it. The futures contracts traded in organized exchanges are standardized in terms of features like Quantity, Quality, Expiration Month, Delivery Terms, Delivery Dates, Minimum and Maximum Price Fluctuation, and finally Trading Days and Hours.

We explain these in case of commodities traded at different exchanges.

QUANTITY

We know that commodities are usually in the form of solids or liquids, based on which the unit of measurement will differ. We look at some of them in the table given below.

Table 2

Commodity	Unit	Number of Units per Contract
Grains (wheat, corn, oats)	Bushels	5000
Metals (silver)	Troy Oz	1000
Meal (Soyabean meal)	Tons	100
Meal (Soyabeans)	Bushels	5000
Livestock (Pork Bellies)	Pounds	40000
Sugar	Pounds	112000
Cocoa	Metric Tons	10
Coffee	Pounds	37500

QUALITY

At the Chicago Board of Trade, the quality of the grain contracts traded should be one of the following types.

Table 3

Commodities	Grades
Wheat grades	No.2 Soft red, No.2 Hard red winter, No.2 Dark Northern Spring, No.1 Northern Spring
Soyabeans	No.2 Yellow
Corn	No.2 Yellow
Sugar	Raw centrifugal cane sugar
Cotton	Strict low middling 1 1/16 inch US grown white cotton
Coffee	Arabica coffee
Pork Bellies	USDA approved frozen pork bellies, cut and trimmed
Oil	Brent oil also described as North Sea oil and Gas oil

EXPIRATION MONTH

The exchanges also specify the months in which the contracts should expire. These months are so selected, that in case of some commodities, say wheat, the traders insist on physical delivery as the wheat harvested is ready for delivery. Table 4 shows the expiration months for certain commodities.

Table 4

Commodities	Expiration months
Wheat	July, September, December, March and May.
Soyabean Oil and Meal	Jan., Mar., May, July, Aug., Sept., Oct., Dec.
Soyabean	Jan., Mar., May, July, Aug., Sept., Dec.
Corn	Mar., May, June, Sept., Dec.
Sugar	Jan., Mar., May, July, Oct.
Cotton	Mar., May, July, Oct., Dec.
Cocoa	Mar., May, July, Sept., Dec.
Coffee	Mar., May, July, Sept., Dec.
Pork Bellies	Feb., Mar., May, July, Aug.

DELIVERY TERMS

The exchange specifies the delivery details like the warehouse in which the trader should store the physicals. For Chicago Board of Trade, the warehouses should be in Chicago Switching district or the Toledo, Ohio Switching district.

DELIVERY DATES

The Chicago Board of Trade specifies that the contract can be delivered on any business day of the expiration month.

Minimum Price Fluctuation

This is usually called the tick size.

Table 5

Commodity	Tick size per unit	Tick size per contract
Wheat	1/4 cent	$12.50
Soyabean oil	1/100 of a cent/pound	$ 6.00
Soyabean meal	10 cents	$10.00
Soyabean	1/4 cent	$12.50
Corn	1/4 cent	$12.50
Sugar	1/100 of a cent/pound	$11.20
Cotton	1/100 of a cent/pound	$ 5.00
Cocoa	$1/Metric ton	$10.00
Coffee	1/100 of a cent/pound	$ 3.75
Pork Bellies	$0.00025 per pound	$10.00

DAILY PRICE LIMIT

To restrict the price movement during the day, the exchange specifies a limit. That is, in case of wheat contracts, the Chicago Board of Trade specifies that the present day's price should differ from the preceding day's price by not more than 20 cents. For a contract, this works out to be $1000. A particular point to remember is that these specifications do not apply to the contracts which are traded in their last month of delivery and those contracts which are experiencing excess volatility. The price limits expand gradually till a stage where there is no limit.

TRADING DAYS AND HOURS

The exchange also controls the days and the hours during which trading should be carried out. For instance, the wheat contracts at CBOT should trade from 9.30 A.M. to 1.15 P.M. on each trading day and the trading should cease by noon on the last trading day. The last trading day in case of wheat contract is seven business days before the last business day of the delivery month. The last trading day differs from commodity to commodity and also from exchange to exchange.

The level of standardization is so high, that all the participants know precisely what is being offered for sale and the terms that accompany such transaction which have helped to promote liquidity and stimulate trading.

FUTURES PRICE QUOTATIONS

Futures prices are usually published briefly in leading newspapers and journals and in a more detailed fashion in the Commodity Trading Manual published by the Chicago Board of Trade. Here, we present a part of the quotations table.

Table 6

Benzene Futures

Month Strike	High	Low	Last	Settle	Pre. Change	Vol	Settle	Vol	Int
Jan-03	-	-	-	-	UNCH	-	1.53	-	-
Feb-03	-	-	-	-	UNCH	-	1.43	-	-
Mar-03	-	-	-	-	UNCH	-	1.62	-	-
Apr-03	-	-	-	-	UNCH	-	1.625	-	-
May-03	-	-	-	-	UNCH	-	1.625	-	-
Jun-03	-	-	-	-	UNCH	-	1.625	-	-

Butter Futures

Month Strike	High	Low	Last	Settle	Pre. Change	Vol	Best Bid	Best Ask
Mar-03	115	115	115	115	UNCH	1	115	116
May-03	118.25	118.25	118.25	118.25	–250	7	118.25	
July-03	121.25	121.25	121.25	121.25	–250	12	121.25	
Sep-03	124	124.75	124	124.75	500	5	124.5	124.75
Oct-03	125.25	125.75	125	125.75	250	12	124.5	
Dec-03					UNCH		125	130
Total					EST Vol			
Total					37			

UNCH – Unchanged.

Source: www.cme.com

To understand what these figures convey, we consider the first row of the quotations for butter (Mar. '03). The first column (Mar. '03) gives the maturity of the contract (the month during which the contract will expire). The second and the third columns, High (115) and low (115) denote the highest and the lowest price at which a particular contract has been traded during that day. The fourth column states the last traded price (115). The fifth column, 'Settle' stands for settlement price (115). The settlement price is determined by the settlement committee, by using a formula which considers the prices at which trading took place during the last few minutes of the closing time. That is, the settlement price need not be the last trading price of that day. The sixth column, change, denotes the difference between today's settlement price and yesterday's settlement price. It can be positive or negative.

In the table, the contract which matures next (Mar.,'03) is said to be a nearby contract, while the contracts maturing after that (May, July) are known as Distant or Deferred contracts.

One should clearly distinguish between the Volume traded and the Open interest. Volume traded is calculated by counting the number of contracts either bought or sold and it gives a definite idea about the trading activity in a period. Open interest denotes the number of contracts that were "open" at the close of trading on the preceding day.

More explicitly, if a trader 'A' has bought two contracts from trader 'B' and sold one of them back to 'B' on the same day, the volume will be three contracts. This is because, 'A' bought two contracts and 'B' bought one contract, which add up to three. For the same example, the open interest will be one contract. This is

because, trader 'A' bought two contracts and sold one of them and B sold two contracts and bought one of them. Therefore, traders 'A' and 'B' are left with one contract each, which gives us the open interest.

What would have been the open interest, if trader 'A' had sold that one contract to some other trader say 'C'. In this case, as far as 'A' is concerned he did close his position in one of the contracts he bought, but that does not affect the open interest as trader 'C' has taken his position. Therefore, the open interest would still remain as '2'. Open interest is calculated from the market point of view and not from an individual's point of view.

TRADING MECHANISM OF FUTURES

In this part, first we shall look at how a trade is initiated and then elaborate on the different players across and the different processes involved.

Flow of the Order

Any person who wants to trade in futures has to contact a Futures Commission Merchant (FCM) or a broker. First, let us look at an FCM. He is necessarily a member of the clearing house. The next step is to open an account at his firm. The account holder will be assigned to one of the Accounts Executives, who will look after his transactions. Whenever the account holder places an order with the accounts executive, he will note down the order specifications and immediately transmits it to one of the floor brokers at the exchange. The floor broker will execute the order and report the transaction to the clearing house. Once he receives the confirmation from the clearing house, he calls back the accounts executive giving him all the details about the trade. The accounts executive, in turn, will pass these details to his client.

Other responsibilities of the FCM is to maintain all the records and to report the trading activity of all his clients to the clearing house and sending the clients monthly statements about their position and account balances.

To Open the Account with a Broker

The broker may or may not be a member of a clearing house. If he is a member of a clearing house, he notes down the specifications and transmits the order to the floor broker who, as mentioned above, executes it, confirms it from the clearing house and sends back the details to the broker, who then conveys the same to his client. In case, he does not happen to be a member of the clearing house, he should necessarily route the order through a member. Once he does so, the remaining procedure will be the same as above.

The investor who wants to trade futures can be a hedger or a speculator. They are defined below.

HEDGERS

Hedgers deal in futures to offset a pre-existing risk. The commodity is usually the one they produce or use in the course of their business.

SPECULATORS

Speculators take long or short positions only with the intention of making profits by getting out of the market when conditions favor them. As with the other markets, speculators play an important role in futures market also. In the process, they assume risk which is disproportionate to the returns they are expecting.

Futures Commission Merchant

By this time it should be clear as to what role the FCM plays. Its role is similar to that of a brokerage house in a stock market. Investors interested in dealing in futures may also put through their deals through the contacting agents of FCM. These agents do not accept money from the investors. The agents are also called introducing brokers. The bulk of the business is carried out by FCMs only.

Box 2: Investor Profile for Derivatives Trading
The minimum value of a contract for stock derivatives at present is fixed at Rs.2 lakh and it is viewed as high for retail participation. However, only a fraction of it has to be paid on the option contract in the form of premium as the option price. With only a marginal investment, one can take large positions in the market. The options market would pick-up in Indian sub-continent fairly quickly despite the nuances of the complex mathematics involved in valuation of options, in view of intuitive understanding of options. Hence, there is a reason to be hopeful that it would grow rapidly. The global experience has shown that in the long run, rolling settlement and derivatives increase liquidity manifold.

Source: "Derivatives Trading: Where is it Headed?" by Dr. A S Harish, Portfolio Organizer, November 2001.

FLOOR BROKERS

These people have the responsibility of executing the trades forwarded by the FCMs on the floor of the exchange. They can also trade for their own account. They work as individuals or in association with an FCM as its agents.

In addition to these brokers, we also have other types of brokers whose functions are similar to those of brokers in an option exchange.

Pit

Now, the next logical question would be: Where do the floor brokers trade in the exchange? The exchange floor is divided into several physical locations called pits. According to the Federal law and the rules of the exchange, trading in futures should take place only during official trading hours in a designated area (a physical location on the exchange floor) called a pit.

Open Outcry

To realize the fair price of the commodity, floor traders are required to make an offer to all other traders present in the pit by openly shouting the bid or ask prices. This method is referred to as Open Outcry System.

The Clearing House

As mentioned earlier, the floor broker will report back to the accounts executive only after confirming the trade from the clearing house. The futures contracts are cleared by a clearing house. The clearing house can be constituted separately or as a part of the futures exchange. Nevertheless, each futures exchange is closely associated with the working of a particular clearing house. The functions of the futures clearing house are very much similar to those of the "Options Clearing Corporation", the body which we would come across when we discuss about Options. As the clearing house is well capitalized and it holds a net zero position (it exists to facilitate trading in futures for the participants and it does not trade on its own account) and finally it being an integral part of the futures market, the traders place immense faith in the institution.

Margin and Daily Settlement

The first important point to note in this regard is that each clearing house prescribes its own limits on initial, maintenance and variation margins. Therefore, the margins we mention here cannot be applied universally. One of the main differences between options and futures is that in futures both the contracting parties are required to pay variation margins depending on the price of the underlying asset in the market. But in case of options, the buyer of the contract after paying the premium does not bother about any other payments irrespective of the underlying asset's price in the market.

In futures trading, both the parties to the contract are required to deposit an initial margin with the broker, which in turn will be deposited with the exchange. This margin depends on the price volatility of the underlying asset. Exchanges generally set this margin equal to $\mu + 3\sigma$, where 'μ' is the average daily absolute

change in the value of the contract and 'σ' is the standard deviation of these changes measured over a period of time.

Box 3: Reforms in Capital Market

In May 2001, SEBI announced significant changes in the capital market in keeping with the international practices and operations in the securities markets. These measures include:

(i) banning of all deferral products in the cash segment including badla; (ii) bringing in 414 scrips accounting for 95 percent of trading volumes within the ambit of rolling settlement system from July 2, 2001; (iii) allowing index based and individual stock based options; (iv) introduction of uniform Monday-to-Friday settlement cycle across all stock exchanges for all scrips not in the rolling mode; (v) a code of conduct and a preventive framework against insider trading; (vi) removal of price bands for all stocks in the rolling mode from July 2, 2001 and for the entire market from January 2, 2002; (vii) introduction of a market wide circuit breaker system to be applicable at three stages of the index movements; (viii) shifting the margining system from net to gross basis (sales and purchases) with effect from September 3, 2001; and (ix) introduction of 99 percent Value at Risk (VaR)-based margin system for all scrips in the compulsory rolling settlement with effect from July 2, 2001.

The derivatives are recognized as the best and most cost-efficient way of meeting the felt need for hedging risk in certain types of commercial and financial operations. Countries not providing such globally accepted risk-hedging facilities are disadvantaged in today's rapidly integrating global economy. The liberalization and opening up of the Indian economy has precipitated the process of integration of India's financial markets with the international financial markets. FIIs would be pleased, with the trading systems moving closer to international methods such as derivatives. FII inflows in the stock markets have increased since banning of badla and introduction of derivatives.

Source: "Derivatives Trading: Where is it Headed?" by Dr. A S Harish, Portfolio Organizer, November 2001.

Illustration 1

The average daily price change is $15 per ounce and the standard deviation of the price changes is $4. Use 100 as the multiple. Then the initial margin would be

$$(15 + 3 \times 4)\ (100) = \$2,700.00.$$

One can also deposit securities instead of cash with the brokerage firm and simultaneously earn the interest on these. The initial margin is reinforced by maintenance and variation margins.

Futures Markets in India

Trading in the Futures commenced on June 12, 2000. National Securities Clearing Corporation Limited (NSCCL) is the clearing and settlement agency for all deals executed on the National Stock Exchange (NSE). NSCCL is the legal counterparty to all deals on NSE's Futures traders.

Admission to Clearing Members (CM) is distinct from NSE Trading Members (TM) for the futures trading. This is in line with the 2 tier membership structure stipulated by SEBI's Dr. L C Gupta Committee to ease the constraint on participation in the Futures and Options (F&O) segment due to high capital adequacy requirements. All TMs of the NSE F&O segment are necessarily required to appoint a CM of NSCCL for clearing and settlement of their deals, before commencing trading.

Eligibility Norms for Clearing Members in F&O Segment

The clearing member should have a net worth of at least Rs.300 lakh, a deposit of Rs.50 lakh to NSCCL, which forms the Base Capital (BC) of the member. The clearing member should have an additional incremental deposits of Rs.10 lakh to NSCCL for clearing and settlement of their deals, before commencing trading.

The following are the types of clearing members:

Trading Member-Clearing Member (TM-CM): A Clearing Member, who is also a trading member may clear and settle his own proprietary trades and clients' trades as well as those of other TMs.

Professional Clearing Member (PCM): A CM who is not a TM. Typically banks or custodians could become a PCM and clear and settle for TMs.

Functions of a Clearing Member

A TM of NSE shall perform execution of an order on the trading system while the CM of NSCCL shall clear and settle all deals. Primarily, the CM will perform the following functions:

- **Clearing:** Computing obligations of all his TMs i.e., determining positions to settle.
- **Settlement:** Performing actual settlement. Only funds settlement is allowed in Nifty Index Futures and Options contracts.
- **Risk Management:** Setting position limits based on upfront deposits/ margins for each TM and monitoring positions on a continuous basis.

Box 4: Risk Containment Measures

Derivatives offer organizations the opportunity to break financial risks into smaller components and then to buy and sell those components to best meet specific risk management objectives.

SEBI has set-up a 'Technical Group' headed by Prof. J R Varma to prescribe risk containment measures for new derivative products. The group has recommended the introduction of Exchange Traded Options on Stocks, which is also in conformity with the sequence of introduction of derivative products recommended by Dr. L C Gupta Committee.

The following are the risk containment measures to be adopted by the derivative exchange/segment and the Clearing House/Corporation for the trading and settlement of Option Contracts on Stocks:

The Stock Option Contracts to be traded on the derivative exchange/segments shall have prior approval of SEBI. The Contract should comply with the disclosure requirements, if any, laid down by SEBI.

The Exchanges shall introduce Premium Settled American Style Stock Options, which shall be settled in cash at exercise, for an initial period of six months, thereafter, the Stock Options, at exercise, shall be settled by delivery.

The Stock Option Contract shall have a minimum contract size of Rs.2 lakh at the time of its introduction in the market.

The Stock Option Contract shall have a maximum maturity of 12 months and shall have a minimum of 3 strikes (in-the-money, near the money and out-of-the-money.)

The Initial Margin requirements shall be based on worst-case loss of a portfolio of an individual client to cover 99 percent VaR over one day horizon. The Initial Margin requirement shall be netted at individual client level and it shall be on gross basis at the Trading/Clearing Member level. The Initial Margin requirement for the proprietary position of Trading/Clearing member shall also be on net basis.

A portfolio based margining approach shall be adopted which takes an integrated view of the risk involved in the portfolio of each individual client comprising of his positions in Derivative Contracts.

Enhancing confidence and knowledge among all market participants is a necessary condition in order to guarantee the stability of the derivatives markets besides information standardization and disclosure at all levels in the derivatives trading industry. Also, the market value concept should always be preferred in order to serve as a benchmark for the marking-to-market or collateralization of the various risks exposures.

The kinds of risks associated with derivatives are no different from those associated with traditional financial instruments, although they can be far more complex i.e., credit, market, operational, and legal risk. However, it is important that all users of derivatives, regardless of size, understand how their contracts are structured, the unique price and risk characteristics of those instruments, and how they will perform under stressful and volatile economic conditions. To address those concerns, supervisory reforms should focus on increasing disclosure of derivatives holdings and the strategies underlying their use, appropriate capital adequacy standards, and sound risk management guidelines.

Source: "Derivatives Trading: Where is it Headed?" by Dr. A S Harish, Portfolio Organizer, November 2001.

Index and Stock Futures at NSE

NSE has introduced trading in Index based futures contracts with a cash market index as the underlying asset as well as futures on the underlying stocks.

Index Futures

NSE will define the characteristics of a futures contract such as the underlying index, market lot, and the maturity date of the contract. The contracts will be available for trading from introduction to the maturity date.

Specifications of a contract

A futures contract is specified as follows:

Instrument Type: FUTIDX

Symbol: NIFTY

Expiry Date: The expiry date identifies the date and month of expiry of the contract, say December 26, 2002. The minimum lot size to be used for trading and settlement of contracts will be 200. If NIFTY futures contract is traded at 1,000 and the lot size is 200, then the contract value would be Rs.2,00,000 (200 x 1,000). The price step is Rs.0.05.

All NIFTY index futures contracts will expire on the last Thursday of the expiry month. In the above example, NIFTY 26 DEC. 2002 futures contracts will expire on December 26, it being the last Thursday of the month. This date is also known as the maturity date of the contract. No further trading in this contract will be permitted beyond this date. In case the last Thursday is a holiday, then the contract shall expire on the preceding day.

NIFTY futures contract will have a 3-month expiration cycle. On expiry of a contract, a new futures contract will be introduced on the trading day following the expiry of a contract. The new contract will be introduced for a three-month duration. This way, at any point in time, there will be 3 contracts available for trading in the market, i.e., one near month, one mid month and one far month duration respectively.

In the month of January 2004, three NIFTY futures contracts will be available for trading viz. January, February and March respectively. On January 24, 2004, the January contract will expire and hence the April contract would be introduced. Hence, the three NIFTY futures contracts which will be available for trading are February, March and April contracts.

Futures on Individual Stocks

The security descriptor for the futures contracts is:

Market type : N

Instrument type : FUTSTK

Underlying : NIFTY

Expiry date : Date of contract expiry

Underlying symbol denotes the underlying security in the Capital Market (equities) segment of the Exchange. Expiry date identifies the date of expiry of the contract.

Underlying Instrument: Futures contracts are available on 29 securities stipulated by the Securities and Exchange Board of India (SEBI). These securities are traded in the Capital Market segment of the Exchange. Expiry day and trading cycle are the same as that of Index futures.

Trading Parameters

The permitted lot size for the futures contracts on individual securities is stipulated by the Exchange from time to time. The value of the option contracts on individual securities may not be less than Rs.2 lakh at the time of introduction. The permitted lot size for the options contracts on individual securities would be in multiples of 100 and fractions if any, shall be rounded off to the next higher multiple of 100.

Base price of futures contracts on the first day of trading (i.e., on introduction) would be the previous day's closing value of the underlying security. The base price of the contracts on subsequent trading days would be the daily settlement price of the futures contracts. There are no day minimum/maximum price ranges applicable for futures contracts. However, in order to prevent erroneous order entry by trading members, operating ranges are kept at +20%.

CLEARING AND SETTLEMENT OF FUTURES

Clearing Mechanism in NSE

The open position of a CM is calculated by taking the aggregate of the open positions of all the Trading Members (TMs) clearing through them. A trading member's open position is calculated by adding up his proprietary open positions and client's open positions. The proprietary positions will be calculated on net basis (buy/sell) and client positions will be calculated on gross basis (i.e., a buy open trade will be offset by a sell close trade and vice versa).

Margining Mechanism

NSCCL has developed a risk containment mechanism for the futures and options segment. It has adopted a margining system to monitor the trading in the exchange. The actual margining will be done on a daily basis while on-line position monitoring will be done on an intra-day basis.

The initial margin is collected in advance for all the open positions of a clearing member. A CM will collect the initial margin from the TMs and his respective clients. When a trading member wishes to take additional positions, then the clearing member is responsible for remitting additional base capital to NSCCL. This base capital can be in the form of a liquid security, a bank guarantee, fixed deposit receipt or cash in addition to the initial margin, the members are also charged premium margin till the premium settlement is complete. Assignment margin is to be paid on assigned positions of clearing members. This margin would be charged as follows:

- Exercise Settlement Value up to Rs.100 lakh for an exercise settlement: 10% of the exercise settlement value for that settlement.
- Exercise Settlement Value greater than Rs.100 lakh for an exercise settlement: 15% of assignment margin would be released to the clearing member after the scheduled pay-in day.

Box 5: Margining System in India

Indian capital markets have finally acquired an international flavor with the market-wide rolling settlement coming into place on both the premier exchanges (Bombay Stock Exchange and National Stock Exchange) and volumes in the derivatives market slowly creeping up.

"Badla was an integrated product suited to Indian stockmarket conditions. Now, with these (futures and options) successors, the product has simply bifurcated into two variants for a different set of market participants," says a former badla financier who is now active in the derivatives segment.

In India (BLESS on BSE and ALBM on NSE), there was a financier who stepped into fund the long (outstanding buy position) or lend securities to the short (outstanding sell position). Therefore, there was always a cash market settlement at the exchange linked to these transactions whereas stock futures is currently being settled in cash and the settlements in futures and cash markets are segregated. With identical trading terminals quoting both the spot and futures market movement, the difference only being that a person can buy a single share in cash market while one has to enter a minimum stipulated size for a particular stock in the derivatives segment.

So, a trader buying a Satyam contract (minimum 1,200) would have to pay an upfront margin of 15-20 percent to buy a contract of a Satyam futures or options. He can shift his position from a one-month contract expiring at the end of that month, to a two-month contract at a slightly higher rate reflecting the implied cost-of-carry for another month. Here the rate of interest, which is nothing but the implied Cost Of Carry (COC percent) is known to the investor beforehand, while in badla the rates were decided by the trades in the badla session, reflecting a level of transparency in derivatives. The margin is collected by the broker on behalf of the exchange on a daily basis depending on daily volatility on the 'mark-to-market' system in operation.

A contract bought by paying an upfront margin is calculated on Value-Added Risk (VAR) basis, which traces the historic volatility (fluctuations in stock price) of a particular stock and arrives at a margin which is reflective of this volatility. This basically implies that a volatile stock, like a Sterlite Opticals or a Satyam Computer, would attract higher margin requirement from an investor compared to the volatile stock like a Hindustan Lever or an ITC.

Source: "Indian Derivatives Market: Finally Catches on" by Abhishek Parekh, Portfolio Organizer, April 2002.

Settlement Mechanism

Nifty index futures and option contracts are cash settled. All CMs are required to open a separate bank account with NSCCL designated clearing banks.

The open positions in the index futures contracts are marked-to-market at the settlement price of the contract at the end of each trading day. The members who have a loss position should pay the loss amount to NSCCL which is then transferred to the members who have made profits. This is known as daily mark-to-market settlement. The daily settlement price of the Nifty index futures contract is the closing price of the index futures contract which is computed by taking the weighted average of the prices of the daily settlement price. The mark-to-market losses and profits are directly debited and credited to the CM's and clearing bank account respectively.

On the expiry of the futures contract, NSCCL marks the open position of a clearing member to the final settlement price and the resulting profit or loss is settled in cash. The final settlement price is the closing value of the index price on the expiration day of the relevant index futures contract. The final settlement profit is the difference between the last mark-to-market price and the final settlement price of the corresponding index futures contract. Final settlement loss or profit is debited or credited to the relevant CM's bank account on the next day to the expiry day.

As the price of the futures contract changes, gains or losses accrue to the holder of the contract. The gains or losses are credited or debited to the margin account. If the price movements are adverse, the balance in the account falls. In these circumstances, the trader is required to replenish the margin, bringing it on par with the initial value whenever the level or value of funds on deposit with the broker reach a certain level. This level is referred to as the Maintenance Margin. The additional amount, which the trader deposits with the brokerage firm, is called the "Variation Margin".

The maintenance margin is generally about 75% of the amount of the initial margin. In the US, most of the exchanges specify the initial and maintenance margins, for the top ten futures contract. A typical futures quotations in Indian exchanges are given below.

Table 7: Sensex Futures

Contract	Prev. Close	High	Low	Close	Traded Qty.	Value (in lakh)	No. of Contracts	Open Interest	Exp. Date
August 2002	3100	-	-	3114.20	0	0	0	0	29/08/02
Sep. 2002	374.70	3165.00	3153	3187.7	30	945500	4	0	27/09/02
Jan. 2003	3367.80	3365.90	3347	3353.9	83850	2815.91	1032	11	30/01/03

Source: www.bseindia.com

Table 8: Nifty Futures

Contracts	Open Price	High	Low	Close	Traded Volume	Traded Value (Rs. Cr)	Open Interest Contracts
Jan. 2003	1079	1085	1078	1083	1310800	141.83	2188000
Feb. 2003	1090	1090	1080	1085	36600	3.97	240800
Mar. 2003	1085	1088	1082	1086	4000	0.43	24800

Source: Businessline.

Illustration 2

An investor buys a contract of Crude Oil on 11th November, 2002. The settlement price on ten consecutive trading days is shown below. The initial margin is $3000, the maintenance margin is $2100.00. For the following prices ($), prepare a table, showing when the various margins were called. The contract is for 1000 barrels.

November 11 $ 26.25	November 15 $ 23.00	November 21 $ 26.50
November 12 $ 27.00	November 18 $ 23.55	November 22 $ 27.00
November 13 $ 25.79	November 19 $ 25.00	
November 14 $ 24.12	November 20 $ 26.25	

This problem consists of two tables. One of them shows the daily gains and losses along with the cumulative trading profits and losses. The second table shows equity and margin account.

Table 9

Daily Gains and Losses along with Cumulative Trading Profit and Losses

Day	Trade Price ($)	Settlement Price/Barrel ($)	Marked-to-Market Cash Flows ($)	Cumulative Profit/Loss ($)
November 11	26.25	26.25	–	–
November 12		27.00	+ 750.00	+750.00
November 13		25.79	–1210.00	–460.00
November 14		24.12	–1670.00	–2130.00
November 15		23.00	–1120.00	–3250.00
November 18		23.55	+550.00	–2700.00
November 19		25.00	+1450.00	–1250.00
November 20		26.25	+1250.00	0.00
November 21		26.50	+250.00	+250.00
November 22	27.00	27.00	+500.00	+750.00

Table 10: Equity and Margin Account

	Equity			Margin Account		
Transactions	Beginning ($)	Cash flow ($)	Ending ($)	Margin call ($)	Deficiency ($)	Excess ($)
Deposits $2000		2000.00	2000.00	–	–	2000.00
Nov.11 Bought a contract	2000.00	–	2000.00	1000.00 (I.M)	1000.00	
Nov. 12 Deposited $1000	3000.00	+750.00	3750.00	–	–	750.00
Nov. 13	3750.00	–1210.00	2540.00			
Nov. 14	2540.00	–1670.00	870.00	2130.00 (V.M)	2130.00	–
Nov. 15 Deposits $2130.00	3000.00	–1120.00	+1880.00	1120.00	1120.00	
Nov. 18 Deposits $1120.00	3000.00	+550	3550.00			550.00
Nov. 19	3500.00	+1450.00	+4950.00			1950.00
Nov. 20 Withdraws $1950	3000.00	+1250.00	+4250.00			1250.00
Nov. 21	4150.00	+250.00	+4400.00			1400.00
Nov. 22 Sold	4400.00	+500.00	+4900.00			1900.00

From the equity and margin account table we observe that on 14th November there was only $870.00 in equity account (Trader's account). This was lower than the maintenance account of $2100.00. Therefore, the trader received a margin call and has to deposit $2130.00 under the variation margin. On 15th November also, the trader received a margin call for $1120 which he deposited on the next day.

It is obvious that the traders would not like to get the margin calls often. To avoid this, they can either deposit securities whose value is more than the initial margin or deposit the cash in excess of the initial margin into an interest bearing account and use the proceeds towards margin amounts.

If the trader does not comply with the above discussed norms, the broker has every right to close the futures position of the trader and return the balance after deducting the loss and brokerage fees to the trader. This usually results in a loss for the trader.

So far we have looked at various facets of buying futures. In this part, we shall look at how the futures position is closed.

Closing a Futures Position

A trader, who has entered into a futures contract, can close the contract in the following three ways. He can either:

i. deliver the commodity or opt for a cash settlement

ii. enter into an offsetting or reversing trade

iii. settle for exchange of physicals.

While entering into an offsetting or a reversing trade, we have to remember that the contract should be identical in terms of the commodity traded, in terms of the number of contracts and the maturity of the one which is currently held.

Exchange of Physicals

A trader can also complete the futures contract by engaging in exchange of physicals. In this method, the parties agree to exchange cash and the commodity underlying the contract. A baker who genuinely requires wheat and a farmer who has wheat can mutually agree on a price for the wheat, so that the exchange can take place, in the process facilitating both the traders to cancel their complementary futures position against each other. The exchange notes their positions and cancels their futures obligations.

This method is quite similar to the offsetting method, but differs from it in the following manner:

i. the traders actually exchange physical goods;
ii. the transaction or the mutual agreement does not take place on the floor of the exchange; and
iii. there may be no intermediaries to negotiate the deal.

Keeping the above points in view, an exchange for physical is also called "Ex-pit" transaction or "Against actuals" or "Versus cash" transaction and is recognized by the Federal laws and Exchange rules.

In the discussion on margins, we considered the manner in which the margins are calculated for a futures contract. However, this was only for a single contract. In the real world, traders seldom deal in single contracts. Since the objective of margins is to protect the trader, the broker and the clearing house against losses, it will make sense to ask traders to pay margins depending on: (i) his cumulative position and (ii) the risk he is exposed to in different markets. Certainly, it will improve the liquidity position and also release the funds locked up in margins.

Before we look at these margins, let us learn a few more basics about futures.

The Relationship between Futures Price and Cash Price

Any commodity that can be bought in the market has a price, which is referred to as cash or spot price for immediate delivery. Similarly, in a futures market, the commodity is delivered at a later date as per the futures contract. There may be more than one cash price for a commodity at one point of time. For instance, petrol is quoted at different rates at different geographical locations. This variation in costs occur due to time and the costs associated with transporting petrol from one part of the globe/country to the other. The cash price varies from one country to another and one commodity to another and depends on the demand and supply of the commodity. If a good has two prices, at two different locations, a trader would normally buy the good from a cheaper market and sell it in a market where it is priced high and thus make a profit. It may be possible, the transportation costs involved and taxes paid will nullify the profit, unless the price difference is large enough to result in a profit.

Basis

We define Basis as the difference between the current cash price of the commodity and the futures price. That is,

Basis = Current Cash Price – Futures Price

The spot price for a physical commodity can differ from location to location, since transportation costs for physical commodities play an important role. Correspondingly, basis calculated also differs from location to location. We know that a single good cannot be sold at different prices at two different locations, as the traders will actively exploit any arbitrage possibilities. Therefore, to avoid arbitrage, the differences should be only to the extent of transportation costs.

Generally, basis is higher for contracts with longer maturity.

Futures markets can be either Normal or Inverted in nature. By normal markets, we mean that the prices for distant futures are higher than those for nearby contracts or for which the basis gradually increases. The inverted futures market is quite the opposite.

The basis for normal markets usually exhibits "Convergence". By "Convergence" we understand that the spot and futures prices converge to a point, where the basis would be zero towards the end of the life of the contract.

Basis is also a valuable indicator for predicting future spot prices of the commodities that underlie the futures contracts and it is more stable than the futures price or the cash price considered separately. The relatively low variability of the basis aids in decision-making for traders interested in hedging and certain types of speculation.

Illustration 3

The spot price of Gold, say, on 6th December, 20x2 was Rs.4,330.00. The price of the futures contract expiring in July, 20x3 is Rs.4,450.00. What is the basis for this contract?

Solution

We know that,

Basis = Current cash price – Futures price

= 4,330.00 – 4,450.00 = –120.00

Cost-of-Carry

The extent to which the futures price exceeds the cash price at one point of time is determined by the concept called 'cost-of-carry' that refers to the carrying charges. The carrying charges can be further classified into storage, insurance, transportation and financing costs. The significance of carrying costs cannot be ignored because they play a crucial role in determining pricing relationships between the spot and futures prices. Moreover, it plays a key role in determining the prices of various futures contracts of maturities.

The following formula determines the relationship between the cash price and the futures price of any commodity:

$$F_{t,T} = C_t + (C_t \times S_{t,T} \times \frac{T - t}{365} + G_{t,T})$$

Where,

C_t = Cash price at time t

$S_{t,T}$ = Annualized interest rate on borrowings

$G_{t,T}$ = Storage costs

T – t = Time period

$F_{t,T}$ = The futures price at time t, which is to be delivered at time period T.

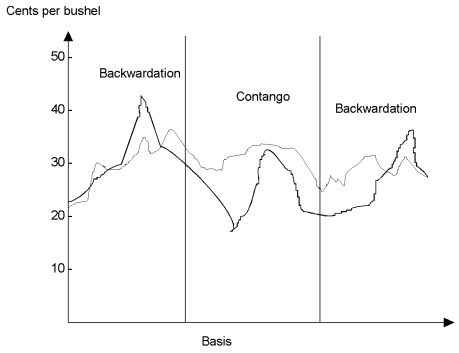
In common parlance, the industry refers the cost-of-carry as 'full carry futures price' (which is nothing but estimated cost of futures price). Hence, in the market there will be two prices namely the actual market price and calculated full-carry price (which is obtained by using formula). The interest rate futures are contracts with underlying assets of fixed income securities or fixed instruments (a fixed income instrument has the payment of amount of interest at specific points of time, as well as the repayment of the principal on maturity).

Contango and Backwardation

If the futures prices obtained by full-carry relationship are accurately projected, the basis is negative, as the futures prices are higher than the cash prices. This condition is referred to as 'contango' market (which means the prices of futures market are only determined by the cost-of-carry). This sort of market is featured by progressively rising futures price as the time to delivery becomes more distant.

If the futures price is less than the cash price, the basis is positive. This condition prevails only if the futures prices are determined by some other factors other than cost-of-carrying. When the futures prices are lower than the cash prices it is referred to as 'Backwardation'. It is featured by lower futures prices as delivery becomes more distant.

Figure 1
Contango and Backwardation



—— Actual price
—— Full carry price

Convenience Yield

The shortage of the physical commodity is probably one of the reasons for having additional costs other than cost-of-carrying. When there is a shortage in a commodity, there is an implied yield (return) by holding the commodity. This yield is referred to as 'convenience yield'.

Spreads

The difference between two futures price is referred to as 'spread'. For the same underlying good, if there are two different prices on two different expiration dates, the underlying spread is referred as 'intra commodity' spread (also known as a 'time spread'). If the spread is between two futures prices for two different but related commodities, such as corn oil futures and cottonseed oil futures, it is referred to as 'inter commodity spread'. If the price difference is between two markets for the same commodity, it is known as 'inter-market spread'. The spread relationships are significant due to the act of speculation. Theoretically, there should be no inter-market spread as the difference in rates is adjusted by the cost-of-carrying or transportation cost, but as discussed above, if the price difference is large enough and there is a seasonality of demand and supply, price differences may occur giving rise to inter-market spreads.

INTEREST RATE DERIVATIVES IN INDIA

India's first trading on interest rate derivatives began in the National Stock Exchange of India (NSE) in June 2003 with futures on 91-day treasury bills and a 10 year notional bond. Trading in the Mumbai Inter-Bank Offered Rate (MIBOR) and other instruments would also be introduced subsequently. The first day of the launch (June 24, 2003) started with 4 trades of Rs.25 crore each, involving two deals on the 10-year zero-coupon bond and two others on a 91-day bill.

The list of securities on which futures contracts would be available and their symbols for trading are as follows:

Symbol	Description
NSETB91D	Futures contract on notional 91-day T-bill
NSE10Y06	Futures contract on notional 10-year coupon bearing bond
NSE10YZC	Futures contract notional 10-year zero-coupon bond

NSE defines the characteristics of the futures contract such as the underlying security, market lot and the maturity date of the contract. Interest rate futures contract shall be for a period of maturity of one year with three months continuous contracts for the first three months and fixed quarterly contracts for the entire year.

Minimum lot size for the interest rate futures contracts is fixed at 2000. To start with, the minimum value of a interest rate futures contract would be Rs.2,00,000. Base price of the interest rate future contracts on introduction of new contracts

would be theoretical futures price computed based on previous day's closing price of the notional underlying security. The base price of the contracts on subsequent trading days will be the closing price of the futures contracts. There is no day minimum/maximum price ranges applicable for the futures contracts. But for practical purposes, operating ranges for interest rate futures contracts will be kept at ±2% of the base price.

Product characteristics are summarized in the following table.

Table 11

Contract underlying	Notional 10 year bond (6% coupon)	Notional 10 year zero-coupon bond	Notional 91 day T-Bill
Contract descriptor	N FUTINT NSE10Y06 26JUN2003	N FUTINT NSE10YZC 26JUN2003	N FUTINT NSETB91D 26JUN2003
Contract value	Rs.2,00,000		
Lot size	2000		
Tick size	Re.0.01		
Expiry Date	Last Thursday of the month		
Contract months	The contracts shall be for a period of a maturity of one year with three months continuous contracts for the first three months and fixed quarterly contracts for the entire year.		
Price limits	Not applicable.		
Settlement Price	As may be stipulated by NSCCL in this regard from time to time.		

Source: www.nse-india.com

MOTIVES BEHIND USING FUTURES

Hedging

As mentioned above, futures markets were formed originally to meet the needs of farmers and merchants. One can take position solely for the purpose of establishing a known price level – weeks or months in advance – or for either going long or short in cash market to minimize the risk. An individual who does hedging is called 'Hedger' and the activity of trading in futures to control or reduce risk is called 'Hedging'.

Let us consider an illustration to understand how futures market is used for hedging. Suppose in August 20x1 A, a manufacturer of cotton apparels, is in need of 20,00,000 pounds of cotton in December, 20x2, and is of the opinion that the price would rise. Currently, on New York Cotton Exchange (NYCE), the December cotton No.2 futures are trading at 57.00 cents per lot. A entered into a futures contract for a 20,00,000 lot, for which he needs to buy 40 contracts (as minimum contract size is a 50000 lot on NYCE) and locks his price at 57.00 cents per lot (i.e., his total outflow in December will be $2280).

Assume that in December, the cash market price of cotton is 58.55 cents per lot, A will have to pay supplier $2342 to procure cotton. However, the extra cost of 1.55 cents per pound (or $62) which A will have to pay for procuring cotton will be offset by a profit of 1.55 cents per lot when the futures contract bought at 57.00 cents is sold at 58.55. In other words, the hedge provides insurance against an increase in the price. However, had the price of cotton declined instead of rising, A would have incurred a loss on his futures position but this would have been offset by the lower cost of acquiring cotton in the cash market.

Futures markets were initially developed to meet the requirements of hedgers.

Hedgeable and Non-Hedgeable Risks

The futures market has two main types of foreseeable risks namely:

i. Price Risks

ii. Quantity Risks.

While price risks are those risks relating to unexpected changes of prices of a commodity in future, quantity risks can be defined as those risks relating to the future output of a commodity. Price risks can be hedged by taking positions in the futures or options markets and the hedging can be quite accurate so as to ensure no losses. Price risks are also known as hedgeable risks. Quantity risks are also known as non-hedgeable risks, as they cannot be accurately quantified and hedged, given the fact that quantity output is more of an act of God and depends on the outcome of nature.

Basis Risk

The meaning of basis has been discussed earlier. If the hedge can eliminate the full risk it is a situation known as perfect hedging, but given the fact that there is always some uncertainty associated with the future and the difference between the spot prices and futures prices may change, there are chances of basis risks. So, in short, basis risk can be defined as the risk which may occur because of imperfect hedging between the spot price of the asset to be hedged and the futures price of the contract used.

Long Hedging and Short Hedging

There are two types of hedging, namely short hedging and long hedging. Short hedging is also known as selling hedge and it happens when the futures are sold in order to hedge the cash commodity against declining prices. Long hedging is also known as buying hedge and it happens when the futures are purchased to hedge against the increase in the prices of a commodity to be acquired either in the spot or futures market. Short and long hedges can be with or without risk. Depending on the extent of minimization of basis risks, there are four outcomes possible:

i. Short Hedge Without Basis Risk

ii. Short Hedge With Basis Risk

iii. Long Hedge Without Basis Risk

iv. Long Hedge With Basis Risk.

Of these, the outcomes without basis risk are less practical as the risks can be minimized but seldom nullified.

Optimal Hedging Ratio

A general question which arises in the mind of anyone dealing with futures is regarding the optimal hedging ratio or the number of futures contracts to be acquired or sold to minimize the risks. The optimal hedging ratio can be understood as under:

Given that Hedge Ratio (HR) = Q_f (Quantity of futures units)/Q_c (Quantity of current units being hedged)

$HR = Q_f/Q_c$

Where,

Q_f = Quantity of futures units

Q_c = Quantity of current units being hedged.

Or

Q_c x ΔCP (Change in price of current units) – Q_f x ΔFP (Change in price of futures contracts) which is taken from the formula of Basis. Equalizing the variance to 0, we get

$$Q_c \times \Delta CP = Q_f \times \Delta FP$$

or substituting in our first equation, we get

$$\frac{\Delta CP}{\Delta FP} = Q_f/Q_c$$

So, $Q_f = Q_c \times \Delta CP/\Delta CF$

or in other words,

$Q_f = Q_c \times HR$

Now, let us assume that number of futures contracts = NFC and the quantity of the commodity represented by the futures contract is Q_{fc}, therefore,

$Q_f = NFC \times Q_{fc}$

Equalizing both the equations, we get

$NFC \times Q_{fc} = Q_c \times HR$

So, $NFC = Q_c/Q_{fc} \times HR$

which is the standard formula of the optimal hedging ratio.

Speculation

Speculation means to take a view and act accordingly to make profit in a short span of time. Buying a futures contract in anticipation of price increases is known as 'going long'. Selling a futures contract in anticipation of a price decrease is known as 'going short'.

Speculators look for the risks that hedgers are willing to avoid. They have no intention of taking delivery; instead they seek a profit from price volatility. We have seen that hedgers use futures as a tool to avoid an exposure by minimizing the adversity. Let us see how speculators take a position to gain from the futures.

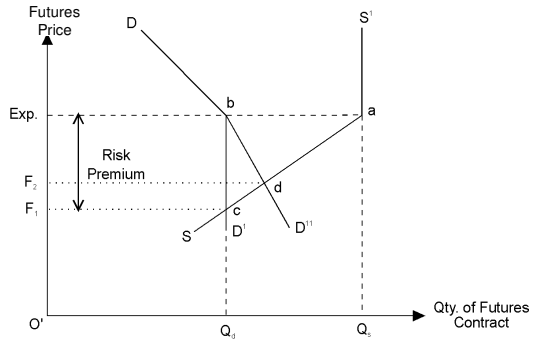
Consider B to be a speculator who, in the month of May, thinks that the price of wheat will go up in the next three to four months. Assume that he does not have enough funds. So, he borrows dollars, and buys wheat of say 1,500,000 bushels at 20.25 per bushel which is the current spot rate. B waits till September. In September, the prices reach the level he expected and thus he sold the wheat and paid-off the borrowed funds along with interest, and realized his profit. But, in this process, he has undertaken some risks associated with the ownership of wheat – the need to store wheat, protect it from pests, transport it from the seller and to the buyer – all these involve either outflow of money or risk.

To avoid all this risk and trouble, he could choose the alternative of trading in futures contracts. Futures contracts on wheat are deliverable in future. That is, B can agree to buy his requirements of wheat at the time he wants at a price which is fixed today. Futures contracts are easy to buy, as they are traded on the exchanges. Also, he can save himself the trouble of checking the quality of the wheat he gets and can be ensured that he has received the one he has bought. This is because futures contracts are standardized not only in terms of quantity, but also in terms of quality.

B can make the same speculation using the futures contracts. He might buy a contract today, for delivery at the end of say, six months hence and sell it when he thinks the price has reached the level of his estimate. This is easier to put through – just two transactions at the futures exchange – compared to buying the actual commodity. The first alternative that involves purchasing the asset upfront will involve more funds and costs. Whereas, for the second alternative, he requires only a small amount of cash as deposit. If we consider the interest loss on the amount blocked in the purchase of wheat, the second option seems to be more attractive, although risky. Whatever be the reasons offered against speculation, it has contributed to the tremendous growth of the futures market.

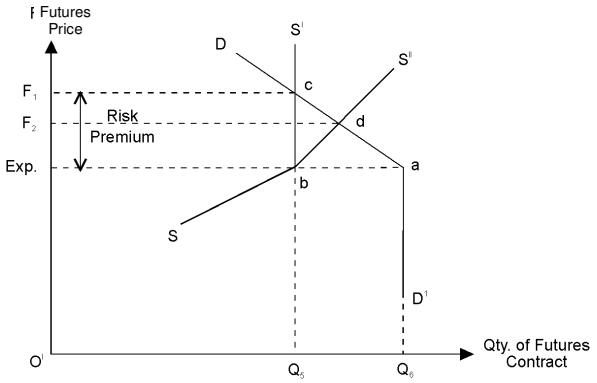
The following charts show the effects of speculation, both in the short-term and long-term.

Figure 2: Effect of Speculation in the Short-term



In the above figure, we can see that when the futures prices fall below the expected spot prices, long speculators enter the market and purchase futures contracts pulling the line DD^1 to the position DD^{11}. This implies that the demand for futures for speculative purposes increases in the futures prices and reduces in comparison to the spot prices.

Figure 3: Effect of Speculation in the Long-term



In the above figure, we can see that the speculative supply of contracts at futures prices is above the expected prices. At this position line SS^1 is pulled down to SS^{11}, implying that the futures prices fall in comparison to the spot prices.

Arbitraging

Arbitraging is a simultaneous purchase and sale of similar assets in different markets to take advantage of price discrepancy.

Arbitrageurs are third group of participants in these markets. The act of arbitraging involves locking in riskless profits by entering into different transactions in two or more markets simultaneously.

Consider an IBM stock traded on the NYSE and on LSE. Suppose the stock price is $155 in NY and 88 pounds in London and the exchange rate is $1.75 per pound. An arbitrageur could simultaneously buy 100 shares in LSE and sell in NY and make a risk-free profit of

100 x [155 – $(1.75 x 88)] = $100.

Transaction costs would reduce the profit of the arbitrageur to the minimum. As the stock is bought on the London Exchange, the demand will increase. Similarly, the price at NYSE will fall as they sell the stock, reducing the arbitraging

opportunities. In short, arbitrage opportunities cannot last for very long periods of time in a stock, but the very existence of arbitrageurs implies that there are opportunities in the markets for at least a short period.

After understanding about the nuances involved in the trading of futures, let us discuss about commodity futures.

COMMODITY FUTURES IN INDIA

The commodity futures in India are very thinly traded though these futures have exclusively designated exchanges incorporated under the Companies Act, 1956. These exchanges are self-regulatory exchanges coming under the supervision of the Forward Markets Commission (FMC), a regulatory body for commodities and forward contracts in India, constituted by the Ministry of Food and Consumer Affairs, Government of India.

In accordance with the National Agriculture Policy, the Union Budget 2002-03 has given a special thrust to the extended coverage of futures trading to all agricultural commodities to minimize the wide fluctuations in commodity prices. This thrust is indeed significant, as it will provide the Indian farmers with an instrument to cover the risks arising from unforeseen market failures. Futures market provides important opportunities for efficient management of price risks through hedging. They also assist in the efficient discovery of prices. Agricultural futures could contribute to the orderly establishment of a more open and liberalized agriculture sector. However, there are still many legal, institutional and operational restrictions that often tend to inhibit the efficient operation of these markets.

Unlike most other developing economies, India has a long experience in operating and managing commodity futures market. In India, agriculture has traditionally been an area with heavy government intervention. Government intervenes by trying to maintain buffer stocks, they try to fix prices, and they have import-export restrictions and a host of other interventions. Commodity futures markets being part and parcel of a program for agricultural liberalization in India have been operating under highly restrictive policies. There are several legal, institutional and operational restrictions that tend to inhibit the efficient operation of these markets. The restrictions provide the markets little chance to contribute significantly to an open and liberalized agriculture sector.

Futures market will produce their own kind of smoothing between the present and the future. If the future price is high and the present price is low, an arbitrageur will buy today and sell in the future. The converse is also true, thus if the future price is low the arbitrageur will buy in the futures market. These activities produce their own "optimal" buffer stocks, smooth prices. They also work very effectively when there is trade in agricultural commodities; arbitrageurs on the futures market will use imports and exports to smooth Indian prices using foreign spot markets.

India produces a range of commodities that enjoy a high global rank in production. The weighted rank of India in the global supply function pertinent to these commodities is between two and three. The impact of the commodity sector on the total economy is considerable.

A reforms program towards building commodity futures exchanges is being effected under the aegis of the Forward Markets Commission (FMC), which is constituted under the Ministry of Consumer Affairs and Public Distribution.

The above commodities are traded in the following exchanges.

No.	Exchange	Commodity
1.	India Pepper & Spice Trade Association, Kochi (IPSTA)	Pepper* (both domestic and international contracts)
2.	Vijai Beopar Chambers Ltd., Muzaffarnagar	Gur
3.	Rajdhani Oils & Oilseeds Exchange Ltd., Delhi	Gur, Mustard seed, its oil and oilcake
4.	Bhatinda Om & Oil Exchange Ltd., Bhatinda	Gur
5.	The Chamber of Commerce, Hapur	Gur, Potatoes and Mustard seed
6.	The Meerut Agro Commodities Exchange Ltd., Meerut	Gur
7.	The Bombay Commodity Exchange Ltd., Mumbai	Castorseed & Castor Oil* Groundnut its oil and oilcake; sunflowerseed, its oil and oilcake; ricebran, its oil and oilcake; sesameseed, its oil and oilcake; safflowerseed, its oil and oilcake; cottonseed, its oil and oilcake and RBD Palmolein.
8.	Rajkot Seeds, Oil & Bullion Merchants Association, Rajkot	Castorseed, Groundnut, its oil and cake, cottonseed, its oil and cake, cotton (kapas) and RBD palmolein.
9.	The Ahmedabad Commodity Exchange, Ahmedabad	Castorseed and cottonseed.
10.	The East India Jute & Hessian Exchange Ltd., Kolkata	Hessian and Sacking
11.	The East India Cotton Association Ltd., Mumbai	Cotton
12.	The Spices & Oilseeds Exchange Ltd., Sangli.	Turmeric
13.	Kanpur Commodity Exchange Ltd., Kanpur	Rapeseed/Mustardseed, its oil and cake
14.	National Board of Trade, Indore	Soya seed, Soyaoil and Soya meals. Rapeseed/Mustard seed its oil and oilcake and RBD Palmolien (Also granted in-principle approval of National Status to trade in all permitted commodities)
15.	The First Commodities Exchange of India Ltd., Kochi	Copra/coconut, its oil and oilcake
16.	Central India Commercial Exchange Ltd., Gwalior	Gur and Mustard seed
17.	E-sugar India Ltd., Mumbai	Sugar
18	On line Commodity Exchange of India Ltd., Ahmedabad	All permitted commodities
19.#	Coffee Futures Exchange India Ltd., Bangalore	Coffee

* In case of pepper and castor oil, international futures trading is also permitted, i.e., one or both the parties to the forward contract can be a foreign participant.
# Registered Association.

Likewise, forward trading in the TSD contracts are regulated in raw jute and jute goods under the auspices of the East India Jute and Hessian Exchange Ltd., Kolkata.

In-principle approval for trading in the above commodities has been given to the following Exchanges/proposed Exchanges:

S. No.	Name of the Association	Commodities
1.	Surendranagar Cotton Oil & Oilseeds, Surendranagar	Cotton, Cottonseed, Kapas
2.	Ahmedabad Commodity Exchange Ltd., Ahmedabad	Cottonseed, Oil and Oilcake.
3.	M/s. NCS Infotec Ltd., Hyderabad	Sugar
4.	E-Commodities Ltd., New Delhi	Sugar
5.	Bombay Commodity Exchange, Mumbai (u/s 14B)	Tea
6.	United Planters Association of South India, Connoor (u/s 14B)	Tea
7.	Tea Auction.com, Kolkata (u/s 14B)	Tea
8.	ICICI Bank led Consortium, Mumbai	All permitted commodities
9.	Financial Technologies led Consortium, Mumbai	All permitted commodities
10.	Bullion Merchants Association, Jaipur	Mustard seed, its oil and oilcake
11.	Bullion Merchants Association, Bikaner	Mustard seed, its oil and oilcake
12.	SGI Commodity Exchange, Mumbai	Soya bean Groundnut, their oils and oilcakes.

These associations/exchanges are at different stages of completing the procedural formalities for setting up the exchange/commencing trading.

In enhancing the institutional capabilities for futures trading, the issue of setting up of a National Commodity Exchange was discussed in an inter-departmental meeting in 1999. The Government followed it up by constituting a Core Group consisting of the Chairman of the Forward Markets Commission (FMC), Adviser, the Reserve Bank of India and CEO & MD, SBI Capital Markets. Based on the Report of the Core Group, the Government gave in-principle approval to a consortium consisting of Mahindra & Mahindra, National Stock Exchange, ICICI Ltd. and Punjab State Warehousing Corporation to set-up the National Commodity Exchange. The Consortium could not complete the procedural formalities for setting up of the NCE within the time frame given to them. In the meantime, some other professional Exchanges are also given in-principle clearance for specific products. The FMC has also issued a press note inviting applications from desirous organizations for setting up of a National Multi-Commodity Exchange. Initiatives are taken for a modernization program including extensive training, structuring a reliable clearinghouse, establishment of a system of warehouse receipts, and the thrust towards the establishment of a National Commodity Exchange.

An exchange was set-up exclusively for trading coffee futures.

Coffee Futures Exchange India Limited (COFEI) was incorporated in December, 1997 in Bangalore in Karnataka where coffee plantation is done extensively. COFEI came into existence in 1996 when the need was felt after the deregulation of the coffee marketing system. Indian coffee production and physical trade is worth over Rs.2,100 crore (US$ 470 million per annum). It is the second largest commodity traded in the world market. India being one of the leading producers of coffee, the price of Indian coffee is exposed to high fluctuations.

The main objectives of COFEI are

i. To provide a hedging opportunity against price risk to all those within and outside coffee industry.

ii. To ensure a platform for guaranteed delivery of coffee.

iii. To provide a price discovery mechanism for future period up to 18 months at any given period of time.

Trading in COFEI was by an "open outcry" system with post trade operations fully computerized prior to September, 2000. But now on-line trading has been introduced. There are two major varieties of coffee viz. Plantation A and Robusta cherry AB. These two are traded as alternate month contracts, i.e., Jan. 2000, March 2000, May 2000, etc. COFEI permits trading in nine contracts simultaneously covering 18 months forward.

Some of the unique features of COFEI are

i. COFEI acts as a counterparty to both buyers and sellers and thus guarantees performance.

ii. The clearing house is a part of COFEI itself and not a separate entity.

iii. All clearing members are shareholders of COFEI.

iv. Daily marking-to-market of all trades enables COFEI to function with minimum risk.

v. All deliveries relating to trade at COFEI are effected from Certified Warehouses recognized and approved by COFEI.

vi. Certified Warehouse system guarantees quality and quantity of coffee delivered.

There are four main categories of members in COFEI. They are:

- Institutional Clearing Members who can clear on behalf of others but cannot trade.
- Trading-cum-Clearing Members (TCM) who can trade on their own account and on others account.
- Trading Members (TM) can trade on their own account and others account but cannot clear trades.
- Ordinary Members (OM) can get their trades executed on their behalf by TM/TCMs.

To become an ordinary member, one has to subscribe to at least one equity share of Rs.10,000 each. An ordinary member cannot directly trade at COFEI but can utilize the services of a Trading Member or a Trading-Cum-Clearing Member to execute the transactions. As compared to a non-member, he gets concessions in both trading fee and clearing fee.

To become a Trading Member, one has to subscribe to at least ten equity shares of Rs.10,000 each besides paying an admission fee of Rs.10,000. COFEI has 65 Trading Members. A Trading Member shall have the right to directly execute his own-account transactions and own-account transactions of ordinary members, other trading members and customers in the trading ring. A trading member shall be a constitutent member of only one clearing member. He has the option to have his contracts cleared either by a Trading-cum-Clearing Member or an Institutional Clearing Member. A Trading Member can levy a maximum of Rs.3.00 as transaction fee, on a Trading Member/Trading-cum-Clearing member, Rs.6.00 on an Ordinary Member and Rs.12.00 on a non-member (customer), for each lot of 600 kilos. Of these, he has to pay Rs.3.00 per lot of 600 kilos to COFEI.

To become a Trading-cum-Clearing Member, one has to subscribe to at least 50 equity shares of Rs.10,000 each, besides contributing Rs.5,00,000 towards guarantee fund and paying admission fee of Rs.40,000. COFEI has 6 Trading-cum-Clearing Members. A Trading-cum-Clearing Member can perform dual functions of executing trades and/or clearing the trades. He has the right to directly execute and/or clear his own account transactions and own account transactions of ordinary members, trading members, trading-cum-clearing members and customers in the trading ring. In his capacity as a Trading Member, he can collect and remit transaction fees within the ceiling fixed by COFEI on a Trading Member. In addition, as a Clearing Member, he can charge a maximum of 0.03% from a Trading Member/Trading-Cum-Clearing Member, 0.04% from an Ordinary Member and 0.05% from a non-member (customer), on the value of the transaction. Of these, he has to pay 0.02% to COFEI.

Institutional Clearing Member (ICM)

A Financial Institution has to subscribe to at least 100 equity shares of Rs.10,000 each to become an Institutional Clearing Member of COFEI. Besides they have to contribute a minimum of Rs.10,00,000 towards guarantee fund and pay Rs.1,00,000 towards admission fees. COFEI will have two Institutional Clearing Members. An institutional clearing member shall have the right to clear transactions in coffee contracts of ordinary members, trading members, trading-cum-clearing members if such transactions in coffee contracts are executed by a trading member or a trading-cum-clearing member in the trading ring. An ICM can levy clearing fee on different categories of Members up to the ceiling fixed by COFEI on clearing transactions by a Trading-cum-Clearing Member.

A non-member can also trade at the exchange through a Trading/Trading-cum-Clearing Member.

The following tools are adopted by COFEI to contain the risk.

- By imposing margins on the traders;
- Daily marking-to-market of all trades;
- By imposing limits on the net positions of Clearing Members linked to their capital and guarantee fund;
- By setting daily price limits for trading;
- By maintaining sufficient capital including guarantee fund.

Box 6: Commodity Market in India

Even well-intentioned moves need a propitious environment to succeed. The proposal of the Bombay Commodities Exchange (BCE) – to be allowed to introduce futures trading in commodities of mass consumption like rice, wheat, sugar, pulses, oilseeds and their products – should be viewed as such. The proposal conforms to the government's stated intention of eventually allowing futures trading in most commodities, in order to prevent excessive price volatility. However, neither the legal framework nor the policy environment is such as to guarantee the success of this proposal. The experience with a few futures exchanges that have already started (for cotton and oilseeds) suggests that a number of policy and institutional changes have to be made before a futures exchange can deliver what is required of it.

The existing futures exchanges are yet to attract enough players and register the trade volumes required to inspire confidence in their long-term viability. Buyers, sellers and traders are still wary of this not-too-well understood mechanism as futures trading is commonly perceived to entail huge risks. Nor is the policy environment quite right. For instance, the existing regulations and curbs on commodity trade and price control mechanisms come in the way of efficient futures trading which, being essentially an instrument of price discovery and price stability, requires undistorted markets in order to work efficiently. Another

pre-condition for the success of futures trading is the strengthening of the market watchdog, the Forward Markets Commission, which needs to be staffed with technically qualified people who are fully *au fait* with the complexities of futures trading. Branches to supervise each commodity exchange are also required. Further, unless proper transparency can be ensured, futures trading in commodities could well prove counter-productive as it would expose millions of small and illiterate producers and small market players to the antics of speculators.

Futures trading is not new to India. The British had to ban it during World War II when they imposed rationing of commodities and stringent market controls. The limited revival of this form of marketing in free India, too, did not last long and had to give way to government controls during the war with China in 1962. Successive governments since then have been wary of reintroducing it in spite of recommendations to this effect by several expert panels.

The latest body to dwell on this subject was the Kabra Committee which was set-up in 1992 and submitted its report in 1994. Though the purpose of constituting this panel was to synchronize the introduction of futures trading in commodities with overall economic reforms, this did not happen. The Kabra Panel had also cautioned against the possibility of speculators with unaccounted money manipulating the market to the detriment of real market players. It had, therefore, recommended that all transactions must close by actual physical delivery so that only those who have a stake in the commodities come to the market. Therefore, while in theory the proposal must be welcomed, it can only be implemented after the necessary pre-conditions have been met.

Source: Business Standard, 12th of April, 2001.

Hedging Using Commodity Futures

Producers of agricultural commodities are faced with price risk and production risk over a period of time and within a marketing year. In case of agricultural commodities, price risk can occur for a number of reasons like drought, floods, uncertain rainfall, natural calamities, near record production, increase in demand, decrease in international prices, etc. One way of reducing this risk is through the commodity futures exchange markets. Agricultural producers can use commodity futures to hedge the potential costs of commodity price volatility.

Hedging in the futures market involves a two-step process. Depending upon the hedger's cash market position, he will either buy or sell futures initially. For example, a firm which owns or plans to purchase or produce a cash commodity will sell futures to hedge this cash position. A long hedge involves a firm purchasing futures to protect itself against a price increase in a commodity prior to purchasing it in either the spot or forward market. In the second stage, once the cash market transaction materializes, the futures position is no longer required and hence the hedger will close his futures position, i.e., if he has gone long on a contract, he will sell it. Alternatively, if he has initially sold a futures contract, he will buy one. It should be noted that both the opening and closing positions must be for the same commodity, same number of contracts and delivery month.

OPTIONS MARKETS

Man has always been innovative and ingenuous. His determination to improvise and overcome the limitations of various processes has resulted in phenomenal and epoch-making discoveries and inventions. To overcome the limitations of proprietorship firms, he discovered the limited companies concept. To limit his dependence on term lending institutions he invented various types of instruments to raise long-term as well as short-term finance like different types of debentures, commercial paper and global depository receipts.

Options and Futures are also the result of this unrelenting search for better financial instruments. They belong to a class of instruments referred to as 'Derivatives' because they derive their value from an underlying commodity or a

financial asset. The underlying commodities and financial assets can range from mundane products like wheat and cotton to precious items like gold, silver, petroleum, and financial assets like stocks, bonds and currencies. Options on commodities have existed in different forms since 1860 for products as diverse as gold, wheat and tulip bulbs in the USA. An active over-the-counter market in stock options has also existed there for nearly a century. However, large-scale manipulations by intermediaries and the absence of standardized contracts resulted in the investors incurring heavy losses due to which the commodity options disappeared from the listing of many exchanges by 1968. It was only in 1973 that organized exchanges began trading options on equities. In 1982, futures on equity and options on bonds made their appearance on stock exchanges.

Now, we shall look at some of the differences between options and futures.

- In options, the obligation to honor the contract is on the writer of the option, whereas in futures both the parties are equally responsible to honor their obligations.
- In options, the buyer has to pay the premium to the writer of the option. In futures, both the parties have to deposit the initial margin with the clearing house and then have to pay variation margin depending on whether the price fluctuation is favorable to them or not.
- American options can be exercised any time before the expiration day, while the European options should be exercised on the last day of expiration period. In futures, no such distinction exists and the parties are expected to honor the contract on the settlement date.
- In options, the buyer limits the downside risk to the extent of premium paid. He, however, retains the upside potential. In futures, the buyer is exposed to the whole of the downside risk and has the potential for all the upside return.
- The expiration period for options is nine months, while for futures it is twelve months.
- Options are employed by both hedgers and speculators, while trading in futures is by and large done by speculators.

For the success of innovative financial products, it is essential that the underlying asset has a strong market presence. The features of equity stocks that have contributed to the success of stock options are:

i. In case of equities, the unsystematic risk component forms a large proportion of the total risk of the security. On diversification, this can be nullified. Buying options on these equities is as good as buying equities themselves, if we do not take into consideration the premium (discussed later) paid. Therefore, once the investor exercises the options he aims to achieve the same objective of nullifying the unsystematic risk.

ii. Equities have high degree of liquidity, that is, they are traded in large volumes. Therefore, purchases and sales by individuals or groups do not cause wide fluctuations in the equity prices, assuring price continuity. This helps the option holder decide the worth of the contract.

iii. Stocks are instruments with no maturity date. They remain on the exchanges for long periods, which facilitate option contracts to be structured on them.

iv. In debt market, quite contrary to the stock market, a large proportion of the total risk is systematic in nature and cannot be eliminated by diversification, within the debt market. Also, the debt instruments have a finite life and limited marketability as compared to stocks. Therefore, options on individual debt instruments could not be successfully traded. However, options on debt indexes were introduced and traded.

Box 7: Derivatives are Injurious to your Financial Health

In the year 2001, options were introduced to the Indian financial markets. Before using these instruments, the investors should be cautious to use them for speculative purposes since they do not have a strong knowledge base of the markets besides lacking strong financial and emotional knowledge. It can be disastrous if an investor indulges in short-term trading.

Hedging and speculation are two sides of the same coin and both are necessary in any financial market. Businesses need to hedge their legitimate risks in the course of conducting their routine business. For example, an importer may need to hedge his currency risk while purchasing goods or services from abroad, or a corporate may need to hedge the interest costs on some loans it has taken. These can be achieved by the use of derivatives.

These risks are assumed by speculators who take an opposing view on the markets than that of the hedgers. Speculation lends depth to markets. However, the speculators are experts in their field, and have a very strong knowledge base of their markets and have a very strong financial and emotional discipline in their operations, normally. Unfortunately most small and retail investors do not have these qualifications.

Retail investors are (were?) mostly long-term players and most of their portfolio gains would have come from long-term investments. Additionally, the retail investor is a psychological bull (optimistic) by temperament, which can be disastrous in short-term trading. When the situation calls, the positions may have to be reversed and short positions have to be built-up and may losses have to be booked. This is psychologically very difficult to do for most people.

The general line of explanation to the masses/retail investors is that the returns can be very high by using the derivatives for short-term investments with the risk being limited to only your premium cost (in each round, the cumulative effect of which they would not tell you; you have to figure it out for yourself). This is because of the extreme leverage. Suppose an investor is very bullish on a company currently priced at Rs.10 per share but whose price is expected to rise to at least Rs.15 in the near future. Investor has only Rs.100 with which he could either buy 10 shares of company priced at Rs.10 in the cash market, or he could buy an option for buying 100 shares at Re.1 premium with a two month maturity. Suppose the price jumps to Rs.15 as expected. Investor return would be 50 percent on the 10 shares which he had bought in the cash market. Investor options would earn a profit of Rs.5 per share on an investment of Re.1. Hence, he makes a return of 400 percent (Rs.500 profit less Rs.100 cost) on investment of Rs.100. Now suppose that due to a political problem, the markets stay depressed and the price is at Rs.10 only and the options expire worthless. Investor loses all the money invested in this options trade. Worse, as expected the price goes to Rs.15 in the third month and I can only see the prices ruefully but he have not profited from investment. Had he bought the ten shares, he would have been able to ride out the delay and still make the profit, only it is slightly later.

George Ure's shortlist of William Gann's 24 rules for trading from his 1930 classic "The Wall Street Stock Selector", for your benefit.

1. Never risk more than 1/10th of your capital in one speculation.
2. Use Stop Loss orders.
3. Do not overtrade.
4. Never let a profit run to a loss.
5. Do not buck the trend.
6. When in doubt, get out.
7. Trade only in active stocks.
8. Spread risk among 4-5 issues – not just one.

9. Never fix your price, trade at market. (*)
10. Don't close positions without a good reason.
11. Build an emergency fund.
12. Never buy to get a dividend.
13. Never average a loss.
14. Never get out because you have lost patience with a position.
15. Avoid taking small profits and big losses.
16. Never cancel a stop order once you make a trade.
17. Avoid getting in and out too often.
18. Be just as willing to go short as long.
19. Never buy because a price is low, or sell because a price is high.
20. Be careful about pyramiding at the wrong time.
21. Select stocks with a small volume of shares outstanding to pyramid on the buying side, and the ones with the largest volume of stock outstanding to sell short.
22. Never Hedge. Get out instead.
23. Never change a position without a good reason.

* Avoid increasing your trading after a period of good trades.

Source: "Derivatives are Injurious to your Financial Health", by Pinank Mehta, Portfolio Organizer, August 2001.

Options Traded in Stock Exchanges

Options are traded on stocks, stock indices, foreign currency and futures. The table below gives some of the leading option exchanges in the United States and the instruments on which options contracts are traded.

Table 12

Exchange Name	Assets on which options are traded
Chicago Board Options Exchange (CBOE)	Individual stocks, Stock indices, Treasury securities
American Stock Exchange	Individual stocks, Stock indices
Philadelphia Stock Exchange	Individual stocks, Stock indices, Currencies
Pacific Stock Exchange	Individual stocks, Stock indices
New York Stock Exchange	Individual stocks, Stock indices
Chicago Mercantile Exchange	Futures (on agricultural goods, stock indices, debt instruments and currencies)
Chicago Board of Trade	Futures (on agricultural goods, precious metals, stock indices and debt instruments)

But the volumes traded differ from exchange to exchange. While CBOE leads in equity and index options, Philadelphia Stock Exchange leads in foreign currency options. In case of options on futures, Chicago Board of Trade and Chicago Mercantile Exchange are the leaders.

OPTIONS TERMINOLOGY

An option is a contract in which the seller of the option grants the buyer the right to purchase from or sell to, the seller a designated instrument or an asset at a specific price which is agreed upon at the time of entering into the contract. It is important to note that the option buyer has the right but not an obligation to buy or sell. But, if the buyer decides to exercise his right the seller of the option has an obligation to deliver or take delivery of the underlying asset at the price agreed upon. The seller of the option is also called the writer of the option.

Call Option

An option contract is called a 'call option', if the writer gives the buyer of the option the right to purchase from him the underlying asset, at a predetermined price at sometime in future.

Put Option

An option contract is said to be a 'put option,' if the writer gives the buyer of the option the right to sell the underlying asset, at a predetermined price at sometime in future.

Exercise Price

At the time of entering into the contract, the parties agree upon a price at which the underlying asset may be bought or sold. This price is referred to as the exercise price or the strike price. At this price, the buyer of a call option can buy the asset from the seller and the buyer of a put option can sell the asset to the writer of the option. This is regardless of the market price of the asset at the time of exercising.

Expiration Period

At the time of introducing an option contract, the exchange specifies the period (not more than nine months from the date of introduction of the contract in the exchange) during which the option can be exercised or traded. This period is referred to as the Expiration Period. An option can be exercised even on the last day of the expiration period. Beyond this date the option contract expires.

Such options, which can be exercised on any day during the expiration period are called American options. There is another class of options called European options. European options can be exercised only on the last day of the expiration period. For these options, the expiration date is always the last day of the expiration period.

Depending on the expiration period, an option can be short-term or long-term in nature. Warrants and convertibles belong to the latter category and are often issued by companies to finance their activities. (In our country, Reliance Petroleum Ltd., has recently converted its warrants issued as a part of triple optional convertible debentures into fully paid shares.)

Option Premium or Option Price

This is the amount which the buyer of the option (whether it be a call or put option) has to pay to the option writer to induce him to accept the risk associated with the contract. It can also be viewed as the price paid to buy the option. Consider the data given below. This is regarding the options traded at Chicago Board Option Exchange.

Table 13

Expiry Date Strike Price	Sales	Open Int.	Week's ($)		Closing Price ($)	Net Change	N.Y. Close ($)
			High	Low			
IBM Jan. 40	1172	3459	7 1/2	6	7 1/8	+1 3/8	45 7/8
IBM Jan. 40 p	2030	6479	1 1/2	7/8	15/16	–9/16	45 7/8
IBM Jan. 45	2410	10184	4 1/8	3	3 5/8	+11/16	45 7/8
IBM Jan. 45 p	1827	8452	3 1/2	2 3/8	2 9/16	–1 3/16	45 7/8
IBM Jan. 50	4964	11862	1 15/16	1 5/16	1 11/16	+7/16	45 7/8
IBM Apr. 45	238	173	5 1/8	4	4 3/4	+7/8	45 7/8
IBM Apr. 50	755	676	2 7/8	2 1/8	2 11/16	+9/16	45 7/8
John Jn. Sep. 35	317	439	6 3/8	5 1/4	5 3/8	+1/4	39 7/8
John Jn. Sep. 40	1146	2376	1 15/16	7/8	7/8	– 3/8	39 7/8
K Mart Oct. 25	222	327	3/16	1/8	1/8	– 3/6	22

Source: Barron's – Dow Jones & Company.

For explanation, we consider the first row of quotations (IBM Jan. 40).

The first column gives the company's name (IBM) on whose stock the option is being traded, the month in which that particular option is going to expire (January), the exercise price (40) and whether it is a put option or not. All options that are not indicated as put options are call options. The second column gives the number of contracts that were traded on that day. Since each contract represents 100 shares of the company, trading 1172 contracts on that day involved a total of 117200 shares of IBM. The figure in the third column (3459) gives the aggregate (cumulative) number of exercisable contracts that exist till date. It is referred to as Open Interest. An opening writing transaction will add to the existing positions and a closing writing transaction will reduce them.

The figures in the fourth column (7 1/2, 6), give the highest and the lowest prices in dollars at which the contracts were traded. The figures in the fifth column give the price of the last trade. The sixth column (1 3/8) gives the change between the closing (last) trade of 7 1/8 and the prior week's last trade of 6 6/8.

The last column gives the closing price of the underlying stock at the New York Stock Exchange. This facilitates the comparison of the prices of the stocks and the options.

Expiration Cycle

The options listed in the stock exchanges and introduced in certain months expire in specific months of the year only. This is due to the fact that option contracts have to expire within nine months from the date of their introduction. Exchanges previously used to assign an issue to one of the three cycles. First is January, April, July and October; other is February, May, August and November; third is March, June, September and December. This has been modified now to include both the current month and the following month, plus the next two months in the expiration cycle so that the investors are always able to trade in the options. Therefore, now the first cycle will be January, February, April and July, the second cycle will be February, March, April and July and the final cycle will be March, April, July and October.

Pay-off from an Option

In this part, we shall look at profit/loss made by an investor when he decides to exercise the option.

CALL OPTIONS

We know that if the investor decides to exercise his right, in a call option, then he will buy the shares of the company at the exercise price. Should he do so irrespective of the current market price of the stock? No, he should not. The explanation for different market prices of the stock is given below.

For a contract assume that the option premium was Rs.3, the exercise price Rs.25 and the current market price of the stock is Rs.23. This data remains the same for all of the following three cases. Each contract stands for 100 shares.

Case 1

After three months assume that the market price of the stock rose to Rs.30. At this point, should the investor exercise the option? Yes, he should. The pay-offs are shown below.

Premium	Exercise price	Total outgo	Worth of stock at current price	Profit/(loss)
300	2500	2800	3000	200

In this case, the trader made a profit of Rs.200. The explanation is as follows: The trader, by exercising the option, has received the stock worth Rs.3,000 by paying only Rs.2,500. That is, a profit of Rs.500. This lowered by the premium will be Rs.200. Therefore, the trader will make a profit whenever the stock price exceeds the sum of the option premium and the exercise price. It is beneficial for him to exercise the option as long as the stock price is greater than the exercise price.

Case 2

In this case, assume that the stock price has increased to Rs.28. Should he exercise the option? He should. The pay-offs are shown in the following table.

Premium	Exercise price	Total outgo	Worth of stock at current price	Profit/(loss)
300	2500	2800	2800	0

In this case, the trader by exercising the option has made a profit of Rs.300. However, this profit is negated by the option premium. From another perspective, if the investor buys the stock in the market, he will have to pay Rs.28, whereas he can get it for Rs.25 on exercising the option.

Case 3

Now assume that the current stock price is Rs.21. Should the investor exercise his option now? What would be the profit/loss if he does or does not exercise his option? The pay-offs are shown in the following table.

Premium	Exercise price	Total outgo	Worth of stock at current price	Profit/(loss)
300	2500	2800	2100	(700)
300	–	300	–	(300)

We observe that if the trader exercises his option, he will incur a total loss of Rs.700 and even if he does not exercise the option the loss will be equivalent to the premium. That is, if the stock price falls below the exercise price, the investor loses and his maximum loss is equal to the premium he pays.

PUT OPTIONS

In case of put options, a buyer will make a profit if he exercises his option when the stock's current price is lower than the exercise price. In this situation, the writer will take delivery of the stock whose worth is less. We consider three cases as above. The option price (Rs.3) and the exercise price (Rs.25) remains the same for all the three cases.

Case 1

Assume that the current market price is Rs.21. Should the buyer of the option exercise it? Yes, he should. The pay-offs are shown in the table.

Premium	Exercise price	Total inflow	Worth of stock at current price	Profit/(loss)
300	2500	2200	2100	100

The explanation is as follows: On buying the option, the trader pays Rs.300. On exercising the option, the trader could manage to make a profit of Rs.400 as the price of the stock in the market is Rs.21. Therefore, Rs.400 reduced by Rs.300 gives him a total profit of Rs.100. Thus, when the current price of the stock is less than the exercise price less the premium, the trader makes a profit.

Case 2

Assume that the stock's current market price is Rs.22. Should the buyer exercise the option? Yes, he should. Pay-offs are shown in the table that follows:

Premium	Exercise price	Total inflow	Worth of stock at current price	Profit/(loss)
300	2500	2200	2200	0

In this case, the buyer paid Rs.300 as option premium. On exercising the option he made a profit of Rs.300 as the market price of the stock is Rs.22. Therefore, whatever profit was made on exercising the option was negated by the option premium paid. As a result, there was no profit for the trader. Therefore, we conclude that when the exercise price of the contract equals the sum of premium paid and the current price of the stock, the trader just manages to recover his investment.

Case 3

Assume that the stock's current market price is Rs.27. The pay-offs are shown in the table.

Premium	Exercise price	Total inflow	Worth of stock at current price	Profit/(loss)
300	2500	2200	2700	(500)
300	–	(300)	2700	(300)

In this case, the trader suffered loss. This is because the buyer already paid the premium of Rs.300. As the price of the stock has increased, it will be a wise decision not to exercise the option. At least by selling the stock, in the exchange, the trader can recover the premium and make profits as a part of capital appreciation. Therefore, the trader suffers a loss when the current market price of the stock is greater than the exercise price. His maximum loss is, again, limited to the premium paid as the option is allowed to lapse.

Note:

In all these cases, we have ignored the transaction costs.

Intrinsic Value

Intrinsic value of an option is the value of the profits that are likely to be made from the option. It consists of the profit that will accrue, if the option is exercised today (in the case of an American option) or the present value of the profit (in the case of a European option).

Time Value

The intrinsic value for first contract above (Table 13) is $\$5\frac{7}{8}$. The difference between the intrinsic value and the option price is paid in the expectation that in future the price of the stock may rise. This price is referred to as the Time Value. The option price is $\$7\frac{1}{2}$. The difference is $\$\left(7\frac{1}{2}-5\frac{7}{8}\right)$ = 13/8 cents. This is the time value of the option.

'Out-of-Money' Options

An option contract is said to be 'Out-of-Money' if the buyer incurs a loss if he exercises it now. An "Out-of-Money" call option will have an exercise price that exceeds the current market price of the stock. In table 13 containing option quotations, the fifth and the seventh contracts are examples of 'Out-of-Money' contracts.

These options have no intrinsic value, whatsoever, and the price quoted for these options is for the perceived time value.

'In-the-Money' Options

An option contract is said to be 'In the Money' if the buyer makes a profit if he exercises it now. An "In-the-Money" call option has an exercise price that is lower than the current market price of the stock. In table 13, the option contracts first, third and sixth are examples of "In-the-Money" contracts. These options possess intrinsic value as well as time value.

'At-the-Money' Options

These contracts do not result either in gain or loss if the buyer exercises them now. For 'At-the-Money' options, the exercise price of the option is equal to the current market price of the stock.

Note:

We have been defining the above concepts for 'Call Options'. For put options exactly the opposite of these have to be considered. These are shown in the following table.

Table 14

Put options	
Out-of-Money	stock price > exercise price
In-the-Money	stock price < exercise price
At-the-Money	stock price = exercise price

TRADING IN OPTIONS

We have already seen that options are traded on exchanges and have already discussed how to understand published quotations. Let us now learn the trading mechanism, that is, the process through which trading takes place on an options' exchange.

Types of Traders

As in stock exchanges, we find different kinds of traders on the floor of the exchange where options are traded. They are market makers, floor brokers and order book officials.

MARKET MAKERS

A trader who trades on his own account in order to make a profit is a market maker. Market makers have an obligation to make market for the investors by standing ready to buy and sell options. Market makers can follow different strategies in the options of the few stocks which he deals in by gauging the mood of the investing public.

FLOOR BROKERS

A floor broker's main job is to execute the order which he receives from outside the exchange at the best possible price quickly. They usually belong to one of the brokerage firms and receive salary or commissions. The brokerage firms also engage in proprietary trading i.e., trading for their own account. Other staff members assist them.

ORDER BOOK OFFICIALS

The order book official is an employee of the exchange who participates in trading. He cannot trade for his own account. His main task is to facilitate the flow of orders. He does so by disclosing the best possible limit orders awaiting execution. He is assisted by other staff members.

SPECIALISTS

These officials function as both dealers and brokers. As dealers, they have to maintain inventory of the stocks they are assigned and deal in them by quoting the prices both ways. As brokers, they have the responsibility of maintaining the limit order book and execute its orders keeping in view the movement in the market prices.

Specialists are employed by the American Stock Exchange, but in Chicago Board Options Exchange, the function of the specialists is divided between market makers and order book officials.

Types of Positions

Options trade fall into one of the four categories:

i. Open a position with a purchase
ii. Open a position with a sale
iii. Close a position with a purchase
iv. Close a position with a sale.

OPEN A POSITION WITH A PURCHASE

An investor opens a position or establishes a position by buying an option. This action on the part of the investor increases the existing long positions by a single contract. An investor is said to be long when he buys an options contract – whether it is a call option or a put option.

OPEN A POSITION WITH A SALE

An investor can also open or establish a position by writing an option. This increases the existing short positions by a single option. An investor is said to be short when he writes an option, whether it is a call or a put option.

CLOSE A POSITION WITH A PURCHASE

An investor who has a short position as a result of writing an option can cancel it by entering into a closing purchase transaction. This reduces the existing short positions by one contract.

CLOSE A POSITION WITH A SALE

An investor who has a long position as a result of buying an option can offset it by entering into a closing sale transaction. This reduces the existing long positions by one contract.

When a trader closes an existing position – either long or short, that order is called an offsetting order. Thus, an investor who is long cancels his position by a sale of an option which belongs to the same series (this is a necessary condition) and an investor who is short can cancel his position by purchasing an option belonging to the same series.

In options trading also we have market order, limit order and stop limit order (along with the specified periods). These are similar to what we have in case of stocks.

Process of Trading

An investor, who wishes to deal in options, has to open an account with the broker. The broker may or may not be a member of a clearing house. Let us first look at the process when the broker happens to be a member of a clearing house. After opening the account, the initial margin has to be deposited. One of the accounts executive notes down the contract specifications and transmits the same to the floor brokers. The floor broker executes the order and intimates the details of the contract to the clearing house. After confirming these with the clearing house, he passes back to the accounts executive the trade details which are then conveyed to the investor.

When the broker does not happen to be a member of the clearing house, the broker has to contact a member of the clearing house and route his client's trades through him. The remaining procedure is the same.

Options Clearing Corporation

The buyer of the call option has every right to purchase the shares of the company at the exercise price. If the writer of the option does not honor his part of the option contract, the buyer loses the benefit of buying the contract. Therefore, he looks for a mechanism which would assure him that the contract will be honored in all the circumstances. To overcome problems like these and to facilitate smooth trading in options, a clearing house 'Options Clearing Corporation' has been formed. In some instances this corporation is jointly owned by several exchanges (the clearing members) while in some other instances it exists as an autonomous body.

THE ROLE OF OCC

After the deal for an option contract is struck on the trading floor of the exchange, the OCC steps in acting as a writer as far as the buyer is concerned and the buyer as far as the seller is concerned. Thus, at this juncture, the link between the buyer and the seller is severed. At the end of every trading day, the OCC examines the contract notes submitted to it by its members. The paperwork submitted by both the parties should match. If they agree, they are called matched trades, else outtrade. The process of matching trades and tracking payments is called clearing. In case of outtrades, the exchange tries to reconcile the differences by contacting the related traders.

The OCC maintains all these data in a computer system. It also maintains a record of the outstanding position of all the investors involved in options trading. Thus, whenever it receives an exercise notice from its members it checks the uncanceled short position of other members in the same series and assigns it to one of them in a random fashion.

After receiving the short notice, the trader with the short position will:

i. Oblige the option holder, or

ii. Default.

WHEN THE WRITER OBLIGES

This is quite a straight forward issue. In this procedure when the buyer of a call option decides to exercise his right, he informs his broker. The broker then delivers an exercise notice form to the OCC with necessary details. When the OCC receives the exercise notice form from the broker, it posts the same to one of the brokers whose account shows short uncanceled position in the same series. This is done on a random basis. The broker house then reassigns the notice to one of its clients, and delivers the share certificates already deposited with it.

WHEN THE WRITER DEFAULTS

In case the short trader fails to oblige, the OCC performs the writer's part of the contract as usual and then initiates proceedings against the writer for default. We will also see how the OCC takes precautions to avoid such situations.

In addition to the above, the OCC makes it possible for buyers and writers to close their positions at any time during the expiration period. When an option is sold, the clearing corporation makes the entry for sale of the option in the account of the holder maintained by it. At the same time, it enters a long position in the account of the writer of the option chosen randomly. The entry made will cancel out the existing entry and the offsetting position of the two is reduced. From this, we observe that whenever a buyer or a writer enters into an offsetting contract, he is relieved from his obligation to pay or to deliver stock.

Margins

To relieve the OCC as well as the broker of the legal complexities and the burden in case the writer defaults, margin requirements have been set in place by the exchanges where options are traded. This gives ample scope to brokers, to impose even stricter requirements on their clients, as in the final arrangement of things the brokers are responsible to the OCC for the actions of their clients. When a trader buys an option, he will pay the price of the option to the writer on the next day. Therefore, it can be said that in long positions, 100% margin is paid.

In case of option writers, margin requirements assume importance. When the option buyer decides to exercise the option, the writer has to deliver or buy the stock. Margins are imposed on writers to make sure that there is no loss to the broker, buyer or the clearing house. The writer of, say a call option, is asked to deposit an amount calculated in accordance with the rules of the exchange. This amount is so calculated that generally, the price fluctuation in the underlying stock in a day is not more than the margin amount.

In case the price movement is adverse to the writer, the amount of loss is debited to the margin account. If the balance in the margin account falls below the maintenance margin amount, the writer is asked to make-up the margin to the original level. The margin to be paid initially is called initial margin and the amount paid to make-up the margin is called the variation margin. If the option writer holds the stock on which he has written the option, he may deposit it with the exchange instead of paying margins. If the stock is so deposited, there is no risk of default by the writer. Therefore, he is exempted from margins. The same has been elaborated below.

COVERED CALL WRITING

An option contract is said to be a covered call option, when the option is covered or protected by the writer by depositing the shares of the company on which the option is written in an escrow account with the brokerage firm. Therefore, the writer of a call option does not have to deposit any cash as such and whenever an exercise notice is received from the OCC, the shares are delivered.

In case, the option expires or if the writer enters into an offsetting transaction, he can withdraw the stocks deposited.

NAKED CALL WRITING

If a trader writes a call option without owning the underlying stock, it is called naked call writing. When the writer does not own the underlying stock, he has to deposit the necessary amount of margin with the brokerage firm who in turn deposits it with the exchange. Sometimes, the deposit required by the broker may be higher than the deposit required by the exchange.

NAKED PUT WRITING

In this situation, the brokerage firm does not have either the cash or the stock of other companies as security deposited by the writer of the put option.

Calculation of the Initial Margin for Naked Options: The method of calculation of the margin differs from exchange to exchange.

We explain the method followed frequently with an example.

If the investor writes a naked call or put option which is 'Out-of-money', the margin is calculated in two ways and the higher of these two is deposited as the margin.

The First Method

i. Calculate the option premium for 100 shares (each option contract is on 100 shares).

ii. Then compute 0.20(market value per share)(100).

iii. Then compute the amount by which the contract is 'Out-of-money'.

The margin amount is given by (i) + (ii) – (iii).

The Second Method

In this case, we calculate the margin as follows:

Margin = 100 x Option premium per share + 0.10(stock's market price)(100)

Illustration 4

An option trader writes a single naked call option. The option premium is Rs.2. The stock price and the exercise price are Rs.52 and Rs.55 respectively. Calculate the margin required.

Solution

The option is out-of-money by Rs.3. We calculate the margin by both the methods.

First Method

Option premium for 100 shares is Rs.200. Substituting in the formula: 100 x Option premium per share + 0.20 (stock's market price) (100) – the amount by which the contract is 'Out-of-money',

We have, (2)(100) + 0.20(52)(100) – 100(55 – 52) = 940.00

Second Method

The formula is = 100 x Option premium + 0.10 (stock's market price)(100)

= 200 + 0.10(52)(100) = 720.00

The initial margin required is, therefore, the higher of two, which is Rs.940.

Illustration 5

A trader writes a single put option at a premium of Rs.3.50. The stock's exercise price and market price are Rs.32.00 and Rs.35.00 respectively. Calculate the margin deposited by the trader at the brokerage firm.

Solution

Margin is calculated by two methods, and highest of the two is deposited.

First Method

Margin = Option Premium x 100 + 0.20 (Market value of the share) (100) – 100 (Stock's market price – Exercise price)

= 3.50 x 100 + 0.20(35.00)(100) – 100 (35 – 32)

= 350 + 700 – 300 = Rs.750.00

Second Method

Margin for single

put option = 100 x Option premium + 0.10 (Stock's market price) 100

= 350 + 0.10 (35) (100) = Rs.700.00

Therefore, margin to be deposited is the higher of these, which is Rs.750.00.

Calculation of Margin for Naked Put Option which is 'In-the-money'.

For a naked put option, which is 'In-the-money', the margin is calculated as follows:

i. By calculating the option premium for 100 shares;

ii. By calculating 0.20 (Stock's market price) (100).

Then, the margin = (i) + (ii).

Illustration 6

An option trader writes a single naked put option. The option premium is Rs.2. The stock price and the exercise price are Rs.36 and Rs.38 respectively. Calculate the margin required.

Solution

We calculate the option premium which is 2 x 100 = Rs.200.

Then, we calculate 0.20(36)(100) = Rs.720

Margin to be deposited = 200 + 720 = Rs.920.

Calculation of Margin for Naked Call Option which is 'In-the-money'.

In this case, the margin is calculated as follows:

i. By computing the premium for 100 shares.

ii. By computing 0.20(Stock's market price)(100).

Then, the Margin = (i) + (ii).

We observe that, this method is similar to the method employed in calculation of margin for naked put option which is 'In-the-money'.

Illustration 7

An investor writes a naked call option at a premium of Rs.3. The current market price of the stock is Rs.64 and the exercise price is Rs.60. Calculate the initial margin.

Solution

In case of call option, Margin = Option premium + 0.20 (Stock's market price)

= 100 x 3 + 0.20(64)(100)

= 300 + 1280 = Rs.1,580.

OPTIONS MARKETS IN INDIA

Options have been introduced in the Indian stock exchanges since July, 2001. But the investors and the traders are still skeptical as these instruments are new to the Indian market and the derivatives market in the world is very dull after a few scams in the derivatives dealing in the late nineties. From July 2002, stock options were also introduced in December 2002, there is a proposal to introduce rupee options in India.

Index options were already traded in the market. On July 2 the trading of stock options started. An index option and a stock option are quoted as follows.

Details about the index and stock options traded at the NSE are given below.

Instrument Type: OPTIDX for index option and OPTSTK for stock option.

Symbol: NIFTY (in the case of index)/stock symbol in the case of stock say, XYZ.

Option Type: CE (to denote the option is a call of European type).

CA indicates the option is a call option and the style of the option is American. Similarly, we have put options denoted as PE and PA respectively.

Strike Prices: Generally there are five strike prices, two in-the-money, one at-the-money and two out-of-the-money prices. In the case of stock options, the strike price intervals are determined based on the price of the underlying security. The strike-intervals are as follows:

Price of Underlying	Strike Price Interval
Less than or equal to Rs.50	2.50
> Rs.50 to < Rs.150	5
> Rs.150 to < Rs.250	10
> Rs.250 to < Rs.500	20
> Rs.500 to < Rs.1,000	30
> Rs.1,000 to < Rs.2,500	50
> Rs.2,500	100

Base price of the options contracts when introduced will be the theoretical value of the option contract calculated as per the Black-Scholes model. The base price on subsequent trading days will be the daily close price of the options contract. For those options, whose orders could not be placed because of application of price ranges, the base prices are modified at the discretion of the exchange and intimated to its members. There is no day minimum or maximum price ranges applicable to the options. The operating ranges and day minimum or maximum ranges of options are kept at 99% of the base price. Hence, the members will not be able to

place orders at prices which are beyond 99% of the base price. Trading members can enter into an index options contract (buy/sell) on NIFTY. Lot size in the case of stock options will be Rs.2,00,000.

Expiry Period of the Contracts

The contracts in general expire on the last Thursday of the expiry month. If the last Thursday is a holiday, then the previous working day will be considered as the expiry date.

Liquidation of Options Contracts

Liquidation of options can be done in three ways. On the expiry date one can sell or buy, abandon or exercise it. But buying and selling are most commonly practised in the options market. When the premium is less than the transaction costs of liquidating the options, the option is usually abandoned.

Pricing of options contracts

Options are generally priced by the negotiations between buyers and sellers. Prices are influenced by the expectations of the future prices of the buyers and sellers and the relationship between the option price and the price of the instrument. The price step in respect of S&P CNX nifty options contracts is Rs.0.05.

Users of options markets

The choice of options for investment purposes will depend on financial goals and investment objectives of the investors. The following types of investors may trade in options:

- Those who want to trade in the market without holding a strong portfolio.
- Those who want to protect the value of their diversified portfolio of equities.
- Those who have strong views on the market and its future movement and would like to take advantage of the same.
- Those who observe the equities market closely.

Eligibility of Stocks for Options Trading

To be eligible for trading for options, the stocks should meet the following criteria:

- The stock should be one among the top 200 scrips on the basis of average market capitalization during the last six months and the average free float market capitalization should not be less than Rs.750 crore. The free float market capitalization means the non-promoter holding in the stock.
- The stock should be amongst the top 200 scrips on the basis of average daily volume (in value terms), during the last six months. Further the average daily volume should not be less than Rs.5 crore in the underlying cash market.
- The stock should be traded in at least 90% of the trading days in the last months, with the exception of cases in which a stock is unable to trade due to corporate actions like demergers, etc.
- The non-promoter holding in the company should be at least 30%.
- The ratio of the daily volatility of the stock *vis-à-vis* the daily volatility of the index (either BSE Sensex or S&P CNX Nifty) should not be more than 4, at any time during the previous six months.

Options on Individual Securities

The following are the stocks on which options are traded.

Table 15

S.No.	Security Name	NSE Symbol
1.	Associated Cement Co. Ltd.	ACC
2.	Bajaj Auto Ltd.	BAJAJ AUTO
3.	Bharat Heavy Electricals Ltd.	BHEL
4.	Bharat Petroleum Corporation Ltd.	BPCL
5.	BSES Ltd.	BSES
6.	Cipla Ltd.	CIPLA
7.	Digital Equipment (I) Ltd.	DIGITALEQP
8.	Dr. Reddy's Laboratories	DRREDDY
9.	Grasim Industries Ltd.	GRASIM
10.	Gujarat Ambuja Cement Ltd.	GUJAMBCEM
11.	HDFC Ltd.	HDFC
12.	Hindalco Industries Ltd.	HINDALCO
13.	Hindustan Lever Ltd.	HINDLEVER
14.	Hindustan Petroleum Corporation Ltd.	HINDPETRO
15.	Infosys Technologies Ltd.	INFOSYSTCH
16.	ITC Ltd.	ITC
17.	Larsen & Toubro Ltd.	L&T
18.	Mahanagar Telephone Nigam Ltd.	MTNL
19.	Mahindra & Mahindra Ltd.	M&M
20.	Ranbaxy Laboratories Ltd.	RANBAXY
21.	Reliance Industries Ltd.	RELIANCE
22.	Satyam Computer Services Ltd.	SATYAMCOMP
23.	State Bank of India	SBIN
24.	Sterlite Optical Technologies Ltd.	STROPTICAL
25.	Tata Iron and Steel Co. Ltd.	TISCO
26.	Tata Power Co. Ltd.	TATAPOWER
27.	Tata Tea Ltd.	TATATEA
28.	Telco Ltd.	TELCO
29.	Videsh Sanchar Nigam Ltd.	VSNL

SETTLEMENT OF OPTIONS CONTRACTS

Settlement of the Index Options Contract

In the index options contract, the premium to be paid or to be received is calculated for each CM after netting the positions at the end of each day. The CMs who have to pay the premium pay them to NSCCL and this is adjusted with those who have to receive the premium. This is known as daily premium settlement, CMs are responsible for collecting and settling the premium amounts from the TMs and their clients. The premium to be paid or received is directly debited or credited respectively to the CM's clearing bank account.

On the expiry day of the options contract, NSCCL will determine the outstanding in-the-money contracts based on the final settlement price, and the resulting profit or loss will be settled in cash. The final settlement price is the closing value of the underlying index price on the expiration day of the contract. The final settlement profit or loss will be the difference between the stock price and the final settlement price of the relevant index option contract. Final settlement profit or loss amount is credited or debited to the relevant CM's clearing bank account on the day following the expiry day.

Settlement of Options Contracts on Individual Securities

The premium to be paid or received is netted across all option contracts on individual securities at the client level to determine the net premium payable or receivable at the end of each day. The settlement procedure is similar to that of the index option contracts. Interim exercise settlement is effected for exercised option

positions at in-the-money strike prices, at the close of trading hours on the exercise day. The interim exercise settlement price is the clearing price of the underlying security on the exercise day. The settlement value is the difference between the strike price and the exercise settlement price of the option contract. The exercise settlement value is debited or credited to the CM's clearing bank account on the third day of the exercise day.

Final settlement is effected at in-the-money prices.

Options quotations in the Indian exchanges are given as below.

Table 16: Sensex Options

Contract (Strike Price)	Prev. Close	Close Price	No. of Contracts	No. of Trades	Value in lakh	Open Interest
BSXCFEB03300	414.09	406.33	100	1	374900	0
BSXPJAN03300	3311.03	3311.03	0	0	0	0

Source: www.bseindia.com.

Table 17: Stock Options on BSE

Stock	Strike Price	Premium	No. of Contracts	No. of Trades	Value in lakh	Open Interest	Exp. Date
Call Option							
Infosys	4900	61.26	-	-	-	100	30/01/2003
L&T	210	1.81	-	-	-	1000	30/01/2003
Sterlite Opt	65	0.12	-	-	-	600	30/01/2003
Put Option							
HPCL	260	2.80	-	-	-	1300	30/01/2003
Infosys	4600	113.00	-	-	-	0	30/01/2003
Sterlite Opt	60	2.20	-	-	-	1200	30/01/2003

Source: Economic Times, 15th Jan., 2003.

Table 18: Nifty Options

Stock	Exp. Date	Strike Price	Premium			No. of Trades	Value in lakh	No. of Contracts	Open Interest
Call Options			Open	High	Low				
Nifty	30/01/03	1050.00	35.00	39.25	34.25	10200	110.87	51	9000
Nifty	30/01/03	1060.00	28.00	29.00	25.00	3400	36.94	17	33000
Put Options									
Nifty	30/01/03	930.00	1.00	1.00	1.00	200	1.86	1	2200
Nifty	30/01/03	930.00	0.25	0.25	0.25	200	1.98	1	200

Source: Economic Times, 15th Jan., 2003.

Table 19: NSE Stock Options

Stock	Exp. Date	Strike Price	Premium		Settle Price	No. of Trades	Value in lakh	No. of Contracts	Open Interest
Call Options			High	Low					
ACC	27/02/03	130	15.30	15.30	58.55	6000	10.2	4	0
Bajaj Auto	30/01/03	450	30.50	30.50	49.75	1600	7.84	2	0
BHEL	27/02/03	170	9.00	9.00	9.00	1200	2.15	1	1200
BSES	30/01/03	200	11.35	11.35	23.90	4400	9.58	4	0
Cipla	30/01/03	900	40.00	40.00	43.00	600	5.65	3	7400
Digital Global	30/01/03	570	30	30	45	4800	29.24	12	4000
Dr. Reddy's	30/01/03	870	110.05	110.05	110.05	400	3.92	1	4400
Guj. Amb. Cement	30/01/03	160	7.30	7.45	7.60	2200	3.68	2	55000

Source: Economic Times, 15th Jan., 2003.

Box 8: Index Options

In view of strengthening the derivative markets SEBI allowed introduction of options on indices. An option confers a right and does not constitute an obligation. In India, index options are introduced based on two underlying indices – S&P CNX Nifty in case of NSE options and BSE Sensex for BSE options. The multipliers for NSE and BSE are 200 and 100 respectively. Every contract has a life cycle of three months.

Therefore, if the NSE is at 1,000, the smallest possible contract on the NSE will be of the size of Rs.0.2 million. If the BSE is at 3,000 then the smallest size of the contract will be Rs.0.3 million

At any point of time, three contracts will be available. One that will expire in the current month, one that will expire in the near month and one that will expire in the far month. For example, in June the contracts available are those expiring in June (near month), July (next month) and August (far month). When the June contract expires the September series will come into existence. Therefore, a contract will have a life cycle of three months. The reasons for having contracts expiring in three different months are to provide the time intervals for which the trader might take a view on the markets.

Underlying Index	S&P CNX Nifty
Contract size	Permitted lot size shall be 200 or multiples thereof
Price steps	Rs.0.05
Price Bands	Not applicable
Style	European/American
Trading cycle	The options contracts will have a maximum tenure of three months – the near month (one), the next month (two) and the far month (three) New contracts will be introduced on the next trading day following the expiry of near month contract
Expiry day	The last Thursday of the expiry month or the previous trading day if the last Thursday is a trading holiday
Settlement basis	Cash settlement on a T + 1 basis
Settlement prices	Based on expiration price as may be decided by the Exchange

Source: NSE.

Source: Article on "Index Options" taken from Portfolio Organizer, July 2001.

SWAP MARKETS

The fall of Bretton Wood system in earlier 70s weakened of the pound. It was imperative to stop the downward slide of the pound. In order to control the flow of foreign exchange during 1970s the British Government imposed various types of restrictions. The British firms were not allowed to undertake large-scale investments or big projects outside the country without paying heavy prices. These restrictions eroded the competitiveness of the British firms in the overseas market. Therefore, these firms engineered a methodology by which they could raise funds and make overseas investments. These firms started taking loans in home currency and exchanged them with their counterparts abroad. For example, a firm willing to make investments in America would take loans in British pounds in UK and exchange it with a company in US which has taken a loan in US dollars. Thus genesis of the Swaps market emerged from these transactions.

The emergence of the swap market in the earlier period was not free from obstacles. The problem was of mounting paper work and accounting. The loans undertaken by the firms were two separate transactions, which caused inflationary figures in the balance sheet. The banks in evaluating such companies could not rate

them higher because of the data reflected in the balance sheet. But introduction of the Currency swap, the first formal swap instrument, alleviated the problem. Thereafter the underlying principal was treated as an off-balance sheet item.

The swap market thus came into existence in the late seventies as the currency traders employed the technique of swaps to evade the British controls on the movement of foreign currency. The swap on currency was earlier in the form of back-to-back parallel loans. Parallel loans/back-to-back loans are currency agreements whereby a UK holding company will lend pounds to the US subsidiary in the UK and the US firm will lend dollars to the UK subsidiary in the US to avoid exchange control. But these transactions during the earlier period were not only expensive but also time consuming, because no structured environment/market existed.

The interest rate swaps followed later on. Though their introduction in the market was because of the underlying advantages of currency swaps, their popularity increased because of the growth in the Euromarket. The major characteristic of Euromarket was the large volume of transaction. The interest rate was very much sensitive to demand and supply factors. Most transactions were in terms of fixed income. Moreover the companies were concerned about the growing interest rates in the US during the early 80s. They were seeking a suitable financial instrument, which would protect them against this phenomenon. The first interest rate swap transaction was undertaken in 1979 in London and in 1981 Salomon Brothers negotiated a benchmark currency swap between IBM and the World Bank. Initially the deals were on matching basis, where a bank would bring two companies together with the same matching requirements. In 1981, the swap market was worth a few million dollars. But today it has grown multifold and is worth several trillion dollars. It primarily comprises interest rate swaps and currency swaps.

Box 9: Swap Market Regulation in India

Guidelines for IRS/FRA were introduced for the first time by the RBI on July 7th, 1999. The salient features of the guidelines are:

1. Scheduled commercial banks, financial institutions and primary dealers can offer these products to corporates for hedging their (corporates) own balance sheet exposures.
2. There is no restriction on the types of FRAs/IRS to be undertaken by banks/PDs/FIs. Apart from plain vanilla types, swaps can have features of caps/floors/collars also.
3. The RBI has left it up to the market to evolve the benchmark rate. The parties are, therefore, free to use any domestic money or debt market rate as benchmark rate for entering into FRAs/IRS, provided methodology of computing the rate is objective, transparent and mutually acceptable to counterparties.
4. There will be no restriction on the minimum or maximum size of 'notional principal' amounts of FRAs/IRS. Norms with regard to size are expected to emerge in the market with the development of the product.
5. There will be no restriction on the minimum or maximum tenor of the FRAs/IRS. The market has evolved over time and up to eight banks/FIs/PDs are currently quoting two way prices for periods of 1 month, 2 months, 3 months, 6 months and 1 year. Some of the banks offer two way quotes for periods up to 5 years.
6. Further, while dealing with corporates, banks/FIs/PDs are expected to ensure that they (corporates) are undertaking FRAs/IRS only for hedging their own rupee balance sheet exposures. Banks/FIs/PDs are also advised to obtain a certificate from the authorized signatory/signatories of corporate/s to the effect that the transaction undertaken by them are meant for hedging balance sheet exposures only, i.e., size and tenor of the transactions undertaken are not in excess of their underlying rupee exposures.

7. Transactions for hedging purposes could be accounted for on accrual basis. For valuation purposes, the respective boards should lay down an appropriate policy to reflect the fair value of the outstanding contracts. Participants should adopt suitable norms for accounting of FRAs/IRS, on the basis of general accounting principles given below after the approval of their respective boards.

   Accounting Treatment for Hedge Swaps

   i. Interest Rate Swap which hedges interest bearing asset or liability should generally be accounted for like the hedge of the asset or liability.

   ii. The swap that is accounted for like a hedge should be accounted for on accrual basis except the swap designated with an asset or a liability that is carried at market value or lower of cost or market value in the financial statements. In that case the swap should be marked-to-market with the resulting gain or loss recorded as an adjustment to the market value of designated asset or liability.

   iii. Redesignation of Hedge items: If a hedge is redesignated from one item of asset/liability to another item of asset/liability such redesignation should be accounted for as the termination of one hedge and acquisition of another. On the date of redesignation, the swap should be marked-to-market; and the mark-to-market value would be amortized over the shorter period of the remaining life of the swap or remaining life of the asset/liability. The offsetting mark-to-market entry adjustments would be treated as premium received or paid for hedge on the newly designated item of asset/liability and this would be amortized over the life of the redesignated asset/liability or remaining term of the swap whichever is shorter.

   iv. When participant is acting like a broker for matching parties and is not a principal to the contract itself, then the fee should be recognized immediately as an income. In case where the bank acts like a principal, the fee should be amortized over the life of the contract.

8. The following should be disclosed in the note to the balance sheet: (a) the notional principal of swap agreements; (b) nature and terms of the swaps including information on market risk and the accounting policies adopted for recording the swaps; (c) quantification of the losses which would be incurred if counterparties failed to fulfill their obligation under the agreement; (d) the "fair" value of the total swaps book. If the swaps are linked to specific assets, liabilities or commitments, the fair value would be the estimated amount that the entity would receive or pay to terminate the swap agreements at balance date.

9. For the sake of uniformity and standardization, participants could consider using ISDA documentation, as suitably modified to comply with these guidelines for undertaking FRAs/IRS transactions. Participants may also consider the changes as suggested below, before finalizing the documentation but after seeking appropriate legal advice. Institutions should further evaluate whether the counterparty has the legal capacity, power and authority to enter into FRAs/IRS transaction. The following changes may be made in the ISDA Master Agreement:

   i. In Clause 8(a) the words, "Subject to the laws and prevailing guidelines in India" should be inserted at the beginning.

   ii. The words, "Stamp Tax" wherever appearing in the Agreement should be substituted by the words "Stamp Duty".

   iii. Paragraph 2(c) may be omitted.

There is a reference to Credit Support Document and Credit Support Provider in the document. In case any further documents/agreements are required to be executed under the given transactions, the provisions of the same will have to be drafted keeping in mind the prevailing laws and guidelines. However, in cases where no further documents are to be executed the reference to the same and to the provisions relating to Credit Support Default in the Agreement may be deleted. This may be done in the Schedule to the Agreement rather than the main Master Agreement. Similarly, if any, further changes are desired to be made to meet specific requirements of participants, it is desirable to do so in the Schedule rather than the main Master Agreement. Clause 13(a) of the Agreement provides that the Agreement will be governed by and construed in accordance with the law specified in the Schedule. Hence, the applicable law will have to be mentioned in the Schedule to the Agreement. Participants may specify the applicable law (e.g. Indian Law or English Law or US Law) as deemed appropriate by them, in the Schedule. It may be further clarified that the change suggested in Clause 8(a) is only clarificatory in as much as all payments would in any case be subject to any Indian Laws or guidelines. The provision made in Clause 13 regarding applicable laws and jurisdiction stipulates the law that would apply to decide any dispute between the parties. It is open to parties to choose the governing law and the jurisdiction that would apply in case there is a dispute between them. Accordingly, participants may decide on the Law and Jurisdiction to be adopted. However, in common practice, where both the counterparties are in India, the Indian Laws would be usually applicable. It may be mentioned that besides the ISDA Master Agreement, participants should obtain specific confirmation for each transaction which should detail the terms of the contract such as gross amount, rate, value date, etc. duly signed by the authorized signatories. It is also preferable to make a mention of the Master Agreement in the individual transaction confirmation.

Source: Project Report on Interest Rate Swaps by Banhid Bhattacharya, Bhavesh Majithia, Shamil Chotai, Index #30001.

The secondary market of swap is also growing at a faster rate of 25-30% per annum. The International Swap and Derivatives Association (ISDA) regulates the market. Most of the swap transactions are linked to 6-month LIBOR rate and are of 2-6 years duration.

Since 1991, the Indian economy is on the path of liberalization. Quotas and import restrictions are being lifted and the system of current account convertibility is being introduced in the economy. The trade barriers have also been reduced. Gradually, the market forces are determining the interest rates. Thus, the Indian companies are having options to select the best available interest rates for their borrowing programs. This will not only strengthen their financial position but will improve international competitiveness. The RBI has announced guidelines regarding Interest Rate Swaps on July 7, 1999. Since then the volume of transactions has grown manifold. It was Rs.4,243 crore as on March 10, 2000 and Rs.5,831 crore as on June 30, 2000. Since then, it has been growing at a fast rate. The benchmark rate for undertaking Interest Rate Transaction is the Mumbai Inter Bank Offer Rate (MIBOR) as decided by the NSE/Reuters. Due to a large spread between bid-ask rate, Interest Rate Swap of more than 1 year is usually not undertaken in the Indian Market. Recently, it has also been decided to use the foreign exchange forward interest rate as a benchmark rate for undertaking the Interest Rate Swap. This was declared on April 27, 2000.

The salient features of the guidelines are:

- Scheduled commercial banks, financial institutions and primary dealers can offer these products to corporates to hedge their (corporates) own balance sheet exposures.

- There is no restriction on the types of FRAs/IRS to be undertaken by banks/PDs/FIs. Apart from plain vanilla types, swaps can have features of caps/floors/collars also.
- The RBI has allowed the market to decide the benchmark rate. The parties are, therefore, free to use any domestic money or debt market rate as benchmark rate for entering into FRAs/IRS, provided methodology of computing the rate is objective, transparent and mutually acceptable to counterparties.
- There will be no restriction on the minimum or maximum size of 'notional principal' amounts of FRAs/IRS. Norms with regard to size are expected to emerge in the market with the development of the product.
- There will be no restriction on the minimum or maximum tenor of the FRAs/IRS. The market has evolved over a period of time and up to eight banks/FIs/PDs are currently quoting two way prices for periods of 1 month, 2 months, 3 months, 6 months and 1 year. Some of the banks offer two way quotes for periods up to 5 years.
- Further, while dealing with corporates, banks/FIs/PDs are expected to ensure that they (corporates) undertake FRAs/IRS only to hedge their own rupee balance sheet exposures. Banks/FIs/PDs are also advised to obtain a certificate from the authorized signatory/signatories of corporate/s to the effect that the transaction undertaken by them is meant to hedge balance sheet exposures only, i.e., size and tenor of the transaction undertaken are not in excess of their underlying rupee exposures.
- Transactions for hedging purposes could be accounted for an accrual basis. For valuation purposes, the respective boards should lay down an appropriate policy to reflect the fair value of the outstanding contracts. Participants should adopt suitable norms for accounting FRAs/IRS, on the basis of general accounting principles given below after the approval of their respective boards.

Few of the Interest Rate Swap deals of Indian markets are as below:

Table 20

Sr. No.	Buyer	Seller	Reference rate used	Amt. (Rs. crore)	Tenor (months)
1.	ICICI	Deutsche Bank	Mibor	25	12
2*	Credit Lyonnais	Vysya Bank	*USDLibortwo-month dollar premium prevailing at the end of July	10	2 months starting end-July
3.	Centurion Bank	ICICI	Reuter's Mibor	10	12
4.	Standard Chartered Bank	General Electric Group Company	-NA-	100	12
5.	Times Bank	Indian Capital Corporation	Mibor	-NA-	3
6.	Standard Chartered Bank	Deutsche Bank	Reuter's Mibor	25	12
7.	Standard Chartered Bank	ICICI	-NA-	25	12
8.	ABN-AMRO Bank	RIL	NSE-Mibor	50	12
9.	HDFC Bank	RIL	NSE-Mibor	-NA-	-NA-
10.	HDFC Bank	KEC International	Mibor	-NA-	6
11.	Standard Chartered Bank	Electrolux Kelvinator	Reuter's Mibor	-NA-	1
12.	Vysya Bank	AmEx Bank	-NA-	10	3

* The RBI canceled the deal because the use of foreign reference rates for swaps is not permitted.

Though the Interest Rate Swap figures of the Indian market appear to be impressive it has not yet been utilized to its full strength, because of the expectations of the participants. Almost all the players (banks, FIs, corporates, etc.) perceive that the future interest rate in the market will decrease. Thus, such sentiments in the market erode the lucrative aspect of the Interest Rate Swap. Moreover, the Asset-Liability composition of the Indian Banks and Financial Institutions are different. A snapshot picture of Asset-Liability is given below.

Table 21

	Asset	Liability
Financial Institutions	Installment repayment loans	Single/Bullet repayment
Banks	Long-term repayment	Short-term maturities

Thus, the attractiveness of interest rate swaps remains limited to banks and financial institutions. The majority of the corporates are constrained because of several factors as listed below.

i. **Absence of standard benchmark rate:** In the international market, there is a well-developed interbank rate which is LIBOR. Most of the players are confident about 3-month LIBOR or 6-month LIBOR. But the absence of adequate liquidity in the Indian market has resulted in non-development of an appropriate benchmark rate. Although MIBOR rates are being used for interest rate swap contracts, long-term MIBOR rates are yet to gain confidence among the players. The long-term benchmark rates available in the market are yet to be strong enough to generate confidence among the parties entering into interest rate swap contract.

ii. **No proper market for Floating Rate Loans:** The peculiar feature of Indian financial markets is that there is uniformity in thinking among the players. Because the interest rates do not fluctuate widely, the demand for floating rate loans also does not pick-up. This is a major factor responsible for poor growth of interest rate swap market. But the recent guidelines and policies of the RBI allowing the market to determine the market interest rate may increase volatility of the interest rate, which in turn would help popularize the interest rate swaps.

iii. **Absence of standard yield curve in the market:** It is important for a derivative market to have a proper yield curve because it facilitates determination of the bid-ask spread and forward market movements. A proper yield curve with respect to the Indian Rupee market is yet to be developed. The players have very little confidence on the existing yield curve.

iv. **Skepticism in the players:** The players in the financial market are skeptical to reap the full advantage of economic liberalization. Very few banks have resorted to innovative practices. Uniformity in practice is yet to gain momentum. For example, very few banks have adopted differential PLR. The growth in interest rate swap can pick-up if more and more banks declare differential PLRs.

v. **Poor information:** Lack of proper information about the interest rate swap itself hinders the growth. The Swap market is still in its nascent growth stage. The participants in the market have yet to learn the trade. Mastering the trade is a distant dream. This inadequate knowledge forbids the players to take up large scale interest rate swap transactions.

vi. Till now the banks and financial institutions have perceived that interest rate swap benefits can only be reaped by the large-scale corporates. The small banks and corporate houses have little to benefit from these transactions. This perception forbids the small banks and corporates to go for the interest rate swap contract. It is necessary that these small houses realize that they can also get advantage from entering into interest rate swap if proper attention is being paid to these contracts.

Thus, apart from the above underlying broad factors, few other factors are also responsible for prohibiting the growth of interest rate swap contracts. They are:

i. Unstable political environment

ii. Slower implementation of economic reforms

iii. Absence of liquidity in the debt market

iv. Cheaper accessibility to funds

v. Core emphasis on the growth of stock market than on derivative markets

vi. Lack of strong underlying assets for derivative markets.

SUMMARY

- The organized future trading was started in 1848 in CBOT. Over the years, it has experienced a rapid growth in terms of trade and volume. Apart from CBOT, Chicago Mercantile Exchange also became very popular for trading in derivative instruments. These two exchanges cover almost 80% of the total volume traded in the futures contracts in the US.
- The Futures Commission Merchants (FCM), brokers, speculators are the main players in the futures market. The function of the futures clearing houses is very much similar to those of the option-clearing corporations.
- In India, trading in futures started on June 12, 2000. National Securities Clearing Corporation Limited (NSCCL) is the clearing and settlement agency for all the deals executed on behalf of the legal counterpart of NSE's futures traders. A trading system while clearing member of NSCCL clears and settles all deals. To begin with, the National Stock Exchange has introduced trading in index based futures contracts with a cash market index as the underlying assets. Nifty index futures and options are cash settled.
- All clearing members are required to open a separate bank account with NSCCL designated clearing banks. The outstanding positions in the index futures are market-to-market at the closing price for the day.
- Commodity futures are not very popular in India although there is a Commodity Futures Exchange here. Commodity futures are basically popular in the form of coffee futures in India. Options on commodities started in 1860 in the US on various underlying commodities like gold, silver and petroleum. Currently, options are traded on stocks, stock indices and foreign currencies and futures.
- The option buyer has the right but not an obligation to buy or sell.
- An option is called a call option if the writer gives the buyer of the option the right to purchase the underlying asset from him.
- An option contract is said to be a put option if the writer gives the buyer of the option the right to sell the underlying asset.
- An European option is exercised only on the due date while an American option can be exercised any day prior to the due date.
- The option premium is the amount which is paid by the buyer of the option to the seller to induce him to undertake the risk associated with such contract.

- Out of Money: option is one in which the buyer incurs loss if the option is exercised now.
- In the Money: option is one in which the buyer books profit if the option is exercised now.
- At the Money: option does not result in loss or gain to the buyer if it is exercised now.
- Options Clearing Corporation (OCC): It is a clearing house established to ensure smooth trading in options. The process of matching trades and tracking payments is done by the OCC.
- Covered Call Writing: When the option is covered or protected by the writer of the option by depositing the share of the company on which the option is written in an escrow account with brokerage firm.
- Naked Call Writing: If a trader writes a call option without owning the underlying asset, it is called Naked Call Writing.
- Naked Put Writing: Here the brokerage firm does not have either the cash or the stock of other companies as security deposited by the writer of the put option.

Annexure

Derivatives Time Line

2000 BC	In India (forward trading by traders and agriculturists).
400 BC	In ancient Greece and Rome (option trading in agriculture products).
12th Century AD	European trade fair sellers (signs contracts promising future deliveries of trade items).
17th Century (beginning)	Tulip Mania in Holland (1634-1637) (Trader's lost fortunes in a speculative boom in tulip futures burst).
17th Century (late)	Dojima Rice Futures (Japan at Dojima (near Osaka) a futures market in rice developed to protect sellers from bad weather or warfare).
19th Century	Asian Trader's Actively traded (In agriculture, products traded via sea). Chicago Board of Trade (1868). Trading in wheat, pork belly and copper futures starts.
20th Century	Late 1960: Black and Scholes begin collaboration. Fischer Black and Myron Scholes tackle the problem of determining how much an option is worth. Robert Merton joins them in 1970. 1968: SCRA (Securities Contracts Regulation Act) bars use of Derivatives as a security in the formal set-up. Leads to derivative instruments moving to unorganized sector. April 1973: Chicago Board of Options Exchange opens. May/June 1973: Black-Scholes Model published (*Journal of Political Economy* accepted the model after repeated rejections including once by JPE). 1994: Metallgesellshaft loses $1.5 bn on oil futures. 1995: Baring Bank goes burst (Nick Leeson loses $1.4 bn by speculating them in the Nikkei 225 index of leading Japanese company shares, which did not move from its normal trading range. The Kobe earthquake shattered that assumption on 17th January whereafter Leeson attempted to conceal his losses). 1997: Nobel Prize in Economics awarded to Robert Merton and Myron Scholes. Weather Derivatives Market and Instruments initiated (late 1997). Aquila Energy introduced a weather option embedded in a power contract. 1998: Long-term credit management bailout (The hedge fund is rescued at a cost of $3.5 bn to secure extensive losses to the world financial system). 1999: The Flaming Ferraris (some traders at CSFB sacked for illegal trades in an attempt to manipulate the Swedish stock market index).
21st Century	2000: India launches derivatives in formal setup (June 2000) in the Bombay Stock Exchange and National Stock Exchange. 2001: Enron, 7th largest company in US goes bankrupt it is the world's largest energy trader that made extensive use of energy and credit derivatives, which built-up an accumulated loss leading to its bankruptcy. September 11 attack (terrorists made huge profits in Insurance and Airline's industry stocks). A model and a weather derivatives instrument based on water tables for hedging risks against floods, droughts and rainfalls developed by Aman Agarwal (for FSD Dept., The World Bank, USA), *Finance India*, XVI No. 3, September 2002. 2002: AIB loses $750 mn (John Rusnak uses fictitious option contracts to cover losses on the spot and forward foreign exchange contracts).

Source: Agarwal Aman, Defining Parameters of an Underlying Variable (Asset/Value) and establishing Water Table as Underlying Value, Finance India, Vol. XVI No. 4 and Derivative Savings Instrument The Empirical Economics Letters, September 2002.

Derivative Products on NSE

Products	Index Futures	Index Options	Futures on Individual Securities	Options on Individual Securities
Underlying Instrument	S&P CNX Nifty	S&P CNX Nifty	40 securities stipulated by SEBI	40 securities stipulated by SEBI Type
Type	–	European		American
Trading Cycle	Maximum of 3-month trading cycle. At any point of time, there will be 3 contracts available: 1. near month, 2. mid-month & 3. far month duration	Same as index futures	Same as index futures	Same as index futures
Expiry Day	Last Thursday of the expiry month	Same as index futures	Same as index futures	Same as index futures
Contract Size	Permitted lot size is 200 and multiples thereof	Same as index futures	Multiple of 100 subject to the minimum value of Rs.2,00,000	Multiple of 100 subject to the minimum value of Rs.2,00,000
Price Steps	Re. 0.05	Re. 0.05	Re. 0.05	Re. 0.05
Base Price-First day of trading	Previous day closing Nifty value	Theoretical value of the options contract arrived at based on Black -Scholes model	Previous day closing value of underlying security	Same as Index options
Base Price-Subsequent	Daily settlement price	Daily close price	Daily settlement price	Daily closing price calculated as follows: • If the contract is traded in the last half-hour, the closing price shall be the last half-hour weighted average price. • If the contract is not traded in the last half-hour, but traded during any time of the day, the closing price will be the Last Traded Price (LTP) of the contract.
Price Bands	Operating ranges are kept at + 10%	Operating ranges are kept at 99% of the base price	Operating ranges are kept at + 20%	Operating ranges are kept at 99% of the base price
Quantity Freeze	20,000 units or greater	20,000 units or greater	Lower of 1% of market-wide position limit stipulated for open positions or Rs.5 crore	Same as individual futures
Note: *BSE also offers similar products in the derivative segment.*				

Source: nse-india.com.

Business Growth of Derivatives Segment

Month/ Year	Index Futures		Stock Futures		Index Options				Stock Options				Total		Average Daily Turnover (Rs. cr.)
					Call		Put		Call		Put				
	No. of contracts	Turnover (Rs. cr.)	No. of contracts	Turnover (Rs. cr.)	No. of contracts	Notional Turnover (Rs. cr.)	No. of contracts	Notional Turnover (Rs. cr.)	No. of contracts	Notional Turnover (Rs. cr.)	No. of contracts	Notional Turnover (Rs. cr.)	No. of contracts	Turnover (Rs. cr.)	
Jun. 2000	1,191	35	-	-	-	-	-	-	-	-	-	-	1,191	35	2
Jul. 2000	3,783	108	-	-	-	-	-	-	-	-	-	-	3,783	108	5
Aug. 2000	3,301	90	-	-	-	-	-	-	-	-	-	-	3,301	90	4
Sep. 2000	4,376	119	-	-	-	-	-	-	-	-	-	-	4,376	119	6
Oct. 2000	6,388	153	-	-	-	-	-	-	-	-	-	-	6,388	153	7
Nov. 2000	9,892	247	-	-	-	-	-	-	-	-	-	-	9,892	247	11
Dec. 2000	9,208	237	-	-	-	-	-	-	-	-	-	-	9,208	237	12
Jan. 2001	17,860	471	-	-	-	-	-	-	-	-	-	-	17,860	471	21
Feb. 2001	19,141	524	-	-	-	-	-	-	-	-	-	-	19,141	524	26
Mar. 2001	15,440	381	-	-	-	-	-	-	-	-	-	-	15,440	381	18
2000-01	**90,580**	**2,365**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**90,580**	**2,365**	**12**
Apr. 2001	13,274	292	-	-	-	-	-	-	-	-	-	-	13,274	292	15
May 2001	10,048	230	-	-	-	-	-	-	-	-	-	-	10,048	230	10
Jun. 2001	26,805	590	-	-	5,232	119	3,429	77	-	-	-	-	35,466	785	37
Jul. 2001	60,644	1,309	-	-	8,613	191	6,221	135	13,082	290	4,746	106	93,306	2,031	92
Aug. 2001	60,979	1,305	-	-	7,598	165	5,533	119	38,971	844	12,508	263	125,589	2,696	128
Sep. 2001	154,298	2,857	-	-	12,188	243	8,262	169	64,344	1,322	33,480	690	272,572	5,281	264
Oct. 2001	131,467	2,485	-	-	16,787	326	12,324	233	85,844	1,632	43,787	801	290,209	5,477	261
Nov. 2001	121,697	2,484	125,946	2,811	14,994	310	7,189	145	112,499	2,372	31,484	638	413,809	8,760	438
Dec. 2001	109,303	2,339	309,755	7,515	12,890	287	5,513	118	84,134	1,986	28,425	674	550,020	12,919	680
Jan. 2002	122,182	2,660	489,793	13,261	11,285	253	3,933	85	133,947	3,836	44,498	1,253	805,638	21,348	928
Feb. 2002	120,662	2,747	528,947	13,939	13,941	323	4,749	107	133,630	3,635	33,055	864	834,984	21,616	1,081
Mar. 2002	94,229	2,185	503,415	13,989	10,446	249	4,773	111	101,708	2,863	37,387	1,094	751,958	20,490	1,078
2001-02	**1,025,588**	**21,482**	**1,957,856**	**51,516**	**113,974**	**2,466**	**61,926**	**1,300**	**768,159**	**18,780**	**269,370**	**6,383**	**4,196,873**	**101,925**	**413**
Apr. 2002	73,635	1,656	552,727	15,065	11,183	260	5,389	122	121,225	3,400	40,443	1,170	804,602	21,674	985

Month/ Year	Index Futures		Stock Futures		Index Options				Stock Options				Total		Average Daily Turnover (Rs. cr.)
					Call		Put		Call		Put				
	No. of contracts	Turnover (Rs. cr.)	No. of contracts	Turnover (Rs. cr.)	No. of contracts	Notional Turnover (Rs. cr.)	No. of contracts	Notional Turnover (Rs. cr.)	No. of contracts	Notional Turnover (Rs. cr.)	No. of contracts	Notional Turnover (Rs. cr.)	No. of contracts	Turnover (Rs. cr.)	
May 2002	94,312	2,022	605,284	15,981	13,070	294	7,719	169	126,867	3,490	57,984	1,643	905,236	23,600	1,073
Jun. 2002	99,514	2,123	616,461	16,178	10,272	223	7,805	166	123,493	3,325	48,919	1,317	906,464	23,332	1,167
Jul. 2002	122,663	2,513	789,290	21,205	16,637	350	7,688	162	154,089	4,341	65,530	1,837	1,155,897	30,407	1,322
Aug. 2002	152,375	2,978	726,310	17,881	15,967	318	10,124	200	147,646	3,837	65,630	1,725	1,118,052	26,938	1,283
Sep. 2002	144,303	2,836	700,051	17,501	16,578	332	12,543	251	151,291	4,016	80,038	2,205	1,104,804	27,140	1,357
Oct. 2002	164,934	3,145	856,930	21,213	23,628	459	13,910	267	214,027	5,595	104,659	2,761	1,378,088	33,441	1,592
Nov. 2002	175,567	3,500	970,251	25,463	25,413	509	17,191	336	261,600	7,106	104,529	2,922	1,554,551	39,837	2,097
Dec. 2002	277,403	5,958	1,217,873	35,532	30,261	660	19,973	427	309,573	9,552	111,756	3,491	1,966,839	55,620	2,649
Jan. 2003	258,955	5,557	1,304,122	38,299	26,376	577	16,805	363	322,876	10,174	132,021	4,179	2,061,155	59,149	2,572
Feb. 2003	237,803	5040	1,198,564	32,445	26,501	571	17,681	374	268,156	7,644	114,512	3,319	1,863,217	49,395	2,600
Mar. 2003	325,299	6,624	1,138,980	29,770	53,788	1,116	35,739	740	255,658	7,163	140,540	3,919	1,950,004	49,330	2,461

Source: nse-india.com

Chapter XIV

Bonds with Warrants and Embedded Options

After reading this chapter, you will be conversant with:

- Bonds with Warrants
- Convertible Bonds
- Callable Bonds
- Floating Rate Notes
- Dual Currency Bonds
- Equity Index-linked Notes
- Commodity-linked Bull and Bear Bonds
- Swap-Linked Notes

Introduction

In the earlier chapters, we have discussed the bond market and its valuation methodologies. We know that the price of a bond depends on various factors such as existing interest rates, coupon rate, maturity, etc. In comparison to equities, a bond at first sight appears less glamorous and exciting. But bonds too have their subtleties and pitfalls for the investors. This is because, in general, there is less uncertainty about the cash flows accruing to the bondholders as compared to the shareholders. The emphasis is, therefore, more on fine tuned calculations and analysis. Such careful computations may not be worthwhile in equities because there is a greater uncertainty about the numbers one is working with. Typically, bond prices fluctuate less than the equity prices and the investor who desires superior performance has to be on the lookout for even small differentials in prices and returns.

In this chapter, we shall discuss the various types of bonds which are offered in the market along with other instruments. These instruments such as warrants, call features, convertibility features attract the investors because of in-built diversity. This diversity generates confidence among the investors to opt for the instruments. The topics of discussion include, bonds with warrants, pricing, attractiveness to investors, convertibles, callable bonds, dual currency bonds, equity index-linked bonds and swap-linked notes. The popularity of these instruments has increased in recent days as more and more companies are coming up with these instruments to attract the investors and financial institutions.

BONDS WITH WARRANTS

Warrants are usually attached with the bonds or preference shares to attract the investor. The objective is to induce the potential investors to subscribe to either bonds or preferred stocks, which give less attractive returns. The investor commits his funds with the expectation that he might be able to realize capital gains by selling the underlying stock of the firm whenever the warrants are exercised and exchanged for equity shares in some specified ratio.

Thus warrant is another variant of the call option wherein the holder has the right to purchase shares of the company at some predetermined price. Warrants can be exercised within a certain time limit, which can be of some years. They entitle the holders to subscribe to the shares of the company, which issued the warrants, at the end of or within certain time period (ranging from 5-10 years). The number of shares and the price at which these shares can be bought are determined at the time of issuing the warrants. The price at which the shares can be subscribed to is called exercise price. Warrants generally have a longer expiration period before they can be exercised compared to exchange traded options.

Often warrants can be traded independent of the instrument along with which they were issued. These warrants are called detachable warrants. Usually the exercise price is fixed over the entire life of the instrument and is greater than the market price of the stock at the time of issue. When bonds with detachable warrants are offered, the investors purchase them as a bundle of securities.

Warrants are usually issued when a firm acquires another firm and new shares are to be offered to the shareholders. These can also be issued when a company issues new shares and the underwriters are to be suitably paid.

The purchaser of a warrant does not have equity rights in that company. He has no voting rights and no dividends are paid for holding the warrant. Most of the warrants have stocks on over the counter markets.

Investment Characteristics

As mentioned earlier, a warrant is a variant of a call option and gives the holder a certain right to purchase shares of the company at a predetermined price within a

certain time limit. But a warrant is different from a call option in the following ways:

i. Investors design call or put options whereas corporates issue warrants.

ii. Warrants have longer shelf life (5–10 years) whereas call or put options have much shorter life.

iii. Each warrant is different/unique in itself. But call or put options are standardized.

The above mentioned characteristics of warrants provide the opportunity to the investors to purchase them as they can be exercised at a later date in lieu of the shares of the company. The investors expect to receive these shares at a lower price than the market price. This speculative feature increases its investment attractiveness. Moreover, the secondary market of warrants itself adds to the investment opportunity of these instruments. Mostly, warrants are more traded in the secondary market than exercised with an objective of capital gain. Thus the in-built leverage feature existing in the warrants provides an opportunity to the investors to make large gains (also losses) in future.

VALUE OF A WARRANT

The market price of a warrant fluctuates between minimum and maximum limits. When the current market price of the stock P_s is greater than the exercise price P_e, the minimum value (Mv) is given by,

$Mv = (P_s - P_e) \times N$, where N is the number of shares.

When the current market price is lower than the exercise price, then the minimum value is zero, as there is no gain from exercising it.

If the warrant price was lower than this value, any investor by arbitrage would make risk-free profits. This is explained below.

Assume the market price of the share to be Rs.40, the warrant price Rs.4 and the exercise price Rs.33. Under these conditions, the total investment by the trader would be Rs.37 (to buy the warrants, exercise them and sell away the shares) and when he sells the underlying share he will realize Rs.40 ignoring the transaction costs. On the whole, he makes a profit of Rs.3. Therefore, the market price of the warrant should at least be equal to the minimum value.

The maximum value of the warrant is given by $P_s \times N$. The warrant holders can realize this maximum value as they do not receive any dividend on the underlying stock during the period they hold the warrant.

Intrinsic Value

It is the minimum value of the warrant.

Warrant Premium

The difference between the warrant price and the minimum value of the warrant is called the warrant premium. Usually, the magnitude of the premium over the intrinsic value for a given change in the stock and the exercise price depends on factors like the expiration period, variability in the stock price and the leverage provided by the warrant.

Let us consider the leverage effect it provides. Assume the stock's current market price to be Rs.33 and the warrant price Rs.7. After one month assume that the price of the stock increased to Rs.35 with a simultaneous increase in the warrant to Rs.9. The percentage change in price of the share is given by $(35 - 33)/33 = 5.71\%$. And the percentage change in the warrant price is given by $(9 - 7)/7 = 28.57\%$. Therefore, a warrant holder will experience a rise of 28.57% for a similar absolute change in the price of the share. The leverage effect acts in a reverse direction

when the price of the underlying stock decreases. The leverage effect also has a premium of the warrants for which the ratio of the stock and the warrant price is high. This is explained as follows.

Table 1

	Period						
	1		2		3		4
Stock Price	25		40		55.00		70.00
Increase in %		60		37.5		27.2	
Warrant Price	5		20		35.00		50.00
Increase in %		300		75.0		42.8	
Stock-warrant ratio	5		2		1.57		1.40

We observe that the stock price increased by 60%, 37.5% and 27.2% in periods 2, 3 and 4 respectively. The corresponding changes in the warrant price were 300%, 75% and 42.8% respectively. Thus, during the first period, the warrant changed 300% corresponding to 60% change in the stock price, which is almost 5 times. In the second period, the stock and the warrant changed 37.5% and 75%, respectively. Change in the price of the warrant is two times that of the stock. We observe that the leverage, which was quite high in the beginning, started decreasing gradually. This process is also indicated by the Stock-Warrant ratio. As the ratio decreases, the leverage effect also decreases.

Also the premium on the warrant of companies which experience wide fluctuations in their earnings is generally high. The dividend pay-out ratio has an inverse relation with the warrant premium. We also observe that more the expiration period, more the chance for the stock price to exceed the exercise price, therefore more the premium.

Thus warrants are expiring assets and their value decreases with the decrease in their maturity value. In other words, as a warrant approaches its maturity, its time value takes a downward turn.

In order to avoid arbitrage possibilities, the minimum value of the warrant should not exceed the market price of the common stock. Mathematically expressing:

$P_m = 0$ if $P_s < P_e$

$P_m = (P_s - P_e) \times N$, if $P_s > P_e$

Where,

P_m = Minimum price of the warrant

P_s = Existing market price of the stock

P_e = Exercise price of the warrant

N = Number of shares which can be purchased per warrant.

The above equation determines the theoretical price of the warrant. But in practice, the warrants usually sell above their theoretical prices. The difference between the theoretical price and the actual price of the warrant is known as premium.

Premium = Market price of the warrant – Minimum price of the warrant.

The market price of the warrant and the premium have an inverse relationship i.e., as the market price of the share increases, the premium of the warrant decreases. As the investors purchase warrants for speculative purposes, the following factors determine the premium on the warrant.

i. **Maturity Period of Warrant:** The longer the period of maturity, the greater will be the premium of warrant. This is because the maturity period increases the attractive potential of the warrant. The underlying cause of this is that chances of increase in the price of the stock reduce as the maturity period of warrant decreases.

ii. **Price Volatility of the Share:** As the price volatility of the underlying share increases, the premium of the warrant also increases. Because the investors are ready to pay extra for such warrants due to speculative reasons, their expectancy of increase in prices of underlying stock also increases, which lures them to purchase such warrants.

iii. **Dividend on the Stock:** As the holders of warrants do not receive any dividends, declaration of dividends on the share makes them skeptical about the price. This results in a fall in the premium of the warrant.

iv. **Potential Leverage on the Warrant:** The greater the leverage on the warrant, the greater the premium it will attract from the investors. This is again because of the expectation of greater return (coupled with losses too) from the warrant.

The present day financial market has grown to a greater extent. Introduction of better financial instruments such as options, futures, swaps, etc., has reduced the popularity of warrants. However, large scale companies having better market capitalization are still coming up with warrant issues for the investors.

Values of Warrants

Let us examine the following particulars relating to a company.

Number of shares presently held = N

Number of warrants issued = M

Number of shares attached to each warrant = K

Exercise price = X

If all the warrants are exercised, the cash inflow to the company = MKX

If V_T is the value of equity before the warrants are exercised, the total value of equity after the warrants are exercised = $V_T + MKX$.

This is held by a total number of shares = N + MK

$$\text{Value per share} = \left(\frac{V_T + MKX}{N + MK}\right)$$

The profit to warrant holder $K\left(\frac{V_T + MKX}{N + MK} - X\right)$

$$= \left(\frac{1}{N + MK}\right)[V_T.K + MK^2X - KNX - MK^2X]$$

$$= \left(\frac{V_T.K - KNX}{N + MK}\right) = \left(\frac{K.N}{N + M}\right)\left(\frac{V_T}{N} - X\right)$$

$\frac{V_T}{N}$ represents the price of the share before warrants are exercised. If $\left(\frac{V_T}{N} - X\right)$ is positive only, the warrant holder gets profit.

The pay-off to warrant holder can also be expressed as $\left(\frac{NK}{N + MK}\right)$ max $\left(\frac{V_T}{N} - X, '0'\right)$.

This means that the value of the warrant is the value of $\left(\frac{NK}{N + MK}\right)$.

It can also be expressed as P_s in the equation,

$$V = N \times P_s + MPW$$

where

P_s = Stock price

V = Total value of the company after warrants are exercised

MPW = Maximum price of the warrant.

Advantages to the Company

1. Growth-oriented companies with a good track record will be in a position to issue a Non-Convertible Debenture (NCD) with an attractive equity warrant directly to the public and reduce their dependence on the financial institutions and mutual funds.
2. Warrants provide a mechanism for raising additional capital depending on the cash flow requirements of the company. They give a reasonable flexibility to the company to plan its cash inflows from exercise of warrant options depending on its requirements.
3. Warrants reduce the overall cost of a debt issue as the investor may accept a lower yield in anticipation of a profit on the exercise of the warrant option.

Advantages to the Investors

1. The warrant acts as a sweetener and ensures a better subscription to the NCDs, especially for companies with good track record. NCDs with warrant option may also be offered to the investors with offer for buy-back, so that the investors are required to retain only the equity warrant and are not required to retain the NCD.
2. NCD with warrant is preferred by many investors because they can expect steady rate of return and capital appreciation on the NCD and can also obtain capital appreciation by subscribing to the equity shares on exercise of the warrant option.
3. Warrants confer a high degree of leverage to the investor. The investor has the option to sell the warrant in the market, subscribe to equity shares by surrendering the warrant and paying the exercise price or allowing the warrant to lapse.
4. Warrants are listed and are traded independently on the stock exchanges. The investor has the option to dispose off the warrant before the right to allotment of equity shares becomes exercisable. However, in practice, warrants have very limited liquidity in India.
5. The investor limits his downside risk to the amount paid for the warrants, but the upside potential of capital appreciation in the event of favorable price movements is large.
6. Warrants are highly geared instruments with tremendous potential for capital appreciation and are attractive speculative tools for investors.

Types of Warrants

DETACHABLE WARRANTS

These warrants are issued with most debentures, like convertible or non-convertible or equity, and are immediately detachable. They are traded in the secondary market as separate instruments.

Example: M/s. Patron Engineering Construction Co. Ltd. has issued, during March 20x3, Rs.5,00,000 – 14% secured non-convertible debentures, with detachable warrants, aggregating to Rs.500 lakh.

M/s. Malavika Steel Ltd. has announced a 5.70 crore equity shares of Rs.10 each for cash at a premium of Rs.30 attached with optional tradeable warrants.

PUTTABLE WARRANTS

These warrants confer a right on the investor to sell the warrant back to the company at a fixed price before the expiry of a fixed period thereby limiting his risk.

WEDDING WARRANTS

These warrants are attached to the host debentures and can be exercised only if the host debenture is surrendered.

NAKED WARRANTS

These warrants are issued separately and not as a part of a bond or a debenture issue. The holder has the option of converting the warrant into debt or equity or some other asset of the issuer.

CONVERTIBLE BONDS

Basics of Convertible Bonds

The provision of conversion in a corporate bond entitles the bondholder the right to convert the bond into a predetermined number of shares of common stock of the issuer. Put differently, one can say that a convertible bond is a corporate bond with a call option to buy common stock of the issuer.

The number of shares of common stock that the bondholder can receive from exercising the call option of the convertible bond is called the conversion ratio.

The strike price or the exercise price at which the investor exchanges the bond for the share is called conversion price.

More often than not, most of the convertible bonds are callable at the option of the issuer. Some of the convertible bonds are puttable. The put options are further classified into hard puts and soft puts. If the convertible bond is redeemable by the issuer only for cash it is known as hard put. If the issuer has the option to redeem the convertible security for cash, common stock, subordinated notes, or for a combination of the three, then it is called a soft put.

Let us analyze a convertible bond with the following example.

Illustration 1

A hypothetical bond XYZ has maturity = 10 years; coupon rate = 10%; conversion ratio = 50; par value = Rs.1,000; current market price of XYZ bond = Rs.950; current market price of XYZ common stock = Rs.17; dividend per share = Re.1.

The conversion price for XYZ bond is = Rs.1,000/50 = Rs.20

The value obtained by multiplying the current market price of the stock and the conversion rate or the number of shares that are allotted on conversion is called the conversion value or the stock value of the bond.

Due to the inverse relationship between the interest rates and the bond prices, we know that when the interest rate increases, the price of the bond declines. In these situations, the intrinsic value of the bond acts as a support value (floor) for the convertible bonds, although the intrinsic value itself would fall. Since the conversion also takes place in case of preferred stock, the theoretical or intrinsic value of a preferred stock is a recent value of the future dividends of perpetuity, discounted at a rate equivalent to the required rate of return or the rate realized on identical securities without the conversion clause.

The minimum price of a convertible bond is the greater of:

1. Its conversion value, or
2. Its value as a corporate bond without the conversion option, the straight value referred to above.

If a convertible bond is sold for a price less than the minimum price of the convertible bond, then arbitrage profits could be realized. Let us suppose that a convertible bond has a conversion value greater than the intrinsic value and the bond

trades at its intrinsic value. It is beneficial for an investor to buy the convertible bond at the intrinsic value and convert it since he gets profit equal to the difference between the conversion value and the intrinsic value. Let us see the other possibility. The intrinsic value is greater than the conversion value and the bond is trading at its conversion value. Then by buying the convertible at the conversion value, the investor will realize a higher yield than that on comparable straight bond.

In our Illustration 1, the conversion value is equal to = Rs.17 x 50 = Rs.850.

To determine the intrinsic value, we need to determine the prices of comparable bonds in the market. Suppose the YTM of such bonds is 15%. The intrinsic value is Rs.788. Since the conversion value is Rs.850, and the straight value Rs.788, the minimum price for the XYZ bond is Rs.850 being the greater of the two. If the bond is selling at Rs.788, an investor purchases it and sells the converted shares at Rs.850 to book a profit of Rs.62 per bond. So this arbitrage profit can only be avoided by selling the convertible bond at Rs.850.

Similarly if the yield on comparable non-convertible bonds is 11.8%, the intrinsic value of the bond will be Rs.896 and the minimum price of the bond Rs.896 itself would be greater than Rs.850, the conversion value. When the convertible bond is selling at Rs.850 the YTM will be 12.7%, 90 basis points higher than on comparable non-convertible bonds. Hence investors would like to purchase XYZ bond.

DOWNSIDE RISK OF CONVERTIBLE BONDS

When the underlying stock becomes worthless, the percentage price decline experienced by the investors is given by,

Percentage of Downside Risk

$$= \frac{(\text{Market price of convertible} - \text{Intrinsic value of right}) \times 100}{\text{Intrinsic value}}$$

It is also called premium over intrinsic value. The higher the premium over the intrinsic value, all other factors remaining constant, the less attractive the convertible bond.

INVESTMENT CHARACTERISTICS OF A CONVERTIBLE BOND

The market price of the stock decides the investment characteristics of a convertible bond. When the stock price is low, the straight value is considerably higher than the conversion value. Then the bond will sell just like a straight bond. The convertible bond in such cases is referred to as a bond equivalent or a busted convertible.

If the market price of the stock is such that the conversion value is considerably higher than the straight value, then the convertible bond will trade as if it were an equity instrument; in this case it is said to be an equity equivalent. In such cases, the market conversion premium per share will be low.

VALUE OF CONVERSION BENEFITS

Having seen the measure used to analyze the convertible bonds, let us now examine the merits and demerits of convertible bonds and why or why not an investor chooses a convertible bond.

In our hypothetical bond XYZ, the market value of the stock is Rs.17. Suppose it rises to Rs.34 in one month period. If an investor purchases the stock at Rs.17, a profit of Rs.17 i.e., 100% can be booked. On the other hand, in bonds the conversion value = Rs.34 x 50 = Rs.1,700. Since the market value of the bond is Rs.950, the investor in bond books a profit of Rs.750 i.e., 79%. The reason for lowering of the return in bond is due to investing Rs.2 additionally (over and above Rs.17) per share more for the stock. The investor realizes a gain based on a stock price of Rs.19 rather than Rs.17.

Let us consider the other possibility. If the stock prices drop to Rs.7 in one month period, the investor who invests in the stock will book a loss of Rs.10 per share i.e., return of 59%. The conversion value of the bond also drops to Rs.350 (Rs.7 x 50). The bond price will not fall to that level. We know that the minimum price of the bond is greater than its conversion value or its straight value, assuming that the

straight value is Rs.788. This shows that the investor realizes a loss of 17%. The loss would be even less in fact because the convertible bond would trade at a premium to its straight value.

The analysis made so far is based on the assumption that the straight value of the bond does not change although it can change due to various reasons. When the rates of interest in the economy grow, the bond values decline and hence the straight value. Even if the interest rates remain constant, due to deterioration of the perceived creditworthiness of the issuer the bond rate may fall. When the price of the stock drops precipitously, like in the above example, the perceived creditworthiness of the issuer may decline, causing a decline in the straight value. In any case although the straight value may decline, it is still a floor price for the convertible bond price (albeit a moving floor). We can observe from our example that it has dropped from Rs.950 to Rs.390.

From the above discussion, it is clear that there are both advantages and disadvantages of investing in convertible bonds. The disadvantage is that we have to pay premium for shares. An advantage is the reduction in downside risk (as determined by the straight value) with an opportunity to recoup the premium per share through the higher current income from owning the convertible bond.

MARKET VALUES

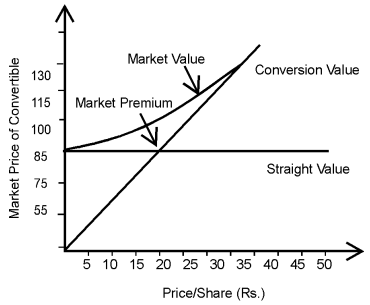
Premium

The amount by which the market price exceeds the conversion value or the investment value is called as the premium. When expressed as a percentage, it is given by,

$$\text{Conversion premium} = \frac{\text{Market Price} - \text{Conversion Value}}{\text{Conversion Value}} \text{ x } 100$$

The conversion value can be lower than or greater than the investment value. Irrespective of this, the premium exists. This may be due to the investor's expectations that in future, the underlying stock may experience a price rise. These relationships can be better understood by Figure 1.

Figure 1



From Figure 1, we observe that the investment value serves as a floor for the price of the convertible security, in the scenario of decline in the price of the underlying stock. When the market price of the stock exceeds certain value, the conversion value exceeds the investment value. The market value of the convertible security on most of the occasions exceeds its conversion value and investment value. The market premium is greatest at the point of intersection of the investment value and the conversion value.

In the above figure, we could understand the changes in the market price of the convertible with respect to conversion and investment values figuratively. If we express these relationships in relative terms, we have the following ratios.

$$\text{Premium over Conversion Value} = \frac{\text{Bond Price} - \text{Conversion Value}}{\text{Conversion Value}}$$

$$\text{Premium over Investment Value} = \frac{\text{Bond Price} - \text{Investment Value}}{\text{Bond Price}}$$

Illustration 2

For the data given below, calculate the premium over the conversion and the investment value.

Market Prices

	Rs.
Stock	11
Bond	117
Conversion rate	10
Conversion value	110
Investment value	100

Solution

$$\text{Premium over Conversion Value} = \frac{\text{Bond Price} - \text{Conversion Value}}{\text{Conversion Value}}$$

$$= \frac{117-110}{110} = 0.0636 = 6.36\%$$

$$\text{Premium over Investment Value} = \frac{\text{Bond Price} - \text{Investment Value}}{\text{Bond Price}}$$

$$= \frac{117-100}{117} = \frac{17}{117} = 14.53\%$$

Conversion Parity Price

We defined the conversion premium as the difference between the market price of the convertible and the conversion value. The conversion premium ratio tells us about the magnitude of appreciation in the price that the stock should experience so that a parity price relationship is reached between the convertible bond and the underlying share. Expressed in another way, the profit/loss, if an investor buys a convertible bond, exercises it and sells the equity shares, his position should not change. That is a situation wherein the investor does not experience either profit or loss. This situation is referred to as conversion parity price relationship. The amount of appreciation that the common stock would undergo is also given by,

$$\text{Conversion parity price of stock} = \frac{\text{Bond Price}}{\text{Number of shares on conversion per warrant}}$$

For the above example, this will be, $\frac{117}{10}$ = Rs.11.70.

This ratio indicates that the price should rise by about Rs.0.70 (6.36% of 11), so that parity is reached.

In no circumstances, will the market price of the convertible be lower than the conversion price, because the investors may make risk-free profits through arbitrage.

BREAK EVEN PERIOD

It is also important to compare the returns from the equity stock and the bond to determine the profitability of both investments. Assume that the dividend paid on equity we have seen above is Rs.0.75. That is, a current yield of 0.75/11 = 0.06818 or 6.82%. The bond, at 10%, will yield 10/117 = 0.08547 or 8.55%.

We note that holding the bond gives us a better return than the outright purchase of the common stock. Under these conditions, we try to calculate the number of years required to recover the conversion premium, which results due to different cash

flows from the instruments. This period is referred to as the Break Even Period. It is calculated by the formula given below.

$$\text{Break Even Period} = \frac{\text{Conversion Premium}}{\text{Interest Income} - \text{Dividends}}$$

For our example, it is given by,

$$\text{Break Even Period} = \frac{7}{10 - 7.50} = 2.8 \text{ years.}$$

Till now we have been looking at a well-known model called the "Traditional Valuation Model". In a more systematic manner,

Annual cash flow differential = Face amount x Coupon rate – Conversion value x Dividend yield, and the payback period is,

$$\text{Payback period} = \frac{\frac{\%\text{Premium}}{1+\%\text{Premium}}}{\text{Current Yield} - \frac{\text{Dividend Yield}}{1+\%\text{Premium}}}$$

We should notice that this method is only an adaptation of the method used in capital budgeting and has its own drawbacks.

CALL RISK

We have seen earlier that there are callable bonds. This is a valuable feature for the issuers who consider that their stock is undervalued enough so that selling the stock directly would dilute the equity of current stockholders. The company will set the conversion ratio based on a stock price it regards as acceptable. When the market price reaches the conversion point, the issuer will want to see the conversion happen in view of the risk that the price may drop in future. This motivates the company to go for conversion even though this is not in the interest of the owners of the security whose price is likely to be adversely affected by the call.

TAKEOVER RISK

If the issuer company is taken over, then the bondholders are likely to suffer. It is due to lowering of the stock prices in the market as a post takeover effect. As the stock of the acquired company may no longer trade after a takeover, the investor can be let with a bond that pays a lower coupon rate than comparable risk corporate bonds.

CALLABLE BONDS

Basics of Callable Bonds

A callable bond is a convertible bond with a favorable feature of call option available to the issuer. When the firm feels that its stock is undervalued in such a way that selling stock directly would dilute the equity of current stockholders and if the firm does not prefer the route of debentures/debt, then it issues a convertible bond duly setting the conversion ratio on the basis of a stock price acceptable to the firm. Once the market price reaches the conversion point, the firm will want to see the conversion happen in view of the risk that the price may drop in the future.

The holder of a callable bond thus gives the issuer the right to call the issue prior to the expiration date. In fact the bondholder is put to two disadvantages. First, the bondholders are exposed to the reinvestment risk, since an issuer will call the bond when the yield on bonds in the market is lower than the issue's coupon rate. Let us try to understand this concept with the help of an example. Suppose a firm has issued a callable bond with a coupon rate of 13%. Subsequently the market rates come down to 7%. When funds are available at 7% in the market, why should the

firm pay interest at 13% to the bondholders? Since it has the option to call it utilizes the opportunity, pays cash to the bondholder by going for the 7% issue.

The second disadvantage is that, the price appreciation potential for the callable bond in a declining interest rate regime is limited. This happens because the investors can reasonably expect that the firm would prefer off-loading the bonds by redeeming at the call price since the market rates of interest have fallen. This phenomenon of a callable bond is called price compression.

In view of the two disadvantages associated with callable bonds and in order to make them attractive, the issuer often provides a call protection for an initial period, akin to the lock-in-period during which the bond may not be called. Despite this why would any investor prefer this at all with inherent reinvestment risk and price compression unless otherwise sufficient potential compensation in the form of a higher potential yield is explicitly provided?

The yield associated with a callable bond is simply the interest rate at which all the coupon payments (generally semi-annual) and the call price are discounted to equate with the price of the bond. Put differently,

$$P = \sum_{t=1}^{n} \frac{C}{(1+y)^t} + \frac{M}{(1+y)^n}$$

Where M = call price in rupees, n = number of periods until the first call date. The discount rate 'y' in this equation represents the yield to call and 'C' is coupon.

The yield to call assumes that (1) the investor will hold the bond to the assumed call date, and (2) the issuer will call the bond on the date. But these assumptions are unrealistic in the sense that they do not take into account the rate at which the investor can reinvest the proceeds after the issue is called. For example, for a five year bond, the investor intends to hold the bond for five years, but when the bond is called at the end of the third year, the total return for five years will depend upon the interest at which the proceeds are reinvested from the call date to the end of the fifth year. Thus it is not possible to calculate the yield to maturity for such callable bonds.

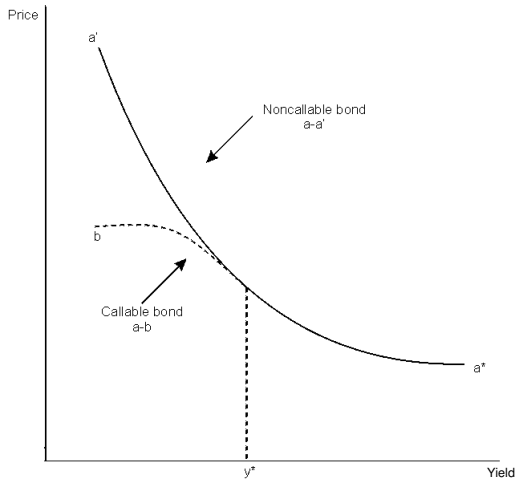
Price-Yield Relationship of a Callable Bond

The price-yield relationship of a non-callable or a non-puttable bond is convex because price and yield are inversely proportional. Figure 2 shows the price-yield relationship of a bond when it is callable and non-callable. The non-convex nature of a callable bond can be explained as follows.

From the definition of the callable bond, we know that a bond becomes callable only when the prevailing market yield is less than the coupon rate on comparable bonds. The price-yield curve of a bond is unaffected till the time it becomes callable. Investors may not be willing to pay the same price for a bond even when the coupon rate on the bond is just lower than the market yield as what would have been its price if it were a callable bond, for there is a possibility of a further drop in the market yield and the issuer may call the bond. As yields decline, there is an increasing possibility of the issuer calling the bond. Though the exact yield level at which the bond would be called may not be known, but the existence of such a level is certain. In Figure 2, for yield levels below y*, the price-yield relationship of a callable bond differs from that of a non-callable bond. For instance, the market yield is such that a bond would be selling for 107. But if it is a callable bond then it might be called at 105 and hence the investors will not be willing to pay 107. Even if the investors purchase at 107 and if the bond is called, then they get only 105 and hence there is a loss of 2 units per bond. For a range of yields below y*, there is price compression. Hereby price compression we mean that as yields decline price appreciation is limited. This portion of the price-yield relationship of a callable bond below y* is termed negatively convex because of

the following reason. Increase in yields by a given number of basis points will result in a greater price decline compared to the price appreciation if yields decline by the same number of basis points.

Figure 2



Components of a Callable Bond

A callable bond can be thought of as the sale of a call option by the investor to the issuer as it allows the issuer to repurchase the bond from the time it becomes callable until the maturity date. The purchaser of a callable bond effectively enters into two transactions.

i. Purchase of a non-callable bond for which they pay some price.

ii. Sale of a call option to the issuer for which they receive the option price from him.

The net price paid by callable bondholder is given by,

Price of the callable bond = Price of the non-callable bond – Price of the call option.

It can be seen in Figure 2 that the difference between the price of the non-callable bond and the callable bond is the price of the embedded call option. Though we have simplified the situation for explanatory purposes, in practice it is not easy to define the price of a callable bond like this. The issuer may call the bond at the first call date or any time thereafter or any subsequent coupon anniversary. Thus the investor has sold a strip of call options to the issuer. The price of the call option may vary with the date the option is exercised by the issuer. But it is always easier to describe the investor's position as a combination of a long position in non-callable bond and a short call option.

Components of a Puttable Bond

In the case of a puttable bond, the investor acquires a right to exercise his option at a predetermined price and time. Thus a puttable bond can also be described as involving two transactions.

i. Purchase of a non-puttable bond;

ii. Purchase of a put option on the bond.

The put option allows the investor to sell the bond to the issuer. An investor will exercise the put option when the market yield is greater than the coupon rate on the bond. The price of the puttable bond is given by,

Price of the puttable bond = Price of the non-puttable bond + Price of the put option.

Option-Adjusted Yield

We know that the price of a non-callable bond can be obtained from the price of a callable bond and the price of the call option on the bond. The price of a call option can be found using one of the option pricing models[1]. The market price of the callable bond is readily observable and this can be added to find the implied price of the non-callable bond. With the knowledge of the implied price of the non-callable bond, we can compute the yield on the bond if the same is not called and held till maturity. The yield will be the interest rate that would equate the present value of the cash flows associated with the bond if it is held to maturity to the implied price of the non-callable bond. This yield is referred to as "option-adjusted yield".

A non-callable bond is said to be fairly priced if the option-adjusted yield for a callable bond is the yield for a non-callable bond with the same features and of the same issuer. A bond is said to be overvalued if the option-adjusted yield is less and is said to be undervalued if the option-adjusted yield is more.

Option-Adjusted Duration (OAD)

For a callable bond, the use of modified duration is not suitable because the expected cash flow changes as the yield changes. The sensitivity of the price of the callable bonds to the change in the interest rates depends on the changes in the components of the callable bond to the changes in the interest rates. The price volatility of a non-callable bond to the changes in the interest rates depends on its duration. If interest rates rise, the price of the non-callable bond will fall and the price of the call option also will fall. The decline in the price of the call option is because it becomes less valuable as the interest rates rise. As seen from the above mentioned equation, the decline in the call price will reduce the price of the callable bond too but the impact of the interest rate rise on the price of the non-callable bond will be greater than that on a callable bond. When the interest rates fall, both the price of the non-callable bond and the price of the call option increase. This will cause the price of a callable bond also to increase but to a lesser extent.

Option-Adjusted Duration is defined as follows:

$$\text{Option-Adjusted Duration} = \frac{\text{Price}_{NCB}}{\text{Price}_{CB}} \text{ x } \text{Dur}_{NCB}(1 - \text{Delta})$$

Where

Price_{NCB} = Price of a non-callable bond

Price_{CB} = Price of a callable bond

Dur_{NCB} = Duration of the non-callable bond

Delta = Delta of the call option

Note that the delta of a call option measures the sensitivity of the option price to the changes in the price of the underlying asset. The delta value of a call option lies between 0 and 1.

Important factors influencing option-adjusted duration are:

i. The ratio of the price of the non-callable bond to the price of the callable bond. But these two prices are influenced by the price of the call option. Hence the higher the price of the call option, the higher the value of this ratio. Thus OAD is indirectly dependent on the price of the call option.

ii. The duration of the corresponding non-callable bond.

iii. The delta of the call option.

Let us take two illustrations to understand the concept of option-adjusted duration.

1 Popular option pricing models are Black Scholes Model and Binomial Model. Readers who are interested in knowing more about option pricing models can refer to any book on Options.

a. A deep discount callable bond,

b. A premium callable bond.

Case a

For a deep discount bond, the coupon rate is significantly lower than the market yield. Therefore, in this case the issuer is unlikely to call such a bond and hence the price of the option is very low. When the option price is very low, the ratio of the price of the non-callable bond to the callable bond would be close to 1. When the option price is low, its delta is close to zero. Therefore, substituting these values in the above equation, we get the option adjusted duration (OAD) to be,

$$OAD = 1 \text{ x } Dur_{NCB} \text{ x } (1 - 0) = Dur_{NCB}$$

Thus we find the OAD of a deep discount callable bond is the same as the duration of a non-callable bond.

Case b

Consider a premium callable bond whose coupon rate is substantially higher than the current market yield. In this case, the issuer is more likely to exercise the option and hence the price of the option would be high. This is because the issuer can call the bonds and issue bonds at a lower coupon. The delta of such a call option will be close to 1. Substituting these values in the OAD equation, we get

$$OAD = \frac{Price_{NCB}}{Price_{CB}} \text{ x } Dur_{NCB}(1-1) = 0$$

Thus we find that the OAD of a premium callable bond in which the coupon rate is significantly higher than the current market yield is zero.

In between these two extreme cases, the OAD of a callable bond would be less than the duration of a non-callable bond.

Illustration 3

Suppose the implied price of a non-callable bond is Rs.112 and the observed price of a callable bond is Rs.105.45. Duration of the non-callable bond is 4.5 years. The delta of the call option is 0.672. Find the option-adjusted duration.

$$\text{Option-adjusted duration} = \frac{Price_{NCB}}{Price_{CB}} \text{ x } Dur_{NCB}(1-Delta)$$

$$= (112/105.45) \text{ x } 4.5 \text{ x } (1 - 0.672) = 1.567$$

Option-Adjusted Spread (OAS)

The prime objective of an investor is to buy securities which have values greater than their market prices. The discussion made on the above valuation helps to arrive at a reasonably correct value of the bonds. Analyzing further, there is an opportunity to convert the divergence between the price observed in the market for the security and the value derived from the model into a yield spread measure. It appears convenient to the investors to compare the yields rather than the prices of bonds. Thus the yield spread measure comes very handy for the investor in taking decisions.

The Option-Adjusted Spread (OAS) is a measure of the yield spread (expressed in basis points) which can be used to convert differences between the values and the prices. It is thus basically used as a tool to reconcile value with market price. Since the cash flows of the callable bonds are adjusted to reflect the embedded option, the resulting spread is called option adjusted spread.

We have now observed that OAS is calculated using the valuation model. Working out in the reverse, it is possible to calculate the theoretical value for a given OAS. The assumed interest rate volatility affects the OAS as well as the theoretical value. The higher the expected interest rate volatility, the lower the OAS. Similarly the lower the expected interest rate volatility, the higher the OAS.

Effective Duration and Convexity

The modified duration is a measure of the sensitivity of a bond's price to interest rate changes; the assumption made here is that the expected cash flow does not change with the interest rates. In the case of a callable bond, the cash flow does change with the interest rates. Then modified duration may not be appropriate to measure the price volatility of such bonds. If the rate of interest falls, the expected cash flow for a callable bond may change. Thus it may be concluded that modified duration is not an appropriate measure of price sensitivity to interest rate changes.

If P_0 is the initial price and P_1 is the price level to which it is reduced on account of a small increase in the yield (Δy) and the price increases to a level of P_2 on account of a small decrease in the yield (Δy) then the approximate duration is given by the formula,

$$\text{Approximate duration} = \frac{P_2 - P_1}{2.P_{0.}(\Delta y)^2}$$

where y is used in the decimal form. It can be observed that the formula measures the average percentage price change relative to the initial price per basis point change in the yield.

When this formula is used for a non-callable bond, it gives the modified duration since there is no change in the cash flow due to change in the yield. But when this formula is used for a callable bond, i.e., a bond embedded with an option, the new prices at the higher and lower yield levels should reflect the value from the valuation model. Duration calculated in this method is called effective duration or option-adjusted duration.

We may summarize the relationships among the duration, modified duration and the effective duration on the following lines:

- Duration is a generic concept that indicates a bond's response to a change in interest rates.
- Modified duration is a measure of duration in which it is assumed that the cash flows do not change with change in the yield.
- Effective duration measures the sensitivity of the bond's price considering that the expected cash flows change on account of changes in the yield due to the option available with it.

Another measure that is normally studied along with duration is convexity. The standard convexity measure may be inappropriate for a bond with embedded options as it does not consider the effect of a change in interest rates on the bond's cash flow. The formula for calculating the approximate convexity of any bond is,

$$\frac{P_1 + P_2 - 2.P_0}{P_0.y}$$

When the prices used in this formula are calculated assuming that the cash flows do not change when yields have changed, the resulting convexity becomes a good approximation of standard convexity. On the other hand, if prices are calculated under the assumption that the cash flows have undergone a change due to changes in the yield in respect of a callable bond, then it is called effective convexity.

FLOATING RATE NOTES

When interest rates are high and the general outlook is either stable or indicating the possibility of a downward trend in return, then an investor would obviously consider purchasing a long-term fixed rate bond. The rationale behind such a strategy is simply to secure the prevailing high returns and also to benefit from any appreciation of capital that may occur when the expected future scenario is of declining rates of interest. If the present rates of interest are discouragingly low and if interest rates are expected to increase in future, then the investor cannot choose to go for long-term or medium-term investments whose coupon rates are based on the prevailing lower interest rates. He naturally looks for instruments

which would pay interest that varies with the trend prevailing in the future years. This need of the investor led to the innovation of Floating Rate Notes. From the point of view of issuers, it should be noted that there are no conditions attached to the use of funds and therefore, the borrowers are free to use them for their general corporate needs. However, since many of these issues are unsecured, sovereign borrowers in developing countries are required to obtain a state guarantee while corporate entities require a bank guarantee.

Definition and Mechanism

A Floating Rate Note (FRN) is a bond issued for medium to long-term, which pays coupons that are pegged to the level of a certain floating index, which is called reference index. Let us consider a five-year FRN with coupons referenced to the six-month LIBOR (London Inter-bank Offer Rate) paying coupon semi-annually and the default risk premium set at 0.125%. This implies that during the five-year tenure of the bond, the coupon interest paid will be varying according to the LIBOR. For example, if the LIBOR is 6.6% the next coupon payment on a $1000 FRN will be equal to 0.5 (0.066 + 0.00125) (1000) = $33,625. If, on the other hand, for the next reset date the six month LIBOR comes down to 5.7%, then the coupon payment will be equal to 0.5 (0.057 + 0.00125) (1000) = $29,125.

In a basic floating rate note, the following are the five important features:

1. Reference Index
2. Quoted Margin to Reference Rate
3. Reset Frequency
4. Observation Date
5. Maturity Date.

REFERENCE INDEX

Every FRN chooses its own reference index upon which the calculation of each successive new coupon is based. The most commonly used reference index is LIBOR. It is a European market rate, used when European banks negotiate loan agreements. The British Banks Association which has a consortium of 24 British banks publishes it. Other reference indices are US 90-day Treasury Bill rates, Prime rates, Commercial Paper rates, etc. In India, MIBOR (Mumbai Inter-bank Offer Rate), 10-year Government Bond rate, 3-year Fixed Deposit rate of State Bank of India, etc., are some of the reference indices.

QUOTED MARGIN TO REFERENCE RATE

This is also called default risk premium. This indicates the additional rate paid over and above the reference rate. It is the compensation for the credit risk of the issuer. The spread over the indexed rate could be fixed or varying. This spread depends mainly on the security offered by the issuer and his creditworthiness. Companies which claim good reputation in the market like Reliance and Tata would be able to issue FRNs with very thin premium.

RESET FREQUENCY

Normally periodicity of coupon payments and the reset dates go together. That is, they are identical. However, on some FRNs, the coupon resets faster than it pays. For example, the coupon rate might be reset monthly but the coupon interest might be paid quarterly. In such cases, the interest payable on the bond will be revised three times between two consecutive interest payments if the reference rate undergoes change in all the three months.

OBSERVATION DATE

The rules for determining the dates upon which the value of the reference index is observed for the purpose of setting the next coupon change from one issue to the other. The rule for specifying the observation date generally includes not only a specific time, but also a specific place. To quote an example, the observation date for three month LIBOR might be specified as the average offered rate for three month Eurodollar deposits at a list of reference banks in London at 12 Noon on the second business day preceding the reset date.

MATURITY DATE

This is simply the due date of the bond on which the principal of the bond and the last coupon payment become payable.

Types of FRNs

In an era of innovations, while changing needs and preferences of the investors trigger introduction of newer FRNs, the borrowers' funding specifications also necessitate the sprouting of new varieties of FRNs. Some of the important varieties are listed hereunder:

1. Flip-flop FRNs
2. Mismatch FRNs
3. Mini-max FRNs
4. Capped FRNs
5. Structured FRNs
6. Perpetual FRNs
7. Deleveraged FRNs
8. Inverse FRNs.

FLIP-FLOP FRNs

The World Bank came out with an issue of FRNs in 1985, with a spread of 50 basis points over the three-month US Treasury Rate and a perpetual life. It also provided the note holder an option of converting the FRN into a three month flat yield at the end of every sixth months. The investor could again go back to floating rate with perpetual maturity if he desires so.

MISMATCH FRNs

These are also called rolling rate FRNs.

MINI-MAX FRNs

These FRNs consist of minimum and maximum coupons. Investors benefit in terms of high spread (over the LIBOR), but have to agree to a minimum rate as well as a maximum rate on their notes, the differential between the two being very small. These are also referred to as Collared FRNs. For example, a bond with 5-year maturity and coupon interest payable six monthly at LIBOR – 0.50% subject to a cap of 8.25% and a floor of 5.5%.

CAPPED FRNs

Under capping arrangements, the FRNs issued are pegged to an interest rate cap. This means that the issuer need not pay interest beyond the ceiling level even if the LIBOR shoots up to more than that level. In order to protect the interests of the investors and make the bond attractive, normally higher margins are offered on such FRNs.

STRUCTURED FRNs (VARIABLE RATE NOTES)

This is one of the latest innovations which is issued for longer terms (sometimes perpetual also) with variable interest spreads with margins over LIBOR going up for later maturities. Margins for the subsequent dates in this regard are fixed either by auctioning or through a mutual agreement.

PERPETUAL FRNs

These are also called irredeemable or unrated FRNs and are akin to a form of capital.

DELEVERAGED FRNs

The reference rate is adopted as a percentage of the value of reference index. For example, the coupon will be determined as 75% of LIBOR + 0.7%. It may be noted that the reference rate is not taken as the full value of LIBOR.

INVERSE FLOATING RATEs

The coupon rate increases when the LIBOR rate decreases and vice versa. This benefits the investors when the rate of interest in the market is in the declining trend.

RISKS ASSOCIATED WITH FRNs

Basically there are two risks associated with FRNs. One is the interest rate risk and other default risk.

Interest Rate Risk

Normally short-term interest rates have higher volatility than long-term interest rates. So an FRN holder may hedge against such risk by taking positions in Eurodollar futures contracts or interest rate swaps. The risk in institutions holding a portfolio of FRNs with different reset dates, is very similar to a portfolio of short-term paper issued by the respective companies with maturity dates coinciding with various reset dates.

Default Risk

This risk arises if the FRN is traded at discount.

Advantages of FRNs

We know that the coupon rate is fixed for fixed rate bonds and that throughout its tenure the investor receives coupons at a predetermined interest rate irrespective of the changes in the interest rates in the market. Further, bonds experience inverse price changes when the market rates of interest change. That is, the price of a bond decreases when there is an increase in the market rates and increases when there is a decrease in the market rates. It has been observed that FRNs will experience only mild price changes between reset dates, the reason being that the reference rate normally moves in tandem with the market rates and the coupon of the FRN is pegged to the reference rate.

It is to be appreciated that FRNs make attractive investment for the investors with a strong need to preserve the principal value of the investment if they desire to withdraw the investment prior to the maturity date of the bond. The reason is very simple; the rate of interest paid as coupon rate is almost the same as the market rate at any given point of time.

FRNs are equally advantageous to the issuers because they need not borrow long-term debt at historically high rates of interest particularly when there is a declining trend in the interest rates. During 1993, MRPL issued partly convertible debentures at 16.5% rate and had to keep on paying interest on the debt portion at the same rate even after five or six years when the market rate of interest had considerably come down. Similarly, the Hyderabad Urban Development Authority (HUDA) also issued bonds at 15% interest whereas the market rate subsequently came down drastically. HUDA is still paying interest at 15% to fulfill its original commitment.

Box 3: Floating Rate Notes Issues

The Power Finance Corporation had accessed the market with a $100 mn floating rate note issue to raise funds for financing various power projects. ABN Amro was the lead manager of the issue. The issue was launched on June 28 and closed on July 9, 1999. The issue carried a coupon of 145 basis points over LIBOR and came with a green-shoe option for $50 mn. The seven-year issue due to mature in 2006 carries a call and a put option at the end of five years.

Road shows were held in Singapore, Mumbai, Dubai, London and three other European cities to promote the issue. The Bank of Baroda, Natexis Banque, Bank of India and Rabobank were appointed as the senior co-lead managers on the issue that was underwritten by ABN Amro.

PFC was accorded the same long-term foreign currency debt rating as the Indian sovereign by Moody's and S&P: Amro was targeting banks and institutional investors mainly in Europe and Asia.

Sterlite had raised $80 mn through a floating rate note issued in 1998, lead-managed by UBS. Most of the funds (Rs.287.51 crore) were still lying locked up in Merrill Lynch's International Bank in London when sterilite had made an open offer for INDAL.

IRFC (Indian Railway Finance Corporation) has raised $150 mn (Rs.540 crore) through floating rate notes sold in the US, Europe and Southeast Asia in August 1997 at an extremely cheap rate of 75 basis points above the London inter-bank offer rate.

Arvind Mills Ltd. has also issued Floating Rate Notes (FRNs) of $125 mn in the overseas market.

Spic Electric Power Corporation, a company promoted by Tamilnadu Petroproducts Ltd., issued during 1996-97, FRN (floating rate convertible notes) for Swiss France 45 mn, to be repaid at par on December 9, 2003. These notes were convertible at the option of investors at Rs.21.03 per share at any time during the period April 1, 1997 to maturity date.

The Chennai-based fertilizer major SPIC also retired through market operations with its $120 mn FRN. The buy-back was done by borrowing money in the local markets in rupees and buying out the FRN, which was being quoted at a heavy discount.

Industrial Development Bank of India floated bonds outside India, which include dollar denominated FRN maturing in 2002 and a similar dollar denominated FRN maturing in 2004. The outstanding FRN maturing on 2002 and FRN maturing on 2004 stood at Rs.987.37 crore and Rs.582.17 crore, respectively.

Source:www.thehindubusinessonline.com

Valuation of FRNs

Valuation of a regular or a fixed income bond involves discounting a series of known cash flows. But in FRNs, the only known cash flows are the coupon interest payment at the end of the current interest payment period and the repayment of principal at maturity while the intermediate coupon payments are unknown.

It may seem difficult at the outset to estimate each of the future floating interest rates to determine the coupon on FRNs. To overcome the problem of valuation of varying coupons we break the valuation of a FRN into three components as follows:

i. Current interest

ii. Annuity stream

iii. Par bond.

CURRENT INTEREST

This represents the known interest amount that would be paid at the end of the current period once the interest rate is fixed at the beginning. If the valuation date is an interest payment date and the new interest rate has not been set, or if this interest period i.e., 'ex-interest' (i.e., interest will not be paid for the current coupon period) then this interest component has zero value.

On the other hand, if the interest period "cum" interest (interest will be paid for the current coupon period) and the interest rate has been fixed, then the interest amount can be calculated. If the base interest rate is denoted as 'b' and the interest margin is 'IM', then IM will be added or subtracted from the base rate to determine the coupon interest rate. The coupon payment is then computed as follows:

$$\text{Coupon} = (b + IM) \times \frac{d}{D} \times 100$$

Where, d is the number of days in the interest period and D is the day count basis which is 360 or 365 and IM is the interest margin paid relative to 'b'.

ANNUITY STREAM

This refers to the IM stream over the life of the FRN. When the base interest is unknown, IM is fixed over the entire life of the FRN. The magnitude of the IM reflects the creditworthiness of the borrower and also the term of the FRN. IMs also change over time like interest rates. While valuing FRNs we should take these changes into consideration. IM is compared to the prevailing margin at which the market is trading and this is referred to as the trading margin or TM. If TM is greater than IM, then there is a negative cash flow and if TM is less than IM, then there is a positive cash flow equivalent to the magnitude of the difference between them.

Annuity Stream is calculated as follows:

$$\text{Annuity Stream} = \frac{(IM - TM)}{m} \times a_n$$

Where,

m = interest payment frequency in a year

$a_n = (1 - v^n) / (r_s/m)$ and $v = \frac{1}{(1 + r_s/m)}$

TM = current interest margin paid relative to b% p.a.

PAR BOND

If we ignore the current interest and the IM annuity stream, we have only the unknown coupon payments after the current interest period and the principal repayment at maturity. This is expressed as follows:

$$\frac{C}{\left(1+\frac{r}{m}\right)} + \frac{C}{\left(1+\frac{r}{m}\right)^2} + \ldots + \frac{(C+100)}{(1+r)^n}$$

Where,

C = the unknown coupons

r = discount rate

n = number of periods to maturity excluding the next payment date

m = coupon payment frequency.

Though both 'C' and 'r' seem to be unknown and are estimates of floating interest rate applicable between the next interest period at maturity, one with intuition would deduce that both are same and are numerically equal. Therefore, the valuation of these unknown cash flows can be likened to a par security where the annualized coupon and YTM are the same.

The important property of par securities is that the present value of the security is the same as the future or that the principal amount can be applied here.

$$\text{Par value} = \frac{C}{1+r} + \frac{C}{(1+r)^2} + \ldots + \frac{(C+100)}{(1+r)^n}$$

Where,

C = r x 100.

The net result of this reasoning is that we can treat all the remaining cash flows as a par security as on the next interest payment date.

Combining all the three components together, we get the value of the FRN as on the next interest payment date. This is arrived as follows:

$$PV = \frac{100\left[(b+IM)\ x\ \frac{d}{D} + \frac{(IM-TM)}{m}\ x\ a_n + 1\right]}{1+(r_b+TM)\ x\ \frac{f}{D}}$$

Accrued interest = (b + IM) x (d – f)/D

Where,

r_b = current yield to next interest payment date (% p.a.)

r_s = current yield to maturity of the FRN on a security that is equivalent to the security underlying the interest rate

b = interest rate set at last interest payment date or issue date % p.a.

A bond has just one yield-to-maturity but an FRN effectively has three types of yield to maturity to incorporate viz., r_b, r_s and TM. The value of r_b is the current rate for the interest index used to determine 'b' from the valuation date to the next interest payment date. If FRN is based on 6-month LIBOR, and we evaluate the FRN with 3 months to the next payment date, then r_b will be the 3-month LIBOR rate. In valuing an FRN, we are interested to find out its replacement cost; r_s is the base rate used to discount the fixed IM cash flows and it should be reflecting our estimate of the floating interest rate over the remaining life of the FRN. Current swap interest rate prevailing over the maturity of the FRN is chosen for r_s.

Floating Rate Notes are also issued with features such as:

i. **Call feature:** Right to call back the issue by the issuer on prespecified date and price.

ii. **Put feature:** Right to investors for redeeming the Floating Rate Notes on prespecified date and price.

iii. **Cap feature:** Having provision of maximum coupon rate which can be given during rising interest rate period.

iv. **Floor feature:** Provision for payment of minimum coupon rate during falling interest rates.

v. **Collar feature:** Provision of both cap and floor feature to attract the investors.

The call and put options can only be exercised at the coupon-reset periods. Thus the interest rate risk in Floating Rate Notes is much less in comparison to the credit risk. Table 2 gives the effect of caps and floors on the prices of floating rate notes.

Table 2: Effect of Caps and Floors on the Prices of Floating Rate Notes with Changing Interest Rates

Factor	Movement	Effect on Neutral Price of Capped FRN	Effect on Neutral Price of Floored FRN
Interest rate volatility	Falling	Increases	Decreases
	Rising	Decreases	Increases
Interest rate level	Falling	Increases	Increases
	Rising	Decreases	Decreases
Shape of yield curve	Flattening	Increases	Increases
	Steepening	Decreases	Decreases

DUAL CURRENCY BONDS[2]

A dual currency bond is a form of a debt instrument. The nomenclature is justified by the feature that its coupons are denominated in a different currency from the one in which its principal amount is denominated. The unique design of a dual currency bond has made it popular in all the world's major markets. It can be viewed as a combination of (i) a single-currency fixed-coupon bond and, (ii) a forward contract to convert the bond's principal value into a predetermined foreign currency. It is sold to investors, who are inclined to make some profits out of the movement in the foreign currency markets. The limitation on the fixed income portfolio managers which prohibits them from trading in forex markets, can be overcome by the unique feature associated with a dual currency bond.

An illustration will help in understanding these instruments better. Consider a five-year bond paying an annual coupon of 6% in US dollars and redemption amount of JPY 120,000. Let the initial price of the bond be USD 1,010 relative to a par value of USD 1,000 (i.e., the bond was trading above par). Since the bond is not issued at par, the forward contract portion of the dual currency instrument is said to be off market. The following table shows the cash flows for this structure from the investors' point of view.

Table 3: Cash Flows for a Dual Currency Bond from Investors' Perspective

	Transaction	0	1	2	3	4	5
1.	Long 6% USD bond	–USD 1,000	+USD 60	+USD 60	+USD 60	+USD 60	+USD 1060
2.	Long yen forward (pay USD, receive yen)	– USD 10	–	–	–	–	+JPY 120,000 and –USD 1000
3.	Long dual currency bond (1) + (2)	– USD 1,010	+USD 60	+USD 60	+USD 60	+USD 60	+JPY120,000 and +USD 60

Thus we can find that the embedded forward contract allows the bondholder to exchange the USD 1,000 for JPY 120,000. This implies an exchange rate of JPY 120/USD (or equivalently USD 0.008/JPY). If the investor has to pay an additional USD 10 now for a future transaction, then there is no need for the knowledge of the effective exchange rate. If the investor, on the other hand, is willing to pay the additional USD 10, then the JPY 120/USD is probably a favorable price to purchase yen forward. The effective exchange rate built into the transaction can be established by dividing JPY 120,000 by the sum of USD 1,000 and the future

2 These sections are drawn from "Investment Analysis and Portfolio Management" by Frank K Reilly and Keith C Brown.

value (in year 5) of USD 10. Calculating this latter amount as 16.55 (= 10 x $(1.06)^5$), the effective exchange rate becomes JPY 118.05/USD (= 120,000/(1,000 + 16.55)).

The dual currency bond is being traded at a premium over a single-currency 6% coupon bond of comparable creditworthiness because there is a possibility that the five-year exchange rate between yen and dollars is JPY 118.05/USD, which implies that the bond is priced properly at USD 1010. But there is a higher probability of the exchange rate turning out to be JPY 120/USD which implies that investors are paying for the foreign exchange exposure willingly which could not have been acquired in any other way. If this had been true, then the issuer who holds a short position in the dollar bond and a short position in the yen forward market would unwind his derivative position at a profit thereby reducing the cost of funds to less than 6%. The issuer's commitment to sell Japanese Yen five years hence can be offset by a long position in a separate yen forward contract at the market forward exchange rate of JPY 120/USD. Thus the issuer's net borrowing cost can be calculated by solving the yield as follows:

$$1{,}010 = \sum_{t=1}^{7} \frac{30}{(1+i)^t} + \frac{1390}{(1+i)^7}$$

(Reader can verify that 'i' works out to be 5.765%.)

EQUITY INDEX-LINKED NOTES[2]

These instruments are traded on the New York Stock Exchange. Merrill Lynch introduced these notes as a series of senior Debt Securities as non-coupon paying instruments. These were termed as units of S&P Market Index Target Term Security (MITTS). At maturity, unitholders received in addition to the original issue price a "supplemental redemption amount", whose value depended on the Standard and Poor's 500 Index relative to a predetermined initial level. This supplemental amount should be positive. The total amount received on maturity was given by

$$10 + \max\left[0, \left(\frac{10 \text{ x (Final S\&P Value} - \text{Initial S\&P Value)}}{\text{Initial S\&P Value}} \text{ x } 1.10\right)\right]$$

The main purpose of these instruments is to facilitate enhanced participation of the investors in the equity market who were otherwise not able to do so because of regulatory and tax constraints. When this instrument is embedded with a call option, the issuer can market to the institutional investors because it is a "no loss" proposition. The worst possibility would be the investor receiving the principal amount without any interest after five years. However, the customer bears the issuer's credit risk for this period. Therefore, unlike the dual currency bond where the investor could either gain or lose from changing exchange rates, at origination, these instruments have no downside exposure to stock price declines. The call option embedded in this instrument is actually a partial position. Therefore, the option portion of the note's redemption can be rewritten as:

$$\max\left[0, \left(\frac{10 \text{ x (Final S\&P} - \text{Initial S\&P)}}{\text{Initial S\&P}} \text{ x } 1.10\right)\right]$$

Thus, a regular index option has a terminal pay-off of max[0, (Final S&P – X)], where X is the exercise price and the derivative in the instrument represents some proportion of this amount. When the terminal pay-offs to the instrument's embedded option are compared with those of a regular index call option, it can be found that both options become "in the money" at the same point (at the initial S&P value), but only the latter produces a "dollar-for-dollar" pay-off with increasing values of index beyond this point.

Thus the value of the instrument is the sum of the value of the bond and the value of the embedded option in it. There is a possibility of synergy benefits based on the market reaction to the individual component values.

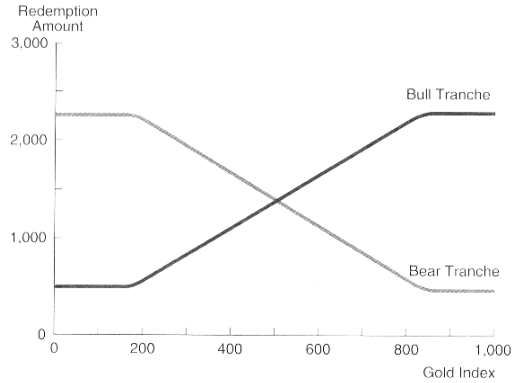
The value of an index call option can also be calculated by the Black-Scholes formula. It is self-evident that if the instrument is priced in the market below its theoretical value, then it gives the investors a potential buying opportunity depending upon their transaction costs.

COMMODITY-LINKED BULL AND BEAR BONDS[2]

Fixed income securities may be designed in such a way that they give an exposure to investors depending on commodity price movements. Fixed income securities' price movements can be linked to commodity price movements. A number of different types of underlying assets can be embedded into a bond issue. But any innovation in the structured note market depends on the investors' attitude demands, and response for such new products. The investors seek convenience and ability to avoid any restrictions in taking direct commodity positions.

The most popular commodity-linked bond is the "bull and bear note". The nomenclature can be attributed to the following reasons. A bull and bear note consists of two parts, (1) a bull tranche, whose principal redemption amount is directly related to the price of the designated commodity, and (2) a bear tranche, whose principal refunding is inversely related to the prices of the commodity. Consider a gold-linked note issued by the Kingdom of Denmark in 1986 in two tranches of $60 million each. Each tranche had a different pay-off structure related to the movement of an index of gold prices. The maturity of both these tranches was 7 years and their annual coupon was 3%. The issue price was 100.125% of par value. The principal redemptions for each $1000 of face value for the two tranches were as follows.

Figure 3: Redemption Values for the "Bull and Bear" Gold-Linked Note



Source: "Investment Analysis and Portfolio Management", by Frank K Reilly and Keith C Brown.

Bull redemption: $1000 x (1.158 x Index at Redemption ÷ Initial Index)

Bear redemption: $1000 x [2.78 – {1.158 x (Index at Redemption ÷ Initial Index)}]

The maximum and minimum redemption levels of $2280 and $500 were set for bull tranche and bear tranche respectively. The bull tranche and bear tranche were designed in such a way that the issuer would not have any net exposure to gold price movements. Thus there is an internal offset effect in this commodity-linked bull and bear bonds. The Kingdom of Denmark held both long and short positions on gold in equal amounts across the bear and bull segments respectively. This in fact fixed the funding cost for $120 million issue at 7.42%.

To verify solve for 'i' in,

$$(1001.25) = \sum_{t=1}^{7} \frac{30}{(1+i)^t} + \frac{1390}{(1+i)^7}$$

where, 1390 is the average redemption amount of both the bull and bear tranches.

The main attraction for the investors is that they are able to purchase a fixed income security while allowing for participation in gold price movements at the same time. The redemption value greater than the purchase price linked to the gold price increases the incentive which buyers of the bull tranche receive in return for lower coupon.

For obvious reasons the investors of two tranches will be different and they pay for this spread position through a reduction in their average yield-to-maturity relative to the regular bond.

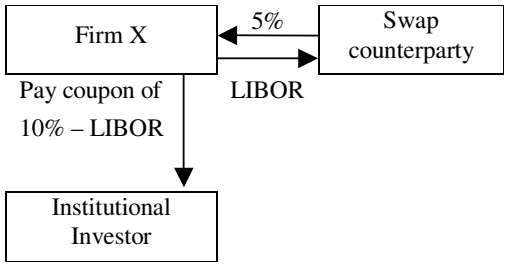
SWAP-LINKED NOTES[2]

Interest rate swaps are derivative products which help in transforming the cash flows of existing debt issues. These are not only useful in covering the existing exposure but also in the new issue market. For instance, consider a company X willing to raise $20 million by issuing a fixed rate note with semi-annual coupon payments over a 3-year period. The company already has some fixed rate exposure and is not in a position for another exposure. A large institutional investor is willing to accept the credit risk of X on a privately placed loan provided that the deal can be structured as per its terms and conditions. As the fund manager of this investment company anticipates a decline in interest rates, he/she would like to design the loan contract based on his/her perception. Hence he/she links the semi-annual coupon on the note inversely with the level of some variable interest rate index such as LIBOR. As the coupon rate increases when the general level of interest rates decreases and vice versa, this is termed as reverse-floating rate contract. Let us take the following illustration to understand the swap-linked note.

Assume that company X and the investor agree to reset the coupon semi-annually at a level equal to 10% minus LIBOR. If 6-month LIBOR is 6%, then the coupon will be (10% – 6%) = 4%. If LIBOR is 3%, then the coupon will be (10% – 3%) = 7%. Thus the investor gains from falling rates and is subject to less credit risk than what would have been if a regular bond issue had an embedded derivative. A reverse floater will benefit more from a rate decline than that could be obtained from a fixed rate note of identical maturity. In particular, when the price of a fixed rate bond paying fixed coupons appreciates as yields fall, the reverse floater increases the investor's periodic cash flows too.

Conversion of a reverse floating rate note with a swap is shown in Figure 4.

Figure 4



X's Net Funding Cost = (10% – LIBOR) + (LIBOR – 5%) = 5%

(Assumption: 3-year fixed swap rate is 5% against LIBOR.)

The given design may not meet the investor's requirements. One way of overcoming this problem is by combining company X's debt position with a swap in which X receives the fixed rate and pays LIBOR as explained in Figure 4.

Another interpretation is that of paying a coupon of 10% minus LIBOR, which is equivalent to paying a coupon of 10% and receiving one of LIBOR. Hence to offset X's floating rate exposure, it must pay out LIBOR on the swap. Net funding cost is shown to be 5% which would hold good as long as LIBOR does not exceed 10%. When LIBOR exceeds 10%, the benefit from paying lower coupons to the investor would stop and the coupon rate cannot be negative. X will continue to pay the net settlement amount on the swap but the effective borrowing cost will rise above 5%. An intuitive reader can easily observe the implicit cap on LIBOR built into the reverse floating rate contract. Company X may need to offset this by purchasing an actual cap agreement with an exercise rate of 10% and a notional principal of $20 million. Though this option may not be expensive it will have some cost attached to it which would raise the funding cost above 5%. Synthetic fixed rate issue from company X can also be viewed as follows:

= (Synthetic Fixed Rate Bond at 5%)

= –(Reverse Floater at 10% – LIBOR) + (Receive 5%, Pay LIBOR Swap)
+ (Cap at 10% Exercise Rate)

= – (Reverse Floater at 10% – LIBOR) – (FRN at LIBOR)
+ (Fixed Rate Bond at 5%) + (Cap at 10% Exercise Rate)

One important point to remember is that this form of structured note would be useful only when the issue can obtain funding cost lower than a direct fixed rate loan. The reason is that a direct fixed rate loan would carry no credit risk for company X but the structured loan does carry it because of the swap and cap positions. A swap-based borrowing would be opted only when it results in lower cost of funding.

SUMMARY

- Warrants are usually attached with the bonds or preference shares to attract the investor. The objective is to induce the potential investors to subscribe to either bonds or preferred stocks, which give less attractive returns.
- Warrants are of different types, namely, Detachable Warrants, Puttable Warrants, Wedding Warrants and Naked Warrants.
- Convertible bond is a corporate bond with a call option to buy common stock of the issuer. The number of shares of common stock that the bondholder can receive from exercising the call option of the convertible bond is called the conversion ratio.
- Convertible bonds are also of different types such as callable bonds and puttable bonds. A callable bond is a convertible bond with a favorable feature of call option available to the issuer. In the case of a puttable bond, the investor acquires a right to exercise his option at a predetermined price and time.
- A Floating Rate Note (FRN) is a bond issued for medium to long-term, which pays coupons that are pegged to the level of a certain floating index, which is called reference index.

Chapter XV

Real Assets

After reading this chapter, you will be conversant with:

- Real Assets
- Appraisal of Real Assets
- Approaches to Estimate the Market Value
- Methods to Calculate the Capitalization Rate
- Subjective Factors Affecting the Value of Real Estate

Introduction

In the previous chapter, we discussed about the financial markets and their functions. In a broad framework we covered the scope and development of financial markets. In this chapter, we would discuss about the components of financial markets which require special coverage because of their nature and contribution to the functioning of the financial system. We would deal with currency markets, commodity markets and the property markets and their vital role in the development of any financial system.

REAL ASSETS

Real estate is not easily exchangeable or transferable. Three types of real estate are identified. They are industrial buildings, commercial buildings and residential complexes. But, however, such a classification is also not unique. While considering an investment in a property, the investor looks into these parameters: location, design, potential for appreciation in value, etc. Of these, location is more important than any other parameter because it determines the value of a property the most. In the beginning of the seventies, operating in the real estate markets was not so difficult as it is today. The sources of funds were limited to equity and mortgage lending during that period. But now the situation has changed with more sources of funds available in the market. The banks, financial institutions and the insurance companies have a variety of schemes to fund real estate investment.

Reasons for opting for real estate investment:

The choice of real estate for investment could be any of the following:

1. Diversification
2. High risk-adjusted returns
3. Inflation adjusted returns
4. Low volatility.

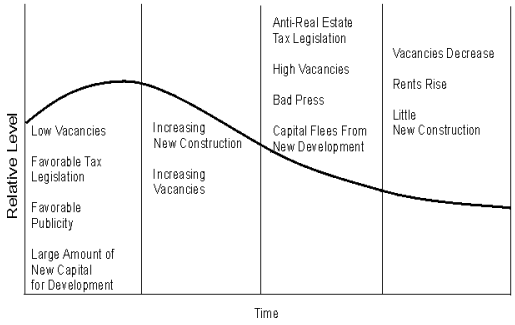
Real estate investment has its own limitations too:

1. Lack of liquidity
2. Real estate market is less efficient than other markets
3. Insufficient historical data available on real estate
4. Diversification is possible only for large investors and not for small investors.

The influence of inflation on the value of a property is more pronounced in the case of emerging markets. When low inflation rates are accompanied by lower interest rates, the capitalization rates tend to be lower. The cash flows and residual values rise gradually. Because of this, low internal rate of return will be accepted. In periods of higher inflation rates, cash flows and terminal values increase more rapidly. The cash flows related to property ownership in response to inflation is more predictable than that with the ownership of any other asset. This is because with rising inflation the property appreciates in value more than the appreciation that occurs with any other type of asset. Thus the real estate is said to be more stable in value.

The real estate cycle is depicted below.

Figure 1: The Real Estate Cycle



Each stage of the above cycle lasts for about 5 to 8 years. But the period of the cycle varies from country to country and within a country from city to city and within a city from area to area.

Characteristics of Real Estate/Property Markets

Valuation of real estate portfolio is different from that of bonds or stocks because of the following characteristics:

a. **Each Packet is Unique:** No two real estate investments can be the same, at least if they are located in different places. This difference may not be very significant but the price of one of them may not give any clue about the price of another. Thus the principle of pricing of similar products cannot be applied to real estate pricing.

b. **Relatively Fewer Players in the Market:** While there are a large number of players in the stock market or bond market, there are a very few players in the property market. This is because the amount required for investment in property markets is comparatively higher than that required in other asset markets.

c. **The Price of a Property is Influential:** In a perfectly competitive market, buyers cannot determine the price. Buyers have no choice. But the situation is different in the case of real estate markets because a buyer who can bid for a much higher price than the second bidder will definitely influence the price of the property. Real estate does not have a market mechanism which allows short selling.

d. **Real Estate Investments are Large Economic Units:** Property investments cannot be divided into smaller units like equity shares. This may be overcome to a certain extent by way of securitization of real estate investments. But still a property investment must be made as a single unit.

e. **Extensive Government Controls:** Property markets are subject to several regulations such as tax laws, building codes, environmental norms to be adhered to, etc. These act as detrimental factors to the development of real estate. Frequent changes in government regulations may cause change in ownership position of a real estate which poses an additional risk.

f. **Slow Reaction of Supply to Demand:** Supply and demand in real estate do not balance. This is because it takes time for conversion of a property from one use to another use. This adds to the complication of the valuation of an investment.

g. **Unorganized Market:** There is no regulated market available for real estate. So the price of the real estate becomes difficult to be estimated. Though the shares in Real Estate Investment Trusts (REITS) are traded, they do assume the properties of a share rather than those of a real estate.

h. **Insufficient Data about Market Prices:** Absence of an organized market and indivisible nature of real estate investment are the reasons for the availability of reliable information about the prices of real estate. Even the buyers and sellers are not willing to disburse the price information. Unless a lease agreement is signed, it is not possible to estimate the price of a vacant space in any building. Thus, price information about the property is difficult to obtain.

i. **Illiquid Nature:** Very few transactions occur in real estate over a period of time. So a definite trend of the prices over time is difficult to determine. The risk and return characteristics are also difficult to estimate.

Efficiency of Property Markets

Because of lack of information available about the price of the real estate, high price is to be paid to obtain useful information. Buyers, sellers, lenders and others are ready prey to the intermediary who provides relevant information about the market.

The buyers who have access to more information tend to be benefited more. In an efficient market, additional returns cannot be obtained by trying to derive more information from the existing reports. But since the real estate market is inefficient, additional returns are possible. Because of this advantage, more investors besides institutional investors are exploring the real estate market. Many analysts take advantage of the lack of efficiency in the market and sell information. The developers in the real estate market adopt strategies like securitization to make available more real estate investments. These approaches will tend to bring about efficiency in the real estate markets.

Appraisal

An appraisal is the first important step towards estimating the real worth (value) of the asset. For it to be objective and authentic, it should be carried out by an impartial person who has the expertise in the relevant field.

LAND AND HOUSE PROPERTY

Whenever we talk of value of a theoretical concept, we try to know the market price of the asset to get an estimate of value. Also, it gives the expectant buyers and sellers an estimate of the price at which they can transact. This is important as most of the time they have their own subjective views. Therefore, we may define market value as,

i. The price at which the asset is most likely to be disposed off, in cash,

ii. The value at which the goods and services are exchangeable for a property, and

iii. The present value of future claim to the income realized on that property.

The market value also plays a crucial role in the estimation of the following.

TRANSFER OF OWNERSHIP

The market values serve as a benchmark at which the transacting parties can negotiate with each other on reasonable terms. Often the price at which the deal is finalized is based on the market value. It forms the basis on which the rent of the house is usually fixed. In case of distribution of property among multiple claimants, it serves as a fair value.

FINANCING A PROPERTY INTEREST

Whenever land property (real estate) is forwarded as a collateral, the lender checks whether the market value of the property is more than the principal amount of the loan or not. The extra value serves as a buffer in case of default.

PAYING TAXES ON PROPERTY

The proper estimate of the market value by the assessor is necessary for paying the correct amount of property tax.

FOR COMPENSATION IN CASE OF LOSS OR DAMAGE

Most of the owners insure the real assets they possess in order to make good the losses and damage caused by natural calamities and accidents.

In some cases, where the government takes over the private property for public use, the compensation to the owner depends on the market value of the property.

PROPERTY UTILIZATION

The property is said to be utilized in the best possible (highest and best use) manner if it yields the greatest present value for that use.

PRINCIPLES OF APPRAISAL

While appraising, these principles play an important role. We discuss them briefly.

Principle of Substitution

According to this principle, a rational buyer will not spend more than the amount it is going to cost him if he buys another similar property with same utility. Also, the buyer while making a decision has three alternatives. They are:

1. The buyer can opt for an existing one with same utility as the one in question,
2. Buy a clear site and develop it to that extent, where it equally serves his purpose, or
3. Buy a property whose risk-return characteristics are similar to that of the subject property.

We will look at various methods, which are appropriate for valuation under these three circumstances later.

Principle of Change

According to this principle, price is a function of demand and supply and as price fluctuates, the value also fluctuates. This may be due to existing political, social and economic environment in the country. Therefore, the appraiser has to take into account these factors and evaluate their effects on the value of the property.

Principle of Marginal Productivity

According to this principle, the value of any factor of production or a component of a property can add to or lower the value of the asset.

Principle of the Highest and Best Use

This principle states that a rational owner will try to gain the maximum out of the resources he possesses.

THE APPRAISAL PROCESS

The various steps are:

1. Defining the problem
2. Making a survey and a plan
3. Collecting the relevant data
4. Applying the most suitable approach to estimate the market value
5. Writing a report.

Defining the Problem

In this step, the appraiser and the owner together, discuss in detail about the property to be valued, the purpose of valuation, the date for which the valuation is desired and the specific value to be evaluated (market value/assessed value).

Making a Survey and a Plan

After getting the necessary details from the owner, the appraiser then estimates the scope, character and the exact amount of work to be carried out. At this stage, he may have to collect information from a host of people like brokers, lenders and other appraisers. As the work involved varies from method to method, the appraiser at this stage decides the approach to be used and the corresponding fee. Only after the owner agrees does he begin his work.

Collecting and Organizing Data

At this stage, the appraiser will make an on-site inspection of the said property and collect data regarding the topographic, environmental, demographic and social factors. He also has to collect the relevant regional, community and the neighborhood data to serve as a background for the appraisal plan.

Applying the Best Approach to Estimate the Market Value

A buyer can acquire property by opting for any one of the three alternatives. There are several ways of appraising the real estate information and arriving at a value. Some of them are:

a. Cost approach
b. Comparison of sales approach
c. Income approach.

The appropriate method to calculate the market value in these three cases is given below.

Table 1

	Alternative	Method
1.	Buy an existing one	Market or direct sales comparison approach
2.	Buy a clear site and develop it	Cost approach
3.	Buy a property with same Risk-Return characteristics	Income approach

COST APPROACH

According to this approach, value of a property is equal to the sum of the land value and the replacement cost of the building. From the value thus obtained, the cost of repairs to be done, and the cost associated with obsolescence of its utility if any (functional or others) are deducted to arrive at the net value. The rationale behind this approach is that any rational investor would not be ready to pay more than the cost of replacing the same building with an equivalent property.

When the existing building cannot be put to the best use, its value is assumed to be diminished.

The steps involved in the Cost Approach are:

1. Estimating the market value of the site,
2. Estimating the improvization or development charges,
3. Estimation of depreciation charges and deducting them from development charges, and
4. Estimating the market value of the property in question.

The drawbacks of cost approach are:

a. It is difficult to quantify the functional and external obsolescence.
b. A developer would not raise any building without any expectation of return. This profit motive has not been considered in arriving at a value under the cost approach.
c. It always assumes that the owner has the first right to the property. If the owner has leased the property, then he would have partial ownership only. Adjustments have to be made in arriving at a value for a building when it is leased.

COMPARISON OF SALES APPROACH

In this approach, the value of a property is determined based on the sales of similar properties. The appraiser should be able to get enough information to adjust for the difference in prices between the properties. The factors that are considered for comparison purposes are similar:

1. Location, type of property
2. Ability to generate identical income
3. Lease structure
4. Risk
5. Ability to finance
6. Rights associated with them.

Assigning a value of the property under consideration based on the value of similar property is a difficult task. This cannot be done without making any adjustments, for we cannot find a hundred percent identical property. The second problem is that this approach ignores market changes. If the comparable property has been sold a few months earlier or a year earlier the same price may not be valid now and using that value without any adjustment does not make any sense.

The steps in Market or Direct Sales Comparison Approach are:

1. Select properties which have similar characteristics to that of the subject property,
2. Then subdivide them into units so that it would aid us in comparing and performing calculations,
3. Then adjust the sales figures with that of the subject property, and
4. Estimating the market value of the subject property.

INCOME APPROACH

Based on the ability to generate income, the value of a property is determined according to this approach. The present value of the future benefits that would arise out of holding the property is determined to assign a value to it. This method also relies on market related data such as market rent for a similar property, expenses that would be incurred on the property, etc. The rate that should be used for arriving at the present value is more important and more difficult to estimate. The crude way of arriving at a capitalization rate is to divide the net operating income on a comparable property by its sale price. This capitalization rate is then used to arrive at a price for the property being evaluated.

The income approach, has two methods. They are gross income multiplier method and direct income capitalization method.

Gross Income Multiplier Method

The steps involved are:

1. Ascertaining the gross market earnings of the subject,
2. Calculating the gross income multiplier, and
3. Estimating the value of the said property.

Illustration 1

Given below is the data of two similar residential properties.

Property	Sales Price (Rs.)	Gross Annual Income (Rs.)
House No. 1	310,000	21,000
House No. 2	305,000	20,800

Compute the indicated market value of the third property which is similar in characteristics to the above two properties. The gross annual income of the third property is Rs.20,500.

Solution

First, we calculate the gross income multiplier for these two units.

$$\text{Gross Income Multiplier (GIM)} = \frac{\text{Sales Price}}{\text{Gross Annual Income}}$$

For House No. 1: GIM = 3,10,000/21,000 = 14.76

For House No. 2: GIM = 3,05,000/20,800 = 14.66

By observing these two ratios, 14.71, the average of these two, will reflect the market sentiment in an appropriate way.

Therefore, the indicated market value of the third unit is

= Gross annual income of third unit x Gross income multiplier derived from the market

= 20,500 x 14.71 = Rs.3,01,555

Direct Income Capitalization Method

The steps involved are:

1. The calculation of the net operating income of the subject,
2. Deriving the income capitalization rate from the market, and
3. Estimating the market value of the subject.

Now, we look at the application part of this method.

Estimation of Market Value for Income Producing Property

For a property which gives us regular returns, the market value is calculated in a similar way as we calculate net present value of cash flows from a financial asset. The formula is

$$MV_0 = \sum_{t=1}^{n} \frac{NOI_t}{(1+r)^t} + \frac{MV_n}{(1+r)^n}$$

where,

MV_0 is the current market price of the property
MV_n is the expected sales price of the property at time n
NOI_t is the annual cash inflows or the net operating income at time t, and
R is the required rate of return.

If we assume that this property changes hands infinite number of times, then the market value of the property is given by

$$MV_0 = \sum \frac{NOI_t}{(1+r)^t}$$

If the net operating income grows at a rate of "g" annually, then

$$MV_0 = \frac{NOI}{r-g}$$

Where NOI is the net operating income growing at a constant rate of "g".

The term (r – g) is the capitalization rate "R_0". When the rate of inflation is high, one would find a very low value of capitalization rate. Capitalization rates are net of appreciation or depreciation.

Illustration 2

The net operating income from a property is Rs.35,000. The required rate of return is 14%. Since past two years, the NOI is growing at a rate of 1.5%. Calculate the market value of this property.

Solution

$$MV = \frac{NOI}{r-g} = \frac{35,000}{0.14-0.015} = Rs.2,80,000$$

ISSUES IN REAL ESTATE VALUATION

Real estate markets have evolved over the years and have now become an alternative investment strategy for many of the investors who were erstwhile only inclined towards stock market investments. The changes in the market scenario have made the valuation of real estate a difficult task.

With international capital flowing into the real estate market in the United States, the values of the real estate have become more influenced. If there is a sufficient number of investors to bid for a particular property, they will constitute a market and if they are genuine investors then the price they are ready to pay will reflect the true value. But one should not ignore the fact that the value of the real estate may change in a short notice.

Institutional investors like pension funds are showing interest in real estate investments because they perceive such investments as means of diversification. They make a serious attempt to analyze the real estate markets and structure the deals in a different way. They use modern portfolio theory for valuing the real estate or make an attempt to securitize the same so that it can be traded like stocks or bonds.

Another factor of importance is the effect of environmental hazards on the properties. So a low premium has to be placed on the properties that are exposed to environmental hazards while valuing the property. This factor has to be incorporated in arriving at a value of a property. For example, Bhuj was a flourishing town in Saurashtra, Gujarat before the earthquake struck on January 26, 2001. Now, the price of real estate has fallen to about 20% of the original price. This is a typical case of low premium being put on high risk of environmental hazard properties.

The regulatory aspects should not be overlooked when valuating real estate. The economic policies of the government, the tax laws, etc. play a role in determining the real estate value.

Approximate indicative rate per sq.ft. rates (builtup/super builtup area) of Residential and commercial areas (including shopping) in Mumbai and Navi Mumbai. Rates may vary depending on location, amenities, etc.

Table 2: Real Estate Prices in Mumbai in 2002-03

Location	Residential Rates (per sq. foot)	Commercial Rates (per sq. foot)
Bandra (East)	3000-4500	5000-17000
Bandra (West)	4000-7500	4500-12000
Khar (East)	2500-3000	4000-5000
Khar (West)	3000-7000	4000-9000
Santacruz (East)	2200-3000	4000-5500
Santacruz (West)	4200-7000	4500-9000
Vile Parle (East)	3000-5000	5000-7000
Vile Parle (West)	3500-5000	5000-7000
Andheri (East)	2200-3500	3000-5000
Andheri (West)	2800-3500	3500-5000
Jogeshwari	1800-2500	2200-3000
Goregaon	2000-2200	2000-3000
Malad	1900-2200	3000-4000
Kandivali (East)	1450-2100	2500-4000
Kandivali (West)	1900-2000	3000-4000
Borivali (East)	1600-2100	3000-4000
Borivali (West)	1600-2800	3500-5000
Dahisar	1500-1800	2200-3300
Mira Road	650-800	700-1200
Bhayandar	600-900	800-1200
Naigam	450-800	700-1000
Vasai Road	650-1000	1500-2200
Nalasopara	600-900	1000-1500
Virar	600-1100	1000-3000
Wadala	3000-3700	3000-4100
KingsCircle	3000-3500	4000-5200
Sion	3500-4500	3500-5200
Kurla	2000-2500	2000-2800
Chembur	2500-4500	2500-3500
Ghatkopar	3000-6000	4000-7000
Vikhroli	1500-2000	1500-2000

Location	Residential Rates (per sq. foot)	Commercial Rates (per sq. foot)
Bhandup	2200-2000	2000-2500
Mulund	1800-3000	2500-4000
Thane	1200-2200	2500-4000
Mumbra	650-800	1000-1500
Dombivali	700-950	1000-2000
Kalyan	900-1200	1500-3000
Ambernath	200-800	1000-1500
Badalapur	700-800	1000-1500
Titwala	700	1000-1200
Asangaon	700	900-1000
Vashi	900-1800	1600-2500
Koparkhairaine	800-1000	1200-1800
Airoli	600-1200	1800-2200
Sanpada	800-1100	1500-2000
Nerul	1000-1300	1500-1800
Konkan Bhavan (CBD)	1000-1300	750-1300
Kharghar	750-1000	600-900
Kalamboli	800-950	1000-1200
Panvel	850-1200	1600-2200

How to Derive the Capitalization Rate

To derive this rate, the following methods are employed. They are:

1. Market extraction method,
2. Band of investment method, and
3. Built-up method.

Market Extraction Method

In this method, we select comparable properties. For these properties, we require net operating income and current market price. The net operating income divided by the sales price, gives the capitalization ratios. From these ratios, we choose a rate which reflects the market sentiment.

Illustration 1

Given below is the data regarding four similar residential properties.

Property	NOI (Rs.)	Market Value (Rs.)
House No. 1	20,000	345,000
House No. 2	18,000	330,000
House No. 3	21,000	350,000
House No. 4	19,000	335,000

Calculate the capitalization rate.

Solution

Property (1)	NOI (Rs.) (2)	Market Value (Rs.) (3)	NOI/Market Value (%) (4)
House No. 1	20,000	345,000	5.80
House No. 2	18,000	330,000	5.45
House No. 3	21,000	350,000	6.00
House No. 4	19,000	335,000	5.67

After observing the ratios in column (4), the average capitalization rate would be 5.73%.

Band of Investment Method

In this method, the rates on equity as well as debt financing are weighted according to their proportions to calculate the capitalization rate.

Illustration 4

Construction of a trade center complex is financed by using 55% of bonds (first charge) bearing a coupon of 9% and maturing in 12 years. The interest will be compounded annually. The rest is financed by issuing equity, whose required rate of return is 14%. To redeem the bonds, a sinking fund is established. Calculate the capitalization rate.

Solution

The total payments required to be made to the bondholder consists of interest payments and contribution to the sinking fund.

$$\text{Amount contributed to the sinking fund} = \frac{i}{(1+i)^n - 1} = \frac{0.09}{(1+0.09)^{12} - 1} = 0.0496$$

Interest rate on the bonds = 0.09

Therefore, total payments for a bond = 0.09 + 0.0496 = 0.1396 = 13.96%

Calculation of Capitalization Rate.

Instruments	% Employed	Required Rate (%)	Weighted Rates (%)
(1)	(2)	(3)	(4) = (2) x (3)
Bonds	55	13.96	7.68
Equity	45	14.00	6.30
Total			13.98

Therefore, the capitalization rate is 13.98%.

Built-Up Method

In this method, the capitalization (built-up) rate is the sum of the following rates:

i. Rate on an asset being non-liquid,
ii. Risk premium,
iii. Pure interest or the risk-free rate, and
iv. Recapture premium (a return of investment).

Illustration 5

Consider the following data.

Risk-free rate = 9.2%
Rate for non-liquidity = 2%
Recapture premium = 4%
Risk premium = 3%
NOI = Rs.30,000.

Compute the capitalization rate and the market value.

Solution

Capitalization rate = Risk-free Rate + Rate for Non-liquidity + Recapture premium + Risk premium

= 9.2% + 2% + 4% + 3% = 18.20%

The capitalized value of NOI is, therefore, given by

$$MV = \frac{NOI}{R} = \frac{30,000}{0.182} = \text{Rs.}1,64,835.$$

FACTOR AFFECTING THE VALUE OF REAL ESTATE

Business Cycle

The existing stage of the business cycle affects the cash flows into and from the real estate market, which has a bearing on the valuation. During the boom period, there will be a natural increase in the economic activity and as a consequence, the demand for real estate also increases, resulting in higher valuations.

Interest Rates and Inflation

Any sector in the economy can attract and retain funds only when it gives more value for the investors' money as compared to returns from other sectors. Therefore, the investors will park their funds in real estate only when they realize more returns from this sector.

During the periods of high inflation, real estate acts as a hedge against price rise.

Population Demographics

The regions, which are densely populated, usually experience high real estate prices as compared to regions which are sparsely populated.

Legal Environment

Lack of uniformity and the presence of multiple laws and regulations with respect to land holdings, act as impediments in frequent turnover of real estate, thereby affecting valuation process.

Taste and Preference for Real Estate

The investors' inclination and their outlook to invest in real estate are determined by their respective tastes and preferences which, in turn, are shaped by a host of factors like being averse to risk, social environment and the purpose of investment.

The micro factors are as follows:

Physical Characteristics like Size, Age and Quality

The measure of the plot, age and quality of construction in case of existing properties and the quality of land (for example, the fertility of the soil in case of farm lands) play an important role in determining the value of the land.

Location

The location of the plot at elite or down market areas or the plot being in a residential or industrial zone, determines the value of the land.

Leasehold/Freehold (Ownership Rights)

In case of inheritance, it is general that the property is passed onto the heirs/successors. This may not be possible in every case, as at the end of the lease period, one has to give up the ownership of the property in question. This may alter the cost structure of the property.

Regulatory Restrictions like Zoning, Floor Space Index and Laws with respect to Easement Rights

Laws and regulations regarding zoning, floor space index and easement rights alter the cost structure of the real estate.

Bullion

Silver or Gold existing in the form of bars are called as bullion or ingots. Most of these private holdings are dealt by few banks and dealers. The bars are of different sizes. The disadvantages of holding in this form is that the investor will not be able to realize any current income. Small bars are usually purchased at a premium and sold at a discount. The difference is the wholesaler's profit or spread. If we analyze them as a percentage of the total cost, we will realize that the wholesaler will make handsome profits on smaller quantities. Therefore the investor, to realize average profits, have to buy large amounts at a single time. In addition to the loss of current income, the high transaction and the storing costs, the price of the bullion should rise substantially for breaking even. The possibility of fraud in case the investor not dealing with reputed dealers adds another dimension to this.

Art Objects

We have seen the definition of this in the avenues of investment. There are different types of participants in every market. This market consists of creative and imaginative artists, a selective and minority group of investors and collectors, agents, auctioneers, dealers and finally museums and art galleries. The investor will do good if

he consults an expert and visit art exhibitions to find out about the authenticity, historic appeal, fashion and the origin of the objects that appeal to him, and at the same time making sound investment sense. It is also advised that an investor who does not possess the requisite skill to identify the genuineness of the object should buy it in an auction. It has been observed that the demand for paintings has been rising in the past decade.

SUMMARY

- Real Assets are physical assets like real estate, diamonds, oil paintings and other investments in physical things. In the case of some real assets the investor enjoys non-financial income called Psychic Income. Investing in real assets differs from investing in securities in the type of income derived, the manner in which the asset is valued and the way inflation affects the value of real assets.
- Real assets are valued using quantitative or qualitative methods. Income Approach, Direct Income Capitalization method, Band of Investment method, Built-up method are quantitative methods. The qualitative methods are further classified into macro and micro factors. Under macro factors, business cycle, interest rates and inflation, population demographics, legal environment, taste and preference for real estate are classified. The micro factors are identified as physical characteristics like size, age and quality and location and leasehold/freehold.
- Most of the times, investors like knowledge about the intricacies of the securities and end up doing mistakes. Therefore mutual funds have come to their rescue them. The next chapter focuses on Mutual Funds.

Chapter XVI

Mutual Funds

After reading this chapter, you will be conversant with:

- The Concept and Objectives of a Mutual Fund
- Types of Mutual Funds
- Advantages of Mutual Funds
- Mutual Fund Services
- Organization and Management of Mutual Funds
- The Mutual Fund Scene in India

Introduction

The concept of Mutual Funds is not new. Originating in the USA and moving on to the UK in the 1930s, this culture started in India only in 1960s, with the setting up of UTI in 1964. Mutual Funds are financial intermediaries in the investment business. In a Mutual Fund, the resources of many investors are pooled and invested to create a diversified portfolio. Thus, in a mutual fund the savings of many investors are combined to form a fairly large and well diversified portfolio of investments.

OBJECTIVES OF A MUTUAL FUND

The objectives sought to be achieved by Mutual Funds are as follows:

- To provide an opportunity for lower income groups to acquire property without much difficulty in the form of shares.
- To cater mainly to the need of individual investors whose means are small.
- To manage investors' portfolios in a manner that provides regular income, growth, safety, liquidity and diversification. Enforcement

TYPES OF MUTUAL FUNDS

Mutual Funds can be classified into the following three broad categories:

1. Portfolio classification of Mutual Funds.
2. Functional classification of Mutual Funds.
3. Geographical classification of Mutual Funds.

Portfolio Classification of Mutual Funds

Mutual Funds differ with reference to the type of instruments in which the money has been invested as per the requirements of the investors. These are specified Mutual Funds structured for feeding a particular investible purpose. Therefore, different Mutual Funds are designed to meet the objectives of different types of savers and are named as such. For example:

BOND FUNDS

Bond Funds provide fixed return for those who desire safety. The savings of investors are invested in various kinds of bonds in which investment is made primarily with the investment objective of safety. Bond funds are more liquid, diversified and conservative investments with modest capital gains. Price of bond Mutual Funds fluctuates with changing interest rates. In India, Mutual Funds income is tax exempt and as such no such classified Mutual Funds have come to exist as in the USA where tax-free income in municipal bond funds or other fixed income bearing securities is an attractive investment.

STOCK FUNDS

Stock Funds are established for those who are willing to accept significant risks in the hope of very high returns. These are called common stock funds. The assets held in the fund are entirely the common stocks of diversified list of industrial corporations. These may be further classified as 'growth funds' which assume high risk to obtain stocks expected to yield high return. When these funds are invested in stocks which pay consistently high dividend like Blue-Chip companies, then it is known as Income Funds.

INCOME FUND

Income Fund is established to maximize the current income (i.e. interest and dividend) of investors. There are two aspects of Income Funds viz., low investment risk, generating constant income and high investment risk generating maximum income. Investment is made in various combinations of high yielding

common stocks and bonds with a view to extract income on regular basis with safety of the principal amount of investment. Conservative investment strategy dominates the Income Funds with modest amount of risk.

MONEY MARKET FUNDS

Money Market Funds are used in short-term liquid assets like Certificate of Deposits [CD(s)] or commercial papers and for them capital is raised by selling shares to the investing public at a price equal to the asset value of the then existing shares outstanding plus a loading fee or service charge. This is known as high liquid asset funds with very low risk and virtually no capital loss. Interest income fluctuates because of volatile interest rates, but investors get better yield than available from pass book saving accounts. In the USA, Money Market Mutual Funds were set up in November, 1972 and have been a very successful vehicle of savings mobilization. In India, Government has only recently taken a decision to allow establishment of MMMFs.

SPECIALIZED FUNDS

Specialized Mutual Funds envisage to specialize investment in securities of firms of certain industries or specific income producing securities. Such funds carry more risk for lack of diversification approach.

LEVERAGED FUNDS

Leveraged Funds or borrowed funds are used in order to increase the size of the value of the portfolio and benefit the shareholders by gains exceeding the cost of the borrowed funds. Such funds are used in speculative and risky investments like short sale to take advantage of declining market to realize gains in the portfolio short sales.

BALANCED FUNDS

Some Mutual Funds are called 'Balanced Funds' where assets are a judicious mixture of industrial stocks and bonds. With a view to embrace modest risk of investment and secure reasonable rate of return the funds are employed in high grade common stock with 25% to 40% investment in conservative fixed income securities like debentures, bonds and preference shares.

GROWTH FUNDS

Growth funds have the principal objective of capital appreciation of the investment over a period of time. The investment is made in equity stock which has above average growth potential. This is a high risk investment fund with high capital gain potential and low current income assurance.

PERFORMANCE FUNDS

Performance Funds were set up in the USA in 1960s to seek large profits from investments in high-flying common stocks. The investment is made in buying equity shares of small unseasoned companies with relatively high price-earnings ratio and higher price volatility.

SPECIALTY FUNDS

These funds, as the name goes, are invested in equity shares of good track record companies which offer long-term capital growth and provide handsome dividend income. In the USA the companies which fall in the group of specialty companies are electronics, chemicals or the foreign securities like Japanese stocks, etc. Sometimes, Specialty Mutual Funds are established for catering financial equipments of one particular type of industry or unit within it, for example, commodity funds, offshore drilling funds, etc. These are highly risky investment funds and require deep knowledge and expertise and extensive experience to handle such funds.

DUAL PURPOSE FUNDS

Income and growth are two objectives which are achieved by offering half of the amount of funds to those investors who wish regular income and half to those who wish growth. The funds thus received are pooled together and used for investment. Any income derived from the portfolio goes to the investors who hold income shares. The investors who hold capital shares receive no income. Instead they receive capital gains or losses that result from investments of total portfolio.

REAL ESTATE FUNDS

Real Estate Fund is of close-ended type. The fund is named so because of primary investment in real estate ventures. Such funds are of various types depending upon real estate transactions.

Thus, the type of Mutual Funds depends upon the nature of securities they issue or sell and purchase. In this way, it is observed that a mutual fund can be named keeping in view the immediate objective behind its creation.

Functional Classification of Mutual Funds

Functional classification of Mutual Funds is based on the basic characteristics of the mutual fund schemes opened for the public for subscription. Mutual Funds on this account are classified into two broad types viz.,

- Open-ended Mutual Fund.
- Closed-ended Mutual Fund.

OPEN-ENDED MUTUAL FUND

The holders of the shares in the fund can resell them to the issuing mutual fund company at any time. They receive in turn the Net Assets Value (NAV) of the shares at the time of resale. Such mutual fund companies place their funds in the secondary securities market. Thus, they influence market price of corporate securities. Open-end investment companies can sell an unlimited number of shares and thus keep growing larger. The open-end mutual fund company buy or sell their own shares. These companies sell new shares at NAV plus a loading or management fee and redeem shares at NAV. In other words, the target amount and the period both are indefinite in such funds. UTI's Unit Scheme, 1964 and CANCIGO and CANGILT are few examples of such funds. For open ended schemes, Mutual Fund Units are sold and bought at NAV with or without loading charges.

NET ASSET VALUE

It is the actual value of the investments made by the mutual fund for each unit issued by it. It changes almost on a daily basis as the market prices of individual securities in its portfolio fluctuate. It is computed by the formulae given below.

$$\text{NAV} = \frac{\text{Assets} - \text{Liabilities}}{\text{Number of units outstanding}}$$

More specifically, it will be

$$\text{NAV} = \frac{\text{Value of Investments} + \text{Receivables} + \text{Accrued Income} + \text{Other Current Assets} - \text{Liabilities} - \text{Accrued Expenses}}{\text{Number of Units Outstanding}}$$

Consider the following data of a Mutual Fund Trust (all figures in Rs. millions)

Value of Investments	=	10.00
Receivables	=	0.75
Accrued Income	=	0.25
Other Current Assets	=	3.00
Liabilities	=	2.25
Accrued expenses	=	0.50
Number of Outstanding Units	=	2.00 million

Given this data the NAV is calculated as shown below:

The formula to calculate NAV is

$$NAV = \frac{\text{Value of Investments} + \text{Receivables} + \text{Accrued Income} + \text{Other Current Assets} - \text{Liabilities} - \text{Accrued Expenses}}{\text{Number of Units Outstanding}}$$

$$= \frac{10 + 0.75 + 0.25 + 3 - 2.25 - 0.50}{2}$$

= Rs.5.625

We know that the value of the mutual fund varies with the value of the portfolio, as the prices of the securities which constitute the portfolio fluctuate day to day. As the intrinsic value of the security represents the fair value of the security, the NAV represents the fair value of a unit in a mutual fund.

Usually, the fund units at the time of application are sold at Public Offering Price (POP). The difference between the NAV and the public offering price is the sales charge recovered by the Asset Management Company from the scheme to cover costs of raising funds on a continuous basis. The public offering price is generally calculated as follows:

$$POP = \frac{NAV}{1 - \text{Sales charge}}$$

Example: If the maximum sales charge is 3% on the NAV of Rs.13.50, the public offering price is given as,

$$POP = \frac{NAV}{1 - \text{Sales charge}} = \frac{13.50}{1 - 0.03}$$

$$= 13.50 = \frac{13.50}{0.097} = \text{Rs.}13.92$$

CLOSE-ENDED MUTUAL FUND

Close-ended Mutual Funds are different from the open-ended Mutual Funds in the following respects:

i. Close-ended fund investment company has a definite target amount for the funds and cannot sell more shares after its initial offering. Its growth in terms of number of shares is limited. Its shares are issued like any other company's new issues listed and quoted at stock exchange.

ii. The shares of close-ended funds are not redeemable at their NAV as are open-ended funds. On the other hand, these shares are traded in secondary market on stock exchanges at market prices that may be above or below their NAV.

iii. Close-ended funds channelize funds in secondary market in acquisition of corporate securities.

iv. The NAV and the price at which units of Mutual Funds are traded in the market need not always be equal: the units may sell for the current NAV per share, for more (at a premium), or for less (at a discount). Financial papers like The Economic Times and magazines like Business Today regularly report the NAVs of closed-ended funds and present a comparison of the current price with the NAV. The reasons for the current market price being less than the NAV can be as follows:

   – Investors' doubts about the abilities of the fund's management
   – Lack of sales effort (brokers earn less commission on closed-ended schemes than on open-ended schemes)
   – Riskiness of the fund
   – Lack of marketability of the fund's units.

The examples of close-ended Mutual Funds include Canstock, Canshare Mastershare, Magnum, Can 80CC, Dhanashree, etc., which have the above features. It is to be noted that unlike in foreign countries where closed-ended and open-ended Mutual Funds are totally separate schemes, in India, this difference is not clearly demarcated for eg.: UTI as Mutual Fund Manager has floated both closed-ended schemes (Master share, Master plus, GMIS '92, etc.) and open-ended schemes (Unit Scheme '64, ULIP '71, Omni Unit Plan, etc.).

Geographical Classification of Mutual Funds

Nations' boundaries provide territorial restrictions on the sale and purchase of mutual fund units or shares as is the case in commodity trade or services. In view of this, Mutual Funds which operate within the nations' boundaries are different from those which are meant for subscription of foreigners or the country's nationals living away from its shores. This classification is broadly of two types viz.,

- Domestic Mutual Funds.
- Offshore Mutual Funds.

DOMESTIC MUTUAL FUNDS

Domestic Mutual Funds are the saving schemes which are opened for mobilizing savings of the nationals within the country. These schemes may be of different types as discussed above under the portfolio classification and functional classification. All the schemes in vogue in the country by the existing Mutual Funds viz., UTI, GIC Mutual Fund, LIC Mutual Fund, SBI Mutual Fund, Canbank Mutual Fund, BOI Mutual Fund, PNB Mutual Fund and Indbank Mutual Fund are the domestic schemes.

OFFSHORE MUTUAL FUNDS

The basic objective of opening offshore mutual fund scheme is to attract foreign capital for investment purposes in the country of the issuing company. Offshore Mutual Funds, thus facilitate cross-border fund flow which is a direct route for getting foreign currency without political strings or domination on the issuer country. From investment point of view too, offshore Mutual Funds open up domestic capital markets to the international investors and global portfolios investments.

The major point of difference between the offshore Mutual Funds and domestic Mutual Funds is the currency and country risk for the global investors as the source of fund is from abroad. Because of the high risk higher return in the invested funds can be expected.

Like domestic Mutual Funds, the offshore Mutual Funds could also be functionally classified into close-ended or open-ended funds.

The major offshore Mutual Funds opened so far comprised of close-ended schemes providing redemption of the units for individual investors only at the end of the specified period specified in the scheme. UTI's India Fund 1986, India Growth Fund, SBI's India Magnum 1989, Canbank's Indo-Swiz Himalayan Fund 1990 and Commonwealth Equity Fund were all close-ended offshore funds.

ADVANTAGES OF MUTUAL FUNDS

Mutual Funds are advantageous to individual investors in relation to their direct involvement in investment portfolio activity covering the following aspects:

Reduced Risk

Mutual fund provides small investors access to reduced investment risk resulting from diversification, economies of scale in transaction cost and professional finance management.

Diversified Investment

Small investors participate in larger basket of securities and share the benefits of efficiently managed portfolio by experts, and are freed of keeping any records of share certificates, etc. of various companies, tax rules, etc.

Botheration-free Investment

Investors get freedom from emotional stress involved in buying or selling securities. Mutual Funds relieve them from such stress as it is managed by experts who act scientifically with right innings in buying and selling for their clients.

Revolving Type of Investment

Automatic reinvestment of dividends and capital gains provides relief to the members of Mutual Funds.

Selection and Timings of Investment

Expertize in stock selection and timing is made available to investors so that invested funds generate higher returns to them.

Wide Investment Opportunities

Availment of wider investment opportunities that create an increased level of liquidity for the funds holders become possible because of package of more liquid securities in the portfolio of Mutual Funds. These securities could be converted into cash without any loss of time.

Investment Care

Care for securities is available through mutual fund to the investors relieving them of various rules and regulations.

Tax Benefits

Income tax exemption has been ensured for Mutual Funds. While originally, only such Mutual Funds as are set up by public sector banks or a public financial institution were exempt from tax, now the benefit of tax exemption has been extended to all Mutual Funds. Investors are eligible for deduction under Section 80L of the Income Tax Act in respect of the dividends from units or shares of Mutual Funds and under Section 88 in respect of contributions made by investors to unit-linked insurance plan of UTI and LIC Mutual Fund.

The above advantages are only illustrative and not exhaustive as there is scope of more to be added to the list in the light of individuals own experience(s).

MUTUAL FUND SERVICES

Financial Mutual Funds, to cater to the need of the different categories of investors, launch schemes involving services to the investors. These are special services in addition to the returns which Mutual Funds offer to the investors, these services are vulnerable to investors and attract them to invest their savings in those Mutual Funds which have such plans to meet their various needs, for example, regular income plan, savings and reinvestment plans, health insurance schemes, equity-linked savings plans for tax exemption purposes, etc.

Some of the important services offered by Mutual Funds globally are discussed below:

Saving Scheme

This is one of the inherent objective of investors to accumulate their savings, voluntary saving plan can be added to Mutual Funds through which an investor can save on monthly or quarterly basis and thus the amount so saved will be added to purchase the units in the Mutual Funds.

The important features of such plans are,

a. Savings could be made through voluntary saving plans which are at the option and free will of the investor to contribute any sum at any time on regular or irregular basis.

b. Alternatively, savings could be made through contractual saving plans pursuant to some agreement envisaging a long-term investment plan binding upon the investor.

   In the USA, these plans are quite in vogue and are under regulation of Securities Exchange Commission. These plans charge investors with substantially high front-end loads. An investor is required to pay commissions over the life of the contract which are recovered in advance in the initial year of the contract from initial installments in the form of front-end loads.

c. The investors who drop out from the contractual plans as stated in (b) above, remain at a disadvantage as the prepaid commission is not refunded to them. Securities Exchange Commission has made rules requiring Mutual Funds to refund the full amount of prepaid commission to investors if the investor cancels the plan within 45 days and 85% of the amount, if the investor cancels within 18 months of joining the saving plan. Those who cancel the commitment after 18 months get no refund.

Automatic Reinvestment Plan

The UTI, in India, has also started this plan where like in the USA, the amount of dividend and other income accrued on mutual fund investments is automatically reinvested in purchasing additional units or shares in the open-ended funds. Other Mutual Funds in the public sector have followed suit.

Regular Income Plan

Systematic withdrawal is allowed to investors of their money locked in mutual fund investments in the form of regular income by way of monthly or quarterly installments to meet their regular financial needs. Initial investment in such plans is stipulated which carries interest at the specified rate. The repayment installments are so formulated as to pay out the earnings first and then the principal amount.

Shifting Advantage or Conversion Privileges

Many mutual fund companies offer different investment plans for investors and many provide the facility to investors within the family of the plans to shift or convert or exchange them afterwards from one plan to another at nominal costs or at no costs subject to tax advantages, if any, available to the investors.

Retirement Pension Plans

Mutual Funds are now very much linked with retirement pension plans. They facilitate setting up by individuals and companies, the tax deferred retirement plans for self or their employees respectively. Regular monthly income plans in India offered by UTI and other Mutual Funds established by nationalized banks are alike.

Insurance Plan

Mutual Funds offer in the USA a relatively new service in the form of insurance program that protects an investment in mutual fund against a long-term loss. The insurance cover is available for a period ranging from 10 to 15 years, for the amounts ranging from $3,000 to $2,00,000 at a premium of about 6% of the insured sum for a period of 10 years. In dollar terms the insurance of a sum of $1,00,000 will cost $600 for a period of 10 years. One has to assess the loss on the insured sum. In the case of capital loss accruing $10,000 then this loss will be completely met by insurance company to cover up the insurance sum of $1,00,000.

LIC Mutual Fund and UTI have come out with schemes providing life insurance covers to the investors.

Cheque-writing Facilities

In the USA, all Mutual Funds offer to the investors the facility of drawing cheques on the Mutual Funds to draw the money invested in Mutual Funds. These cheques are drawn and paid through the funds' banks. This service is rendered frequently by all the Mutual Funds in the USA. In India, Mutual Funds have yet to conceive such noval and innovative schemes.

To conclude, real service to investors is done by Mutual Funds by offering the schemes which directly offer income, capital gains and solutions to their personal individual problems. For this purpose, Mutual Funds should maintain marketing research wing which should always remain on toes looking for new opportunities and conceiving innovative schemes to meet the other conceptual needs of the investors than income and gains in money terms.

ORGANIZATION AND MANAGEMENT OF MUTUAL FUNDS

Structural Pattern

In Mutual Funds, usually formed as trusts, three parties are generally involved viz.,

- Settler of the trust or the sponsoring organization.
- The trust formed under the Indian Trust Act, 1882 or the trust company registered under the Indian Companies Act, 1956.
- Fund managers or the merchant banking unit.
- Custodians.

While in the USA and other countries an "arms length" distance is maintained between settlers, trustees and fund managers, whereas in India, very often, there is an overlapping of roles. For example, in the case of Canbank Mutual Fund, Canara Bank is the settler or sponsor, members of Canara Bank's board form the trust company as trustees and the subsidiary of Canara Bank Canbank Financial Services Ltd. serves as fund managers.

Let us take a look at the organization and management pattern of UTI vis-a-vis the organization and management pattern of some other Mutual Funds established by banks or insurance companies.

Organization and Management Pattern of UTI

UTI has a full-time Chairman with an Executive Trustee reporting to him. The Executive Trustee looks after the Corporate Office, Zonal Offices and 32 Branch Offices. Mutual Funds are managed through various well organized and staffed departments viz.,

- Business Development and Marketing Department which formulates in markets schemes and manages the network of branches and agents;
- Operations and Vigilance Department which divides the scheme-wise responsibilities of branches, organizes the computer network for investor services, issues certificates and repurchases units;
- Investment Department which makes investments in short-term and long-term debt securities;
- Market Operations Department which invests in equity shares, convertible securities and engages in secondary market operations;
- International Department which looks after the offshore funds;
- Support departments like Accounts, Research and Planning, Personnel and Administration, etc.

UTI has a well planned and fully developed market network involving 32 branches, over 300 representatives serving over 150 lakh investors throughout the country. UTI represents nearly 60% of the total savings mobilization done by Mutual Funds and holds nearly 80% of the investible funds of Mutual Funds. UTI is responsible directly to the Department of Economic Affairs, Ministry of Finance, Government of India and is not regulated by SEBI.

Organization and management pattern of Mutual Funds established by banks or insurance companies

These Mutual Funds have been established under the Indian Trust Act, 1882, as trusts for the benefits of investors.

Parties to Mutual Fund Trust

As is common to any trust covered under the Indian Trust Act, the parties involved in a mutual fund trust are the sponsor or settler, the trustees, the investor as beneficiary and the trust property. In a mutual fund trust, subscription made by the investor to the scheme, investments made by the mutual fund of the moneys received into capital market or money market instruments, the income received from such investments after incurring expenses incurred by the trust and any other assets bought by the mutual fund out of the investors money are trust property and the investors are entitled to all these properties as per the terms of the scheme and the provisions of the trust deed.

Table 1

Existing Organization of some Public Sector Mutual Funds

Sponsor/ Settler	Name of the Fund	Trustee	Fund Managers	Custodians
SBI	SBI Mutual Fund	SBI Cap Markets Ltd.	SBI	SBI
Canara Bank	Canbank MF	Canara Bank	Canbank Mutual Fund	Canbank Mutual Fund
LIC	LIC Mutual Fund	SHCI	LIC MF	SHCI
Indian Bank	Ind Bank MF	Indian Bank	Ind Bank	Indian Bank
Bank of India	BOI MF	BOI	BOI Finance Ltd.	BOI Finance Ltd.
Punjab National Bank	PNB MF	PNB	PNB Capital Services Ltd.	PNB Capital Services Ltd.
GIC	GIC MF	Own Board of Trustees	GIC	SHCI
UTI	UTI	-do-	UTI	SHCI/Citibank.

Till recently, in all the Mutual Funds including UTI, the sponsors, trustees, fund managers and custodians were the same persons with no difference of organization and management. But after the issue of certain guidelines by the Government of India on 14.2.1992, sponsors, trustees, custodians and fund managers are to be separate entities with independent legal standing. This has been done with a view to eliminate mismanagement of Mutual Funds.

Let us take a closer look at the 4 constituents of Mutual Funds i.e. sponsors, trustees, fund managers and custodians.

SPONSORS

The sponsor of a mutual fund can be a public limited or private limited company registered under the Companies Act, 1956. One or more public and private limited companies can join to sponsor a mutual fund. The following are the requirements of a competent sponsor.

Track Record

The sponsor company should have a track record of 5 years established through its audited final accounts exhibiting consistency in operating profits, dividend payments, rising cash accruals, etc.

General Reputation

The sponsor should have a good general reputation having directors with clean business records.

Fairness in all Business Transactions

The sponsor company should have good credit record, default-free dealings with suppliers of material, good and tension-free personal relations and should not have any outstanding dues with bankers, creditors, income tax or sales tax authorities.

The sponsor should contribute atleast 40% to the networth of the asset management company.

ROLE OF SPONSOR

In the establishment of mutual fund trust, the main role is played by the sponsors. Both the trustees and the fund managers or the asset management company have to be located and appointed by the sponsor. Alternatively, the sponsor has to appoint Board of Trustees and incorporate an asset management company. It has to submit to SEBI the drafts of the Trust Deed for creation of mutual fund trust with particulars of the persons consenting to be the Trustees both from the sponsor company and the outsiders. It has also to submit draft Memorandum and Articles of Association of Asset Management Company to SEBI with particulars of Directors i.e. the persons to be appointed from the sponsors' Board and those to be taken from outside. It has also to suggest the name and particulars of the custodians to be engaged for the mutual fund. Once the mutual fund trust is authorized by SEBI, the role of sponsor diminishes as it is the Trust that will interact with SEBI.

Mutual Fund Trust

Mutual Fund Trust is created by the sponsors under the Indian Trust Act, 1882 which is the main body in the creation of Mutual Fund Trust.

The main functions of Mutual Fund Trust are as follows:

- Planning and formulating mutual fund schemes.
- Seeking SEBI's approval and authorization to these schemes.
- Marketing the schemes for public subscription.
- Seeking RBI approval in case NRIs' subscription to mutual fund is invited.
- Attending to trusteeship functions. This function as per guidelines can be assigned to separately established trust companies too.

In the absence of such companies, existing debenture trustees, banks and financial institutions may be contracted to act as mutual fund trustees with approval of SEBI. Alternatively, a separate Board of Trustees consisting of individuals of sufficient repute and experience may act as mutual fund trustees. Two third of the trustees shall be independent persons and shall not be associated with the sponsors or be associated with them in any manner whatsoever. The trust company, companies as aforesaid or the Board of trustees including the eligibility of each member shall be intimated to SEBI as per the Guidelines.

Each trustee shall file the details of his transactions of dealing in securities with Mutual Fund on a quarterly basis. Trustees are also required to submit an annual report to the investors in the fund.

Fund Managers or the Asset Management Company (AMC)

The role of fund managers is highly significant in the mutual fund operations. So far, this role is being played by the Mutual Funds through the subsidiary company of the sponsoring bank or inside the banks through department or division. Under the Guidelines fund managers will have to be a separate company specialized and skilled in the investment activities.

AMC has to discharge mainly three functions as given below:

- Taking investment decisions and making investments of the funds through market dealer/brokers in the secondary market securities or directly in the primary capital market or money market instruments;
- Realize fund position by taking account of all receivables and realizations, moving corporate actions involving declaration of dividends, etc. to compensate investors for their investments in units; and
- Maintaining proper accounting and information for pricing the units and arriving at Net Assets Value (NAV), the information about the listed schemes and the transactions of units in the secondary market. AMC has to feedback the trustees about its fund management operations and has to maintain a perfect information system.

FORMATION OF BOARD OF AMC AND RESTRICTIONS ON DIRECTORS

Having regard to the significant role of the Board of Directors of the AMC in rendering the company's operations efficiently, the Government has prescribed stringent qualifications for the members of the Board. According to the Guidelines, AMC should have persons on its Board of high repute and adequate professional experience in the relevant fields such as portfolio management, investment analysis, financial administration, etc. At least 50% of the directors on its Board should be independent persons not connected with the sponsoring organizations. The names of the directors and any subsequent changes must be intimated to SEBI. A director on the Board of AMC shall not be director on the Board of any other AMC. Further, a person who is a director of an AMC shall not hold the position of a trustee or director in a trust company of a fund operated by the same AMC. No person should be a Director/Trustee of more than one Trust Company/Board of Trustees.

SBI Mutual Funds and Canara Bank Mutual Funds have already incorporated their respective asset management companies. The asset management should have a networth of not less than Rs.10 crore.

Custodians for Mutual Funds

Mutual Funds run by the subsidiaries of the nationalized banks had their respective sponsor banks as custodians like Canara Bank, SBI, PNB, etc. Foreign banks with higher degree of automation in handling the securities had assumed the role of custodians for Mutual Funds. Citibank has been a very prominent bank in this regard which acts as custodian for UTI and SBI's funds. With the establishment of Stock Holding Corporation of India, the work of custodian for Mutual Funds is now being handled by it for various Mutual Funds. A few other foreign banks are also eager to act as custodians as they are well equipped with a network of telecommunication facilities and software support systems essential for efficient discharge of the role of the custodian. It is only because of this quality, the Indian Growth Fund (promoted by UTI Merrill Lynch) was shifted from SHCI to Citibank. Now SHCI is also fully equipped with the software support system and acts as Custodian for Mutual Funds for SBI and other Mutual Funds schemes. Automation eliminates manual handling and reduces requisition and delivery time and brings efficiency in operations of a custodian.

Besides, Industrial Investment Trust Company acts as sub-custodian for SHCI for domestic schemes of UTI, BOIMF, LICMF, etc.

ROLE OF CUSTODIANS

The Securities and Exchange Board of India on 5th May, 1996, through its notification No. S.O.344 (E) has issued the SEBI (Custodian of Securities) Regulations, 1996. If any person, wishes to act as custodian of securities on or after the regulations have come into vogue; he has to obtain a certificate to that effect from SEBI. Generally, custodian services are availed of in-house by the Mutual Funds. However, the institutions which are acting as professional custodians are Stock Holding Corporation of India (SHCI), Citibank, Industrial Investment Trust Ltd (IITL); Hong Kong Bank and BOI Shareholdings Ltd. SHCI has not so far decided to extend their services as custodian to private sector Mutual Funds. The capacity of IITL is not specified to cater the needs of private sector Mutual Funds, only Citibank and Hong Kong Bank are in the limelight which could be contacted by the aspirant mutual fund sponsors.

Responsibilities to be discharged by the custodians on behalf of Mutual Funds include receipt and delivery of securities, holding of securities, collecting income, holding and processing cost, corporate actions, etc.

Functions of custodians widely cover safe keeping of securities bid settlements, corporate actions and transfer agents. Salient features of each of these functions are given below:

SAFE CUSTODY

Safe keeping of securities covers a wider range of services rendered to the customer viz. scheme-wise segregation of assets and regular checking and verification of securities, registration of securities for proper verification, regular reconciliation of assets to accounting records.

TRADE SETTLEMENT

Trade transactions take place at the instance of fund managers, but settlements are done at the instance of the custodian which is responsible for the timely receipt and delivery of cash and securities i.e. securities will be delivered on receipt of cash and payment will be made only on receipt of securities. Any discrepancies arising out of the trade settlements are resolved at the end of the custodian.

CORPORATE ACTION

Custodian also assists the corporate actions viz. dividend declarations, exercise the rights of equity holders, collection of dividends, rights, etc.

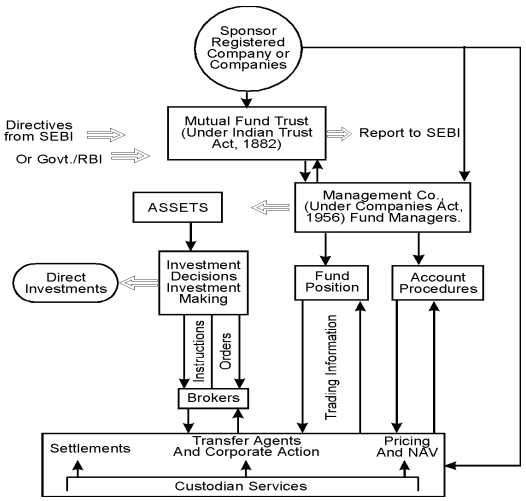
TRANSFER AGENTS

There are four important functions which are attended to by the custodians in addition to the above, viz. firstly attending to shareholders transactional activities viz. to issue, transfer, exchange, redeem, maintain detailed records of transactions, receipt of dividends, reimbursement of dividend and purchase of securities, etc. Secondly, maintaining records of confirmations of transactions, cheque registers, certificates, files, commission reports, tax reporting, etc.

To sum up, the consolidated activities of sponsors, trustees, AMC and custodians form the basis of the organization and management of the mutual fund.

Figure 1 presents a compact representation of the organization and management of Mutual Funds.

Figure 1



Advantages of Private Mutual Funds

It is felt that the entry of private Mutual Funds would encourage competitiveness in the financial sector and promote the existing investment climate. At present, many of the leading industrial houses, through their investment companies are already providing financial support to their group companies besides deploying their investible funds in a profitable manner. Thus, many of these private corporate investment companies have already carved a niche for themselves by registering excellent performance in deployment of their funds through their rich experience in portfolio management. Therefore, many of the private sector companies that have applied for setting up Mutual Funds are already proven companies and are ready for playing the game. The entry of private Mutual Funds could also lead to a lot of accountability about the transparency of their transactions, which had till now not been published by a few existing Mutual Funds. With the government stressing more emphasis on the private corporate sector and mass mobilization of funds by the private sector in the Eighth Plan, the entry of private mutual fund will certainly fill up the slot.

Money Market Mutual Fund

Even as the Mutual Funds show a promise of becoming a major instrument of household savings, another concept which is being talked about and which is waiting to make an entry into the Indian capital market is money market Mutual Funds (MMMFs). Though MMMF has taken a foothold in the West, almost a couple of decades ago, owing to a widespread and well-knit infrastructure and communications network, its arrival in India is fraught with procedural delays and conceptual difficulties.

Basically, the idea is to take advantage of the surplus funds lying with the Mutual Funds' institutions (LIC, UTI, banks, etc.) by investing them in the money market. This might serve two important purposes: one it might open the access of the individual saver's to the short-term capital market. Two, the MMMF may exercise its stabilizing influence on the volatile interest rates, particularly when liquidity pressure is high. In 1990, for instance, call money market rates had zoomed through the roofs owing to tight money conditions in the market.

Presently, Mutual Funds operate in the money market only to a limited extent owing to a number of restrictions imposed on them. They just manage to invest around 20 percent of their funds in Money Market. A separate mutual fund to participate exclusively in the money market was hence thought of. This would help to increase the size of the mutual fund's investible resources in the money market and also allow an individual investor who hitherto stayed away from the money market to indirectly participate in the money market through MMMF.

THE MUTUAL FUND SCENE IN INDIA

Mutual Funds made their entry in India in 1964 with the setting up of UTI. However, their progress has not been encouraging in the past 30 years by way of offering investor friendly products and features.

In November, 1993, India's first private sector mutual fund was launched in the form of Kothari Pioneer mutual fund. This started a spate of other private sector Mutual Funds.

The present trend in the industry is in favor of open-ended scheme as all close-ended schemes have disappointed the investors by continuously quoting at a discount to their NAV's. The promoters of some recent issues have reacted to this development by coming out with open-ended schemes. These schemes also are innovative and cater to different segments of the market. This change has come about with growing awareness among investors about the functioning of Mutual Funds. Also, the individual investor is increasingly getting alienated from the primary and secondary markets, which makes Mutual Funds an attractive avenue for investments. The concept of mutual fund rating too has caught on with the market, and thus an individual investor can ask for unbiased source of information on the performance of various funds. The emergence of industry specific funds is a good sign for the choosy investor to enter the mutual fund industry. It will only be a matter of time before the Mutual Funds really dominate the market, though at present they are not very strong.

Performance of Mutual Funds

The performance of Mutual Funds can be evaluated by calculating the rate of return earned during the relevant comparison period. The return will include changes in the value of the fund during the performance period plus any income from contributions to the fund minus any outgoing fund due to withdrawal from the fund.

Guidelines for Mutual Funds

The Securities and Exchange Board of India on 9th December, 1996 through its notification No. S.O. 856 (E) has issued a set of comprehensive guidelines applicable to Mutual Funds. In January, 1998 some amendments were made by SEBI in these regulations. The highlights of the regulations are given below.

FORMATION AND REGULATIONS

i. Mutual Funds are to be established in the form of trusts under the Indian Trusts Act and are to be operated by separate Asset Management Companies (AMCs);

ii. AMCs shall have a minimum net worth of Rs.10 crore;

iii. AMCs and trustees of Mutual Funds are to be two separate legal entities and that an AMC or its affiliate cannot act as a manager in any other fund;

iv. All the schemes launched by the Asset Management Company should be approved by the trustees and a copy of the offer document should be filed with SEBI.

SCHEMES

i. The AMC should mention in the offer document,
   a. The minimum amount it wishes to raise under the scheme and
   b. The amount of funds it may retain in case of oversubscription. In this case, all the applicants who apply for five thousand units or less should be given full allotment keeping in view the oversubscription levels.

ii. The mutual fund as well as the AMC are liable to refund the application money back wholly or in part if
   a. The Mutual Funds does not receive the minimum amount which it mentions in the prospectus and
   b. If the amount received for units is in excess of subscription referred in i(b).

iii. Every close-ended scheme launched by the AMC should be listed on a recognized stock exchange within a period of six months from the date of closure of the subscription.

   However, this is not mandatory in cases where
   a. There is a provision in the scheme for periodic repurchase facility to all the unitholders;
   b. The scheme provides for monthly income or if it takes into account the needs of certain classes of persons like senior citizens, women, widows or physically handicapped and children with a provision for periodic repurchase of units;
   c. The details of the repurchase facility are disclosed in the offer document;
   d. The scheme opens for repurchase within a period of six months from the date of closure of the subscription.

iv. The AMC at its discretion can repurchase or reissue the units repurchased under the close-ended scheme.

v. The units of a close-ended scheme can be converted into an open-ended scheme provided that:
   a. The offer document discloses the option and the period of such conversion or
   b. The unitholders are provided with an option to redeem their units in full.

vi. The close-ended scheme should be redeemed completely at the end of its maturity period. However, a close-ended scheme may be allowed to be roll-over if the purpose, period and other terms of the roll-over and all other material details of the scheme including the composition of assets immediately before the roll-over, the net assets and net asset value of the scheme, are disclosed to the unitholders and a copy of the same has been filed with the Board. However, further that such roll-over will be permitted only in case of those unit holders who express their consent in writing and the unit holders who do not opt for the roll-over or have not given written consent shall be allowed to redeem their holdings in full at net asset value based price.

Restrictions on Investments

A mutual fund scheme shall not invest more than 15% of its NAV in debt instruments issued by a single issuer, which are rated not below investment grade by a credit rating agency authorized to carry out such activity under the Act. Such investment limit may be extended to 20% of the NAV of the scheme with the prior approval of the Board of Trustees and the Board of Asset Management Company. Provided that such limit shall not be applicable for investments in government

securities and money market instruments. Provided further that investment within such limit can be made in mortgaged backed securitised debt, which are rated not below investment grade by a credit rating agency, registered with the Board.

A mutual fund scheme shall not invest more than 10% of its NAV in unrated debt instruments issued by a single issuer and the total investment in such instruments shall not exceed 25% of the NAV of the scheme. All such investments shall be made with the prior approval of the Board of Trustees and the Board of Asset Management Company.

No mutual fund under all its schemes should own more than 10% of any company's paid up capital carrying voting rights. Transfers of investments from one scheme to another scheme in the same mutual fund shall be allowed only if, –

a. Such transfers are done at the prevailing market price for quoted instruments on spot basis.

   Explanation – "spot basis" shall have same meaning as specified by stock exchange for spot transactions.

b. The securities so transferred shall be in conformity with the investment objective of the scheme to which such transfer has been made.

A scheme may invest in another scheme under the same asset management company or any other mutual fund without charging any fees, provided that aggregate interscheme investment made by all schemes under the same management or in schemes under the management of any other Asset Management Company shall not exceed 5% of the net asset value of the mutual fund.

The initial issue expenses in respect of any scheme may not exceed six percent of the funds raised under that scheme.

Every mutual fund shall buy and sell securities on the basis of deliveries and shall in all cases of purchases, take delivery of relative securities and in all cases of sale, deliver the securities and shall in no case put itself in a position whereby it has to make short sale or carry forward transaction or engage in bad finance. Provided that Mutual Funds shall enter into derivatives transactions in a recognized stock exchange for the purpose of hedging and portfolio balancing, in accordance with the guidelines issued by the Board.

Every mutual fund shall, get the securities purchased or transferred in the name of the mutual fund on account of the concerned scheme, wherever investments are intended to be of long-term nature.

Pending deployment of funds of a scheme in securities in terms of investment objectives of the scheme a mutual fund can invest the funds of the scheme in short-term deposits of scheduled commercial banks.

No mutual fund scheme shall make any investment in:

a. Any unlisted security of an associate or group company of the sponsor; or

b. Any security issued by way of private placement by an associate or group company of the sponsor; or

c. The listed securities of group companies of the sponsor which is in excess of 25% of the net assets.

No mutual fund scheme shall invest more than 10 percent of its NAV in the equity shares or equity related instruments of any company. Provided that, the limit of 10 percent shall not be applicable for investments in case of index fund or sector or industry specific scheme.

A mutual fund scheme shall not invest more than 5% of its NAV in the unlisted equity shares or equity related instruments in case of open ended scheme and 10% of its NAV in case of close ended scheme.

Rights of Investors

CERTIFICATES

An investor is entitled to receive shares/unit certificates allotted to him within a period of 6 weeks from the date of closure of the subscription.

TRANSFER

An investor is entitled to get the unit/share certificates transferred within a period of 30 days from the date of lodgment for transfer.

REFUND

If the total collection of the funds by a mutual fund is less than the minimum amount of subscription planned to be raised, as mentioned in the prospectus, the applicants are entitled to receive the entire application money as refund, within a period of six weeks from the date of closure of subscription. Should the refund be delayed beyond this period, the applicants are entitled to receive, along with the application money, interest at the rate of 15% p.a. for the period of delay.

DISCLOSURES

a. An investor under a mutual fund scheme is entitled to receive information about the 'Net Asset Value' at intervals not exceeding one week. This information should be published in at least two daily newspapers.

b. Every mutual fund is required to publish the audited annual report and unaudited half-yearly report, through prominent newspapers in respect of each of its schemes, within six months and two months respectively of the date of closure of accounts.

c. A mutual fund shall before the expiry of one month from the close of each half year sent to all unitholders a complete statement of its scheme portfolio. However, the statement of scheme portfolio may not be sent to the unit holders if the statement is published, by way of an advertisement in one English daily circulating in the whole of India and in a newspaper published in the language of the region where the head office of mutual fund is situated.

This set of guidelines will go a long way in providing a level playing field to all Mutual Funds.

Conclusion

Mutual Funds are subject to market risks and past performance is not necessarily an indication for the future. A general depression in the stock markets will bring down the NAV. But depressions are only temporary phases. Good fund management is the only solution and the investors have realized it as is indicated by the growing popularity of existing schemes as well as the new schemes that are cropping up.

SUMMARY

- The main objectives of Mutual Funds are to provide an opportunity to small investor to acquire property in the form of shares without much difficulty, to cater mainly to the needs of small individual investors and to manage investors' portfolio in a manner that provides regular income, growth, safety, liquidity and diversification.
- The mutual funds can be divided into the main categories: portfolio classification, functional classification and geographical classification.
- Portfolio classification: Based on the security in which the funds are invested, the mutual funds are divided into bond funds, stock funds, income funds, money market funds, specialized funds, leveraged funds, balanced funds, growth funds, performance funds, specialty funds, dual purpose funds and real estate funds.

- Functional classification: Open-ended mutual funds and close-ended mutual funds come under this category.
- Geographical classification: Domestic mutual funds and offshore mutual funds.
- Net Asset Value: It is the difference between assets and liabilities of a mutual fund divided by the number of units outstanding.
- Advantages of Mutual Funds: Reduced risk, diversified investment, botheration-free investment, automatic reinvestment of dividends, tax benefits such as Section 80L and Section 88 exemptions.
- Mutual funds can be sponsored by either public or private limited companies. The sponsors will appoint the trustees and the funds managers or asset management company. A mutual fund is created by the sponsors under the Indian Trust Act.

Appendix – A

Securities and Exchange Board of India (SEBI)

Why SEBI was Constituted?

The ever expanding investors' population and market capitalization led to a variety of malpractices on the part of companies, brokers, merchant bankers, investment consultants and others involved in new issues and stock in India.

The glaring examples of these malpractices are as under:

1. Existence of self-styled merchant bankers, investment consultants without sufficient expertize and infrastructure for proper services.
2. Unofficial private placements.
3. Jacking up of prices.
4. Unofficial premiums on new issues.
5. Manipulation of prices even before listing.
6. Allotments with or without premium to the favored persons.
7. Delays in finalizing the allotments and despatch of allotment letters and refund orders before the due date.
8. Non-adherence of provisions of the Companies Act and other relevant Acts.
9. Violation of rules and regulations of the stock exchanges and listing requirements.
10. Absence of fair practices in trading in the market such as rigging of shares, manipulation of prices, insider trading and a large spread between the bid and offer prices of jobbers.
11. Delay in delivery of shares and in making payments for sales by the brokers to their customers.
12. Problem of odd lots and poor liquidity of a number of shares in the secondary market.
13. Diversion of funds of the mega issues for a purpose other than intended such as takeover bids of other companies, acquisition of shares or investments of other companies and for working capital.

The malpractices and unfair trading practices have eroded investor's confidence. It multiplied the investor's grievances. The Government and the stock exchanges were rather helpless in redressing the investor's problems because of lack of proper penal provisions in the existing legislation.

Realising this, SEBI was constituted by the Government in April, 1988 as a supervisory body to regulate and promote the securities market. The objectives of the Board were as under:

1. To promote fair dealings by the issuers of securities and ensure a market place where they can raise funds at a relatively low cost.
2. To provide a degree of protection to the investors and safeguard their rights and interests so that there is a steady flow of savings into the market.
3. To regulate and develop a code of conduct and fair practices by intermediaries like brokers, merchant bankers etc., with a view to making them competitive and professional.

The regulatory functions of the Stock Exchanges were to continue but the SEBI would supervise, oversee and control the operations of the stock exchanges on the one hand, and the practices of companies, on the other. The basic objective remains, i.e., to protect the investor's rights and enforce an orderly growth of the markets.

Legal Status to SEBI

Initially, SEBI was established as an interim body under the administrative control of the Finance Ministry. Recently it was given statutory powers. These statutory powers were conferred on SEBI vide the Securities and Exchange Board of India Ordinance, 1992. The Ordinance was later on replaced by an Act of Parliament known as the Securities and Exchange Board of India Act, 1992, text of which is reproduced at Annexure – II along with the extracts from Acts amended by the SEBI Act.

The preamble to the SEBI Act provides for the establishment of a Board to protect the interest of investors in securities and to promote the development of, and to regulate the securities market and for matters connected there with or incidental thereto.

Salient Features of SEBI Act

The salient features of the SEBI Act are as under:

1. The SEBI shall be a body corporate by the name having perpetual succession and a common seal with power to acquire, hold and dispose of property, both movable and immovable, and to contract, and shall, by the said name, sue or to be sued.
2. The head office of the Board shall be at Bombay. The Board may establish offices at other places in India. In Mumbai, the Board is situated at Mittal Court, B-Wing, 224, Nariman Point, Mumbai-400021.
3. The Chairman and the Members of the Board are appointed by the Central Government.
4. The Government can prescribe terms of office and other conditions of service of the chairman and members of the Board. The members can be removed under section 6 of the SEBI Act under specified circumstances.
5. It is the primary duty of the Board to protect the interest of the investors in securities and to promote the development of and to regulate the securities market by such measures as it thinks fit.

Functions of SEBI

The following functions have been entrusted to the Board :

1. Regulating the business in stock exchanges and any other securities markets.
2. Registering and regulating the working of stock brokers, sub-brokers, share transfer agents, bankers to an issue, trustees of trust deeds, registrars to an issue, merchant bankers, underwriters, portfolio managers, investment advisers and such other intermediaries who may be associated with securities markets in any manner.
3. Registering and regulating the working of collective investment schemes including mutual funds.
4. Promoting and regulating self-regulatory organisations.
5. Prohibiting fraudulent and unfair trade practices relating to securities markets.
6. Promoting investor's education and training of intermediaries of securities markets.
7. Prohibiting insider trading in securities.
8. Regulating substantial acquisition of shares and takeover of companies.
9. Calling for information from undertaking inspection, conducting inquiries and audits of the stock exchanges and intermediaries and self-regulatory organisations in the securities market.

10. Performing such functions and exercising such powers under the provisions of the Securities Contracts (Regulations) Act, 1956, as may be delegated to it by the Central Government.
11. Levying fees or other charges for carrying out the purpose of the Act.
12. Conducting research for the above purposes.
13. Performing such other functions as may be prescribed.

Powers of SEBI in Relation to Stock Exchanges

The SEBI Act amends the Securities Contracts (Regulation) Act, 1956, so as to empower the SEBI in respect of the following matters. Prior to the Act, the Central Government was exercising such powers :

1. Power to call for periodical returns from stock exchanges [section 6(1)];
2. Power to prescribe maintenance of certain documents by the stock exchanges [section 6(2)];
3. Power to call upon the exchange or any member to furnish explanation or information relating to the affairs of the stock exchange or any member(s); power to appoint any person to make inquiry into the affairs of the governing body of any stock exchange, or any member of the stock exchange [section 6(3)];
4. Power to approve bye-laws of the stock exchange(s) for regulation and control of contracts [section 9];
5. Power to amend bye-laws of stock exchange(s) [section 10];
6. Licensing of dealers in securities in certain areas [section 17]; and
7. Power to compel a public company to list its shares [section 21].

The power to grant recognition to any stock exchange and the power to withdraw such recognitions continues to vest in the Central Government. However, an enabling provision (new section 29) has been incorporated in the SCRA whereby the Central Government may simultaneously vest with SEBI, certain powers exercisable by the Central Government under the Act. This power is subject to such conditions as may be specified in the Order. Here also, there is no provision for a complete transfer of powers to the SEBI. There is only a power to delegate, which means such delegated powers can also be withdrawn. In effect, after the enactment of the Act, the Central Government continues to exercise the following powers under SCRA.

1. Power to grant recognition to a stock exchange [section 4];
2. Power to withdraw recognition granted to a stock exchange [section 5];
3. Power to direct any stock exchange to amend the rules relating to the constitution of stock exchange, which includes, admission of new member, readmission of members, qualifications, suspension/expulsion etc., of members of any stock exchange [section 8];
4. Power to supersede governing body of any stock exchange [section 11];
5. Power to suspend business of a recognised stock exchange [section 12];
6. Power to declare contracts in notified areas as illegal [section 13];
7. Power to declare contracts in notified areas as void [section 14]; and
8. Power to prohibit contracts in certain cases [section 16].

Thus certain vital powers under SCRA have been retained by the Central Government with the possibility of some of these powers being vested with SEBI, by means of a notified order. At least in respect of some of the provisions, SEBI has been given absolute powers under the SCRA.

Achievements of SEBI

1. Guidelines on Disclosure and Investor Protection issued and clarified from time to time.
2. Proper disclosure to investors through prospectus made obligatory.
3. Guidelines for merchant bankers issued.
4. Advertising code for mutual funds.
5. Mutual funds required to publish balance sheets.
6. Finalisation of takeover code.
7. Draft guidelines on share transfer agents and registrars to an issue.
8. Portfolio management service rules and regulations.
9. Insider Trading Regulations.
10. Stockinvest scheme to eliminate delayed refunds.
11. Bombay Stock Exchange persuaded to pass a resolution admitting corporate members.
12. Proposed that the exchanges take a percentage of the issue amount as deposit from companies seeking listing.
13. BSE made to publicise outstanding trading position on some scrips.
14. Suggested retailing brokerage / commission in contract notes.
15. Registered a number of investor associations.
16. Set up self-regulatory organisations like the Association of Merchant Bankers of India.
17. Commenced registration of intermediaries associated with the Stock Exchange.
18. Regulations for Foreign Institutional Investors for Portfolio Investments in India.

Annexure – I

Constitution of Securities and Exchange Board of India

I. SEBI was established by the Government to promote orderly and healthy growth by the securities market and for investor protection.

II. SEBI shall be headed by a Chairman to be appointed by the Central Government.

III. The Chairman shall hold office during the pleasure of the Government and shall be governed by such terms and conditions as may be determined by the Government from time to time.

IV. Other members of the SEBI, not exceeding four shall be nominated by the Central Government who shall be persons having experience and knowledge relevant to the security and investment industry.

V. The Chairman of SEBI shall have appropriate powers to discharge the functions of SEBI effectively. For this purpose, SEBI shall provide itself with suitable supporting staff and raise adequate resources.

VI. The initial financing of the SEBI would be through contributions from the public financial and investment institutions.

VII. SEBI shall –

   a. deal with all matters relating to development and regulation of securities market and investor protection, and advise Government on these matters;

b. prepare a comprehensive legislation for the regulation and development of the securities market;

c. carry out such functions as may be delegated to the Board/Chairman by the Central Government for the development and regulation of securities market.

VIII. SEBI shall be free to determine its own procedures and will have powers to call for records, returns, notes, memoranda, data or any other material relevant to its working from official and non-official bodies and also hold discussions with them.

IX. SEBI will have its headquarters in Mumbai.

X. SEBI shall submit reports to the Government periodically on various aspects of the securities market and on such other specific matters as may be called for by the Government.

Annexure – II

The Securities and Exchange Board of India Act, 1992

Chapter I

Preliminary

Short title & commencement

1. 1. This Act may be called the Securities and Exchange Board of India Act, 1992.

   2. It extends to the whole of India.

   3. It shall be deemed to have come into force on the 30th day of January 1992.

Definitions

2. 1. In this Act, unless the context otherwise requires, -

   a. "Board" means the Securities and Exchange Board of India established under section 3;

   b. "Chairman" means the Chairman of the Board;

   b(a). "collective investment scheme" means any scheme or arrangement which satisfies the conditions specified in Section 11AA;

   c. "existing Securities and Exchange Board" means the Securities and Exchange Board of India constituted under the Resolution of the Government of India in the Department of Economic Affairs No.1 (44)SE/86, dated the 12th day of April, 1988;

   d. "Fund" means the fund constituted under Section 14;

   e. "member" means a member of the Board including the Chairman;

   f. "notification" means a notification published in the Official Gazette;

   g. "prescribed" means prescribed by rules made under this Act;

   h. "regulations" means the regulations made by the Board under this Act;

   42 of 1956 (i) "securities" has the meaning assigned to it in section 2 of the Securities Contracts (Regulation) Act, 1956.

   42 of 1956 (2) Words and expressions used and not defined in this Act but defined in the Securities Contracts (Regulation) Act, 1956, or the Depositories Act, 1996, shall have the meanings respectively assigned to them in that Act.

Chapter II

Establishment of the Securities And Exchange Board Of India

Establishment and incorporation of Board

3. 1. With effect from such date as the Central Government may, by notification, appoint, there shall be established, for the purposes of this Act, a Board by the name of the Securities and Exchange Board of India.

   2. The Board shall be a body corporate by the name aforesaid having perpetual succession and a common seal, with power subject to the provisions of this Act, to acquire, hold and dispose of property, both movable and immovable, and to contract, and shall, by the said name, sue or be sued.

   3. The head office of the Board shall be at Bombay.

   4. The Board may establish offices at other places in India.

Management of the Board

4. 1. The Board shall consist of the following members, namely:-
   a. a Chairman;
   b. two members from amongst the officials of the Ministries of the Central Government dealing with Finance and Law; 2 of 1934;
   c. one member from amongst the officials of the Reserve Bank of India constituted under section 3 of the Reserve Bank of India Act, 1934;
   d. two other members, to be appointed by the Central Government.
   2. The general superintendence, direction and management of the affairs of the Board shall vest in a Board of members, which may exercise all powers and do all acts and things which may be exercised or done by the Board.
   3. Save as otherwise determined by regulations, the Chairman shall also have powers of general superintendence and direction of the affairs of the Board and may also exercise all powers and do all acts and things which may be exercised or done by the Board.
   4. The Chairman and members referred to in clauses (a) and (d) of sub-section (1) shall be appointed by the Central Government and the members referred to in clauses (b) and (c) of that sub- section shall be nominated by the Central Government and the Reserve Bank of India respectively.
   5. The Chairman and the other members referred to in clauses (a) and (d) of sub-section (1) shall be from amongst the persons of ability, integrity and standing who have shown capacity in dealing with problems relating to securities market or have special knowledge or experience of law, finance, economics, accountancy, administration or in any other discipline which, in the opinion of the Central Government, shall be useful to the Board.

Term of office and conditions of service of Chairman and members of the Board

5. 1. The term of office and other conditions of service of the Chairman and the members referred to in clause (d) of sub-section (1) of section 4 shall be such as may be prescribed.
   2. Notwithstanding anything contained in sub-section (1), the Central Government shall have the right to terminate the services of the Chairman or a member appointed under clause (d) of sub- section (1) of section 4, at any time before the expiry of the period prescribed under sub-section (1), by giving him notice of not less than three months in writing or three months salary and allowances in lieu thereof, and the Chairman or a member, as the case may be, shall also have the right to relinquish his office, at any time before the expiry of the period prescribed under sub-section (1), by giving to the Central Government notice of not less than three months in writing.

Removal of member from office

6. The Central Government shall remove a member from office if he -
   a. is, or at any time has been, adjudicated as insolvent;
   b. is of unsound mind and stands so declared by a competent court;
   c. has been convicted of an offence which, in the opinion of the Central Government, involves a moral turpitude;
   d. deleted;

e. has, in the opinion of the Central Government, so abused his position as to render his continuation in office determined to the public interest;

Provided that no member shall be removed under this clause unless he has been given a reasonable opportunity of being heard in the matter.

Meetings

7. 1. The Board shall meet at such times and places, and shall observe such rules of procedure in regard to the transaction of business at its meetings (including quorum at such meetings) as may be provided by regulations.

2. The Chairman or, if for any reason, he is unable to attend meeting of the Board, any other member chosen by the members present from amongst themselves at the meeting shall preside at the meeting.

3. All questions which come up before any meeting of the Board shall be decided by a majority vote of the members of the Board present and voting, and in the event of an equality of votes, the Chairman, or in his absence, the person presiding, shall have a second or casting vote.

Member not to participate in meetings in certain cases

7(A). Any member, who is a director of a company and who as such director has any direct or indirect pecuniary interest in any matter coming up for consideration at a meeting of the Board, shall, as soon as possible after relevant circumstances have come to his knowledge, disclose the nature of his interest at such meeting and such disclosure shall be recorded in the proceedings of the Board, and the member shall not take any part in any deliberation or decision of the Board with respect to that matter.

Vacancies, etc. not to invalidate proceedings of Board

8. No act or proceeding of the Board shall be invalid merely by reason of -

a. any vacancy in, or any defect in the constitution of, the Board; or

b. any defect in the appointment of a person as a member of the Board; or

c. any irregularity in the procedure of the Board not affecting the merits of the case.

Officers and employees of the Board

9. 1. The Board may appoint such other officers and employees as it considers necessary for the efficient discharge of its functions under this Act.

2. The term and other conditions of service of officers and employees of the Board appointed under sub-section (1) shall be such as may be determined by regulations.

Chapter III

Transfer of Assets, Liabilities, etc. of the Existing Securities and Exchange Board to the Board

Transfer of assets, liabilities, etc. of existing Securities and Exchange Board to the Board

10. 1. On and from the date of establishment of the Board,-

a. any reference to the existing Securities and Exchange Board in any law other than this Act or in any contract or other instrument shall be deemed as a reference to the Board;

b. all properties and assets, movable and immovable, of or belonging to the existing Securities and Exchange Board, shall vest in the Board;

c. all rights and liabilities of the existing Securities and Exchange Board shall be transferred to and be the rights and liabilities of the Board;

d. without prejudice to the provisions of clause (c), all debts, obligations and liabilities incurred, all contracts entered into and all matters and things engaged to be done by, with or for the existing Securities and Exchange Board immediately before that date, for or in connection with the purpose of the said existing Board shall be deemed to have been incurred, entered into, or engaged to be done by, with or, for, the Board;

e. all sums of money due to the existing Securities and Exchange Board immediately before that date shall be deemed to be due to the Board;

f. all suits and other legal proceedings instituted or which could have been instituted by or against the existing Securities and Exchange Board immediately before that date may be continued or may be instituted by or against the Board; and

g. every employee holding any office under the existing Securities and Exchange Board immediately before that date shall hold his office in the Board by the same tenure and upon the same terms and conditions of service as respects remuneration, leave, provident fund, retirement and other terminal benefits as he would have held such office if the Board had not been established and shall continue to do as an employee of the Board or until the expiry of the period of six months from the date if such employee opts not to be the employee of the Board within such period.

2. Notwithstanding anything contained in the Industrial Disputes Act, 1947, or in any other law for the time being in force, absorption of any employee by the Board in its regular service under this section shall not entitle such employee to any compensation under that Act or other law and no such claim shall be entertained by any court, tribunal or other authority.

Chapter IV

Powers and Functions of the Board

Functions of the Board

11. 1. Subject to the provisions of this Act, it shall be duty of the Board to protect the interests of the investors in securities and to promote and development of, and to regulate the securities market by such measures as it thinks fit.

2. Without prejudice to the generality of the foregoing provisions, the measures referred to therein may provide for -

a. regulating the business in stock exchanges and any other securities markets;

b. registering and regulating the working of stock brokers, sub- brokers, share transfer agents, bankers to an issue, trustees of trust deeds, registrars to an issue, merchant bankers, underwriters, portfolio managers, investment advisers and such other intermediaries who may be associated with securities markets in any manner;

b(a). registering and regulating the working of the depositories, participants, custodians of securities, foreign institutional investors, credit rating agencies and such other intermediaries as the Board may, by notification, specify in this behalf;

c. registering and regulating the working of venture capital funds and collective investment schemes including mutual funds;

d. promoting and regulating self- regulatory organisations;

e. prohibiting fraudulent and unfair trade practices relating to securities markets;

f. promoting investors' education and training of intermediaries of securities markets;

g. prohibiting insider trading in securities;

h. regulating substantial acquisition of shares and take-over of companies;

i. calling for information from, undertaking inspection, conducting inquiries and audits of the stock exchanges, mutual funds and other persons associated with the securities market and intermediaries and self- regulatory organizations in the securities market;

j. performing such functions and exercising such powers under the provisions of Securities Contracts (Regulation) Act, 1956, as may be delegated to it by the Central Government;

k. levying fees or other charges for carrying out the purpose of this section;

l. conducting research for the above purposes;

l(a). calling from or furnishing to any such agencies, as may be specified by the Board, such information as may be considered necessary by it for the efficient discharge of its functions;

m. performing such other functions as may be prescribed.

3. Notwithstanding anything contained in any other law for the time being in force while exercising the powers under clause (i) of sub-section (2), the Board shall have the same powers as are vested in a civil court under the Code of Civil Procedure, 1908 (5 of 1908) while trying a suit, in respect of the following matters, namely:-

i. the discovery and production of books of account and other documents, at such place and such time as may be specified by the Board;

ii. summoning and enforcing the attendance of persons and examining them on oath;

iii. inspection of any books, registers and other documents of any person referred to in section 12, at any place;

Matters to be disclosed by the companies

11(A). Without prejudice to the provisions of the Companies Act, 1956, (1 of 1956) the Board may, for the protection of investors, specify, by regulations,-

a. the matters relating to issue of capital, transfer of securities and other matters incidental thereto; and

b. the manner in which such matters, shall be disclosed by the companies.

11(AA) 1. Any scheme or arrangement which satisfies the conditions referred to in sub-section (2) shall be a collective investment scheme.

2. Any scheme or arrangement made or offered by any company under which,- - -

i. the contributions or payments made by the investors, by whatever name called, are pooled and utilized solely for the purposes of the scheme or arrangement;

ii. the contributions or payments are made to such scheme or arrangement by the investors with a view to receive the profits, income, produce or property, whether movable or immovable from such scheme or arrangement;

iii. the property, the contribution or investment forming part of scheme or arrangement, whether identifiable or not, is managed on behalf of the investors;

iv. the investors do not have day to day control over the management and operation of the scheme or arrangement.

3. Notwithstanding anything contained in sub-section (2), any scheme or arrangement -

i. made or offered by a co-operative society registered under the co-operative societies Act,1912 or a society being a society registered or deemed to be registered under any law relating to cooperative societies for the time being in force in any state;

ii. under which deposits are accepted by non-banking financial companies as defined in clause (f) of section 45-I of the Reserve Bank of India Act, 1934;

iii. being a contract of issuance to which the Insurance Act,1938, applies;

iv. providing for any scheme, Pension Scheme or the Insurance Scheme framed under the Employees Provident Fund and Miscellaneous Provisions Act, 1952;

v. under which deposits are accepted under section 58A of the Companies Act, 1956;

iv. under which deposits are accepted by a company declared as a Nidhi or a mutual benefit society under section 620A of the Companies Act, 1956;

vii. falling within the meaning of Chit business as defined in clause (d) of section 2 of the Chit Fund Act, 1982;

viii. under which contributions made are in the nature of subscription to a mutual fund; shall not be a collective investment scheme.

Power to issue directions

11(B) Save as otherwise provided in section 11, if after making or causing to be made an enquiry, the Board is satisfied that it is necessary,-

i. in the interest of investors, or orderly development of securities market; or

ii to prevent the affairs of any intermediary or other persons referred to in section 12 being conducted in a manner detrimental to the interests of investors or securities market; or

iii. to secure the proper management of any such intermediary or person, it may issue such directions,-

a. to any person or class of persons referred to in section 12, or associated with the securities market; or

b. to any company in respect of matters specified in section 11A. as may be appropriate in the interests of investors in securities and the securities market.

Chapter V

Registration Certificate

Registration of stock broker, sub-broker, share transfer agents etc.

12. 1. No stock-broker, sub-broker, share transfer agent, banker to an issue, trustee of trust deed, registrar to an issue, merchant banker, underwriter, portfolio manager, investment adviser and such other intermediary who may be associated with securities market shall buy, sell or deal in securities except under, and in accordance with, the conditions of a certificate of registration obtained from the Board in accordance with the regulations made under this Act.

Provided that a person buying or selling securities or otherwise dealing with the securities market as a stock-broker, sub-broker, share transfer agent, banker to an issue, trustee of trust deed, registrar to an issue, merchant banker, underwriter, portfolio manager, investment adviser and such other intermediary who may be associated with securities market immediately before the establishment of the Board for which no registration certificate was necessary prior to such establishment, may continue to do so for a period of three months from such establishment or, if he has made an application for such registration within the said period of three months, till the disposal of such application.

Provided further that any certificate of registration, obtained immediately before the commencement of the Securities Laws (Amendment) Act, 1995, shall be deemed to have been obtained from the Board in accordance with the regulations providing for such registration.

1(A). No depository, participant, custodian of securities, foreign institutional investor, credit rating agency or any other intermediary associated with the securities market as the Board may by notification in this behalf specify, shall buy or sell or deal in securities except under and in accordance with the conditions of a certificate of registration obtained from the Board in accordance with the regulations made under this Act.

Provided that a person buying or selling securities or otherwise dealing with the securities market as a depository, participant, custodian of securities, foreign institutional investor or credit rating agency immediately before the commencement of the Securities Laws (Amendment) Act, 1995, for which no certificate of registration was required prior to such commencement, may continue to buy or sell securities or otherwise deal with the securities market until such time regulations are made under clause (d) of sub-section (2) of section 30.

1(B). No person shall sponsor or cause to be sponsored or carry on or cause to be carried on any venture capital funds or collective investment schemes including mutual funds, unless he obtains a certificate of registration from the Board in accordance with the regulations.

Provided that any person sponsoring or causing to be sponsored, carrying or causing to be carried on any venture capital funds or collective investment schemes operating in the securities market immediately before the commencement of the Securities Laws (Amendment) Act, 1995 for which no certificate of registration was required prior to such commencement, may continue to operate till such time regulations are made under clause (d) of sub-section (2) of section 30.

2. Every application for registration shall be in such manner and on payment of such fees as may be determined by regulations.

3. The Board may, by order, suspend or cancel a certificate of registration in such manner as may be determined by regulations.

Provided that no order under this sub-section shall be made unless the person concerned has been given a reasonable opportunity of being heard.

Chapter VI

Finance, Accounts And Audit

Power of Central Government to issue directions

16. 1. Without prejudice to the foregoing provisions of this Act, the Board shall, in exercise of its powers or the performance of its functions under this Act, be bound by such directions on questions of policy as the Central Government may give in writing to it from time to time: Provided that the Board shall, as far as practicable, be given an opportunity to express its views before any direction is given under this sub-section.

2. The decision of the Central Government whether a question is one of policy or not shall be final.

Power of Central Government to supersede the Board

17. 1. If at any time the Central Government is of the opinion-

a. that on account of grave emergency, the Board is unable to discharge the functions and duties imposed on it by or under the provisions of this Act; or

b. that the Board has persistently made default in complying with any direction issued by the Central Government under this Act or in the discharge of the functions and duties imposed on it by or under the provisions of this Act and as a result of such default the financial position of the Board or the administration of the Board has deteriorated; or

c. that circumstances exist which render it necessary in the public interest so to do, the Central Government may, by notification, supersede the Board for such period, not exceeding six months, as may be specified in the notification.

2. Upon the publication of a notification under sub-section (1) superseding the Board,-

a. all the members shall, as from the date of supersession, vacate their offices as such;

b. all the powers functions and duties which may, by or under the provisions of this Act, be exercised or discharged by or on behalf of the Board, shall until the Board is reconstituted under sub-section (3), be exercised and discharged by such person or persons as the Central Government may direct; and

c. all property owned or controlled by the Board shall, until the Board is reconstituted under sub-section (3), vest in the Central Government.

3. On the expiration of the period of supersession specified in the notification issued under sub-section (1), the Central Government may reconstitute the Board by fresh appointment and in such case any person or persons who vacated their offices under clause (a) of sub-section (2), shall not be deemed disqualified for appointment:

Provided that the Central Government may, at any time, before the expiration of the period of supersession, take action under this sub-section.

4. The Central Government shall cause a notification issued under sub-section (1) and a full report of any action taken under this section and the circumstances leading to such action to be laid before each House of Parliament at the earliest.

Returns and reports

18. 1. The Board shall furnish to the Central Government at such time and in such form and manner as may be prescribed or as the Central Government may direct, such returns and statements and such particulars in regard to any proposed or existing programme for the promotion and development of the securities market, as the Central Government may, from time to time require.

2. Without prejudice to the provisions of sub-section (1), the Board shall within ninety days, after the end of each financial year, submit to the Central Government a report in such form, as may be prescribed, giving a true and full account of its activities, policy and programmes during the previous financial year.

Delegation

3. A copy of the report received under sub-section (2) shall be laid, as soon as may be after it is received, before each House of Parliament.

19. The Board may, by general or special order in writing, delegate to any member, officer of the Board or any other person subject to such conditions, if any, as may be specified in the order, such of its powers and functions under this Act (except the powers under section 29) as it may deem necessary.

Appeals

20. 1. Any person aggrieved by an order of the Board made under this Act, or the rules or regulations made thereunder may prefer an appeal to the Central Government within such time as may be prescribed.

2. No appeal shall be admitted if it is preferred after the expiry of the period prescribed therefor. Provided that an appeal may be admitted after the expiry of the period prescribed therefor if the appellant satisfies the Central Government that he had sufficient cause for not preferring the appeal within the prescribed period.

3. Every appeal made under this section shall be made in such form and shall be accompanied by a copy of the order appealed against and by such fees as may be prescribed.

4. The procedure for disposing of an appeal shall be such as may be prescribed:

Provided that before disposing of an appeal, the appellant shall be given a reasonable opportunity of being heard.

Bar of jurisdiction

20(A).No order passed by the Board under this Act shall be appealable except as provided in section 20 and no Civil Court shall have jurisdiction in respect of any matter which the Board is empowered by, or under, this Act to pass any order and no injunction shall be granted by any court or other authority in respect of any action taken or to be taken in pursuance of any order passed by the Board by, or under, this Act.

Savings

21. Nothing in this Act shall exempt any person from any suit or other proceedings which might, apart from this Act, be brought against him.

Members, Officers and employees of the Board to be public servants 45 of 1860.

22. All members, officers and other employees of the Board shall be deemed, when acting or purporting to act in pursuance of any of the provisions of this Act, to be public servants within the meaning of section 21 of the Indian Penal Code.

Protection of action taken in good faith

23. No suit, prosecution or other legal proceedings shall lie against the Central Government or Board or any officer of the Central Government or any member, officer or other employee of the Board for anything which is in good faith done or intended to be done under this Act or the rules or regulations made thereunder.

Offences

24. 1. Without prejudice to any award of penalty by the Adjudicating Officer under this Act, if any person contravenes or attempts to contravene or abets the contravention of the provisions of this Act or of any rules or regulations made thereunder, he shall be punishable with imprisonment for a term which may extend to one year, or with fine, or with both.

    2. If any person fails to pay the penalty imposed by the Adjudicating Officer or fails to comply with any of his directions or orders, he shall be punishable with imprisonment for a term which shall not be less than one month, but which may extend to three years or with fine which shall not be less than two thousand rupees, but which may extend to ten thousand rupees or with both.

Exemption from tax on wealth and income (27 of 1957) (43 of 1961)

25. Notwithstanding anything contained in the Wealth Tax Act, 1957, the Income Tax Act, 1961 or any other enactment for the time being in force relating to tax on wealth, income, profits or gains -

    a. the Board;

    b. the existing Securities and Exchange Board from the date of its constitution to the date of establishment of the Board, shall not be liable to pay wealth-tax, income-tax or any other tax in respect of their wealth, income, profits or gains derived.

Cognizance of offences by courts

26. 1. No court shall take cognizance of any offence punishable under this Act or any rules or regulations made thereunder, save on a complaint made by the Board.

    2. No court inferior to that of a Metropolitan Magistrate or a Judicial Magistrate of the first class shall try an offence punishable under this Act.

Offences by companies

27. 1. Where an offence under this Act has been committed by a company, every person who at the time the offence was committed was in charge of, and was responsible to, the company for the conduct of the business of the company, as well as the company, shall be deemed to be guilty of the offence and shall be liable to be proceeded against and punished accordingly:

    Provided that nothing contained in this sub-section shall render any such person liable to any punishment provided in this Act, if he proves that the offence was committed without his knowledge or that he had exercised all due diligence to prevent the commission of such offence.

    2. Notwithstanding anything contained in sub-section (1), where an offence under this Act has been committed by a company and it is proved that the offence has been committed with the consent or connivance of, or is attributable to any neglect on the part of, any director, manager, secretary or other officer of the company, such director, manager, secretary or other officer shall be liable to be proceeded against and punished accordingly.

Explanation:

For the purposes of this section, -

a. "company" means any body corporate and includes a firm or other association of individuals; and

b. "director" in relation to a firm, means a partner of the firm.

Power to exempt

28. Deleted

Power to make rules

29. 1. The Central Government may, by notification, make rules for carrying out the purposes of this Act.

2. In particular and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters, namely:-

a. the term of office and other conditions of service of the Chairman and the members under sub-section (1) of section 5;

b. the additional functions that may be performed by the Board under section 11;

c. deleted;

d. the manner in which the accounts of the Board shall be maintained under section 15;

d(a). the manner of inquiry under sub-section (1) of section 15-I;

d(b). the salaries and allowances and other terms and conditions of service of the Presiding Officers and other officers and employees of the Securities Appellate Tribunal under section 15O and sub-section (3) of section 15S;

d(c). The procedure for the investigation of misbehaviour or incapacity of the Presiding Officers of the Securities Appellate Tribunals under sub-section (3) of section 15Q;

d(d). The form in which an appeal may be filed before the Securities Appellate Tribunal under section 15T and the fees payable in respect of such appeal;

e. The form and the manner in which returns and report to be made to the Central Government under section 18;

f. Any other matter which is to be, or may be, prescribed, or in respect of which provision is to be, or may be, made by rules.

Power to make regulations

30. 1. The Board may, with the previous approval of the Central Government by notification, make regulations consistent with this Act and the rules made thereunder generally to carry out the purposes of this Act.

2. In particular, and without prejudice to the generality of the foregoing power, such regulations may provide for all or any of the following matters, namely:-

a. the times and places of meetings of the Board and the procedure to be followed at such meetings under sub-section (1) of section 7 including quorum necessary for the transaction of business;

b. the term and other conditions of service of officers and employees of the Board under sub-section (2) of section 9;

c. the matters relating to issue of capital, transfer of securities and other matters incidental thereto and the manner in which such matters shall be disclosed by the companies under section 11A;

d. the conditions subject to which certificate of registration is to be issued, the amount of fee to be paid for certificate of registration and the manner of suspension or cancellation of certificate of registration under section 12.

Rules and regulations to be laid before Parliament

31. Every rule and every regulation made under this Act shall be laid, as soon as may be after it is made, before each House of Parliament, while it is in session, for a total period of thirty days which may be comprised in one session or in two or more successive sessions, and if, before the expiry of the session immediately following the session or the successive sessions aforesaid, both Houses agree in making any modification in the rule or regulation or both Houses agree that the rule or regulation should not be made, the rule or regulation shall thereafter have effect only in such modified form or be of no effect, as the case may be; so, however, that any such modification or annulment shall be without prejudice to the validity of anything previously done under that rule or regulation.

Application of other laws not barred

32. The provisions of this Act shall be in addition to, and not in derogation of, the provisions of any other law for the time being in force.

Amendment of certain enactments

33. The enactments specified in Parts I and II of the Schedule to this Act shall be amended in the manner specified therein and such amendments shall take effect on the date of establishment of the Board.

Power to remove difficulties

34. 1. If any difficulty arises in giving effect to the provisions of this Act, the Central Government may, by order, published in the Official Gazette, make such provisions not inconsistent with the provisions of this Act as may appear to be necessary for removing the difficulty;

Provided that no order shall be made under this section after the expiry of five years from the commencement of this Act.

2. Every order made under this section shall be laid, as soon as may be after it is made, before each House of Parliament.

Repeal and saving

(Ord.5 of 1992)

35. 1. The Securities and Exchange Board of India Ordinance, 1992, is hereby repealed.

2. Notwithstanding such, repeal, anything done or any action taken under the said Ordinance, shall be deemed to have been done or taken under the corresponding provisions of the Act.

Chapter VIA

Penalties and Adjudication

Penalty for failure to furnish information, return, etc.

15(A). If any person, who is required under this Act or any rules or regulations made thereunder,-

a. to furnish any document, return or report to the Board, fails to furnish the same, he shall be liable to a penalty not exceeding one lakh and fifty thousand rupees for each such failure;

b. to file any return or furnish any information, books or other documents within the time specified therefor in the regulations, fails to file return or furnish the same within the time specified

therefor in the regulations, he shall be liable to a penalty not exceeding five thousand rupees for every day during which such failure continues;

c. to maintain books of accounts or records, fails to maintain the same, he shall be liable to a penalty not exceeding ten thousand rupees for every day during which the failure continues.

Penalty for failure by any person to enter into an agreement with clients.

15(B). If any person, who is registered as an intermediary and is required under this Act or any rules or regulations made there under, to enter into an agreement with his client, fails to enter into such agreement, he shall be liable to a penalty not exceeding five lakh rupees for every such failure.

Penalty for failure to redress investors' grievances

15(C) If any person, who is registered as an intermediary, after having been called upon by the Board in writing to redress the grievances of investors, fails to redress such grievances, he shall be liable to a penalty not exceeding ten thousand rupees for each such failure.

Penalty for certain defaults in case of mutual funds

15(D) If any person, who is -

a. required under this Act or any rules or regulations made thereunder to obtain a certificate of registration from the Board for sponsoring or carrying on any collective investment scheme, including mutual funds, sponsors or carries on any collective investment scheme, including mutual funds, without obtaining such certificate of registration, he shall be liable to a penalty not exceeding ten thousand rupees for each day during which he carries on any such collective investment scheme, including mutual funds, or ten lakh rupees, whichever is higher;

b. registered with the Board as a collective investment scheme, including mutual funds, for sponsoring or carrying on any investment scheme, fails to comply with the terms and conditions of certificate of registration, he shall be liable to a penalty not exceeding ten thousand rupees for each day during which such failure continues or ten lakh rupees, whichever is higher;

c. registered with the Board as a collective investment scheme including mutual funds, fails to make an application for listing of its schemes as provided for in the regulations governing such listing, he shall be liable to a penalty not exceeding five thousand rupees for each day during which such failure continues or five lakh rupees, whichever is higher;

d. registered as a collective investment scheme, including mutual funds, fails to despatch unit certificates of any scheme in the manner provided in the regulation governing such despatch, he shall be liable to a penalty not exceeding five thousand rupees for each day during which such failure continues;

e. registered as a collective investment scheme, including mutual funds, fails to refund the application moneys paid by the investors within the period specified in the regulations, he shall be liable to pay a penalty not exceeding one thousand rupees for each day during which such failure continues;

f. registered as a collective investment scheme, including mutual funds, fails to invest money collected by such collective investment schemes in the manner or within the period specified in the regulations, he shall be liable to a penalty not exceeding five lakh rupees for each such failure.

Penalty for failure to observe rules and regulations by an asset management company

15(E) Where any asset management company of a mutual fund registered under this Act fails to comply with any of the regulations providing for restrictions on the activities of the asset management companies, such asset management company shall be liable to a penalty not exceeding five lakh rupees for each such failure.

Penalty for failure in case of Stock brokers

15(F). If any person, who is registered as a stock broker under this Act,-

a. Fails to issue contract notes in the form and manner specified by the stock exchange of which such broker is a member, he shall be liable to a penalty not exceeding five times the amount for which the contract note was required to be issued by that broker;

b. Fails to deliver any security or fails to make payment of the amount due to the investor in the manner or within the period specified in the regulations, he shall be liable to a penalty not exceeding five thousand rupees for each day during which such failure continues;

c. Charges an amount of brokerage which is in excess of the brokerage specified in the regulations, he shall be liable to a penalty not exceeding five thousand rupees or five times the amount of brokerage charged in excess of the specified brokerage whichever is higher.

Penalty for insider trading

15(G) If any insider who,-

i. either on his own behalf or on behalf of any other person, deals in securities of a body corporate listed on any stock exchange on the basis of any unpublished price sensitive information; or

ii. communicates any unpublished price sensitive information to any person, with or without his request for such information except as required in the ordinary course of business or under any law; or

iii. counsels, or procures for any other person to deal in any securities of any body corporate on the basis of unpublished price sensitive information, shall be liable to a penalty not exceeding five lakh rupees.

Penalty for non-disclosure of acquisition of shares and take-overs

15(H) If any person, who is required under this Act or any rules or regulations made thereunder, fails to-

i. disclose the aggregate of his shareholding in the body corporate before he acquires any shares of that body corporate; or

ii. make a public announcement to acquire shares at a minimum price, he shall be liable to a penalty not exceeding five lakh rupees.

Power to adjudicate

15(I).1 For the purpose of adjudging under sections 15(A), 15(B), 15(C), 15(D), 15(E), 15(F), 15(G) and 15(H), the Board shall appoint any of its officer not below the rank of a Division Chief to be an adjudicating officer for holding an inquiry in the prescribed manner after giving any person concerned a reasonable opportunity of being heard for the purpose of imposing any penalty.

2. While holding an inquiry the adjudicating officer shall have power to summon and enforce the attendance of any person acquainted with the facts and circumstances of the case to give evidence or to produce any document which in the opinion of the adjudicating officer, may be useful for or relevant to the subject matter of the inquiry and if,

on such inquiry, he is satisfied that the person has failed to comply with the provisions of any of the sections specified in sub-section (1), he may impose such penalty as he thinks fit in accordance with the provisions of any of those sections.

Factors to be taken into account by the adjudicating officer.

15(J). While adjudging quantum of penalty under section 15(J), the adjudicating officer shall have due regard to the following factors, namely:

a. The amount of disproportionate gain or unfair advantage, wherever quantifiable, made as a result of the default;

b. The amount of loss caused to an investor or group of investors as a result of the default;

c. The repetitive nature of the default.

Chapter VIB

Establishment, Jurisdiction, Authority and Procedure of Appellate Tribunal

Establishment of Securities Appellate Tribunals

15(K).1. The Central Government shall by notification, establish one or more Appellate Tribunals to be known as the Securities Appellate Tribunal to exercise the jurisdiction, powers and authority conferred on such Tribunal by or under this Act.

2. The Central Government shall also specify in the notification referred to in sub-section (1) the matters and places in relation to which the Securities Appellate Tribunal may exercise jurisdiction.

Composition of Securities Appellate Tribunal

15(L). A Securities Appellate Tribunal shall consist of one person only (hereinafter referred to as the Presiding Officer of the Securities Appellate Tribunal) to be appointed, by notification, by the Central Government.

Qualifications for appointment as Presiding Officer of the Securities Appellate Tribunal.

15(M). A person shall not be qualified for appointment as the Presiding Officer of a Securities Appellate Tribunal unless he-

a. Is, or has been, or is qualified to be, a Judge of a High Court; or

b. Has been a member of the Indian Legal Service and has held a post in Grade I of that Service for atleast three years; or

c. Has held office as the Presiding Officer of a Tribunal for atleast three years.

Term of office

15(N) The Presiding Officer of a Securities Appellate Tribunal shall hold office for a term of five years from the date on which he enters upon his office or until he attains the age of sixty-five years, whichever is earlier.

Salary and allowances and other terms and conditions of service of Presiding Officers.

15(O) The salary and allowances payable to and the other terms and conditions of service (including pension, gratuity and other retirement benefits) of, the Presiding Officer of a Securities Appellate Tribunal shall be such as may be prescribed.

Providing that neither the salary and allowances nor the other terms and conditions of service of the said Presiding Officers shall be varied to their disadvantage after appointment.

Filling up of vacancies

15(P) If, for reason other than temporary absence, any, vacancy occurs in the office of the Presiding Officer of a Securities Appellate Tribunal, then the Central Government shall appoint another person in accordance with the provisions of this Act to fill the vacancy and the proceedings may be continues before the Securities Appellate Tribunal from the stage at which the vacancy is filled.

Resignation and removal

15(Q)1. The Presiding Officer of a Securities Appellate Tribunal may, by notice in writing under his hand addressed to the Central Government, resign his office:

Provided that the said Presiding Officer shall, unless he is permitted by the Central Government to relinquish his office sooner, continue to hold office, until the expiry of three months from the date of receipt of such notice or until a person duly appointed as his successor enters upon his office or until the expiry of his term of office, whichever is the earliest.

2. The Presiding Officer of a Securities Appellate Tribunal shall not be removed from his office except by an order by the Central Government on the ground of proved misbehaviour or incapacity after inquiry made by a Judge of the Supreme Court, in which the Presiding Officer concerned has been informed of the charges against him and given a reasonable opportunity of being heard in respect of these charges.

3. The Central Government may, by rules, regulate the procedure for the investigation of misbehaviour or incapacity of the aforesaid Presiding Officer.

Orders constituting Appellate Tribunal to be final and not to invalidate its proceedings.

15(R). No order of the Central Government appointing any person as the Presiding Officer of a Securities Appellate Tribunal shall be called in question in any manner, and no act or proceeding before a Securities Appellate Tribunal shall be called in question in any manner on the ground merely of any defect in the constitution of a Securities Appellate Tribunal.

Staff of the Securities Appellate Tribunal

15(S).1. The Central Government shall provide the Securities Appellate Tribunal with such officers and employees as that Government may think fit.

2. The officers and employees of the Securities Appellate Tribunal shall discharge their functions under general superintendence of the Presiding Officer.

3. The salaries and allowances and other conditions of service of the officers and employees of the Securities Appellate Tribunal shall be such as may be prescribed.

Appeal to the Securities Appellate Tribunal

15(T).1. Save as provided in sub-section (2), any person aggrieved by an order made by an Adjudicating Officer under this Act, may prefer an appeal to a Securities Appellate Tribunal having jurisdiction in the matter.

2. No appeal shall lie to the Securities Appellate Tribunal from an order made by an adjudicating officer with the consent of the parties.

3. Every appeal under sub-section (1) shall be filed within a period of forty-five days from the date on which a copy of the order made, by the Adjudicating Officer is received by him and it shall be in such form and be accompanied by such fee as may be prescribed:

Provided that the Securities Appellate Tribunal may entertain an appeal after the expiry of the said period of forty-five days if it is satisfied that there was sufficient cause for not filing it within that period.

4. On receipt of an appeal under sub-section (1), the Securities Appellate Tribunal may, after giving the parties to the appeal, an opportunity of being heard, pass such orders thereon as it thinks fit, confirming, modifying or setting aside the order appealed against.

5. The Securities Appellate Tribunal shall send a copy of every order made by it to the parties to the appeal and to the concerned Adjudicating Officer.

6. The appeal filed before the Securities Appellate Tribunal under sub-section (1) shall be dealt with by it as expeditiously as possible and endeavour shall be made by it to dispose of the appeal finally within six months from the date of receipt of the appeal.

Procedure and powers of the Securities Appellate Tribunal

15(U).1. The Securities Appellate Tribunal shall not be bound by the procedure laid down by the Code of Civil Procedure, 1908, but shall be guided by the principles of natural justice and, subject to the other provisions of this Act and of any rules, the Securities Appellate Tribunal shall have powers to regulate their own procedure including the places at which they shall have their sittings.

2. The Securities Appellate Tribunal shall have, for the purposes of discharging their functions under this Act, the same powers as are vested in a civil court under the Code of Civil Procedure, 1908, while trying a suit, in respect of the following matters, namely:

   a. summoning and enforcing the attendance of any person and examining him on oath;

   b. requiring the discovery and production of documents;

   c. receiving evidence on affidavits;

   d. issuing commissions for the examination of witnesses or documents;

   e. reviewing its decision;

   f. dismissing an application for default or deciding it ex-parte;

   g. setting aside any order of dismissal of any application for default or any order passed by it ex-parte;

   h. any other matter which may be prescribed.

3. Every proceeding before the Securities Appellate Tribunal shall be deemed to be a judicial proceeding within the meaning of sections 193 and 228, and for the purposes of section 196, of the Indian Penal Code and the Securities Appellate Tribunal shall be deemed to be a civil court for all the purposes of section 195 and Chapter XXVI of the Code of Criminal Procedure, 1973.

Right to legal representation

15(V). The appellant may either appear in person or authorise one or more legal practitioners or any of its officers to present his or its case before the Securities Appellate Tribunal.

Limitation

15(W). The provisions of the Limitation Act, 1963, shall, as far as may be, apply to an appeal made to a Securities Appellate Tribunal.

Presiding Officer and staff of Securities Appellate Tribunal to be public servants

15(X). The Presiding Officer and other officers and employees of a Securities Appellate Tribunal shall be deemed to be public servants within the meaning of section 21 of the Indian Penal Code.

Civil Court not to have jurisdiction

15(Y). No civil court shall have jurisdiction to entertain any suit or proceeding in respect of any matter which an adjudicating officer appointed under this Act or a Securities Appellate Tribunal constituted under this Act is empowered by or under this Act to determine and no injunction shall be granted by any court or other authority in respect of any action taken or to be taken in pursuance of any power conferred by or under this Act.

Appeal to High Court

15(Z). Any person aggrieved by any decision or order of the Securities Appellate Tribunal may file an appeal to the High Court within sixty days from the date of communication of the decision or order of the Securities Appellate Tribunal to him on any question of fact or law arising out of such order:

Provided that the High Court may, if it is satisfied that the appellant was prevented by sufficient cause from filing the appeal within the said period, allow it to be filed within a further period not exceeding sixty days.

Annexure – III

Registration of Intermediaries Associated with the Securities Market

The Securities and Exchange Board of India has been established as a statutory body under the Securities and Exchange Board of India Act, 1992. In terms of section 12 of the Securities and Exchange Board of India Act, any person, who is carrying on any business as an intermediary in the securities market immediately before February 21, 1992, is required to make an application latest by May 21, 1992 to the Board for issue of certificate of registration.

Accordingly, the intermediaries such as Share Transfer Agents, Bankers to the Issue, Debenture Trustees to the trust deeds, Registrars to an Issue, Underwriters, Portfolio Managers and Investment Advisers other than Merchant Bankers, Stock Brokers and Sub-brokers, are advised to make the application for issue of Certificate of Registration by the Board on or before May 21, 1992, containing the undernoted particulars for each category of intermediaries. The applications shall be addressed to the Securities and Exchange Board of India, Post Bag No. 19971, Mittal Court, B Wing, 224, Nariman Point, Bombay 400 021. The application fee, as may be prescribed under the Rules and Regulations, should be remitted on receipt of advice from the Board. The envelopes containing the applications must be superscribed "For Registration as Share Transfer Agents", "For Registration as Registrars to Issue", etc., as the case may be.

The Merchant Bankers currently holding authorisation for carrying on various activities including underwriting of issues and portfolio management services and as investment advisers, are being advised individually for necessary compliance. Any other person seeking fresh registration as a merchant banker may make the application in accordance with the existing procedure.

The Stockbrokers are advised to make the application for registration through the stock exchange of which they are members. The sub-brokers are advised to do so through the stock exchange where the sponsor broker is a member. Necessary instructions are being issued to the stock exchange in this behalf.

The applications received pursuant to this advertisement will be considered in the light of the Rules and Regulations to be notified in due course for each category of the intermediaries. All persons concerned may please note that carrying on the activities as intermediaries without making an application on or before May 21, 1992 for grant of certificate of registration would be violating the provisions of the Act.

Particulars to be furnished for making an Application for Registration Under Section 12 of SEBI Act, 1992 for different categories of Intermediaries.

I. Registrars to an issue, share transfer agents or both

1. Applicant details (such as Name, Regd. Office, correspondence address and stock exchange where shares are listed).
2. Categories of Registration required.

   Category I = Registrar to Issue & Securities Transfer Agent.

   Category II = Registrar to Issue or Securities Transfer Agent.
3. Nature of organisation together with details of ownership (names of major shareholders with percentage held).
4. Details of Directors, their qualifications and experience and other positions held by them.
5. Details of investments and loans by or to group and associate companies.

6. Details of infrastructure, branch network, associates of the applicant and their activities and nature of applicant's interest in them. Data processing capacity both in-house and otherwise may be indicated in detail.
7. Details of key management personnel with their qualification and experience in issue and securities transfer activities.
8. Details of activities of the applicant and experience in issue and securities transfer activities (documentary evidence be submitted if required) particularly during last three years.
9. Networth (Paid Capital + Free Reserves = Surplus/Deficit in balance sheet).
10. Particulars of outstanding trade disputes.
11. A three year corporate business plan indicating activity-wise physical targets, resultant income and profit.
12. Address of Principal Bankers and Auditors.

Documents to be furnished

i. Declaration and undertaking by two Directors / partners that information furnished is true and correct and that neither the applicant nor any of its Directors / partners and key management personnel have been involved in or convicted of any economic offences during the last three years.

ii. Certified copies of audited accounts for last three years, Memorandum and Articles of Association, Organisation chart should be enclosed.

The details of other group companies, associates, firms etc., in which one or more of the Directors are interested may be indicated.

II. Bankers to the issue (scheduled banks other than a co-operative bank or a regional rural bank)

1. Applicant details such as Name, Regd. office, correspondence address and stock exchange where shares are listed (where applicable).
2. Name, Address & Tel. No. of contact officer.
3. Details of ownership in case of banks other than public sector banks (names of major shareholders with percentage).
4. List of centres where the bank has branches out of centres notified by the Ministry of Finance for collection of public issue forms.
5. System of co-ordination between the branches for exchange of information, remittance of moneys and adequacy thereof for handling, collection of application moneys and acting as refund bankers.
6. Particulars of arrangements for handling receipt of applications, processing thereof and also adequacy of manpower for handling such work at the Head Office and other branches.
7. Details of experience as Bankers to the Issue, i.e., collection of application/allotment moneys refund bankers, paying bankers for payment of dividend/interest warrants.
8. Networth, deposits and working funds.

Documents to be furnished

i. Declaration and undertaking by two authorised officials of the bank that information furnished is true and correct and that neither the applicant nor any of its Directors and key executive personnel have been involved in or convicted of economic offences during the last three years or by the Reserve Bank for violation of the provisions of the Reserve Bank of India Act, 1934 and Banking Regulations Act, 1949.

III. Trustees to the debenture trust deeds (scheduled banks, public financial institutions, insurance companies or bodies corporate)

1. Applicant details such as name, form of organisation, registered office, correspondence address and stock exchange where shares are listed (where applicable).
2. Name, address & Tel. No. of contact officer.
3. Details of ownership in case of non-public sector banks and bodies corporate (names of major partners/shareholders with percentage).
4. Particulars of directors only in case of other bodies corporate.
5. Net worth (Paid-up capital + Free Reserves = Surplus/Deficit in balance sheet).
6. Particulars of key management personnel including legal personnel.
7. Details of experience as Debenture Trustees.
8. Infrastructure availability for carrying on the activities as trusts.
9. Address of principal bankers and auditors (for other bodies corporate only).
10. Facilities proposed for redressal of investors' grievances.

Documents to be furnished

i. Declaration and undertaking by two authorised officials that information furnished is true and correct and that neither the applicant nor any of its Directors and key executive personnel have been involved in or convicted of economic offences during the last three years.

ii. Certified copies of audited accounts for last three years, Memorandum and Articles of Association, organisation chart should be enclosed by other bodies corporate.

IV. Underwriters other than merchant bankers holding authorisation from SEBI

1. Applicant details (such as Name, Regd. office, correspondence address and stock exchange where shares are listed).
2. Particulars of activities proposed to be carried on as underwriter.
3. Nature of organisation together with details of ownership (names of major partners/ shareholders with percentage held).
4. Details of directors, partners, proprietors, etc. as also their qualifications and experience and other positions held by them.
5. Details of infrastructure facilities, branch network, associates of the applicant and their activities and nature of applicants, interest in them.
6. Details of key management personnel with their qualification and experience in rendering financial services and in particular underwriting activities.
7. Business during the last three years regarding underwriting and developments undertaken if any. Indicate details of all settled and pending devolvements/disputes. Also indicate underwriting defaults with any company and reasons for the same, and with what results.
8. Networth (Paid Capital + Free Reserves = Surplus/Deficit in balance sheet) and its deployment.
9. Three year corporate business plan indicating activity-wise target, resultant income and profit.
10. Address of Principal Bankers and Auditors.

Documents to be furnished

i. Declaration and undertaking by two Directors/partners that information furnished is true and correct and that neither the applicant nor any of its Directors/partners and key management Personnel have been involved in or convicted of economic offences during the last three years.

ii. Certified copies of audited accounts for last three years, Memorandum and Articles of Association, organisation chart, a copy of typical contract entered with the issuer for underwriting activity should be enclosed.

Note: The details of other group companies, associates, firms, etc., in which one or more of the Directors/Partners are interested may be indicated.

V. Portfolio Managers other than merchant bankers holding authorisation from SEBI in categories I and II

1. Applicant details (such as Name, Regd. office, correspondence address and stock exchange where shares are listed).
2. Particulars of activities proposed to be carried on as portfolio manager.
3. Nature of Organisation together with details of ownership (names of major shareholders with percentage held).
4. Details of Directors, Partners, etc., their qualifications and experience and other positions held by them.
5. Details of infrastructure, branch network, associates of the applicant and their activities and nature of applicant's interest in them. Data processing capacity both inhouse and otherwise may be indicated in detail.
6. Details of key management personnel with their qualification and experience in rendering financial services and in particular portfolio management services.
7. Business during the last three years regarding portfolio management discretionary as well as non-discretionary and other portfolio management services rendered to both residents and non-residents.
8. Networth (Paid Capital + Free Reserves = Surplus/Deficit in balance sheet).
9. A three year corporate business plan indicating activity-wise physical targets, resultant income and profit.
10. Address of Principal Bankers and Auditors.

Documents to be furnished

i. Declaration and undertaking by two Directors/Partners that information furnished is true and correct and that neither the applicant nor any of its Directors/Partners and key management personnel have been involved in or convicted of economic offences during the last three years.

Certified copies of audited accounts for last three years. Memorandum and Articles of Association, Organisation chart should be enclosed.

Note: The details of other group companies, associates, firms, etc., in which one or more of the Directors/Partners are interested may be indicated.

VI. Investment advisers (only persons carrying on such activities for a specific fee or charge) other than merchant bankers holding authorisation from SEBI

1. Applicant details (such as Name, Regd. office, correspondence address and stock exchange where shares are listed).
2. Particulars of activities proposed to be carried on as Investment Advisor.

3. Nature of Organisation together with details of ownership (names of major shareholders with percentage held).
4. Details of Directors, Partners, Proprietor etc., their qualifications and experience and other positions held by them.
5. Details of infrastructure facilities, branch network, associates of the applicant and their activities and nature of applicant's interest in them may be indicated in detail.
6. Details of key management personnel with their qualification and experience in rendering financial service and in particular as Investment Advisers
7. Business during the last three years as Investment Adviser. Indicate how Investment Advice is usually given, including the responsibility, if any, taken up by the Investment Advisers.
8. Networth (Paid Captial + Free Reserves = Surplus/Deficit in balance sheet) and its deployment.
9. A three year corporate business plan indicating activity-wise physical targets, resultant income and profit.
10. Address of Principal Bankers and Auditors.
11. Declaration and undertaking by two Directors/Partners/Individuals that information furnished is true and correct and that neither the applicant nor any of its Directors/Partners and key management personnel have been involved in or convicted of economic offences during the last three years.

Certified copies of audited accounts for last three years, Memorandum and Articles of Association, Organisation Chart should be enclosed.

Note: The details of other group companies, associates, firms, etc. in which one or more of the Directors/Partners are interested may be indicated.

Annexure – IV

Securities and Exchange Board of India (Insider Trading) Regulations, 1992

In exercise of the powers conferred by Section 30 of the Securities and Exchange Board of India Act, 1992 (15 of 1992), the Board with the previous approval of the Central Government, hereby makes the following regulations, namely :

Chapter I

Preliminary

1. Short title and commencement

1. These regulations may be called the Securities and Exchange Board of India (Insider Trading) Regulations, 1992.
2. These regulations shall come into force on the date of their publication in the Official Gazette.

2. Definition

In these regulations, unless the context otherwise requires :

a. "Act" means the Securities and Exchange Board of India Act, 1992 (15 of 1992);

b. "body corporate" means a body corporate as defined in Section 2 of the Companies Act, 1956 (1 of 1956);

c. "connected person" means any person who –

i. is a director, as defined in clause (13) of Section 2 of the Companies Act, 1956 (1 of 1956), of a company, or is deemed to be a director of that company by virtue of sub-clause(10) of Section 307 of that Act; or

ii. occupies the position as an officer or an employee of the company or holds a position involving a professional or business relationship between himself and the company and who may reasonably be expected to have an access to unpublished price sensitive information in relation to that company;

d. "dealing in securities" means an act of buying, selling or agreeing to buy, sell or deal in any securities by any person either as principal or agent;

e. "insider" means any person who, is or was connected with the company or is deemed to have been connected with the company and who is reasonably expected to have access, by virtue of such connection, to unpublished price sensitive information in respect of securities of the company, or who has received or has had access to such; unpublished price sensitive information;

f. "investigating authority" means any officer of the Board or any other person, not being a firm, body corporate or an association of persons having experience in dealing with the problems relating to the securities market and who is authorised by the Board under Chapter III;

g. "officer of a company" means any person as defined in clause (30) of Section 2 of the Companies Act, 1956 (1 of 1956), including the auditor of the company;

h. "person is deemed to be a connected person" if such person

i. is a company under the same management or group, or any subsidiary company thereof within the meaning of sub-section (1B) of Section 370, or sub-section (11) of Section 372, of the Companies Act, 1956 (1 of 1956), of sub-clause (g) of Section 2 of the Monopolies and Restrictive Trade Practices Act, 1969 (54 of 1969), as the case may be; or

ii. is an official or a member of a stock exchange or of a clearing house of that stock exchange or a dealer in securities within the meaning of clause (c) of Section 2 and Section 217 of the Securities Contracts (Regulation) Act, 1956 (42 of 1956) respectively, or any employee of such member or dealer of a stock exchange;

iii. is a merchant banker, share transfer agent, registrar to issue, debenture trustee, broker, portfolio manager, investment adviser, sub-broker, investment company or an employee thereof, or is a member of the Board of Trustees of a mutual fund or a member of the Board of Directors of the Asset Management Company of a mutual fund or is an employee thereof, who have a fiduciary relationship with the company;

iv. is a Member of the Board of Directors, or an employee, of a public financial institution as defined in Section 4A of the Companies Act, 1956; or

v. is an official or an employee of a Self-regulatory Organisation recognised or authorised by the Board of a regulatory body; or

vi. is a relative of any of the aforementioned persons;

vii. is a banker of the company;

i. "relative" means a person, as defined in section 6 of the Companies Act, 1956 (1 of 1956);

j. "stock exchange" means a stock exchange which is recognised by the Central Government under Section 4 of the Securities Contracts (Regulation) Act, 1956 (42 of 1956);

k. "unpublished price sensitive information" means any information which relates to the following matters or is of concern, directly or indirectly, to a company, and is not generally known or published by such company for general information, but which if published or known, it's likely to materially affect the price of securities of that company in the worked –

i. financial results (both half-yearly and annual) of the company;

ii. intended declaration of dividends (both interim and final);

iii. issue of shares by way of public rights, bonus, etc.;

iv. any major expansion plans or execution of new projects;

v. amalgamation, mergers and takeovers;

vi. disposal of the whole or substantially the whole of the undertaking;

vii. such other information as may affect the earnings of the company;

viii. any changes in policies, plans or operations of the company.

Chapter II

Prohibition on Dealing, Communicating or Counselling

3. Prohibition on dealing, communicating or counselling on matters relating to insider trading

No insider shall –

i. either on his own behalf or on behalf of any other person, deal in securities of a company listed on any stock exchange on the basis of any unpublished price sensitive information;

ii. communicate any unpublished price sensitive information to any person, with or without his request for such information, except as required in the ordinary course of business or under any law; or

iii. counsel or procure any other person to deal in securities of any company on the basis of unpublished; price sensitive information.

4. Violation of provisions relating to insider trading

Any insider who deals in securities or communicates any information or counsels any person dealing in securities in contravention of the provisions of regulation 3 shall be guilty of insider trading.

Chapter III

Investigation

5. Board's right to investigate

1. Where the Board, on the basis of written information in its possession, is of the opinion that it is necessary to investigate and inspect the books of account, either records and documents of an insider for any of the purposes specified in sub-regulation (2), it may appoint an investigating authority for the said purpose.
2. The purposes referred to in sub-regulation (1) may be as follows :
   a. to investigate into the complaints received from investors, intermediaries or any other person on any matter having a bearing on the allegations of insider trading; and
   b. to investigate suo motu upon its own knowledge or information in its possession to protect the interest of investors in securities against breach of these regulations.

6. Procedure for investigation

1. Before undertaking any investigation under Regulation 5 the Board shall give a reasonable notice to insider for that purpose.
2. Notwithstanding anything contained in sub-regulation (1), where the Board is satisfied that in the interest of investors or in public interest no such notice should be given, it may by an order in writing direct that the investigation be taken up without such notice.
3. On being empowered by the Board, the investigating authority shall undertake the investigation and inspection of books of accounts and the insider against whom an investigation is being carried out shall be bound to discharge his obligations as provided in Regulation 7.

7. Obligations of insider on investigation by the Board

1. It shall be the duty of every insider, who is being investigated to produce to the investigating authority such books, accounts and other documents in his custody or control and furnish the authority with the statements and information relating to the transactions in securities market within such time as the said authority may require.
2. The insider shall allow the investigating authority have reasonable access to the premises occupied by such insider and also extend reasonable facility for examining any books, records, documents and computer data in the possession of the stockbroker or any other person and also provide copies of documents or other materials which, in the opinion of the investigating authority are relevant.
3. The investigating authority, in the course of investigation shall be entitled to examine or record statements of any member, director, partner, proprietor and employee of the insider.
4. It shall be the duty of every director, proprietor, partner, officer and employee of the insider to give to the investigating authority assistance in connection with the investigation, which insider may be reasonably expected to give.

8. Submission of Report to the Board

The investigating authority shall, within one month of the conclusion of the investigation submit an investigation report to the Board.

9. Communication of Findings etc.

1. The Board shall after consideration of the investigation report communicate the findings to the insider and shall be given opportunity of being heard before any action is taken by the Board on the findings of the investigating authority.
2. On receipt of the explanation, if any, from the insider, the Board may call upon the insider to take such measures as the Board may deem fit to protect the interest of investors and in the interest of the securities market and for due compliance with the provisions of the Act, rules made thereunder and these regulations.

10. Appointment of Auditor

Notwithstanding anything contained in regulation 6, the Board may appoint a qualified auditor to investigate into the books of accounts or the affairs of the insider; Provided that, the auditor so appointed still have the same powers of the inspecting authority as stated in regulation 5 and the insider shall have the obligations specified in regulation 7.

11. Directions by the Board

On receipt of the explanation, if any, from the insider under sub-regulation (2) of regulation 9, the Board may without prejudice to its right to initiate criminal prosecution under Section 24 of the Act, give such directions to protect the interest of investors and in the interest of the securities market and for the compliance with the provisions of the Act, rules made there under and these regulations, as it deems fit for all or any of the following purposes, namely :

a. directing the insider not to deal in securities in any particular manner;

b. prohibiting the insider from disposing of any of the securities acquired in violation of these regulations;

c. restraining the insider to communicate or counsel any person to deal in securities.

12. Appeal to the Central Government

Any person aggrieved by an order of the Board made, on and 1999, under these regulations may prefer an appeal to a Securities Appellate Tribunal having jurisdiction in the matter.

Annexure – V

Securities and Exchange Board of India

(Stock-brokers and Sub-brokers) Rules, 1992

Chapter I

Preliminary

1. Short title and commencement

1. These regulations may be called the Securities and Exchange Board of India (Stock-brokers and Sub-brokers) Regulations, 1992.
2. These regulations shall come into force on the date of their publication in the Official Gazette.

2. Definitions

In these regulations, unless the context otherwise requires:-

a. 'clearing corporation or clearing house' means the clearing corporation or clearing house of a recognised stock exchange to clear and settle trades in securities;

a(a). 'clearing member' means a member of a clearing corporation or clearing house of the derivatives exchange or derivatives segment of an exchange, who may clear and settle transactions in securities.

a(aa). "enquiry officer" means any officer of the Board, or any other person,having experience in dealing with the problems relating to the securities market, who is appointed by the Board under Chapter VI;

b. "form" means a form specified in Schedule I;

c. "inspecting authority" means one or more persons appointed by the Board to exercise powers conferred under Chapter V of these regulations;

d. "regulations" means Securities and Exchange Board of India (Stock-brokers and Sub- brokers) Regulations, 1992;

e. "rules" means Securities and Exchange Board of India (Stock-brokers and Sub-brokers) Rules, 1992;

f. "Securities Contracts (Regulation) Act" means the Securities Contracts (Regulation) Act, 1956 (42 of 1956);

g. "small investor" means any investor buying or selling securities on a cash transaction for a market value not exceeding rupees fifty thousand in aggregate on any day as shown in a contract note issued by the stock-broker;

g(a). 'trading member' means a member of the derivatives exchange or derivatives segment of a stock exchange and who settles the trade in the clearing corporation or clearing house through a clearing member;

h. All other words and expressions occurring in these regulations shall bear the same meaning as in the Act and the rules.

Chapter II

Registration of Stock Brokers

3. Application for registration of stock broker

1. An application by a stock-broker for grant of a certificate shall be made in Form A through the stock exchange or stock exchanges, as the case may be, of which he is admitted as a member.

2. The stock exchange shall forward the application form to the Board as early as possible but not later than thirty days from the date of its receipt.

3. Notwithstanding anything contained in sub-regulation(1), any application made by a stock- broker prior to coming into force of these regulations containing such particulars or as near thereto as mentioned in the Form A shall be treated as an application if made in pursuance of sub-regulation (1) and dealt with accordingly:

Provided that the requirement of the payment of fees shall be the same as is referred to in sub-regulation (1) of regulation.

4. Furnishing information, clarification, etc.

1. The Board may require the applicant to furnish such further information or clarifications, regarding the dealings in securities and matters connected thereto to consider the application for grant of a certificate.

2. The applicant or, its principal officer shall, if so required, appear before the Board for personal representation.

5. Consideration application

The Board shall take into account for considering the grant of a certificate all matters relating to buying, selling, or dealing in securities and in particular the following, namely, whether the stock broker-

a. is eligible to be admitted as a member of a stock exchange;

b. has the necessary infrastructure like adequate office space, equipments and man power to effectively discharge his activities;

c. has any past experience in the business of buying, selling or dealing in securities;

d is subjected to disciplinary proceedings under the rules, regulations and bye-laws of a stock exchange with respect to his business as a stock-broker involving either himself or any of his partners, directors or employees;

e. is a fit and proper person.

6. Procedure for registration

The Board on being satisfied that the stock-broker is eligible, shall grant a certificate in Form D to the stock-broker and send an intimation to that effect to the stock exchange or stock exchanges as the case may be.

7. Stock-Brokers to abide by Code of Conduct, etc.

The stock-broker holding a certificate shall at all times abide by the Code of Conduct as specified at Schedule II.

8. Procedure where registration is not granted

1. Where an application for grant of a certificate under regulation 3, does not fulfill the requirements mentioned in regulation 5, the Board may reject the application after giving a reasonable opportunity of being heard.

2. The refusal to grant the registration certificate shall be communicated by the Board within thirty days of such refusal to the concerned stock exchange and to the applicant stating therein the grounds on which the application has been rejected.

3. An applicant may, being aggrieved by the decision of the Board under sub-regulation (2) apply within a period of thirty days from the date of receipt of such intimation, to the Board for reconsideration of its decision.

4. The Board shall reconsider an application made under sub-regulation (3) and communicate its decision as soon as possible in writing to the applicant and to the concerned stock-exchange.

9. Effect of refusal of certificate of registration

A stock-broker, whose application for grant of a certificate has been refused by the Board, shall not, on and from the date of the receipt of the communication under the sub-regulation (2) of regulation 8, buy, sell, or deal in securities as a stock-broker.

10. Payment of fees and the consequences of failure to pay fees

1. Every applicant eligible for grant of a certificate shall pay such fees and in such manner as specified in Schedule III:

   Provided that the Board may on sufficient cause being shown permit the stock-broker to pay such fees at any time before the expiry of six months from the date for which such fees become due.

2. Where a stock-broker fails to pay the fees as provided in regulation 10, the Board may suspend the registration certificate, whereupon the stock-broker shall cease to buy, sell or deal in securities as a stock-broker.

Chapter III

Registration of Sub-Brokers

11. Application for registration of sub-broker

1. An application by a sub-broker for the grant of a certificate shall be made in Form B.
2. The application for registration under sub-regulation (1) above, shall be accompanied by a recommendation letter from a stock-broker of a recognised stock exchange with whom he is to be affiliated along with two references including one from his banker.
3. The application form shall be submitted to the stock exchange of which the stock-broker with whom he is to be affiliated is a member.
4. The stock exchange on receipt of an application under sub-regulation (3) shall verify the information contained therein and shall also certify that the applicant is eligible for registration as per criteria specified in sub-regulation (5).
5. The eligibility criteria for registration as a sub-broker shall be as follows, namely:
   i. in the case of an individual;
      a. the applicant is not less than 21 years of age;
      b. the applicant has not been convicted of any offence involving fraud or dishonesty;
      c. the applicant has atleast passed 12th standard equivalent examination from an institution recognised by the Government;
      d. the applicant is a fit and proper person.

      Provided that the Board may relax the educational qualifications on merits having regard to the applicant's experience.

   ii. In the case of partnership firm or a body corporate the partners or directors, as the case may be, shall comply with the requirements contained in clauses (a) to (c) of sub-regulation (i).
6. The stock exchange shall forward the application form of such applicants who comply with all the requirements specified in sub- regulations (1) to (5) to the Board as early as possible, but not later than thirty days from the date of its receipt.

12. Procedure for registration

1. The Board on being satisfied that the sub-broker is eligible, shall grant a certificate in Form E to the sub-broker and send an intimation to that effect to the stock exchange or stock exchanges as the case may be.
2. The Board may grant a certificate of registration to the appellant subject to the terms and conditions as stated in rule 5.

13. Procedure where registration is not granted

1. Where an application for grant of a certificate under regulation 11, does not fulfill the requirements mentioned in regulation 11, the Board may reject the application after giving a reasonable opportunity of being heard.
2. The refusal to grant the certificate shall be communicated by the Board within thirty days of such refusal to the concerned stock exchange and to the applicant stating therein the grounds on which the application has been rejected.
3. An applicant being aggrieved by the decision of the Board under sub-regulation (2) may within a period of thirty days from the date of receipt of such intimation, apply to the Board for reconsideration of its decision.
4. The Board shall reconsider an application made under sub- regulation (3) and communicate its decision as soon as possible in writing to the applicant and to the concerned stock exchange.

14. Effect of refusal

A person whose application for grant of a certificate has been refused by the Board shall, on and from the date of the communication of refusal under regulation 13 cease to carry on any activities as a sub-broker.

15. General Obligations and Inspection

1. The sub-broker shall -
   a. pay the fees as specified in Schedule III;
   b. abide by the Code of Conduct specified in Schedule II;
   c. enter into an agreement with the stock broker for specifying the scope of his authority and responsibilities.
2. The sub-broker shall keep and maintain the books and documents specified in regulation 17 except for the books and documents referred to in clauses (h), (i),(j),(k),(l) and (m) of sub regulation (1) of regulation 17.

Application of Chapter IV, V & VI

The provisions of Chapters IV, V and VI of these regulations shall apply to a sub-broker as they apply in case of a stock broker.

Chapter III A

Registration of Trading and Clearing Members

16(A). Application for registration of Trading member or Clearing member.

1. An application for grant of certificate of registration by a trading member of a derivatives exchange or derivatives segment of a stock exchange shall be made in Form AA of Schedule - I, through the concerned derivatives exchange or derivative segment of a stock exchange of which he is a member.
2. An application for grant of certificate of registration by a clearing member of the clearing corporation or clearing house of a derivatives exchange or derivatives segment of a stock exchange, shall be made in Form AA of Schedule I, through the concerned clearing corporation or clearing house of which he is a member.

Provided that a trading member who also seeks to act as a clearing member shall make separate applications for each activity in Form AA of Schedule I.

3. The derivatives exchange or segment or clearing house or corporation as the case may be shall forward the application to the Board as early as possible but not later than thirty days from the date of its receipt.

16(B). Furnishing of Information, Clarification,etc.

1. The Board may require the applicant or the concerned stock exchange or segment or clearing house or corporation to furnish such other information or clarifications, regarding the trading and settlement in derivatives and matters connected thereto, to consider the application for grant of a certificate.
2. The applicant or its principal officer shall, if so required, appear before the Board for personal representation.

16(C). Consideration of Application

1. The Board shall take into account for considering the grant of a certificate all matters relating to dealing and settlement in derivatives and in particular the following, namely, whether the applicant -
   a. is eligible to be admitted as a trading member of a derivative exchange and/ or a clearing member of a derivatives exchange or derivatives segment of a stock exchange or clearing corporation or house;
   b. has the necessary infrastructure like adequate office place, equipments and manpower to effectively undertake his activities;
   c. is subjected to disciplinary proceedings under the rules, regulations and bye-laws of any stock exchange with respect to his business as a stock broker or member of derivatives exchange or segment or member of clearing house or corporation involving either himself or any of his partners, directors or employees.
2. An applicant who desires to act as a trading member, in addition to complying with the requirements of sub-regulation (1), shall have a net-worth as may be specified by the derivative exchange or segment from time to time and the approved user and sales personnel of the trading member have passed a certification programme approved by the Board.
3. An applicant who desires to act as a clearing member, in addition to complying with the requirements of sub-regulation (1), shall have a minimum net worth of Rs.300 lacs and shall deposit at least a sum of Rs.50 lacs or higher amount with the clearing corporation or clearing house of the derivatives exchange or derivatives segment in the form specified from time to time.

Explanation: For the purpose of sub-regulation (2) and (3), the expression 'net worth' shall mean paid up capital and free reserves and other securities approved by the Board from time to time (but does not include fixed assets, pledged securities, value of member's card, non-allowable securities (unlisted securities), bad deliveries, doubtful debts and advances (debts or advances overdue for more than three months or debts or advances given to the associate persons of the member), prepaid expenses, losses, intangible assets and 30% value of marketable securities).

16(D). Procedure for registration:

The Board on being satisfied that the applicant is eligible, shall grant a certificate in Form DA of Schedule I, to the applicant and send an intimation to that effect to the derivatives segment of the stock exchange or derivatives exchange or clearing corporation or clearing house, as the case may be.

16(E). Procedure where registration is not granted.

1. Where an application for the grant of a certificate under regulation 16(A) does not fulfil the requirements specified in 16(C) of the regulations, the Board may reject the application of the applicant after giving a reasonable opportunity of being heard.
2. The refusal to grant the certificate of registration shall be communicated by the Board within 30 days of such refusal to the concerned segment of the stock exchange, or clearing house or corporation and to the applicant stating therein the grounds on which the application has been rejected.
3. An applicant may, if aggrieved by the decision of the Board under sub-regulation (2) apply within a period of thirty days from the date of receipt of such information to the Board for reconsideration of its decision.
4. The Board shall reconsider an application made under sub-regulation (3) and communicate its decision as soon as possible in writing to the applicant and to the concerned segment of the stock exchange or clearing house or corporation.

16(F). Effect of refusal of certificate of registration

An applicant, whose application for the grant of a certificate of registration has been refused by the Board, shall not, on and from the date of receipt of the communication under sub-regulation (2) or sub-regulation (4) of regulation 16E, deal in or settle the derivatives contracts as a member of the derivatives exchange or derivatives segment or clearing corporation or clearing house.

16(G). Payment of fees and consequences of failure to pay fees

1. Every applicant eligible for grant of a certificate as a trading or clearing member shall pay such fee and in such manner as specified in Schedule IV.
2. Where a trading or clearing member fails to pay the fees as provided in sub-regulation (1), the Board may suspend or cancel the registration certificate after giving an opportunity of being heard, whereupon the trading and clearing member shall cease to deal in or settle the derivatives contract as a member of the derivatives segment of the exchange or derivatives exchange or clearing corporation or 'clearing house'.

16(H). Trading member/Clearing member to abide by the Code of Conduct, etc.

1. The code of conduct specified for the stock brokers as stipulated in Schedule II, shall be applicable mutatis mutandis to the trading member, clearing member and such members shall at all times abide by the same.
2. The trading member and clearing member shall abide by the code of conduct as specified in the rules, bye-laws and regulations of the derivatives exchange or derivatives segment of the exchange.

3. The trading members shall obtain details of the prospective clients in 'Know Your Client' format as specified by the Board before executing an order on behalf of such client.
4. The trading member shall mandatorily furnish 'Risk Disclosure Document' disclosing the risk inherent in trading in derivatives to the prospective clients in the form specified by the derivatives exchange or derivatives segment.
5. The trading or clearing member shall deposit margin or any other deposit and shall maintain position or exposure limit as specified by the Board or the concerned exchange or segment or clearing corporation or clearing house from time to time.

16(I). Chapter IV,V and VI applicable

1. The provision of Chapter IV,V and VI shall be applicable mutatis mutandis to a trading member and a clearing member and such members shall abide by the provisions of the said Chapters.
2. In the chapters referred to in sub-regulation (1), the word ' stock broker' shall refer to trading member or clearing member and the word 'stock exchange' shall refer to 'derivatives exchange or derivatives segment of an exchange or clearing corporation or clearing house.'
3. The Board may issue such directions under section 11B of the Act to the trading member or clearing member as may be deemed appropriate and such member shall abide by such directions.
4. In case of violation of any regulation, the trading or the clearing member shall be liable to penalty as specified in regulation 26.

Chapter IV

General Obligations And Responsibilities

17. To maintain proper books of accounts, records etc.

1. Every stock-broker shall keep and maintain the following books of accounts, records and documents namely:
   a. Register of transactions (Sauda Book);
   b. Clients ledger;
   c. General ledger;
   d. Journals;
   e. Cash book;
   f. Bank pass book;
   g. Documents register should include particulars of shares and securities received and delivered;
   h. Members' contract books showing details of all contracts entered into by him with other members of the same exchange or counterfoils or duplicates of memos of confirmation issued to such other member;
   i. Counterfoils or duplicates of contract notes issued to clients;
   j. Written consent of clients in respect of contracts entered into as principals;
   k. Margin deposit book;
   l. Registers of accounts of sub-brokers;
   m. An agreement with a sub-broker specifying the scope of authority and responsibilities of the Stock-Broker and such sub-broker.

2. Every stock-broker shall intimate to the Board the place where the books of accounts, records and documents are maintained.

3. Without prejudice to sub-regulation (1), every stock-broker shall, after the close of each accounting period furnish to the Board if so required as soon as possible but not later than six months from the close of the said period a copy of the audited balance sheet and profit and loss account, as at the end of the said accounting period:

Provided that, if it is not possible to furnish the above documents within the time specified, the stock-broker shall keep the Board informed of the same together with the reasons for the delay and the period of time by which such documents would be furnished.

18. Maintenance of books of accounts and records

Every stock broker shall preserve the books of account and other records maintained under regulation 17 for a minimum period of five years.

Chapter V

Procedure For Inspection

19. Board's right to inspect

1. Where it appears to the Board so to do, it may appoint one or more persons as inspecting authority to undertake inspection of the books of accounts, other records and documents of the stock- brokers for any of the purposes specified in sub-regulation (2).

2. The purposes referred to in sub-regulation (1) shall be as follows, namely:

   a. to ensure that the books of accounts and other books are being maintained in the manner required;

   b. that the provisions of the Act, rules, regulations and the provisions of the Securities Contracts (Regulation) Act and the rules made thereunder are being complied with;

   c. to investigate into the complaints received from investors, other stock brokers, sub-brokers or any other person on any matter having a bearing on the activities of the stock-brokers; and

   d. to investigate suo-moto, in the interest of securities business or investors' interest, into the affairs of the stock-broker.

20. Procedure for inspection

1. Before undertaking any inspection under regulation 19, the Board shall give a reasonable notice to the stock-broker for that purpose.

2. Notwithstanding anything contained in sub-regulation (1), where the Board is satisfied that in the interest of the investors or in public interest no such notice should be given, it may by an order in writing direct that the inspection of the affairs of the stock broker be taken up without such notice.

3. On being empowered by the Board, the inspecting authority shall undertake the inspection and the stock-broker against whom an inspection is being carried out shall be bound to discharge his obligations as provided under regulation 21.

21. Obligations of stock - broker

1. It shall be the duty of broker on inspection by the Board every director, proprietor, partner, officer and employee of the stock-broker, who is being inspected, to produce to the inspecting authority such books, accounts and other documents in his custody or control and furnish him

with the statements and information relating to the transactions in securities market within such time as the said officer may require.

2. The stock-broker shall allow the inspecting authority to have reasonable access to the premises occupied by such stock-broker or by any other person on his behalf and also extend reasonable facility for examining any books, records, documents and computer data in the possession of the stock-broker or any other person and also provide copies of documents or other materials which, in the opinion of the inspecting authority are relevant.

3. The inspecting authority, in the course of inspection, shall be entitled to examine or record statements of any member, director, partner, proprietor and employee of the stock-broker.

4. It shall be the duty of every director proprietor, partner, officer and employee of the stock broker to give to the inspecting authority all assistance in connection with the inspection, which the stock broker may be reasonably expected to give.

22. Submission of Report to the Board

The inspecting authority shall, as soon as may be possible submit an inspection report to the Board.

23. Communication of Findings etc.

1. The Board shall after consideration of the inspection report communicate the findings to the stock-broker to give him an opportunity of being heard before any action is taken by the Board on the findings of the inspecting authority.

2. On receipt of the explanation, if any, from the stock-broker, the Board may call upon the stock-broker to take such measures as the Board may deem fit in the interest of the securities market and for due compliance with the provisions of the Act, rules and regulations.

24. Appointment of Auditor

Notwithstanding anything contained above, the Board may appoint a qualified auditor to investigate into the books of account or the affairs of the stock-broker: Provided that, the auditor so appointed shall have the same powers of the inspecting authority as mentioned in regulation 19 and the obligations of the stock-broker in regulation 21 shall be applicable to the investigation under this regulation.

Chapter VI

Procedure for Action in Case of Default

25. Liability for action in case of default

1. **A stock-broker who**

   a. fails to comply with any conditions subject to which registration has been granted;

   b. contravenes any of the provisions of the Act, rules or regulations;

   c. contravenes the provisions of the Securities Contracts (Regulation) Act or the rules made there under;

   d. contravenes the rules, regulations or bye-laws of the stock exchange; shall be liable to any of the penalties specified in sub- regulation (2).

2. The penalties referred to in sub-regulation (1) may be either -

   a. suspension of registration, after the inquiry, for a specified period; or

   b. cancellation of registration.

26. Suspension, cancellation of registration, etc.

1. A penalty of suspension of registration of a stock-broker may be imposed if:-
   i. the stock-broker violates the provisions of the Act, rules and regulations;
   ii. the stock-broker does not follow the code of conduct annexed at Schedule II;
   iii. the stock-broker -
      a. fails to furnish any information related to his transactions in securities as required by the Board;
      b. furnishes wrong or false information;
      c. does not submit periodical returns as required by the Board;
      d. does not co-operate in any enquiry conducted by the Board;
   iv. the stock-broker fails to resolve the complaints of the investors or fails to give a satisfactory reply to the Board in this behalf;
   v. the stock-broker indulges in manipulating or price rigging or cornering activities in the market;
   vi. the stock-broker is guilty of misconduct or improper or unbusinesslike or unprofessional conduct;
   vii. the financial position of the stock broker deteriorates to such an extent that the Board is of the opinion that his continuance in securities business is not in the interest of investors and other stock-brokers;
   viii. the stock-broker fails to pay the fees;
   ix. the stock-broker violates the conditions of registration;
   x. the membership of the stock-broker is suspended by the stock exchange:

Provided that the Board for reasons to be recorded in writing may in case of repeated defaults of the type mentioned above impose a penalty of cancellation of registration of the stock-broker.

2. A penalty of cancellation of registration of a stock-broker may be imposed if-
   i. the stock-broker violates any provisions of insider trading regulations or take-over regulations;
   ii. the stock-broker is guilty of fraud, or is convicted of a criminal offence; and
   iii. cancellation of membership of the stock-broker by the stock exchange.

27. Manner of order of suspension or cancellation

No order of penalty of suspension and cancellation shall be imposed except after holding an enquiry in accordance with the procedure specified in regulation 28.

Provided that the holding of such an enquiry shall not be necessary in cases where the stock broker:

a. ceases to be a member of a recognised stock exchange; or
b. is declared defaulter by the stock exchange and is not readmitted to the membership of the exchange within a period of six months from such declaration; or

c. surrenders the membership of the stock exchange; or

d. is declared insolvent by a Court; or

e. fails to pay the registration or annual fees to the Board in the manner specified in the regulations; or

f. voluntarily surrenders certificate to the Board; or

g. is wound up by an order passed by the Court.

Provided further that no action shall be taken against the stock broker without giving an opportunity of hearing to the stock broker.

28. Manner of holding enquiry

1. For the purpose of holding an enquiry under regulation 27, the Board may appoint an enquiry officer.
2. The enquiry officer shall issue to the stock-broker a notice at the registered office or the principal place of business of the stock-broker.
3. The stock-broker may, within thirty days from the date of receipt of such notice, furnish to the enquiry officer a reply together with copies of documentary or other evidence relied on by him or sought by the Board from him.
4. The enquiry officer shall, give a reasonable opportunity of hearing to the stock-broker to enable him to make submissions in support of his reply made under sub-regulation (3).
5. Before the enquiry officer, the stock-broker may either appear in person or through any person duly authorised on his behalf:

   Provided that no lawyer or advocate shall be permitted to represent the stock-broker at the enquiry:

   Provided further that where a lawyer or an advocate has been appointed by the Board as a presenting officer under sub-regulation (6), it shall be lawful for the stock-broker to present his case through a lawyer or advocate.
6. If it is considered necessary, the enquiry officer may request the Board to appoint a presenting officer to present its case.
7. The enquiry officer shall, after taking into account all relevant facts and submissions made by the stock-broker, submit a report to the Board and recommend the penalty to be awarded as also on the justification of the penalty proposed in the notice.

29. Show-cause notice and order

1. On receipt of the report from the enquiry officer, the Board shall consider the same and issue a show-cause notice as to why the penalty as it considers appropriate should not be imposed.
2. The stock-broker shall within twenty-one days of the date of the receipt of the show-cause send a reply to the Board.
3. The Board after considering the reply to the show-cause notice, if received, shall as soon as possible but not later than thirty days from the receipt of the reply, if any, pass such order as it deems fit.
4. Every order passed under sub-regulation (3) shall be self-contained and give reasons for the conclusions stated therein including justification of the penalty imposed by that order.
5. The Board shall send a copy of the order under sub-regulation (3) to the stock-broker, stock exchange of which the stock-broker is the member.

30. Effect of suspension and cancellation of registration of stock- the stock-broker

1. On and from the date of the suspension of broker he shall cease to buy, sell or deal in securities as a stock-broker during the period of suspension.
2. On and from the date of cancellation, the stock-broker shall with immediate effect cease to buy sell or deal in securities as a stock-broker.

31. Publication of order of suspension

The order of suspension or cancellation of certificate passed in sub- regulation (3) of regulation 29 shall be published in atleast two daily newspapers by the Board.

32. Appeal to the Securities Appellate Tribunal

Any person aggrieved by an order of the Board made, on and after the commencement of the Securities Laws (Second Amendment) Act, 1999, (i.e., after 16th December 1999), under these regulations may prefer an appeal to a Securities Appellate Tribunal having jurisdiction in the matter.

Appendix – B

The Securities Contracts (Regulation) Act, 1956 (Act No. 42 of 1956)

An Act to prevent undesirable transactions in securities by regulating the business of dealing therein, [***][1] by providing for certain other matters connected therewith.

Be it enacted by Parliament in the Seventh Year of the Republic of India as follows:

Preliminary

1. Short title, extent and commencement

1. This Act may be called the Securities Contracts (Regulation) Act, 1956.
2. It extends to the whole of India.
3. It shall come into force on such date as the Central Government may, by notification in the Official Gazette appoint.[2]

2. Definitions

In this Act, unless the context otherwise requires,-

a. "contract" means a contract for or relating to the purchase or sale of securities;

a "derivative" includes -

A. a security derived from a debt instrument, share, loan whether secured or unsecured, risk instrument or contract for differences or any other form of security;

B. a contract which derives its value from the prices, or index or prices, of underlying securities.[3]

b. "Government security" means a security created and issued, whether before or after the commencement of this Act, by the Central Government or a State Government for the purpose of raising a public loan and having one of the forms specified in clause (2) of section 2 of the Public Debt Act, 1944 (18 of 1944);

c. "member" means a member of a recognised stock exchange;

d. "option in securities" means a contract for the purchase or sale of a right to buy or sell, or a right to buy and sell, securities in future, and includes a teji, a mandi, a teji mandi, a galli, a put, a call or a put and call in securities;

e. "prescribed" means prescribed by rules made under this Act;

f. "recognised stock exchange" means a stock exchange which is for the time being recognised by the Central Government under section 4;

g. "rules", with reference to the rules relating in general to the constitution and management of a stock exchange, includes, in the case of a stock exchange which is an incorporated association, its memorandum and articles of association :

a. "Securities Appellate Tribunal" means a Securities Appellate Tribunal established under sub-section (1) of section 15K of the Securities and Exchange Board of India Act, 1992.[4]

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1 The words "by prohibiting options and" omitted by the Securities Laws (amendment) Act, 1995, w.e.f. 25-3-1995.

2 The Act came into force on 20 February, 1957 vide Notification No. SRO 528, dated 6 February, 1957 published in Gazette of India, Extraordinary, Part II, section 3 page 549, dated 16 February, 1957.

3 Inserted by Securities Laws (Second Amendment) Act, 1999 vide Gazette notification dated December 16, 1999.

4 Ibid

h. "Securities" include-

i. shares, scrips, stocks, bonds, debentures, debenture stock or other marketable securities of a like nature in or of any incorporated company or other body corporate;

a. derivative;

b. units or any other instrument issued by any collective investment scheme to the investors in such schemes;[5]

ii. Government securities;

a. such other instruments as may be declared by the Central Government to be securities; and[6]

iii. rights or interests in securities;

[(i). spot delivery contract means a contract which provides for, –

a. actual delivery of securities and the payment of a price therefor either on the same day as the date of the contract or on the next day, the actual period taken for the despatch of the securities or the remittance of money therefor through the post being excluded from the computation of the period aforesaid if the parties to the contract do not reside in the same town or locality;

b. transfer of the securities by the depository from the account of a beneficial owner to the account of another beneficial owner when such securities are dealt with by a depository;][7]

j. "stock exchange" means any body of individuals, whether incorporated or not, constituted for the purpose of assisting, regulating or controlling the business of buying, selling or dealing in securities.

2A. Words and expressions used herein and not defined in this Act but defined in the Companies Act, 1956 or the Securities and Exchange Board of India Act, 1992 or the Depositories Act, 1996 shall have the same meanings respectively assigned to them in those Acts.[8]

CHAPTER II

RECOGNISED STOCK EXCHANGES

3. Application for recognition of stock exchanges

1. Any stock exchange, which is desirous of being recognised for the purposes of this Act may make an application in the prescribed manner to the Central Government.

2. Every application under sub-section (1) shall contain such particulars as may be prescribed, and shall be accompanied by a copy of the bye-laws of the stock exchange for the regulation and control of contracts and also a copy of the rules relating in general to the constitution of the stock exchange and in particular, to-

a. the governing body of such stock exchange, its constitution and powers of management and the manner in which its business is to be transacted;

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5 Ibid

6 substituted for "(ii) Government Securities; and" by the Securities and Exchange Board of India Act, 1992, w.e.f. 30-1-1992.

7 Substituted for the following:
i. "spot delivery contract" means a contract which provides for the actual delivery of securities and the payment of a price therefore either on the same day as the date of the contract or on the next day, the actual period taken for the dispatch of the securities or the remittance of money therefore through the post being excluded from the computation of the period aforesaid if the parties to the contract do not reside in the same town or locality"; by the Depositories Act, 1996 (22 of 1996), w.e.f. 12-8-1996

8 supra n.3

b. the powers and duties of the office bearers of the stock exchange;

c. the admission into the stock exchange of various classes of members, the qualifications, for membership, and the exclusion, suspension, expulsion and re-admission of members therefrom or thereinto;

d. the procedure for the registration of partnerships as members of the stock exchange in cases where the rules provide for such membership; and the nomination and appointment of authorised representatives and clerks.

4. Grant of recognition to stock exchanges

1. If the Central Government is satisfied, after making such inquiry as may be necessary in this behalf and after obtaining such further information, if any, as it may require:

   a. that the rules and bye-laws of a stock exchange applying for registration are in conformity with such conditions as may be prescribed with a view to ensure fair dealing and to protect investors;

   b. that the stock exchange is willing to comply with any other conditions (including conditions as to the number of members) which the Central Government, after consultation with the governing body of the stock exchange and having regard to the area served by the stock exchange and its standing and the nature of the securities dealt with by it, may impose for the purpose of carrying out the objects of this Act; and

   c. that it would be in the interest of the trade and also in the public interest to grant recognition to the stock exchange;

   it may grant recognition to the stock exchange subject to the conditions imposed upon it as aforesaid and in such form as may be prescribed.

2. The conditions which the Central Government may prescribe under clause (a) of sub-section (1) for the grant of recognition to the stock exchanges may include, among other matters, conditions relating to –

   i. the qualifications for membership of stock exchanges;

   ii. the manner in which contracts shall be entered into and enforced as between members;

   iii. the representation of the Central Government on each of the stock exchanges by such number of persons not exceeding three as the Central Government may nominate in this behalf; and

   iv. the maintenance of accounts of members and their audit by chartered accountants whenever such audit is required by the Central Government.

3. Every grant of recognition to a stock exchange under this section shall be published in the Gazette of India and also in the Official Gazette of the State in which the principal office as of the stock exchange is situate, and such recognition shall have effect as from the date of its publication in the Gazette of India.

4. No rules of a recognised stock exchange relating to any of the matters specified in sub-section (2) of section 3 shall be amended except with the approval of the Central Government.

5. Withdrawal of recognition

If the Central Government is of the opinion that the recognition granted to a stock exchange under the provisions of this Act should, in the interest of the trade or in the public interest, be withdrawn, the Central Government may serve on the governing body of the stock exchange a written notice that the Central Government is considering the withdrawal of the recognition for the reasons stated in the notice and after giving an opportunity to the governing body to be heard in the matter, the Central Government may withdraw, by notification in the Official Gazette, the recognition granted to the stock exchange:

Provided that no such withdrawal shall affect the validity of any contract entered into or made before the date of the notification, and the Central Government may, after consultation with the stock exchange, make such provision as it deems fit in the notification of withdrawal or in any subsequent notification similarly published for the due performance of any contracts outstanding on that date.

6. Power of Central Government to call for periodical returns or direct inquiries to be made

1. Every recognised stock exchange shall furnish to the [Securities and Exchange Board of India][9] such periodical returns relating to its affairs as may be prescribed.
2. Every recognised stock exchange and every member thereof shall maintain and preserve for such periods not exceeding five years such books of account, and other documents as the Central Government, after consultation with the stock exchange concerned, may prescribe in the interest of the trade or in the public interest, and such books of account, and other documents shall be subject to inspection at all reasonable times by the [Securities and Exchange Board of India][10]
3. Without prejudice to the provisions contained in sub-sections (1) and (2), the [Securities and Exchange Board of India][11], if it is satisfied that it is in the interest of the trade or in the public interest so to do, may, by order in writing,–
    a. call upon a recognised stock exchange or any member thereof to furnish in writing such information or explanation relating to the stock exchange as the [Securities and Exchange Board of India][12] may require; or
    b. appoint one or more persons to make an inquiry in the prescribed manner in relation to the affairs of any of the members of the stock exchange in relation to the stock exchange and submit a report of the result of such inquiry to the [Securities and Exchange Board of India][13]
4. Where an inquiry in relation to the affairs of a recognised stock exchange or the affairs of any of its members in relation to the stock exchange has been undertaken under sub-section (3), –
    a. every director, manager, secretary or other officer of such stock exchange;
    b. every member of such stock exchange;
    c. if the member of the stock exchange is a firm, every partner, manager, secretary or other officer of the firm; and

9 Substituted for 'Central Government' by the Securities and exchange Bourd of India Act, 1992, w.e.f. 30-1-1992.
10 Ibid
11 Ibid
12 Ibid
13 Ibid

d. every other person or body of persons who has had dealings in the course of business with any of the persons mentioned in clauses (a), (b) and (c) whether directly or indirectly; shall be bound to produce before the authority making the inquiry all such books of account, and other documents in his custody or power relating to or having a bearing on the subject-matter of such inquiry and also to furnish the authorities within such time as may be specified with any such statement or information relating thereto as may be required of him.

7. Annual reports to be furnished to Central Government by stock exchanges

Every recognised stock exchange shall furnish the Central Government with a copy of the annual report, and such annual report shall contain such particulars as may be prescribed.

7(A) Power of recognised stock exchange to make rules restricting voting rights, etc.

1. A recognised stock exchange may make rules or amend any rules made by it to provide for all or any of the following matters, namely:
   a. the restriction of voting rights to members only in respect of any matter placed before the stock exchange at any meeting;
   b. the regulation of voting rights in respect of any matter placed before the stock exchange at any meeting so that each member may be entitled to have one vote only, irrespective of his share of the paid-up equity capital of the stock exchange;
   c. the restriction on the right of a member to appoint another person as his proxy to attend and vote at a meeting of the stock exchange; and
   d. such incidental, consequential and supplementary matters as may be necessary to give effect to any of the matters specified in clauses (a), (b) and (c).
2. No rules of a recognised stock exchange made or amended in relation to any matter referred to in clauses (a) to (d) of sub-section (1) shall have effect until they have been approved by the Central Government and published by that Government in the Official Gazette and, in approving the rules so made or amended, the Central Government may make such modifications therein as it thinks fit, and on such publication, the rules as provided by the Central Government shall be deemed to have been validly made, notwithstanding anything to the contrary contained in the Companies Act, 1956 (1 of 1956).

8. Power of Central Government to direct rules to be made or to make rules

1. Where, after consultation with the governing bodies of stock exchanges generally or with the governing body of any stock exchange in particular, the Central Government is of the opinion that it is necessary or expedient so to do, it may, by order in writing together with a statement of the reasons therefor, direct recognised stock exchanges generally or any recognised stock exchange in particular, as the case may be, to make any rules or to amend any rules already made in respect of all or any of the matters specified in sub-section (2) of section 3 within a period of [two months][14] from the date of the order.

14 Substituted by the Securities Laws (Amendment) Act, 1995, w.e.f. 25-3-1995 for "six months".

2. If any recognised stock exchange fails or neglects to comply with any order made under sub-section (1) within the period specified therein, the Central Government may make the rules for, or amend the rules made by, the recognised stock exchange, either in the form proposed in the order or with such modifications thereof as may be agreed to between the stock exchange and the Central Government.

3. Where in pursuance of this section any rules have been made or amended, the rules so made or amended shall be published in the Gazette of India and also in the Official Gazette or Gazettes of the State or States in which the principal office or offices of the recognised stock exchange or exchanges is or are situate, and, on the publication thereof in the Gazette of India, the rules so made or amended shall, notwithstanding anything to the contrary contained in the Companies Act, 1956 (1 of 1956), or in any other law for the time being in force, have effect as it they had been made or amended by the recognised stock exchange or stock exchanges, as the case may be.

9. Power of recognised stock exchange to make bye-laws

1. Any recognised stock exchange may, subject to the previous approval of the [Securities and Exchange Board of India],[15] make bye-laws for the regulation and control of contracts.

2. In particular, and without prejudice to the generality of the foregoing power, such bye-laws may provide for:

   a. the opening and closing of markets and the regulation of the hours of trade;

   b. a clearing house for the periodical settlement of contracts and differences thereunder, the delivery of and payment for securities, the passing on of delivery orders and the regulation and maintenance of such clearing house;

   c. the submission to the [Securities and Exchange Board of India][16] by the clearing house as soon as may be after each periodical settlement of all or any of the following particulars as the [Securities and Exchange Board of India][17] may, from time to time require, namely:

      i. the total number of each category of security carried over from one settlement period to another.

      ii. the total number of each category of security, contracts in respect of which have been squared up during the course of each settlement period.

      iii. the total number of each category of security actually delivered at each clearing;

   d. the publication by the clearing house of all or any of the particulars submitted to the [Securities and Exchange Board of India][18] under clause (c) subject to the directions, if any, issued by the [Securities and Exchange Board of India][19] in this behalf;

   e. the regulation or prohibition of blank transfers;

15 Substituted for "Central Government" by the Securities and Exchange Board of India Act, 1992, w.e.f. 30-1-1992.
16 Ibid
17 Ibid
18 Ibid
19 Ibid

f. the number and classes of contracts in respect of which settlements shall be made or differences paid through the clearing house;

g. the regulation, or prohibition of badlas or carry-over facilities;

h. the fixing, altering or postponing of days for settlements;

i. the determination and declaration of market rates, including the opening, closing, highest and lowest rates for securities;

j. the terms, conditions and incidents of contracts, including the prescription of margin requirements, if any, and conditions relating thereto, and the forms of contracts in writing;

k. the regulation of the entering into, making, performance, rescission and termination, of contracts, including contracts between members or between a member and his constituent or between a member and a person who is not a member, and the consequences of default or insolvency on the part of a seller or buyer or intermediary, the consequences of a breach or omission by a seller or buyer, and the responsibility of members who are not parties to such contracts;

l. the regulation of taravani business including the placing of limitations thereon;

m. the listing of securities on the stock exchange, the inclusion of any security for the purpose of dealings and the suspension or withdrawal of any such securities, and the suspension or prohibition of trading in any specified securities;

n. the method and procedure for the settlement of claims or disputes, including settlement by arbitration;

o. the levy and recovery of fees, fines and penalties;

p. the regulation of the course of business between parties to contracts in any capacity;

q. the fixing of a scale of brokerage and other charges;

r. the emergencies in trade which may arise, whether as a result of pool or syndicated operations or cornering or otherwise, and the exercise of powers in such emergencies including the power to fix maximum and minimum prices for securities;

s. the regulation of dealings by members for their own account;

t. the separation of the functions of jobbers and brokers;

u. the limitations on the volume of trade done by any individual member in exceptional circumstances;

v. the obligation of members to supply such information or explanation and to produce such documents relating to the business as the governing body may require.

3. The bye-laws made under this section may:

a. specify the bye-laws, the contravention of which shall make a contract entered into otherwise than in accordance with the bye-laws void under sub-section (1) of section 14;

b. provide that the contravention of any of the bye-laws shall render the member concerned liable to one or more of the following punishments, namely:

i. fine,

ii. expulsion from membership,

iii. suspension from membership for a specified period,

iv. any other penalty of a like nature not involving the payment of money.

4. Any bye-laws made under this section shall be subject to such conditions in regard to previous publication as may be prescribed, and, when approved by the [Securities and Exchange Board of India][20] shall be published in the Gazette of India and also in the Official Gazette of the State in which the principal office of the recognised stock exchange is situate, and shall have effect as from the date of its publication in the Gazette of India: Provided that if the [Securities and Exchange Board of India][21] is satisfied in any case that in the interest of the trade or in the public interest any bye-laws should be made immediately, it may, by order in writing specifying the reasons therefor, dispense with the condition of previous publication.

10. Power of [Securities and Exchange Board of India][22] to make or amend bye-laws of recognised stock exchanges

1. The [Securities and Exchange Board of India][23] may, either on a request in writing received by it in this behalf from the governing body of a recognised stock exchange or on its own motion, if it is satisfied after consultation with the governing body of the stock exchange that it is necessary or expedient so to do and after recording its reasons for so doing, make bye-laws, for all or any of the matters specified in section 9 or amend any bye-laws made by such stock exchange under that section.

2. Where in pursuance of this section any bye-laws have been made or amended, the bye-laws so made or amended shall be published in the Gazette of India and also in the Official Gazette of the State in which the principal office of the recognised stock exchange is situate, and on the publication thereof in the Gazette of India, the bye-laws so made or amended shall have effect as if they had been made or amended by the recognised stock exchange concerned.

3. Notwithstanding anything contained in this section, where the governing body of a recognised stock exchange objects to any bye-laws made or amended under this section by the [Securities and Exchange Board of India][24] on its own motion, it may, within [two months][25] of the publication thereof in the Gazette of India under sub-section (2), apply to the [Securities and Exchange Board of India][26] for revision thereof the [Securities and Exchange Board of India][27] may, after giving an opportunity to the governing body of the stock exchange to be heard in the matter, revise the bye-laws so made or amended, and where any bye-laws so made or amended are revised as a result of any action taken under this sub-section, the bye-laws so revised shall be published and shall become effective as provided in sub-section (2).

4. The making or the amendment or revision of any bye-laws under this section shall in all cases be subject to the condition of previous publication:

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20 Ibid
21 Ibid
22 Ibid
23 Ibid
24 Ibid
25 Substituted by the Securities Laws (Amendment) Act, 1995, w.e.f. 25-1-1995 for "six months".
26 supra n. 13
27 Ibid

Provided that if the [Securities and Exchange Board of India][28] is satisfied in any case that in the interest of the trade or in the public interest any bye-laws should be made, amended or revised immediately, it may, by order in writing specifying the reasons therefor, dispense with the condition of previous publication.

11. Power of Central Government to supersede governing body of a recognised stock exchange

1. Without prejudice to any other powers vested in the Central Government under this Act, where the Central Government is of the opinion that the governing body of any recognised stock exchange should be superseded, then, not withstanding anything contained in any other law for the time being in force, the Central Government may serve on the governing body a written notice that the Central Government is considering the supersession of the governing body for the reasons specified in the notice and after giving an opportunity to the governing body to be heard in the matter, it may, by notification in the Official Gazette declare the governing body of such stock exchange to be superseded, and may appoint any person or persons to exercise and perform all the powers and duties of the governing body, and, and where more persons than one are appointed, may appoint one of such persons to be the chairman and another to be the vice-chairman thereof.
2. On the publication of a notification in the Official Gazette under sub-section (1), the following consequences shall ensue, namely:-
   a. the members of the governing body which has been superseded shall, as from the date of the notification of supersession, cease to hold office as such members;
   b. the person or persons appointed under sub-section (1) may exercise and perform all the powers and duties of the governing body which has been superseded;
   c. all such property of the recognised stock exchange as the person or persons appointed under sub-section (1) may, by order in writing, specify in this behalf as being necessary for the purpose of enabling him or them to carry on the business of the stock exchange, shall vest in such person or persons.
3. Notwithstanding anything to the contrary contained in any law or the rules or bye-laws of the recognised stock exchange the governing body of which is superseded under sub-section (1), the person or persons appointed under that sub-section shall hold office for such period a may be specified in the notification published under that sub-section and, the Central Government may from time to time, by like notification, vary such period.
4. The Central Government may at any time before the determination of the period of office of any person or persons appointed under this section call upon the recognised stock exchange to reconstitute the governing body in accordance with its rules and on such re-constitution all the property of the recognised stock exchange which has vested in, or was in the possession of, the person or persons appointed under sub-section (1), shall re-vest, as the case may be, in the governing body so re- constituted:

Provided that until a governing body is so re-constituted, the person or persons appointed under sub-section (1), shall continue to exercise and perform their powers and duties.

28 Ibid

12. Power to suspend business of recognised stock exchanges

If in the opinion of the Central Government an emergency has arisen and for the purpose of meeting the emergency the Central Government considers it expedient so to do, it may, by notification in the Official Gazette, for reasons to be set out therein, direct a recognised stock exchange to suspend such of its business for such period not exceeding seven days and subject to such conditions as may be specified in the notification, and if, in the opinion of the Central Government, the interest of the trade or the public interest requires that the period should be extended may, by like notification extend the said period from time to time.

Provided that where the period of suspension is to be extended beyond the first period, no notification extending the period of suspension shall be issued unless the governing body of the recognised stock exchange has been given an opportunity of being heard in the matter.

CHAPTER III

CONTRACTS AND OPTIONS IN SECURITIES

13. Contracts in notified areas illegal in certain circumstances

If the Central Government is satisfied, having regard to the nature or the volume of transactions in securities in any State or area, that it is necessary so to do, it may, by notification in the Official Gazette, declare this section to apply to such State or area, and thereupon every contract in such State or area which is entered into after date of the notification otherwise than between members of a recognised stock exchange in such State or area or through or with such member shall be illegal.

13(A) Additional trading floor

A stock exchange may establish additional trading floor with the prior approval of the Securities and Exchange Board of India in accordance with the terms and conditions stipulated by the said Board.

Explanation: For the purposes of this section 'additional trading floor' means a trading ring or trading facility offered by a recognised stock exchange outside its area of operation to enable the investors to buy and sell securities through such trading floor under the regulatory framework of the [stock exchange.][29]

14. Contracts in notified areas to be void in certain circumstances

1. Any contract entered into in any State or area specified in the notification under section 13 which is in contravention of any of the bye-laws specified in that behalf under clause (a) of sub-section (3) of section 9 shall be void:
   - i. as respects the rights of any member of the recognised stock exchange who has entered into such contract in contravention of any such bye-laws, and also
   - ii. as respects the rights of any other person who has knowingly participated in the transaction entailing such contravention.
2. Nothing in sub-section (1) shall be construed to affect the right of any person other than a member of the recognised stock exchange to enforce any such contract or to recover any sum under or in respect of such contract if such person had no knowledge that the transaction was in contravention of any of the bye-laws specified in clause (a) of sub-section (3) of section 9.

29 Inserted by the Securities Laws (Amendment) Act, 1995, w.e.f. 25-1-1995.

15. Members may not act as principals in certain circumstances

No member of a recognised stock exchange shall in respect of any securities enter into any contract as a principal with any person other than a member of a recognised stock exchange, unless he has secured the consent or authority of such person and discloses in the note, memorandum or agreement of sale or purchase that he is acting as a principal:

Provided that where the member has secured the consent or authority of such person otherwise than in writing he shall secure written confirmation by such person of such consent or authority within three days from the date of the contract:

Provided further that no such written consent or authority of such person shall be necessary for closing out any outstanding contract entered into by such person in accordance with the bye-laws, if the member discloses in the note, memorandum or agreement of sale or purchase in respect of such closing out that he is acting as a principal.

16. Power to prohibit contracts in certain cases

1. If the Central Government is of opinion that it is necessary to prevent undesirable speculation in specified securities in any State or area, it may, by notification in the Official Gazette, declare that no person in the State or area specified in the notification shall, save with the permission of the Central Government, enter into any contract for the sale or purchase of any security specified in the notification except to the extent and in the manner, if any, specified therein.
2. All contracts in contravention of the provisions of sub-section (1) entered into after the date of the notification issued thereunder shall be illegal.

17. Licensing of dealers in securities in certain cases

1. Subject to the provision of sub-section (3) and to the other provisions contained in this Act, no person shall carry on or purport to carry on, whether on his own behalf or on behalf of any other person, the business of dealing in securities in any State or area to which section 13 has not been declared to apply and to which the Central Government may, by notification in the Official Gazette declare this section to apply, except under the authority of a licence granted by the [Securities and Exchange Board of India][30] in this behalf.
2. No notification under sub-section (1) shall be issued with respect to any State or area unless the Central Government is satisfied, having regard to the manner in which securities are being dealt with in such State or area, that it is desirable or expedient in the interest of the trade or in the public interest that such dealings should be regulated by a system of licensing.
3. The restrictions imposed by sub-section (1) in relation to dealings in securities shall not apply to the doing of anything by or on behalf of a member of any recognised stock exchange.

18. Exclusion of spot delivery contracts from sections 13, 14, 15 and 17

1. Nothing contained in sections 13, 14, 15 and 17 shall apply to spot delivery contracts.
2. Notwithstanding anything contained in sub-section (1), if the Central Government is of opinion that in the interest of the trade or in the public

30 supra n. 9

interest it is expedient to regulate and control the business of dealing in spot delivery contracts also in any State or are (whether section 13 has been declared to apply to that State or area or not), it may, by notification in the Official Gazette, declare that the provisions of section 17 shall also apply to such State or area in respect of spot delivery contracts generally or in respect of spot delivery contract for the sale or purchase of such securities as may be specified in the notification, and may also specify the manner in which, and the extent to which, the provision of that section shall so apply.

18(A) Notwithstanding anything contained in any other law for the time being in force, contracts are –

a. traded on a recognised stock exchange;

b. settled on the clearing house of the recognised stock exchange,in accordance with the rules and bye-laws of such stock exchange.[31]

19. Stock exchanges other than recognised stock exchanges prohibited

1. No person shall, except with the permission of the Central Government, organise or assist in organising or be a member of any stock exchange (other than a recognised stock exchange) for the purpose of assisting in, entering into or performing any contracts in securities.

2. This section shall come into force in any State or area on such date, as the Central Government may, by notification in the Official Gazette, appoint.

20. Prohibition of options in securities

[Omitted by the Securities Laws (Amendment) Act, 1995, w.e.f. 25- 1-1995][32]

CHAPTER IV

LISTING OF SECURITIES [****][33]

21. Conditions for listing

Where securities are listed on the application of any person in any recognised stock exchange, such person shall comply with the conditions of the listing agreement with that stock exchange.[34]

22. Right of appeal against refusal of stock exchanges to list securities of public companies

Where a recognised stock exchange acting in pursuance of any power given to it by its bye-laws, refuses to list the securities of any public company or collective investment scheme[35] the company or scheme[36] shall be entitled to be furnished with reasons for such refusal, any may,–

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31 supra n. 3

32 Prior to omission it read as under: "20 Prohibition of options in securities-
1. Notwithstanding anything contained in this Act or in any other law for the time being in force, all options in securities entered into after the commencement of this Act shall be illegal.
2. Any option in securities which has been entered into before such commencement and which remains to be performed whether wholly or in part, after such commencement, shall to that extent, become void".

33 "By public companies" omitted by Securities Laws (Second Amendment) Act, 1999. w.e.f. 16.12.1999

34 Substituted by the Securities Laws (Amendment) Act, 1995, w.e.f. 25-1-1995 for the following: "21. Power to compel listing of securities by public companies-Notwithstanding anything contained in any other law for the time being in force, if the Securities and Exchange Board of India is of opinion, having regard to the nature of the securities issued by any public company as defined in the Companies Act, 1956 (1 of 1956), or to the dealings in them, that it is necessary or expedient in the interest of the trade or in the public interest so to do, it may require the company, after giving it an opportunity of being heard in the matter, to comply with such requirements as may be prescribed with respect to the listing of its securities on any recognized stock exchange".

35 Supra n. 3

36 Ibid

a. within fifteen days from the date on which the reasons for such refusal are furnished to it, or

b. where the stock exchange has omitted or failed to dispose of, within the time specified in sub-section (1) of section 73 of the Companies Act, 1956 (1 of 1956) (hereafter in this section referred to as the "specified time"), the application for permission for the shares or debentures to be dealt with on the stock exchange, within fifteen days from the date of expiry of the specified time or within such further period, not exceeding one month, as the Central Government may, on sufficient cause being shown, allow, appeal to the Central Government against such refusal, omission or failure, as the case may be, and thereupon the Central Government may, after giving the Stock Exchange an opportunity of being heard,–

   i. vary or set aside the decision of the stock exchange; or

   ii. where the stock exchange has omitted or failed to dispose of the application within the specified time, grant or refuse the permission,and where the Central Government sets aside the decision of the recognised stock exchange or grants the permission, the stock exchange shall act in conformity with the orders of the Central Government.

Provided that no appeal shall be preferred against refusal, omission or failure, as the case may be, under this section on and after the commencement of the Securities Laws (Second Amendment) Act, 1999.[37]

22(A). Right of Appeal to Securities Appellate Tribunal against refusal of stock exchange to list securities of public companies

1. Where a recognised stock exchange, acting in pursuance of any power given to it by its bye-laws, refuses to list the securities of any public company, the company shall be entitled to be furnished with reasons for such refusal, and may, –

   a. within fifteen days from the date on which the reasons for such refusal are furnished to it, or

   b. where the stock exchange has omitted or failed to dispose of, within the time specified in sub-section (1A) of section 73 of the Companies Act, 1956 (hereafter in this section referred to as the "specified time"), the application for permission for the shares or debentures to be dealt with on the stock exchange, within fifteen days from the date of expiry of the specified time or within such further period, not exceeding one month, as the Securities Appellate Tribunal may, on sufficient cause being shown, allow,appeal to the Securities Appellate Tribunal having jurisdiction in the matter against such refusal, omission or failure, as the case may be, and thereupon the Securities Appellate Tribunal may, after giving the stock exchange, an opportunity of being heard, –

      i. vary or set aside the decision of the stock exchange; or

      ii. where the stock exchange has omitted or failed to dispose of the application within the specified time, grant or refuse the permission, and where the Securities Appellate Tribunal sets aside the decision of the recognised stock exchange or grants the permission, the stock exchange shall act in conformity with the orders of the Securities Appellate Tribunal.

37 Inserted by Securities Laws (Second Amendment) Act, 1999 vide Gazette Notification dated December 16, 1999

2. Every appeal under sub-section (1) shall be in such form and be accompanied by such fee as may be prescribed.
3. The Securities Appellate Tribunal shall send a copy of every order made by it to the Board and parties to the appeal.
4. The appeal filed before the Securities Appellate Tribunal under sub-section (1) shall be dealt with by it as expeditiously as possible and endeavour shall be made by it to dispose of the appeal finally within six months from the date of receipt of the appeal.[38]

22(B). Procedure and powers of Securities Appellate Tribunal

1. The Securities Appellate Tribunal shall not be guided by the principles of natural justice and, subject to the other provisions of this Act and of any rules, the Securities Appellate Tribunal shall have powers to regulate their own procedure including the places at which they shall have their sittings.
2. The Securities Appellate Tribunal shall have for the purpose of discharging their functions under this Act, the same powers as are vested in a civil court under the Code of Civil Procedure, 1908, while trying a suit, in respect of the following matters, namely:-
   a. summoning and enforcing the attendance of any person and examining him on oath;
   b. requiring the discovery and production of documents;
   c. receiving evidence on affidavits;
   d. issuing commissions for the examination of witnesses or documents;
   e. reviewing its decisions;
   f. dismissing an application for default or deciding it ex-parte;
   g setting aside any order of dismissal of any application for default or any order passed by it ex-parte; and
   h. any other matter which may be prescribed.
3. Every proceeding before Securities Appellate Tribunal shall be deemed to be a judicial proceeding, within the meaning of sections 193 and 228, and for the purposes of section 196 of the Indian Penal Code and the Securities Appellate Tribunal shall be deemed to be a civil court for all the purposes of section 195 and Chapter XXVI of the Code of Criminal Procedure, 1973.[39]

22(C). Right to legal representations

The appellant may either appear in person or authorise one or more chartered accountants or company secretaries or cost accountants or legal practitioners or any of its officers or present his or its case before the Securities Appellate Tribunal.

Explanation. – For the purposes of this section, –

a. "chartered accountant" means a chartered accountant as defined in clause (b) of sub-section (1) of section 2 of the Chartered Accountants Act, 1949 and who has obtained a certificate of practice under sub-section (1) of section 6 of that Act;
b. "company secretary" means a company secretary as defined in clause (c) of sub-section (1) of section 2 of the Company Secretaries Act, 1980 and who has obtained a certificate of practice under sub-section (1) of section 6 of that Act;

38 Inserted by Securities Laws (Second Amendment) Act, 1999 vide Gazette Notification dated December 16, 1999
39 Inserted by Securities Laws (Second Amendment) Act, 1999 vide Gazette Notification dated December 16, 1999

c. "cost accountant" means a cost accountant as defined in clause (b) of sub-section (1) of section 2 of the Cost and Works Accountants Act, 1959 and who has obtained a certificate of practice under sub-section (1) of section 6 of that Act;

d. "legal practitioner" means an advocate, vakil or an attorney of any High Court, and includes a pleader in practice[40]

22(D). Limitation

The provisions of the Limitation Act, 1963 shall as far as may be apply to an appeal made to a Securities Appellate Tribunal.[41]

22(E). Civil court not to have jurisdiction

No civil court shall have jurisdiction to entertain any suit or proceeding in respect of any matter which a Securities Appellate Tribunal is empowered by or under this Act to determine and no injunction shall be granted by any court or other authority in respect of any action taken or to be taken in pursuance of any power conferred by or under this Act.[42]

22(F). Appeal to High Court

Any person aggrieved by any decision or order of the Securities Appellate Tribunal may file an appeal to the High Court within sixty days from the date of communication of the decision or order of the Securities Appellate Tribunal on any question of fact or law arising out of such order;

Provided that the High Court may, if it is satisfied that the appellant was prevented by sufficient cause from filing the appeal within the said period, allow it to be filed within a further period not exceeding sixty days.[43]

CHAPTER V

PENALTIES AND PROCEDURES

23. Penalties

1. Any person who –

   a. without reasonable excuse (the burden of proving which shall be on him) fails to comply with any requisition made under sub-section (4) of section 6; or

   b. enters into any contract in contravention of any of the provisions contained in section 13 or section 16; or

   c. contravenes the provisions contained in section 17 or section 19; or

   d. enters into any contract in derivative in contravention of section 18 A or the rules made under section 30.[44]

   e. owns or keeps a place other than that of a recognised stock exchange which is used for the purpose of entering into or performing any contracts in contravention of any of the provisions of this Act and knowingly permits such place to be used for such purposes; or

   f. manages, controls, or assists in keeping any place other than that of a recognised stock exchange which is used for the purpose of entering into or performing any contracts in contravention of any

40 Ibid
41 Ibid.
42 Ibid
43 Ibid
44 44 Inserted by Securities Laws (Second Amendment) Act, 1999 vide Gazette Notification dated December 16, 1999. Clause (d) was earlier omitted by the Secondary Laws (Amendment) Act, 1995, w.e.f. 25-1-1995. Prior to omission it read as under: "(d) enters into any option in securities in contravention of the provisions contained in section 20;" or willfully represents to or induces any person to believe that contracts can be entered into or performed under this Act through him; or

of the provisions of this Act or at which contracts are recorded or adjusted or rights or liabilities arising out of contracts are adjusted, regulated or enforced in any manner whatsoever; or

g. not being a member of a recognised stock exchange or his agent authorised as such under the rules or bye-laws of such stock exchange or not being a dealer in securities licensed under section 17

h. not being a member of a recognised stock exchange or his agent authorised as such under the rules or bye-laws of such stock exchange or not being a dealer in securities licensed under section 17, canvasses, advertises or touts in any manner either for himself or on behalf of any other person for any business connected with contracts in contravention of any of the provisions of this Act; or

i. joins, gathers or assists in gathering at any place other than the place of business specified in the bye-laws of a recognised stock exchange any person or persons for making bids or offers or for entering into or performing any contracts in contravention of any of the provisions of this Act; shall, on conviction, be punishable with imprisonment for a term which may extend to one year, or with fine, or with both.

2. Any person who enters into any contract in contravention of the provisions contained in section 15 [or who fails to comply with the provisions of section 21 or with the orders of][45] the Central Government under section 22 or with the orders of the Securities Appellate Tribunal shall[46] on conviction, be punishable with fine which may extend to one thousand rupees.

24. Offences by companies

1. Where an offence has been committed by a company, every person who, at the time when the offence was committed, was incharge of, and was responsible to, the company for the conduct of the business of the company, as well as the company, shall be deemed to be guilty of the offence, and shall be liable to be proceeded against and punished accordingly:

   Provided that nothing contained in this sub-section shall render any such person liable to any punishment provided in this Act, if he proves that the offence was committed without his knowledge or that he exercised all due diligence to prevent the commission of such offence.

2. Notwithstanding anything contained in sub-section(1), where an offence under this Act has been committed by a company and it is proved that the offence has been committed with the consent or connivance of, or is attributable to any gross negligence on the part of any director, manager, secretary or other officer of the company, such director, manager, secretary or other officer of the company, shall also be deemed to be guilty of that offence and shall be liable to be proceeded against and punished accordingly.

   Explanation:

   For the purpose of this section, –

   a. "company" means any body corporate and includes a firm or other association of individuals, and

   b. "director", in relation to –

      i. a firm, means a partner in the firm;

45 Substituted for "or who fails to comply with the orders of the Securities and Exchange Board of India under section 21" by the Securities Laws (Amendment) Act, 1995. w.e.f. 25-1-1995.

46 Inserted by the Securities Laws (Second Amendment) Act, 1999 vide Gazette Notification dated December 16, 1999.

ii. any association of persons or a body of individuals, means any member controlling the affairs thereof.[47]

3. The provisions of this section shall be in addition to, and not in derogation of, the provisions of section 22A[48]

25. Certain offences to be cognizable

Notwithstanding anything contained in the [Code of Criminal Procedure, 1898 (5 of 1898)][49] any offence punishable under sub-section (1) of section 23, shall be deemed to be a cognizable offence within the meaning of that Code.

26. Jurisdiction to try offences under this Act

No court inferior to that of a presidency magistrate or a magistrate of the first class shall take cognizance of or try any offence punishable under this Act.

CHAPTER VI

MISCELLANEOUS

27. Title to dividends

1. It shall be lawful for the holder of any security whose name appears on the books of the company issuing the said security to receive and retain any dividend declared by the company in respect thereof for any year, notwithstanding that the said security has already been transferred by him for consideration, unless the transferee who claims the dividend from the transferor has lodged the security and all other documents relating to the transfer which may be required by the company with the company for being registered in his name within fifteen days of the date on which the dividend became due.

   Explanation:

   The period specified in this section shall be extended –

   i. in case of death of the transferee, by the actual period taken by his legal representative to establish his claim to the dividend;

   ii. in case of loss of the transfer deed by theft or any other cause beyond the control of the transferee, by the actual period taken for the replacement thereof; and

   iii. in case of delay in the lodging of any security and other documents relating to the transfer due to causes connected with the post, by the actual period of the delay.

2. Nothing contained in sub-section (1) shall affect –

   a. the right of a company to pay any dividend which has become due to any person whose name is for the time being registered in the books of the company as the holder of the security in respect of which the dividend has become due; or

   b. the right of the transferee of any security to enforce against the transferor or any other person his rights, if any, in relation to the transfer in any case where the company has refused to register the transfer of the security in the name of the transferee.

27(A). Right to receive income from collective investment scheme –

1. It shall be lawful for the holder of any securities, being units or other instruments issued by collective investment scheme, whose name appears on the books of the collective investment scheme issuing the said security to receive and retain any income in respect of units or other instruments issued by the collective investment scheme declared by the collective investment scheme in respect thereof for any year

47 Substituted by the Securities Laws (Second Amendment) Act, 1999 vide Gazette Notification dated December 16, 1999 for "(b) director, in relation to a firm, means a partner in the firm".
48 Inserted by the Securities Contracts (Regulation) Amendment Act, 1985.
49 Now Code of Criminal Procedure, 1973.

notwithstanding that the said security, being units or other instruments issued by collective investment scheme, has already been transferred by him for consideration, unless the transferee who claims the income in respect of units or other instruments issued by collective investment scheme from the transfer or has lodged the security and all other documents relating to the transfer which may be required by the collective investment scheme with the collective investment scheme for being registered in his name within fifteen days of the date on which the income in respect of units or other instruments issued by the collective investment scheme became due.

Explanation: -

The period specified in this section shall be extended –

i. in case of death of the transferee, by the actual period taken by his legal representative to establish his claim to the income in respect of units or other instrument issued by collective investment scheme;

ii. in case of loss of the transfer deed by theft or any other cause beyond the control of the transferee, by the actual period taken for the replacement thereof; and

iii. in case of delay in the lodging of any security, being units or other instruments issued by collective investment scheme, and other documents relating to the transfer due to causes connected with the post, by the actual period of the delay.

2. Nothing contained in sub-section (1) shall affect –

a. the right of a collective investment scheme to pay any income from units or other instruments issued by collective investment scheme which has become due to any person whose name is for the time being registered in the books of the collective investment scheme as the holder of the security being units or other instruments issued by collective investment scheme in respect of which the income in respect of units or other instruments issued by collective scheme has become due; or

b. the right of transferee of any security, being units or other instruments issued by collective investment scheme, to enforce against the transferor or any other person his rights, if any, in relation to the transfer in any case where the company has refused to register the transfer of the security being units or other instruments issued by collective investment scheme in the name of the transferee[50]

28. Act not to apply in certain cases

1. The provisions of this Act shall not apply to –

a. the Government, the Reserve Bank of India, any local authority or any corporation set up by a special law or any person who has effected any transaction with or through the agency of any such authority as is referred to in this clause;

b. any convertible bond or share warrant or any option or right in relation thereto, in so far as it entitles the person in whose favour any of the foregoing has been issued to obtain at his option from the company or other body corporate, issuing the same or from any of its shareholders or duly appointed agents, shares of the company or other body corporate, whether by conversion of the bond or warrant or otherwise, on the basis of the price agreed upon when the same was issued.

50 supra n. 3

2. Without prejudice to the provisions contained in sub-section (1), if the Central Government is satisfied that in the interests of trade and commerce or the economic development of the country it is necessary or expedient so to do,it may, by notification in the Official Gazette, specify any class of contracts as contracts to which this Act or any provision contained therein shall not apply, and also the conditions, limitations or restrictions, if any, subject to which it shall not so apply.

29. Protection of action taken in good faith

No suit, prosecution or other legal proceeding whatsoever shall lie in any court against the governing body or any member, office bearer or servant of any recognised stock exchange or against any person or persons appointed under sub-section (1) of section 11 for anything which is in good faith done or intended to be done in pursuance of this Act or of any rules or bye-laws made thereunder.

29A. Power to delegate

The Central Government may, by order published in the Official Gazette, direct that the powers (except the power under section 30) exercisable by such conditions, if any, as may be specified in the order, be exercisable also by the Securities and Exchange Board of India or the Reserve Bank of India constituted under section 3 of the Reserve Bank of India Act, 1934.[51]

30. Power to make rules

1. The Central Government may, by notification in the Official Gazette, make rules for the purpose of carrying into effect the objects of this Act.
2. In particular, and without prejudice to the generality of the foregoing power, such rules may provide for,
   a. the manner in which applications may be made, the particulars which they should contain and the levy of a fee in respect of such applications;
   b. the manner in which any inquiry for the purpose of recognizing any stock exchange may be made, the conditions which may be imposed for the grant of such recognition, including conditions as to the admission of members if the stock exchange concerned is to be the only recognised stock exchange in the area; and the form in which such recognition shall be granted;
   c. the particulars which should be contained in the periodical returns and annual reports to be furnished to the Central Government;
   d. the documents which should be maintained and preserved under section 6 and the periods for which they should be preserved;
   e. the manner in which any inquiry by the governing body of a stock exchange shall be made under section 6;
   f. the manner in which the bye-laws to be made or amended under this Act shall before being so made or amended be published for criticism;

51 Substituted by Securities Laws (Second Amendment) Act, 1999 vide Gazette Notification dated December 16,1999 for "The Central Government may, by order published in the Official Gazette, direct that the powers exercisable by it under any provision of this Act shall, in relation to such matters and subject to such conditions, if any, as may be specified in the order, be exercisable also by the [Securities and Exchange Board of India]" which was inserted by Securities and Exchange Board of India Act, 1992, w.e.f. 30.1.92

g. the manner in which applications may be made by dealers in securities for licences under section 17, the fee payable in respect thereof and the period of such licences, the conditions subject to which licences may be granted, including conditions relating to the forms which may be used in making contracts, the documents to be maintained by licensed dealers and the furnishing of periodical information to such authority as may be specified and the revocation of licences for breach of conditions;

h. the requirements which shall be complied with –

i. by public companies for the purpose of getting their securities listed on any stock exchange;

ii. by collective investment scheme for the purpose of getting their units listed on any stock exchange;[52]

h(a). the form in which an appeal may be filed before the Securities Appellate Tribunal under section 22A and the fees payable in respect of such appeal.[53]

i. any other matter which is to be or may be prescribed.

3. Any rules made under this section [***][54] shall, as soon as may be, after their publication in the Official Gazette, be laid before both Houses of Parliament.

31. Repeal

Repealed by the Repealing and Amending Act, 1960 (58 of 1960), section 2 and Schedule 1.

52 Substituted by Securities Laws (Second Amendment), Act, 1999 vide Gazette Notification dated December 16, 1999 for "the requirements which shall be complied with by public companies for the purpose of getting their securities listed on any stock exchange;" [***]

53 Substituted by Securities Laws (Second Amendment) Act, 1999 vide Gazette notification dated December 16, 1999 for [(ha) the form in which a notice referred to in sub-clause (b) of sub-section (4) of section 22Ashall be the particulars which such reference shall contain, and the evidence and the fees which shall accompany such reference; and] which was inserted by Securities Contracts (Regulation) Amendment Act, 1985.

54 The words "shall be subject to the condition of previous publication and" deleted by the Securities Laws (Amendment) Act, 1995, w.e.f. 25-3-1995.

The Securities Contracts (Regulation) Rules, 1957[1]

(Notification No. SRO 576, dated 21-2-1957)

In exercise of the powers conferred by section 30 of the Securities Contracts (Regulation) Act, 1956, (42 of 1956), the Central Government hereby makes the following rules, the same having been previously published as required by sub-section (3) of the said section, namely:

1. Short title

These rules, may be called Securities Contracts (Regulation) Rules, 1957.

2. Definitions

In these rules, unless the context otherwise requires –

a. "form" means a form appended to these rules;

b. "the Act" means the Securities Contracts (Regulation) Act, 1956 (42 of 1956);

c. "government company" means a company in which not less than fifty-one percent of the share capital is held by the Central Government or by any State Government or Governments or partly by the Central Government and partly by one or more State Governments.

3. Application for recognition

An application under section 3 of the Act for recognition of a stock exchange shall be made to the Securities and Exchange Board of India[2] in Form A.

4. Fees for application

1. There shall be paid in respect of every application under rule(3) a fee of rupees five hundred.

2. The amount of the fee shall be deposited in the nearest government treasury or the nearest branch of the State Bank of India:

   Provided that at Mumbai, Calcutta, Chennai, Delhi and Kanpur, the amount shall be deposited in the Reserve Bank of India.

3. The amount of the fee so deposited shall be credited to the receipt head "XLVI- Miscellaneous-other fees, fines and forfeitures".

5. Documents to be filed along with the application and particulars it should contain

Every application shall be accompanied by four copies of the rules (including the memorandum and articles of association where the applicant stock exchange is an incorporated body) and bye-laws of the stock exchange applying for recognition as specified in section 3 of the Act and the receipt granted by the government treasury, or as the case may be, the State Bank of India or the Reserve Bank of India, in respect of the amount of the fee deposited and shall contain clear particulars as to the matters specified in the Annexure to Form A.

[3]5(A). Power to make inquiries and call for information

Before granting recognition to a stock exchange under section 4 of the Act, the Securities and Exchange Board of India[4] may make such inquiries and require such further information to be furnished, as it deems necessary, relating to the information furnished by the stock exchange in the Annexure to its application in Form A.

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1 Published vide Notification No. S.R.O. 576, dated 21st February, 1957.
2 Substituted by Notification No. GSR 581(E), dated 23-12-1996.
3 Inserted vide Amendment Rules 1967, Notification No. GSR 1096, dated 14-7-1967 w.e.f. 22-7-1967.
4 Substituted vide Notification No. GSR 581 (E), dated 23-12-1996.

6. Form of recognition

The recognition granted to a stock exchange shall be in Form B and subject to the following conditions namely:–

a. that the recognition unless granted on a permanent basis, shall be for such period not less than one year as may be specified in the recognition;

b. that the stock exchange shall comply with such conditions as are or may be prescribed or imposed under the provisions of the Act and these rules from time to time.

7. Renewal of recognition

1. Three months before the expiry of the period of recognition, a recognised stock exchange desirous of renewal of such recognition may make an application to the Securities and Exchange Board of India in Form A.

2. The provisions of rule 3, rule 4, rule 5, [5][rule 5A] and rule 6 shall apply in relation to renewal of recognition as they apply in relation to grant of recognition except that the fee payable in respect of an application for renewal of recognition shall be rupees two hundred.

8. Qualifications for membership of a recognised stock exchange

The rules relating to admission of members of a stock exchange seeking recognition shall *inter alia* provide that :

1. No person shall be eligible to be elected as a member if –

   a. he is less than twenty-one years of age;

   b. he is not a citizen of India :

      Provided that the governing body may in suitable cases relax this condition with the prior approval of the [6]Securities and Exchange Board of India;

   c. he has been adjudged bankrupt or a receiving order in bankruptcy has been made against him or he has been proved to be insolvent even though he has obtained his final discharge;

   d. he has compounded with his creditors unless he has paid sixteen annas in the rupee;

   e. he has been convicted of an offence involving fraud or dishonesty;

   f. he is engaged as principal or employee in any business other than that of securities except as a broker or agent not involving any personal financial liability unless he undertakes on admission to severe his connection with such business;

      Provided that the Securities and Exchange Board of India[7] may, for reasons sufficient in the opinion of the said Board[8] permit a recognised stock exchange to suspend the enforcement of this clause for a specified period on condition that the applicant is not associated with or is a member of or subscriber to or shareholder or debenture holder in or connected through a partner or employee with any other organisation, institution, association, company or corporation in India where forward business of any kind whether in goods or commodities or otherwise is carried on or is not engaged as a principal or employee in any such business;

   [9][(g)***]

5 Inserted by Notification No. GSR 1096, dated 14-7-1967.
6 Inserted vide Amendment Rules, 1995, Notification No. GSR 121 (E), dated 9-3-1995.
7 Inserted vide Amendment Rules, 1995, Notification No. GSR 121 (E), dated 9-3-1995.
8 Inserted vide Amendment Rules, 1995, Notification No. GSR 121 (E), dated 9-3-1995.
9 Omitted vide Amendments Rules, 1988, Notification No. GSR 1070(E), dated 15-11-1988

h. he has been at any time expelled or declared a defaulter by any other stock exchange;

i. he has been previously refused admission to membership unless a period of one year has elapsed since the date of such rejection.

2. No person eligible for admission as a member under sub-rule (1) shall be admitted as a member unless:

a. he has worked for not less than two years as a partner with, or as an authorized assistant or authorized clerk or remisier or apprentice to, a member; or

b. he agrees to work for a minimum period of two years as a partner or representative member with another member and to enter into bargains on the floor of the stock exchange and not in his own name but in the name of such other member; or

c. he succeeds to the established business of a deceased or retiring member who is his father, uncle, brother or any other person who is, in the opinion of the governing body, a close relative;

Provided that the rules of the stock exchange may authorise the governing body to waive compliance with any of the foregoing conditions if the person seeking admission is in respect of means, position, integrity, knowledge and experience of business in securities, considered by the governing body to be otherwise qualified for membership.

3. No person who is a member at the time of application for recognition or subsequently admitted as a member shall continue as such if –

a. he ceases to be a citizen of India:

Provided that nothing herein shall affect who are not citizens of India but who were members at the time of such application or were admitted subsequently under the provisions of clause(b) sub-rule(1) of this rule, subject to their complying with all other requirements of this rule;

b. he is adjudged bankrupt or a receiving order in bankruptcy is made against him or he is proved to be insolvent;

c. he is convicted of an offence involving fraud or dishonesty;

[10][(d) ****]

[11][(e) ***]

f. he engages either as principal or employee in any business other than that of securities except as a broker or agent not involving any personal financial liability, provided that –

i. the governing body may, for reasons, to be recorded in writing, permit a member to engage himself as principal or employee in any such business, if the member in question ceases to carry on business on the stock exchange either as an individual or as a partner in a firm.

ii. in the case of those members who were under the rules in force at the time of such application permitted to engage in any such business and were actually so engaged on the date of such application, a period of three years from the date of the grant of recognition shall be allowed for severing their connection with any such business.

10 Omitted vide Amendments Rules, 1988, Notification No. GSR 1070(E), dated 15-11-1988
11 Omitted vide Amendments Rules, 1988, Notification No. GSR 1070(E), dated 15-11-1988

iii. nothing herein shall affect members of a recognised stock exchange, permitted under the proviso to clause (f) of sub-rule (1) to suspend the enforcement of the aforesaid clause, for so long as such suspension is effective, except that no member of such exchange shall engage in forward business of any kind whether in goods or commodities or otherwise and, if actually so engaged on the date of such application, he shall sever his connection with any such business within a period of three years from the date of the grant of recognition.

[(4)] A company as defined in the Companies Act, 1956 (1 of 1956), shall be eligible to be elected as a member of a stock exchange if–

i. such company is formed in compliance with the provisions of section 322 of the said Act;

ii. a majority of the directors of such company are shareholders of such company and also members of that stock exchange; and

iii. the directors of such company, who are members of that stock exchange, have ultimate liability in such company:

Provided that where the [12]Securities and Exchange Board of India makes a recommendation in this regard, the governing body of a stock exchange shall, in relaxation of the requirements of this clause, admit as member the following corporations, companies or institutions, namely –

a. the Industrial Finance Corporation, established under the Industrial Finance Corporation Act, 1948 (15 of 1948);

b. the Industrial Development Bank of India, established under the Industrial Development Bank Act, 1964 (18 of 1964);

c. the Life Insurance Corporation of India, established under the Life Insurance Corporation Act, 1956 (31 of 1956);

d. the General Insurance Corporation of India constituted under the General Insurance Corporation (Nationalisation) Act, 1972 (57 of 1972);

e. the Unit Trust of India, established under the Unit Trust of India Act, 1963 (52 of 1963);

f. the Industrial Credit and Investment Corporation of India, a company registered under the Companies Act, 1956 (1 of 1956);

g. the subsidiaries of any of the corporations or companies specified in (a) to (f) and any subsidiary of the State Bank of India or any nationalised bank set up for providing merchant banking services, buying and selling securities and other similar activities.

[13]4(A) A company as defined in the Companies Act, 1956 (1 of 1956), shall also be eligible to be elected as a member of a Stock Exchange if–

i. such company is formed in compliance with the provisions of section 12 of the said Act;

ii. such company undertakes to comply with such financial requirements and norms as may be specified by the Securities and Exchange Board of India for the registration of such company under sub-section (1) of Section 12 of the Securities Exchange Board of India Act, 1992 (15 of 1992);

12 Substituted vide Notification No. GSR 581(E), dated 23-12-1996.
13 Inserted vide Amendment Rules, 1992, Notification No. GSR 870 (E), dated 13-11-1992.

[14]iii. [***]

iv. the directors of the company are not disqualified from being members of a stock exchange under [15]clause (1) (except sub-clause (b) and sub-clause (f) thereof) or clause (3) [except sub-clause (a) and sub-clause (f) thereof] and the Directors of the company had not held the offices of the Directors in any company which had been a member of the stock exchange and had been declared defaulter or expelled by the stock exchange; and

v. not less than two directors of the company are persons who possess a minimum two year's experience;

a. in dealing securities

b. as portfolio managers

c. as investment consultants.

5. Where any member of a stock exchange is a firm, the provisions of sub-rules (1), (3) and (4), shall, so far as they can, apply to the admission or continuation of any partner in such firm.

9. Contracts between members of a recognised stock exchange

All contracts between the members of a recognised stock exchange shall be confirmed in writing and shall be enforced in accordance with the rules and bye-laws of the stock exchange of which they are members.

10.[16] Nominees of Securities and Exchange Board of India on the governing bodies of recognised stock exchanges

The Securities and Exchange Board of India[17] may nominate one or more persons not exceeding three in number, as member or members of the governing body of every recognised stock exchange. Such member or members shall enjoy the same status and powers as other members of the governing body.

11. Obligation of the governing body to take disciplinary action against a member if so directed by the Central Government

After receiving the report of the result of an enquiry made under clause (b) of sub-section (3) of Section 6 of the Act, the Central Government may take such action as they deem proper and, in particular, may direct the governing body of the stock exchange to take such disciplinary action against the offending member, including fine, expulsion, suspension or any other penalty of a like nature not involving the payment of money, as may be specified by the Central Government; notwithstanding anything to the contrary contained in the rules or bye-laws of the stock exchange concerned, the governing body shall give effect to the directions of the Central Government in this behalf and shall not in any manner commute, revoke or modify the action taken in pursuance of such directions, without the prior approval of the Central Government. The Central Government may however, either of its own motion or on the representation of the member concerned, modify or withdraw its direction to the governing body.

12. Audit of accounts of members

Every member shall get his accounts audited by a chartered accountant whenever such audit is required by the Securities and Exchange Board of India.[18]

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14 Omitted by the Second (Amendment) Rules, 1994, w.e.f. 12-10-1994 issued by the Department of economic Affairs.
15 Substituted by GSR 790(E), dated 7-11-1994.
16 Substituted by GSR 780(E), dated 26-10-1994, issued by Department of Economic Affairs.
17 Ibid
18 Substituted by Notification No. GSR 581 (E) dated 23-12-1996.

13. Withdrawal of recognition

The written notice referred to in section 5 of the Act shall be in Form C.

14. Books of account and other documents to be maintained and preserved by every recognised stock exchange

Every recognised stock exchange shall maintain and preserve the following books of account and documents for a period of five years :

1. Minute books of meetings of –
   a. members;
   b. governing body;
   c. any standing committee or committees of the governing body or of the general body of members.
2. Register of members showing their full names and addresses. Where any member of the stock exchange is a firm, full names and addresses of all partners shall be shown.
3. Register of authorised clerks.
4. Register of remisiers of authorised assistants.
5. Record of security deposits.
6. Margin deposits book.
7. Ledgers.
8. Journals.
9. Cash book.
10. Bank pass-book.

15. Books of account and other documents to be maintained and preserved by every member of a recognised stock exchange

1. Every member of a recognised stock exchange shall maintain and preserve the following books of account and documents for a period of five years:
   a. Register of transactions (Sauda book).
   b. Client's ledger.
   c. General ledger.
   d. Journals.
   e. Cash book.
   f. Bank pass-book.
   g. Documents register showing full particulars of shares and securities received and delivered.
2. Every member of a recognised stock exchange shall maintain and preserve the following documents for a period of two years:
   a. Members' contract books showing details of all contracts entered into by him with other members of the same exchange or counter-foils

or duplicates of memos of confirmation issued to such other members.

b. Counter-foils or duplicates of contract notes issued to clients.

c. Written consent of clients in respect of contracts entered into as principals.

16. Manner of inquiry in relation to the affairs of the governing body of a recognised stock exchange or the affairs of any member of the stock exchange in relation to the exchange

1. a. the person or persons appointed by the Securities and Exchange Board of India[19] to make an inquiry under clause (b) of sub-section (3) of section 6 of the Act shall hereafter in this rule be referred to as the 'inquiring authority;

b. where the inquiring authority consists of two or more persons, one of them shall be appointed as a chairman or senior members thereof;

c. the inquiring authority shall over a statement of issues to be inquired into the governing body or the member concerned, as the case may be, who will be given a reasonable opportunity to state their or his side of the case;

d. if any witness is called for examination, an opportunity shall be provided to the governing body or the member whose affairs are being inquired into, as the case may be, to cross-examine such witness;

e. where the inquiring authority consists of more than one person, the views of the majority shall be deemed to represent the findings of such authority and, in the event of an equity of votes, the chairman or senior member shall have a casting vote;

f. the inquiring authority shall submit its report in writing to the Central Government within the period specified in the order of appointment;

g. temporary absence from any hearing or hearings of any member of the inquiring authority shall not vitiate its proceedings.

2. Where the Central Government had directed the governing body of a stock exchange to make an inquiry under clause (b) of sub-section (3) of section 6 of the Act, the governing body concerned shall appoint one or more members thereof to make the inquiry and the provisions of sub-rule (1) shall apply mutatis mutandis to such inquiry.

17. Submission of annual report

1. Every recognised stock exchange shall before the 31st day of January in each year or within such extended time as the Securities and Exchange Board of India[20] may, from time to time, allow, furnish the Central Government annually with a report about its activities during the preceding calendar year, which shall *inter alia* contain detailed information about the following matters:

a. changes in rules and bye-laws, if any;

b. changes in the composition of the governing body;

c. any new sub-committees set up and changes in the composition of existing ones;

d. admissions, re-admissions, deaths or resignations of members;

19 Submitted by Notification No. GSR 581 (E) dated 23-12-1996.
20 Submitted by Notification No. GSR 581 (E) dated 23-12-1996.

e. disciplinary action against members;

f. arbitration of disputes (nature and number) between members and non-members;

g. defaults;

h. action taken to combat any emergency in trade;

i. securities listed and de-listed; and

j. securities brought on or removed from the forward list.

[21]2. Every recognised stock exchange shall within one month of date of the holding of its annual general meeting, furnish the Securities and Exchange Board of India[22] with a copy of its audited balance sheet and profit and loss account for its preceding financial year.

[23]17A. Submission of periodical returns

Every recognised stock exchange shall furnish the Securities and Exchange Board of India[24] periodical returns relating to –

i. the official rates for the securities enlisted thereon;

ii. the number of shares delivered through the clearing house;

iii. the making-up prices;

iv. the clearing house programmes;

v. the number of securities listed and de-listed during the previous three months;

vi. the number of securities brought on or removed from the forward list during the previous three months; and

vii. any other matter as may be specified by the Securities and Exchange Board of India.[25]

18. Manner of publication of bye-laws for criticism

The bye-laws to be made, amended or revised under the Act shall be published for criticism in accordance with the provisions of section 23 of the General Clauses Act, 1897 both in the Gazette of India and Official Gazette of the State in which the principal office of the recognised stock exchange is situated.

19. Requirements with respect to the listing of securities on a recognised stock exchange

1. A public company as defined under the Companies Act, 1956, desirous of getting its securities listed on a recognised stock exchange, shall apply for the purpose to the stock exchange and forward along with its application the following documents and particulars:

a. Memorandum and articles of association and, in the case of a debenture issue, a copy of the trust deed.

b. Copies of all prospectuses or statements in lieu of prospectuses issued by the company at any time.

c. Copies of offers for sale and circulars or advertisements offering any securities for subscription or sale during the last five years.

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21 Substituted by Amendment Rules, 1967, vide Notification No. GSR 1696 dated 14-7-1967
22 Substituted by Notification No. GSR 581 (E) dated 23-12-1996
23 Inserted by Amendment Rules, 1967 vide Notification No. GSR 1096, dated 14-7-1967
24 Substituted by Notification No. GSR 581 (E) dated 23-12-1996
25 Substituted by Notification No. GSR 581 (E) dated 23-12-1996

d. Copies of balance sheets and audited accounts for the last five years, or in the case of new companies, for such shorter period for which accounts have been made up.

e. A statement showing –

   i. dividends and cash bonuses, if any, paid during the last ten years (or such shorter period as the company has been in existence, whether as a private or public company);

   ii. dividends or interest in arrears, if any.

f. Certified copies of agreements or other documents relating to arrangements with or between:

   i. vendors and/or promoters,

   ii. underwriters and sub-underwriters,

   iii. brokers and sub-brokers.

g. Certified copies of agreements with:

   i. managing agents and secretaries and treasurers,

   ii. selling agents,

   iii. managing directors and technical directors,

   iv. general manager, sales manager, manager or secretary.

h. Certified copy of every letter, report, balance sheet, valuation contract, court order or other documents, part of which is reproduced or referred to in any prospectus, offer for sale, circular or advertisement offering securities for subscription or sale, during the last five years.

i. A statement containing particulars of the dates of, and parties to all material contracts, agreements (including agreements for technical advice and collaboration), concessions and similar other documents (except those entered into in the ordinary course of business carried on or intended to be carried on by the company) together with a brief description of the terms, subject-matter and general nature of the documents.

j. A brief history of the company since its incorporation giving details of its activities including any reorganisation, reconstruction or amalgamation, changes in its capital structure (authorised, issued and subscribed) and debenture borrowings, if any.

k. Particulars of shares and debentures issued (i) for consideration other than cash, whether in whole or part, (ii) at a premium or discount, or (iii) in pursuance of an option.

l. A statement containing particulars of any commission, brokerage, discount or other special terms including an option for the issue of any kind of the securities granted to any person.

m. Certified copies of:

   i. acknowledgement card or the receipt of filing offer document with the Securities and Exchange Board of India;[26]

   ii. agreements, if any, with the Industrial Finance Corporation, Industrial Credit and Investment Corporation and similar bodies.

n. Particulars of shares forfeited.

26 Substituted by Notification No. GSR 581 (E) dated 23-12-1996

o. A list of highest ten holders of each class or kind of securities of the company as on the date of application along with particulars as to the number of shares or debentures held by and the address of each such holder.

p. Particulars of shares or debentures for which permission to deal is applied for: Provided that a recognised stock exchange may either generally by its bye-laws or in any particular case call for such further particulars or documents as it deems proper.

2. Apart from complying with such other terms and conditions as may be laid down by a recognised stock exchange, an applicant company shall satisfy the stock exchange that:

a. Its articles of association provide for the following among others –

i. that the company shall use a common form of transfer;

ii. that the fully paid shares will be free from all lien, while in the case of partly paid shares, the company's lien, if any, will be restricted to moneys called or payable at a fixed time in respect of such shares;

iii. that any amount paid-up in advance of calls on any share may carry interest but shall not entitle the holder of the share to participate in respect thereof, in a dividend subsequently declared;

iv. there will be no forfeiture of unclaimed dividends before the claim becomes barred by law;

v. that option or right to call of shares shall not be given to any person except with the sanction of the company in general meeting :

Provided that a recognised stock exchange may provisionally admit to dealings in the securities of a company which undertakes to amend its articles of association at its next general meeting so as to fulfil the foregoing requirements and agrees to act in the meantime strictly in accordance with the provisions of this clause.

[27]b. At least [28][twenty five] percent of each class or kind of securities issued by the company was offered to the public for subscription through advertisement in newspapers for a period not less than [29][two days] and that applications received in pursuance of such offer were allotted fairly and unconditionally.

[30]Provided that a recognised stock exchange may relax this requirement, with the previous approval of the Securities and Exchange Board of India[31] in respect of a Government Company within the meaning of section 617 of the Companies Act, 1956 (1 of 1956) and subject to such instructions as that board[32] issue in this behalf from time to time.

Explanation: Where any part of the securities sought to be listed have been or are agreed to be taken up by the Central Government, a State Government, development or investment agency of a State Government, Industrial Development Bank of India, Industrial

27 Substituted by Amendment Rules, 1972 vide Notification No. GSR No. 685, dated 3-6-1972.
28 Substituted by Securities Contracts (Regulation) Amendment Rules, 1993, by GSR 671(E) dated 20-9-1993.
29 Substituted by GSR 1083, dated 11.11.1985 w.e.f. 23.11.1985.
30 Substituted by Securities Contracts (Regulation) Amendment Rules, 1993, vide Notification No. GSR 617(E), dated 20-9-1993.
31 Substituted by Notification No. GSR 581(E), dated 23-12-1996.
32 Substituted by Notification No. GSR 581(E), dated 23-12-1996.

Finance Corporation of India, [33][Industrial Credit and Investment Corporation of India Limited], Life Insurance Corporation of India.

[34][General Insurance Corporation of India and its subsidiaries, namely, the National Insurance Company Limited, the New India Assurance Company Limited, the Oriental Fire and General Insurance Company Limited, the New India Assurance Company Limited, the Oriental Fire and General Insurance Company Limited and the United Fire and General Insurance Company Limited] or Unit Trust of India, the total subscription to the securities, whether by one or more of such bodies, shall not form part of the twenty-five percent of the securities to be offered to the public].

Listing of bonds of public sector undertaking – Waiver of Rule 19(2)(B)
In order to promote the development of an active and orderly secondary market for debt securities of public sector undertakings (PSU), it has been decided by the Government in exercise of the powers conferred under Rule 19(7) of the Securities Contracts (Regulation) Rules, 1957, to exempt all bonds issued by such enterprises from the requirements of rule 19(2)(b) of the said Rules. This waiver of Rule 19(2)(b) will enable the Stock Exchanges to list the privately-placed bonds of PSUs.[35]

3. A company applying for listing shall, as a condition precedent, undertake *inter alia*–

   a. i. that letters of allotment will be issued simultaneously and that, in the event of its being impossible to issue letters of regret at the same time, a notice to that effect will be inserted in the press so that it will appear on the morning after the letters of allotment have been posted,

      ii. that letters of right will be issued simultaneously,

      iii. that letters of allotment, acceptance or rights will be serially numbered, printed on good quality paper and, examined and signed by a responsible officer of the company and that whenever possible, they will contain the distinctive numbers of the securities to which they relate,

      iv. that letters of allotment and renounceable letters of right will contain a proviso for splitting and that, when so required by the exchange, the form of renunciation will be printed on the back of or attached to the letters of allotment and letters of right,

      v. that letters of allotment and letters of right will state how the next payment of interest or dividend on the securities will be calculated;

   b. to issue, when so required, receipts for all securities deposited with it whether for registration, sub-division, exchange or for other purposes; [36] and not to charge any fees for registration of transfers, for sub-division and consolidation of certificates and for sub-division of letters of allotment, renounceable letters of right, and split, consolidation, renewal and transfer receipts into denominations of the market unit of trading;

33 Inserted by GSR 959, dated 8.8.1972, w.e.f. 12.08.1972.
34 Inserted by GSR 2641, dated 01.11.1975, w.e.f. 08.11.1975-76
35 Issued by the Ministry of Finance, Department of Economic Affairs (ECB and Investment Division) vide F.No. 1/10/SE/94, dated 29-4-1994
36 Inserted by GSR 1096, dated 14.7.1976 w.e.f. 22.7.1967

b(b). to issue, when so required, consolidation and renewal certificates in denominations of the market unit of trading, to split certificates, letters of allotment, letters of right, and transfer, renewal, consolidation and split receipts into smaller units, to split call notices, issue duplicates thereof and not require any discharge on call receipts and to accept the discharge of members of stock exchange on split, consolidation and renewal receipts as good and sufficient without insisting on the discharge of the registered holders;

c. when documents are lodged for sub-division or consolidation [37][or renewal] through the clearing house of the exchange :

   i. to accept the discharge of an official of the stock exchange clearing house on the company's split receipts and [38][consolidation receipts and renewal receipts] as good and sufficient discharge without insisting on the discharge of the registered holders, and

   ii. to verify when the company is unable to issue certificates or split receipt or [39][consolidation receipts or renewal receipts] immediately on lodgement whether the discharge of the registered holders, on the documents lodged for sub-division or consolidation [40][or renewal] and their signatures on the relative transfers are in order;

d. on production of the necessary documents by shareholders or by members of the exchange, to make on transfers an endorsement to the effect that the power of attorney or probate or letters of administration or death certificate or certificate of the Controller of Estate Duty or similar other document has been duly exhibited to and registered by the company;

e. to issue certificates in respect of shares or debentures lodged for transfer within a period of one month of the date of lodgement of transfer and to issue balance certificates within the same period where the transfer is accompanied by a larger certificate;

f. to advise the stock exchange of the date of the board meeting at which the declaration or recommendation of a dividend [41][or the issue or right or bonus share] will be considered;

g. [42][to recommend or declare all dividends and/or cash bonuses at least five days before the commencement of the closure of its transfer books or the record date fixed for the purpose and to advise the stock exchange] in writing of all dividends and/or cash bonuses recommended or declared immediately after a meeting of the board of the company has been held to finalise the same;

h. to notify the stock exchange of any material change in the general character or nature of the company's business;

i. to notify the stock exchange of any change –

   i. in the company's directorate by death, resignation, removal or otherwise,

   ii. of managing director, managing agent or secretaries and treasurers,

37 Inserted by GSR 1096, dated 14.7.1967 w.e.f. 22.7.1967.
38 Substituted, ibid.
39 Substituted, ibid.
40 Inserted, ibid.
41 Inserted, ibid.
42 Substituted vide Amendment Rules, 1993, Notification No. GSR 617(E), dated 20-9-1993.

iii. of auditors appointed to audit the books and accounts of the company;

j. to forward to the stock exchange copies of statutory and annual reports and audited accounts as soon as issued, including directors' report;

k. to forward to the stock exchange as soon as they are issued, copies of all other notices and circulars sent to the shareholders including proceedings of ordinary and extraordinary general meetings of the company and to file with the stock exchange certified copies of resolutions of the company as soon as such resolutions become effective;

l. to notify the stock exchange prior to intimating the shareholders, of any new issue of securities whether by way of right, privilege, bonus or otherwise and the manner in which it is proposed to offer or allot the same;

m. to notify the stock exchange in the event of reissue of any forfeited securities or the issue of securities held in reserve for future issue;

n. to notify the stock exchange of any other alteration of capital including calls;

o. [43][to close the transfer books only for the purpose of declaration of dividend or issue of right or bonus shares or for such other purposes as the stock exchange may agree and] to give notice to the stock exchange as many days in advance as the exchange may from time to time reasonably prescribe, stating the dates of closure of its transfer books (or, when the transfer books are not to be closed, the date fixed for taking a record of its shareholders or debentureholders) and specifying the purpose or purposes for which the transfer books are to be closed (or the record is to be taken) [44][and in the case of a rights or bonus issue to close the transfer books or fix a record date only after the sanctions of the competent authority subject to which the issue is proposed to be made have been duly obtained, unless the exchange agrees otherwise];

p. to forward to the stock exchange an annual return immediately after each annual general meeting of at least ten principal holders of each class of security of the company along with particulars as to the number of shares or debentures held by, and address of, each such holder;

q. to grant to shareholders the right of renunciation in all cases of issue of rights, privileges and benefits and to allow them reasonable time [45][not being less than four weeks] within which to record, exercise, or renounce such rights, privileges and benefits, [46][and to issue, where necessary, coupons or fractional certificates or provide for the payment of the equivalent of the value of the fractional right in cash unless the company in general meeting or the stock exchange agrees otherwise];

r. to promptly notify the stock exchange:

i. of any action which will result in the redemption, cancellation or retirement in whole or in part of any securities listed on the exchange,

43 Inserted by G.S.R. 1096, dated 14.07.1967, w.e.f. 22.07.1967.
44 Inserted by G.S.R. 1096, dated 14.07.1967, w.e.f. 22.07.1967.
45 Ibid.
46 Ibid.

ii. of the intention to make a drawing of such securities, intimating at the same time the date of the drawing and the period of the closing of the transfer books (or the date of the striking of the balance) for the drawing,

iii. of the amount of securities outstanding after any drawing has been made;

s. to intimate the stock exchange any other information necessary to enable the shareholders to appraise the position of the company and to avoid the establishment of a false market in the shares of the company;

t. that in the event of the application for listing being granted, such listing shall be subject to the rules and bye-laws of the exchange in force from time to time and that the company will comply within a reasonable time, with such further listing requirements as may be promulgated by the exchange as a general condition for new listings.

4. A fresh application for listing will be necessary in respect of all new issues desired to be dealt in, provided that, where such new securities are identical in all respects with those already listed, admission to dealings will be granted on the company intimating to the stock exchange particulars of such new issues.

Explanation : Shares are identical in all respects only if –

a. they are of the same nominal value and the same amount per share has been called up;

b. they are entitled to dividend at the same rate and for the same period, so that the next ensuing distribution, the dividend payable on each share will amount to exactly the same sum, net and gross; and

c. they carry the same rights in all other respects.

5. A recognised stock exchange may suspend or withdraw admission to dealings in the securities of a company or body corporate either for a breach of or non-compliance with, any of the conditions of admission to dealings or for any other reason, to be recorded in writing, which in the opinion of the stock exchange justifies such action :

Provided, however, that no such action shall be taken by a stock exchange without affording to the company or body corporate concerned a reasonable opportunity by a notice in writing, stating the reasons, to show cause against the proposed action;

Provided further that where a recognised stock exchange has withdrawn admission to dealings in any security, or where suspension of admission to dealings has continued for a period exceeding three months, the company or body corporate concerned may appeal to the Securities and Exchange Board of India[47] and the Securities and Exchange Board of India[48] may, after giving the stock exchange an opportunity of being heard, vary or set aside the decision of the stock exchange and thereupon the orders of the Securities and Exchange Board of India[49] shall be carried out by the stock exchange.

47 Substituted by the Notification No. 581(E), dated 23-12-1996
48 Ibid.
49 Ibid.

6. A recognised stock exchange may, either at its own discretion or shall in accordance with the orders of the Securities and Exchange Board of India[50] under sub-rule (5) restore or re-admit to dealings in any securities suspended or withdrawn from the list.

[51]6(A).All the requirements with respect to listing prescribed by then rules, shall so far as they may be, also apply to a body corporate constituted by an Act of Parliament or any state legislature.

Provided that a recognised stock exchange may relax the requirement of offer to the public for subscription of at least 25% of each class or kind of securities issued in respect of a body corporate referred to in this sub-rule with the previous approval of the [52]Securities and Exchange Board of India and also subject to such instructions as that [53]Board may issue in this behalf from time to time.

7. The Securities and Exchange Board of India[54] may, at its own discretion or on the recommendation of a recognised stock exchange, waive or relax the strict enforcement of any or all the requirements with respect to listing prescribed by these rules.

FORM A

(See Rules 3 and 7)

Application for recognition/renewal of recognition of a stock exchange under section 3 of the Securities Contracts (Regulation) Act, 1956

To

_____-

_____-

_____-

Subject: Application for recognition/renewal of recognition of a stock exchange under section 3 of the Securities Contracts (Regulation) Act, 1956.

Sir,

Pursuant to the Securities and Exchange Board of India[55] Notification No. …..... dated ..... /Certificate of recognition dated .....……..... We/I on behalf of .....……..... being a stock exchange (name and address of stock exchange)

as defined in section 2 of the Securities Contracts (Regulation) Act, 1956 hereby apply for recognition/renewal of recognition for the purpose of the said Act in respect of contracts in securities.

2. Four copies of the rules, memorandum and articles of association relating in general to the constitution and management of the stock exchange and four copies of the bye-laws for the regulation and control of contracts in securities are enclosed.

50 Substituted by the Notification No.581(E), dated 23-12-1996.
51 Inserted by Amendment Rules. 1995 vide GSR No. 121(E), dated 9-3-1995.
52 Substituted by the Notification No.581(E), dated 23-12-1996.
53 Ibid.
54 Ibid.
55 Ibid

3. All the necessary information required in Annexure to this Form is enclosed. Any additional information will be furnished as and when called for by the [56]Securities and Exchange Board of India.

4. We/I on behalf of the said stock exchange hereby undertake to comply with the requirements of section 4 of the said Act and such other conditions and terms as may be contained in the Certificate of Recognition or be prescribed or imposed subsequently.

5. Treasury Receipt No. ..... dated ..... for Rs. ..... is attached.

Yours faithfully,

Signature of applicant

56 Ibid

ANNEXURE TO FORM 'A'

Part I – General

1. Name of the applicant stock exchange.
2. Address.
3. Date of establishment.
4. Is your exchange a joint stock company (state whether public or private) registered under the Indian Companies Act or an association for profit or otherwise? If it is organised on some other basis, this may be stated.
5. Give details of your capital structure and attach three copies of the audited balance sheets and profit and loss accounts of the exchange for the preceding three years.

Part II – Membership

6. State the number of members at the time of application. Also specify how many are inactive.
7. State whether there is any provision, resolution or convention for limiting the number of members and whether in pursuance thereof you have fixed a ceiling on the number of members that you would take.
8. Do you insist on any minimum qualification and experience before enrolling new members? If so, give details.
9. State the different classes of members, if any, the number thereof and the privileges enjoyed by each class. What is the procedure followed by your exchange for the admission of different classes of new members?
10. What is the rate of your annual subscription in respect of the different classes of members?
11. Do you collect any security deposit from your members? If so, give details and also state the manner in which such deposits are utilised and the rate of interest allowed, if any.
12. Do you collect any admission or entrance fees from your members or from partners of firms who are members? If so, how much?
13. Do you insist on your members and partners of firms who are members divesting themselves of other activities either as principal or as employee?
14. Do your rules permit firms to become members? If so, is it incumbent on members to seek the approval of the governing body before admitting new partners? State the conditions, if any, laid down in your rules for the admission of such partners.
15. If your rules do not permit the firms being enrolled as members, do you permit individual members to form a partnership? State the procedure followed for the recognition of such partnership.
16. Do you permit members to work in partnership with non-members? If so, how far are such non-members subject to the control of the stock exchange?

Part III – Governing Body

17. What is the present strength of your governing body? Give details of the constitution, powers of management, election and tenure of office of members of the governing body, and the manner in which its business is transacted.
18. Are any trade or commercial interests represented on your governing body? If so, give details of interests represented.
19. Do you associate shareholders of investors' associations with the management of your exchange? If so, state the manner in which it is done.

20. Are there any government representatives on your governing body? If so, furnish their names.
21. Do your rules provide for the direct election by members of any other bodies or committees, apart from the governing body? If so, give details of their constitution, tenure, powers and functions.
22. Do you have any provision for the appointment of standing or ad hoc sub-committees of the governing body? If so, furnish details of the method of their appointment, terms of office, powers and functions.
23. Give the designations, powers and duties of principal office-bearers of your exchange. Are any of these office-bearers in the pay of the stock exchange? If so, give details as to the mode of their appointment, tenure of office and remuneration.

Part IV – Trading

24. Do you have a trading ring? If not, how do you carry on the business? Give details.
25. State the different kinds of contracts in use on your exchange e.g., spot, ready and forward. State the period of delivery and payment in each case.
26. Give details of business hours for each type of contract.
27. Give details of the scale of brokerage and other charges, if any, prescribed by your exchange.
28. Do you prescribe standard forms of contract for the use of your members? Attach three copies of each such contract form.
29. Do you classify your members into brokers and jobbers? If so, specify the bye-law under which this is done.
30. Do you have a system of registration of remisiers and/or authorised clerks? If so, give details as to their qualifications, obligations and rights, etc.
31. Do you have any regulations regarding dealings by members on their own account whether in the nature of Taravani (day-to-day) or otherwise?
32. Do you have any provisions for regulating the volume of business done by any individual member other than through a system of margins? If so, give details.
33. What provisions have you made for periodical settlement of contracts and differences thereunder, the delivery of, and payment for securities and the passing of delivery orders?
34. Do you have a clearing house for the settlement of contracts? If so, give details of its organisation and management.
35. If you have clearing house, what returns do the members of your exchange submit regarding the transactions cleared through such clearing house? Does the exchange ask for any regular returns in respect of transactions settled outside the clearing house? Submit three copies of forms used in this connection.
36. How do you fix, alter or postpone the dates of settlement?
37. How do you determine and declare making-up prices?
38. Do you have any arrangements for making or recording of bargains?
39. Have you any arrangements for recording and publishing market rates including opening, closing, highest and lowest rates?
40. What provisions have you made for regulating — (a) the entering into contracts, their performance and rescission, including contracts; (i) between members, (ii) between a member and his constituent and (iii) between a member and a non-member; (b) the consequences of breach, default or insolvency on the part of members whether acting as buyers, sellers or intermediaries; and (c) 'havalas' and other matters relating to conduct of business of members in the exchange?

41. Do you prescribe margin requirements? If yes, give details.
42. Do you prescribe maximum and minimum prices for securities? If so, how and under what conditions.
43. Do you provide any safeguard for the prevention of 'bull-squeezes' and 'bear-raids' and for meeting emergencies in trade? Give details.
44. What are the measures adopted by you to regulate or prohibit advertising or issue of circulars by your members?
45. What are the disciplinary powers with the governing body to enforce due compliance by members of the rules and bye-laws of the exchange and generally to ensure proper standard of business conduct?
46. Do you require members to supply such information or explanation and to produce such books relating to their business as your governing body may require?
47. Do you publish any statistics in regard to business done on the exchange including the transactions settled through the clearing house, if maintained? In particular, have you evolved any machinery for computing the volume of transactions in different kinds of contracts permitted on your exchange? Give details.
48. Do you have any bye-laws contravention of which makes a contract void?

Part V – Miscellaneous

49. Do you have any machinery for arbitration of disputes between members and/or between members and their constitutions? Give details.
50. What are the conditions subject to which securities are listed for dealings on your exchange?
51. What are your requirements for admitting securities to forward trading?
52. Do you have the right to prohibit, withdraw or suspend dealings in a listed security? If so, under what circumstances is this right exercised?
53. What provisions have you made for the levy and recovery of fees, fines and penalties?

FORM B

(See Rules 6 and 7)

[57]Securities and Exchange Board of India

New Delhi, the 19.....

No....The [58]Securities and Exchange Board of India, having considered the application for recognition/renewal of recognition made under Section 3 of the Securities Contracts (Regulation) Act, 1956 by ..... and being satisfied that it would be in the interest of the trade and also in the public interest so to do, hereby grants, in exercise of the powers conferred by Section 4 of the Securities Contracts (Regulation) Act, 1956 recognition to the said exchange under Section 4 of the said Act for ..... year/years ending ..... 19..... on a permanent basis in respect of contracts in securities subject to the conditions stated herein below or as may be prescribed or imposed hereafter.

Seal of the Board[59] Signature of Officer

Note: Application for renewal of recognition shall be made so as to reach the Securities and Exchange Board of India[60] not less than three months before the expiry of the period. (This certificate, will also have to be published as a Notification in the Gazette of India and also in the Official Gazette of the State in which principal office of the recognised stock exchange is situated).

[61]FORM C

(See Rule 13)

Notice to show cause against the withdrawal of recognition

The Securities and Exchange Board of India, Mumbai

The .....

To

_____-

_____-

(Name and address of the exchange)

You are hereby called upon to show cause on or before ..... at the office of .....……

(designation of the officer)

why the recognition granted to you under the Ministry of Finance/the Securities and Exchange Board of India Notification No. ..... dated ..... and certificate No. ..... dated ..... should not be withdrawn for the reasons given in the Annexure to this Notice.

By order and in the name of the Securities and Exchange Board of India.

Seal of the Securities and

Exchange Board of India

57 Substituted by Notification No. 581(E), dated 23-12-1996.
58 Ibid
59 Ibid
60 Ibid
61 Ibid

Annexure – V

(Appeal to the Central Government Rules, 1993)

G.S.R. 362 (E) – dated 2-4-1993

In exercise of the powers conferred by section 29 read with section 20 of the Securities and Exchange Board of India Act, 1992 (15 of 1992), the Central Government hereby makes the following rules, namely:–

1. Short title and commencement

1. These rules may be called the Securities and Exchange Board of India (Appeal to the Central Government) Rules, 1993.
2. They shall come into force on the date of their publication in the Official Gazette.

2. Definitions

In these rules, unless the context otherwise requires,

a. "Act" means the Securities and Exchange Board of India Act, 1992 (15 of 1992);

b. "Authorised representative" means –

   a. in relation to an appellant, a person duly authorised by the appellant to present an appeal on his behalf to the Central Government;

   b. in relation to the Board, person duly appointed by the Board by notification in the Official Gazette as authorised representative to appear, plead and act for such authority in any such appeal and any other person acting on behalf of the person so appointed;

   c. "Board" means the Securities and Exchange Board of India established under section 3 of the Act;

   d. "Form" means the form appended to these rules;

   e. "regulations" means the regulations made by the Board under the Act;

   f. "rules" means the rules made under the Act.

3. Form of appeal

Any person aggrieved by an Order of the Board made under the Act or the rules or regulations made thereunder, may prefer an appeal to the Central Government in the Form.

4. Time within which appeal is to be preferred

1. An appeal shall be preferred by the aggrieved person within a period of thirty days from the date of communication to him of the order of the Board made under the Act or rules or regulations.
2. When the appeal is preferred after the expiry of the period of thirty days specified in sub-rule (1), it shall be accompanied by an application supported by an affidavit setting forth the facts on which the appellant relies to satisfy the Central Government that he has sufficient cause for not preferring the appeal within the said period of thirty days.

   Provided that if the Central Government is satisfied that the appellant had sufficient cause for not preferring the appeal within the aforesaid period, it may, for reasons to be recorded in writing, admit the appeal after the expiry of the aforesaid period but before the expiry of 45 days from the date of communication to him of the order of the Board.

5. Payment of fees

1. Every appeal shall be accompanied by a fees of rupees five hundred only.
2. The amount of fees shall be deposited in the nearest Government treasury of the nearest branch of the State Bank of India.
3. The amount of the fees shall be deposited under the head "065 – other Admn. Services – Other Services – Other Receipts".

6. Contents of appeal

Every appeal filed under rule 3 shall be written in English or Hindi and shall set forth concisely under distinct heads, the grounds of appeal without any argument or narrative and such grounds shall be numbered consecutively.

7. What to accompany form

Every appeal shall be filed in the Form in duplicate and shall be accompanied by two copies (at least one of which shall be a certified copy) of the order of the Board appealed against and other documents to support the grounds of objection mentioned in the appeal.

Explanation – For the purpose of this rule "certified copy" includes the copy which was originally supplied to the appellant as well as a photostat copy thereof duly authenticated by the appellant or his authorised representative as a true copy.

8. Filing of affidavits

Where a fact which can not be borne out by, or is contrary to, the record is alleged, it shall be stated clearly and concisely and supported by a duly sworn affidavit.

9. Rights of appellant to appear before the Central Government

1. Every appellant may appear before the Central Government in person or through his authorized representative.
2. An appellant may, by writing, authorise–
   i. an advocate, or
   ii. a Chartered Accountant, or
   iii. a Cost and Works Accountant, or
   iv. a Company Secretary, having prescribed qualifications under clause (45) of Section 2 of the Companies Act, 1956 (1 of 1956) to function as authorised representative of such party.

10. Authorising a representative to appear

In an appeal by any appellant, where the Form is signed by his authorised representative, the appellant shall append to the Form documents authorising the authorised representative to appear for him and the said document shall state what his relationship is with the appellant.

11. Authorisation to be filed

An authorised representative appearing for the appellant at the hearing of an appeal shall, unless the document referred to in rule 10 has been appended, file such a document before the commencement of the hearing.

12. Procedure for filing appeal

1. An appeal shall be preferred by the appellant or his authorised representative to the Central Government in person or be sent by Registered Post addressed to the Secretary to the Government of India, Department of Economic Affairs, Ministry of Finance, New Delhi.

2. An appeal sent by post under sub-rule (1) shall be deemed to have been preferred to the Central Government on the day on which it is received in the office of the Secretary to the Government of India, Department of Economic Affairs, Ministry of Finance, at Delhi.

13. Furnishing of information and documents

1. The Central Government may, before considering the appeal, require the appellant or the Board or both to furnish such further information and documents as it considers necessary.
2. Parties concerned shall furnish such information and documents within 30 days of such order.

14. Date and place of hearing of appeal of communicated

The Central Government shall communicate, before considering the appeal, to the appellant or the Board or both the date and place of the hearing of the appeal and may send a copy of the appeal to the Board either before or with such communication.

15. Hearing of appeal

1. On the day fixed or on any other day to which the hearing may be adjourned, the appellant shall be heard in support of the appeal. The Central Government shall, then, if necessary, hear the Board or its authorised representative against the appeal, and in such case the appellant shall be entitled to reply.
2. In case the appellant does not appear in person or through an authorised representative when the appeal is called for hearing, the Central Government may dispose of the appeal on merits :

   Provided that where an appeal has been disposed of as provided above and the appellant appears afterwards and satisfies the Central Government that there was sufficient cause for his not appearance, when the appeal was called for hearing, the Central Government shall make an order setting aside the ex-parte order and restore the appeal.

16. Orders by Central Government

The Central Government shall,

a. after considering the appeal preferred to it under rule 3;
b. after considering further documentary evidence referred to in rule 13; and
c. after giving hearing under rule 15;

Pass such orders or give such directions as may be necessary or expedient to give effect to or, in relation to, its orders.

17. Order to be signed and dated

The Order of the Central Government shall be in writing and shall be signed and dated.

18. Order to be communicated to the party

The Central Government shall, after the order is signed, cause it to be communicated to appellant and to the Board.

FORM

Securities and Exchange Board of India (Appeal to the Central Government) Rules, 1992

(See rule 3)

FORM OF APPEAL

From
(Mention the name and address of the appellant here)

To

The Secretary to the Government of India,

Department of Economic Affairs,

Ministry of Finance, North Block,

New Delhi

Sir,

The appellant named above, begs to prefer this appeal under section 20 of the Securities and Exchange Board of India Act, 1992 (15 of 1992) against order No. ..... dated ..... passed by the Securities and Exchange Board of India under the said Act, ... [62]Rules …….. and [63]Regulation …….. on the following facts and grounds.

FACTS

(Mention briefly the facts of the case here. Enclose copy of the order passed by the Board and copies of letters written by the appellant to the Board and copies of other relevant documents, if any)

GROUNDS

(Mention here the grounds on which the appeal is made)

PRAYER

In the light of what is stated above, the appellant prays that he/she/it may be granted the following relief.

RELIEF SOUGHT

(Specify the relief sought)

The amount of Rs. Five hundred as fees for this appeal has been deposited in ..... vide receipt No. ..... dated ……

Place: .....

Date : .....

(signature of the Appellant or his authorised representative)

List of documents attached : .....

(Signature of the Appellant or his authorised representative)

62 Indicate the relevant rule.
63 Indicate the relevant regulation.

Appendix – C

Depositories Act, 1996

CHAPTER I : PRELIMINARY

1. Short titlextent and commencement

(1) This Act may be called the Depositories Act, 1996.

(2) It extends to the whole of India.

(3) It shall be deemed to have come into force on the 20th day of September, 1995.

2. Definitions

(1) In this Act, unless the context otherwise requires-

(a) "beneficial owner" means a person whose name is recorded as such with a depository;

(b) "Board" means the Securities and Exchange Board of India established under section 3 of the Securities and Exchange Board of India Act, 1992 (15 of 1992);

(c) "bye-laws" means bye-laws made by a depository under section 26;

(d) "Company Law Board" means the Board of Company Law Administration constituted under section 10E of the Companies Act, 1956 (1 of 1956);

(e) "depository" means a company formed and registered under the Companies Act, 1956 (1 of 1956) and which has been granted a certificate of registration under sub-section (1A) of Section 12 of the Securities and Exchange Board of India Act, 1992 (15 of 1992);

(f) "issuer" means any person making an issue of securities;

(g) "participant" means a person registered as such under sub-section (1A) of Section 12 of the Securities and Exchange Board of India Act, 1992 (15 of 1992);

(h) "prescribed" means prescribed by rules made under this Act;

(i) "record" includes the records maintained in the form of books or stored in a computer or in such other form as may be determined by regulations;

(j) "registered owner" means a depository whose name is entered as such in the register of the issuer;

(k) "regulations" means the regulations made by the Board;

[1][(ka) "Securities Appellate Tribunal" means a Securities Appellate Tribunal established under sub-section (1) of section 15K of the Securities and Exchange Board of India Act, 1992;]

(l) "security" means such security as may be specified by the Board;

(m) "service" means any service connected with recording of allotment of securities or transfer of ownership of securities in the record of a depository.

(2) Words and expressions used herein and not defined but defined in the Companies Act, 1956 (1 of 1956) or the Securities Contracts (Regulation) Act, 1956 (42 of 1956) or the Securities and Exchange Board of India Act, 1992 (15 of 1992), shall have the meanings respectively assigned to them in those Acts.

3. Certificate of commencement of business by depositories

(1) No depository shall act as a depository unless it obtains a certificate of commencement of business from the Board.

(2) A certificate granted under sub-section (1) shall be in such form as may be specified by the regulations.

(3) The Board shall not grant a certificate under sub-section (1) unless it is satisfied that the depository has adequate systems and safeguards to prevent manipulation of records and transactions:

PROVIDED that no certificate shall be refused under this section unless the depository concerned has been given a reasonable opportunity of being heard.

CHAPTER III : RIGHTS AND OBLIGATIONS OF DEPOSITORIES, PARTICIPANTS, ISSUERS AND BENEFICIAL OWNERS

4. Agreement between depository and participant

(1) A depository shall enter into an agreement with one or more participants as its agent.

(2) Every agreement under sub-section (1) shall be in such form as may be specified by the bye-laws.

5. Services of Depository

Any person, through a participant, may enter into an agreement, in such form as may be specified by the bye-laws, with any depository for availing its services.

6. Surrender of Certificate of Security

(1) Any person who has entered into an agreement under Section 5 shall surrender the certificate of security, for which he seeks to avail the services of a depository, to the issuer in such manner as may be specified by the regulations.

(2) The issuer, on receipt of certificate of security under sub-section (1), shall cancel the certificate of security and substitute in its records the name of the depository as a registered owner in respect of that security and inform the depository accordingly.

(3) A depository shall, on receipt of information under sub-section (2), enter the name of the person referred to in sub-section (1) in its records, as the beneficial owner.

7. Registration of Transfer of Securities with Depository

(1) Every depository shall, on receipt of intimation from a participant, register the transfer of security in the name of the transferee.

(2) If a beneficial owner or a transferee of any security seeks to have custody of such security the depository shall inform the issuer accordingly.

8. Options to receive Security Certificate or Hold Securities with Depository

(1) Every person subscribing to securities offered by an issuer shall have the option either to receive the security certificates or hold securities with a depository.

(2) Where a person opts to hold a security with a depository, the issuer shall intimate such depository the details of allotment of the security, and on receipt of such information the depository shall enter in its records the name of tile allottee as the beneficial owner of that security.

9. Securities in Depositories to be in Fungible Form

(1) All securities held by a depository shall be dematerialised and shall be in a fungible form.

[2][(2) Nothing contained in sections 153, 153A, 153B, 187B, 187C and 372 of the Companies Act, 1956 (1 of 1956), shall apply to a depository in respect of securities held it on behalf of the beneficial owners.]

10. Rights of Depositories and Beneficial Owner

(1) Notwithstanding anything contained in any other law for the time being in force, a depository shall be deemed to be the registered owner for the purposes of effecting transfer of ownership of security on behalf of a beneficial owner.

(2) Save as otherwise provided in sub-section (1), the depository as a registered owner shall not have any voting rights or any other rights in respect of securities held by it.

(3) The beneficial owner shall be entitled to all the rights and benefits and be subjected to all the liabilities in respect of his securities held by a depository.

11. Register of Beneficial Owner

Every depository shall maintain a register and an index of beneficial owners in the manner provided in Sections 150, 151 and 152 of the Companies Act, 1956 (1 of 1956).

12. Pledge or Hypothecation of Securities held in a Depository

(1) Subject to such regulations and bye-laws, as may be made in this behalf, a beneficial owner may with the previous approval of the depository create a pledge or hypothecation in respect of a security owned by him through a depository.

(2) Every beneficial owner shall give intimation of such pledge or hypothecation to the depository and such depository shall thereupon make entries in its records accordingly.

(3) Any entry in the records of a depository under sub-section (2) shall be evidence, of a pledge or hypothecation.

13. Furnishing of Information and Records by Depository and Issuer

(1) Every depository shall furnish to the issuer information about the transfer of securities in the name of beneficial owners at such intervals and in such manner as may be specified by the bye-laws.

(2) Every issuer shall make available to the depository copies of the relevant records in respect of securities held by such depository.

14. Option to Opt Out in Respect of any Security

(1) If a beneficial owner seeks to opt out of a depository in respect of any security he shall inform the depository accordingly.

(2) The depository shall on receipt of intimation under sub-section (1) make appropriate entries in it records and shall inform the issuer.

(3) Every issuer shall, within thirty days of the receipt of intimation from the depository and on fulfillment of such conditions and on payment of such fees as may be specified by the regulations, issue the certificate of securities to the beneficial owner or the transferee, as the case may be.

15. Act 18 of 1891 to Apply to Depositories

The Bankers' Books Evidence Act, 1891 (18 of 1891) shall apply in relation to a depository as if it were a bank as defined in Section 2 of that Act.

16. Depositories to Indemnify Loss in Certain Cases

(1) Without prejudice to the provisions of any other law for the time being in force, any loss caused to the beneficial owner due to the negligence of the depository or the participant, the depository shall indemnify such beneficial owner.

(2) Where the loss due to the negligence of the participant under sub-section (1) is indemnified by the depository, the depository shall have the right to recover the same from such participant.

17. Rights and Obligations of Depositories, etc.

(1) Subject to the provisions of this Act, the rights and obligations of the depositories, participants and the issuers whose securities are dealt with by a depository shall be specified by the regulations.

(2) The eligibility criteria for admission of securities into the depository shall be specified by the regulations.

CHAPTER IV : ENQUIRY AND INSPECTION

18. Power of Board to Call for Information and Enquiry

(1) The Board, on being satisfied that it is necessary in the public interest or in the interest of investors so to do, may, by order in writing–

(a) call upon any issuer, depository, participant or beneficial owner to furnish in writing such information relating to the securities held in a depository as it may require; or

(b) authorise any person to make an enquiry or inspection in relation to the affairs of the issuer, beneficial owner, depository or participant, who shall submit a report of such enquiry or inspection to it within such period as may be specified in the order.

(2) Every director, manager, partner, secretary, officer or employee of the depository or issuer or the participant or beneficial owner shall on demand produce before the person making the enquiry or inspection all information or such records and other documents in his custody having a bearing on the subject matter of such enquiry or inspection.

19. Power of Board to give Directions in Certain Cases

Save as provided in this Act, if after making or causing to be made an enquiry or inspection, the Board is satisfied that it is necessary-

(i) in the interest of investors, or orderly development of securities market; or

(ii) to prevent the affairs of any depository or participant being conducted in the manner detrimental to the interests of investors or securities market, it may issue such directions-

(a) to any depository or participant or any person associated with the securities market; or

(b) to any issuer, as may be appropriate in the interest of investors or the securities market.

20. Offences

Whoever contravenes or attempts to contravene or abets the contravention of the provisions of this Act or any regulations or bye-laws made thereunder shall be punishable with imprisonment for a term which may extend to five years or with fine, or with both.

21. Offences by Companies

(1) Where an offence under this Act has been committed by a company, every person who at the time the offence was committed was in charge of, and was responsible to, the company for the conduct of the business of the company, as well as the company, shall be deemed to be guilty of the offence and shall be liable to be proceeded against and punished accordingly:

PROVIDED that nothing contained in this sub-section shall render any such person liable to any punishment provided in this Act, if he proves that the offence was committed without his knowledge or that he had exercised all due diligence to prevent the commission of such offence.

(2) Notwithstanding anything contained in sub-section (1), where an offence under this Act has been committed by a company and it is proved that the offence has been committed with the consent or connivance of, or is attributable to any neglect on the part of, any director, manager, secretary or other officer of the company, such director, manager, secretary or other officer shall also be deemed to be guilty of the offence and shall be liable to be proceeded against and punished accordingly.

Explanation: For the purposes of this section –

(a) "company" means any body corporate and includes a firm or other association of individuals; and

(b) "director", in relation to a firm, means a partner in the firm.

CHAPTER VI : MISCELLANEOUS

22. Cognizance of Offences by Courts

(1) No court shall take cognizance of any offence punishable under this Act or any regulations or bye-laws made thereunder, save on a complaint made by the Board.

(2) No court inferior to that of a Metropolitan Magistrate or a Judicial Magistrate of the First Class shall try any offence punishable under this Act.

23. Appeals

(1) Any person aggrieved by [3][an order of the Board made before the commencement of the Securities Laws (2nd Amendment) Act, 1999] under this Act, or the regulations made thereunder may prefer an appeal to the Central Government within such time as may be prescribed.

(2) No appeal shall be admitted if it is preferred after the expiry of the period prescribed therefor:

PROVIDED that an appeal may be admitted after the expiry of the period prescribed therefor if the appellant satisfies the Central Government that he had sufficient cause for not preferring the appeal within the prescribed period.

(3) Every appeal made under this section shall be made in such form and shall be accompanied by a copy of the order appealed against and by such fees as may be prescribed.

(4) The procedure for disposing of an appeal shall be such as may be prescribed:

PROVIDED that before disposing of an appeal, the appellant shall be given a reasonable opportunity of being heard.

1[23A. Appeal to Securities Appellate Tribunal

(1) Save as provided in sub-section (2), any person aggrieved by an order of the Board made, on and after the commencement of the Securities Laws (2nd Amendment) Act, 1999, under this Act, or the regulations made thereunder, may prefer an appeal to a Securities Appellate Tribunal having jurisdiction in the matter.

(2) No appeal shall lie to the Securities Appellate Tribunal from an order made by the Board with the consent of the parties.

(3) Every appeal under sub-section (1) shall be filed within a period of forty-five days from the date on which a copy of the order made by the Board is received by the person referred to in sub-section (1) and it shall be in such form and be accompanied by such fees as may be prescribed:

PROVIDED that the Securities Appellate Tribunal may entertain an appeal after the expiry of the said period of forty-five days if it is satisfied that there was sufficient cause for not filing it within that period.

(4) On receipt of an appeal under sub-section (1), the Securities Appellate Tribunal may, after giving the parties to the appeal an opportunity of being heard, pass such orders thereon as it thinks fit, confirming, modifying or setting aside the order appealed against.

(5) The Securities Appellate Tribunal shall send a copy of every order made by it to the Board and parties to the appeal.

(6) The appeal filed before the Securities Appellate Tribunal under sub-section (1) shall be dealt with by it as expeditiously as possible and endeavour shall be made by it to dispose of the appeal finally within six months from the date of receipt of the appeal.

23B. Procedure and Powers of Securities Appellate Tribunal

(1) The Securities Appellate Tribunal shall not be bound by the procedure laid down by the Code of Civil Procedure, 1908, but shall be guided by the principles of natural justice and, subject to the other provisions of this Act and of any rules, the Securities Appellate Tribunal shall have powers to regulate their own procedure including the places at which they shall have their sittings.

(2) The Securities Appellate Tribunal shall have, for the purpose of discharging their functions under this Act, the same powers as are vested in a civil court under the Code of Civil Procedure, 1908, while trying a suit, in respect of the following matters, namely:

(a) summoning and enforcing the attendance of any person and examining him an oath;

(b) requiring the discovery and production of documents;

(c) receiving evidence on affidavits;

(d) issuing commissions for the examination of witnesses or documents

(e) reviewing its decisions;

(f) dismissing an application for default or deciding it ex parte;

(g) setting aside any order of dismissal of any application for default or any order passed by it ex parte; and

(h) any other matter which may be prescribed.

(3) Every proceeding before the Securities Appellate Tribunal shall be deemed to be a judicial proceeding within the meaning of Sections 193 and 228, and for the purposes of Section 196 of the Indian Penal Code, 1860 and the Securities Appellate Tribunal shall be deemed to be a civil court for all the purposes of Section 195 and Chapter XXVI of the Code of Criminal Procedure, 1973.

23C. Right to Legal Representation

The appellate may either appear in person or authorise one or more chartered accountants or company secretaries or cost accountants or legal practitioners or any of its officers to present his or its case before the Securities Appellate Tribunal.

Explanation: For the purposes of this section, –

(a) "chartered accountant" means a chartered accountant as defined in clause (b) of sub-section (1) of section 2 of the Chartered Accountants Act, 1949 and who has obtained a certificate of practice under sub-section (1) of section 6 of that Act;

(b) "company secretary" means a company secretary as defined in clause (c) of sub-section (1) of section 2 of the Company Secretaries Act, 1980 and who has obtained a certificate of practice under sub-section (1) of section 6 of that Act;

(c) "cost accountant" means a cost accountant as defined in clause (b) of sub-section (1) of section 2 of the Cost and Works Accountants Act, 1959 and who has obtained a certificate of practice under sub-section (1) of section 6 of that Act;

(d) "legal practitioner" means an advocate, vakil or an attorney of any High Court, and includes a pleader in practice.

23D. Limitation

The provisions of the Limitations Act, 1963 shall, as far as may be, apply to an appeal made to a Securities Appellate Tribunal.

23E. Civil Court not to have Jurisdiction

No civil court shall have jurisdiction to entertain any suit or proceeding in respect of any matter which a Securities Appellate Tribunal is empowered by or under this Act to determine and no injunction shall be granted by any court or other authority in respect of any action taken or to be taken in pursuance of any power conferred by or under this Act.

23F. Appeal to High Court

Any person aggrieved by any decision order of the Securities Appellate Tribunal may file an appeal to the High Court within sixty days from the date of communication of the decision or order of the Securities Appellate Tribunal to him on any question of fact or law arising out of such order:

PROVIDED that the High Court may, if it is satisfied that the appellant was prevented by sufficient cause from filing the appeal within the said period, allot it to be filed within a further period not exceeding sixty days.]

24. Power of Central Government to make Rules

(1) The Central Government may by notification in the Official Gazette, make rules for carrying out the provisions of this Act.

(2) In particular, and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters, namely,-

(a) the time within which an appeal may be preferred under sub-section (1) of section 23;

(b) the form in which an appeal may be preferred under sub-section (3) of section 23 and the fees payable in respect of such appeal;

(c) the procedure for disposing of an appeal under sub-section (4) of section 23;

[1][(d) the form in which an appeal may be filed before the Securities Appellate Tribunal under section 23A and the fees payable in respect of such appeal.]

25. Power of Board to make Regulations

(1) Without prejudice to the provisions contained in section 30 of the Securities and Exchange Board of India Act, 1992 (15 of 1992), the Board may by notification in the Official Gazette, make regulations consistent with the provisions of this Act and the rules made thereunder to carry out the purposes of this Act.

(2) In particular and without prejudice to the generality of the foregoing power, such regulations may provide for-

(a) the form in which record is to be maintained under clause (i) of sub-section (1) of section 2;

(b) the form in which the certificate of commencement of business shall be issued under sub-section (2) of section 3;

(c) the manner in which the certificate of security shall be surrendered under sub-section (1) of section 6;

(d) the manner of creating a pledge or hypothecation in respect of security owned by a beneficial owner under sub-section (1) of section 12;

(e) the conditions and the fees payable with respect to the issue of certificate of securities under sub-section (3) of section 14;

(f) the rights and obligations of the depositories, participants and the issuers under sub-section (1) of section 17;

(g) the eligibility criteria for admission of securities in the depository under sub-section (2) of section 17.

26. Power of Depositories to make Bye-laws

(1) A depository shall, with the previous approval of the Board, make bye-laws consistent with the provisions of this Act and the regulations.

(2) In particular, and without prejudice to the generality of the foregoing power, such bye-laws shall provide for–

(a) the eligibility criteria for admission and removal of securities in the depository;

(b) the conditions subject to which the securities shall be dealt with;

(c) the eligibility criteria for admission of any person as a participant;

(d) the manner and procedure for dematerialisation of securities;

(e) the procedure for transactions within the depository;

(f) the manner in which securities shall be dealt with or withdrawn from a depository;

(g) the procedure for ensuring safeguards to protect the interests of participants and beneficial owners;

(h) the conditions of admission into and withdrawal from a participant by a beneficial owner;

(i) the procedure for conveying information to the participants and beneficial owners on dividend declaration, shareholder meetings and other matters of interest to the beneficial owners;

(j) the manner of distribution of dividends, interest and monetary benefits received from the company among beneficial owners;

(k) the manner of creating pledge or hypothecation in respect of securities held with a depository;

(l) *inter se* rights and obligations among the depository, issuer, participants, and beneficial owners;

(m) the manner and the periodicity of furnishing information to the Board, issuer and other persons;

(n) the procedure for resolving disputes involving depository, issuer, company or a beneficial owner;

(o) the procedure for proceeding against the participant committing breach of the regulations and provisions for suspension and expulsion of participants from the depository and cancellation of agreements entered with the depository;

(p) the internal control standards including procedure for auditing, reviewing and monitoring.

(3) Where the Board considers it expedient so to do, it may, by order in writing, direct a depository to make any bye-laws or to amend or revoke any bye-laws already made within such period as it may specify in this behalf.

(4) If the depository fails or neglects to comply with such order within the specified period, the Board may make the bye-laws or amend or revoke the bye-laws made either in the form specified in the order or with such modifications thereof as the Board thinks fit.

27. Rules and Regulations to be Laid before Parliament

Every rule and every regulation made under this Act shall be laid, as soon as may be after it is made, before each House of Parliament, while it is in session, for a total period of thirty days which may be comprised in one session or in two or more successive sessions, and if, before the expiry of the session immediately following the session or the successive sessions aforesaid, both Houses agree in making any modification in the rule or regulation or both Houses agree that the rule or regulation should not be made, the rule or regulation shall thereafter have effect only in such modified form or be of no effect, as the case may be; so, however, that any such modification or annulment shall be without prejudice to the validity of anything previously done under that rule or regulation.

28. Application of other Laws not Barred

The provisions of this Act shall be in addition to, and not in derogation of, any other law for the time being in force relating to the holding and transfer of securities.

29. Removal of Difficulties

(1) If any difficulty arises in giving effect to the provisions of this Act, the Central Government may, by order published in the Official Gazette, make such provisions not inconsistent with the provisions of this Act as appear to it to be necessary or expedient for removing the difficulty:

PROVIDED that no order shall be made under this section after the expiry of a period of two years from the commencement of this Act.

(2) Every order made under this section shall be laid, as soon as may be after it is made, before each House of Parliament.

30. Amendments to Certain Enactment

The enactment specified in the Schedule to this Act shall be amended in the manner provided therein.

31. Repeal and Saving

(1) The Depositories (Third) Ordinance, 1996 (Ordinance 28 of 1996) is hereby repealed.

(2) Notwithstanding such repeal, anything done or any action taken under the said Ordinance shall be deemed to have been done or taken under the corresponding provisions of this Act.

The Schedule: Amendments to Certain Enactments

[See section 30]

PART I

Amendment to the Indian Stamp Act, 1899

[2 of 1899]

Amendment

After section 8, the following section shall be inserted, namely:-

"8A. Securities not liable to stamp duty – Notwithstanding anything contained in this Act-

(a) an issuer, by the issue of securities to one or more depositories shall, in respect of such issue, be chargeable with duty on the total amount of security issued by it and such securities need not be stamped;

(b) where an issuer issues certificate of security under sub-section (3) of section 14 of the Depositories Act, 1996, on such certificate duty shall be payable as is payable on the issue of duplicate certificate under this Act;

(c) transfer of registered ownership of shares from a person to a depository or from a depository to a beneficial owner shall not be liable to any stamp duty;

(d) the transfer of beneficial ownership of shares, such shares being shares of a company dealt with by a depository shall not be liable to duty under article 62 of Schedule I of this Act.

Explanation: For the purposes of this section, the expressions "beneficial owner", "depository", and "issuer" shall have the meanings respectively assigned to them in clauses (a), (e) and (f) of sub-section (1) of section 2 of the Depositories Act, 1996."

PART II

Amendments to the Companies Act, 1956

[1 of 1956]

Amendments

1. In section 2, after clause (45A) the following clause shall be inserted, namely:-

   "(45B) "Securities and Exchange Board of India" means the Securities and Exchange Board of India established under section 3 of the Securities and Exchange Board of India Act, 1992 (15 of 1992)."

2. After section 2, the following section shall be inserted, namely:-

   "2A. Interpretation of certain words and expressions: Words and expressions used and not defined in this Act but defined in the Depositories Act, 1996 shall have the same meanings respectively assigned to them in that Act."

3. In section 41, after sub-section (2), the following sub-section shall be inserted, namely:- "(3) Every person holding equity share capital of a company and whose name is entered as beneficial owner in the records of the depository shall be deemed to be a member of the concerned company."

4. In section 49, in sub-section (5), after clause (b), the following clause shall be inserted, namely: "(c) from holding investments in the name of a depository when such investments are in the form of securities held by the company as a beneficial owner."

5. In section 51, the following proviso shall be inserted, namely:-

   "PROVIDED that where the securities are held in a depository, the records of the beneficial ownership may be served by such depository on the company by means of electronic mode or by delivery of floppies or discs."

6. Section 83 shall be omitted.

7. In section 108, after sub-section (2), the following sub-section shall be inserted, namely:-

   "(3) Nothing contained in this section shall apply to transfer of security effected by the transferor and the transferee both of whom are entered as beneficial owners in the records of a depository."

8. In section 111, after sub-section (13), the following sub-section shall be inserted, namely:-

"(14) In this section "company" means a private company and includes a private company which had become a public company by virtue of section 43A of this Act."

9. After section 111, the following section shall be inserted, namely:-

"111 A. Rectification of register on transfer-

(1) In this section, unless the context otherwise requires, "company" means a company other than a company referred to in sub-section (14) of section 111 of this Act.

(2) Subject to the provisions of this section, the shares or debentures and any interest therein of a company shall be freely transferable.

(3) The Company Law Board may on an application made by a depository, company, participant or investor or the Securities and Exchange Board of India within two months from the date of transfer of any shares or debentures held by a depository or from the date on which the instrument of transfer or the intimation of transmission was delivered to the company, as the case may be, after such inquiry as it thinks fit, direct any company or depository to rectify register or records if the transfer of the shares or debentures is in contravention of any of the provisions of the Securities and Exchange Board of India Act, 1992 (15 of 1992) or regulations made thereunder or the Sick Industrial Companies (Special Provisions) Act, 1985 (1 of 1986).

(4) The Company Law Board while acting under sub-section (3), may at its discretion make such interim order as to suspend the voting rights before making or completing such enquiry.

(5) The provisions of this section shall not restrict the right of a holder of shares or debentures, to transfer such shares or debentures and any person acquiring such shares or debentures shall be entitled to voting rights unless the voting rights have been suspended by an order of the Company Law Board.

(6) Notwithstanding anything contained in this section, any further transfer, during the pendency of the application with the Company Law Board, of shares or debentures shall entitle the transferee to voting rights unless the voting rights in respect of such transferee have also been suspended.

(7) The provisions of sub-sections (5), (7), (9), (10) and (12) of section 111 shall, so far as may be, apply to the proceedings before the Company Law Board under this section as they apply to the proceedings under that section."

10. In section 113, after sub-section (3), the following sub-section shall be inserted, namely:- "(4) Notwithstanding anything contained in sub-section (1), where the securities are dealt with in a depository, the company shall intimate the details of allotment of securities to depository immediately on allotment of such securities."

11. In section 150, in sub-section (1), in clause (b), the words "distinguishing each share by its number" shall be omitted.

12. In section 152, in sub-section (1), in clause (b), the words "distinguishing each debenture by its number" shall be omitted.

13. After section 152, the following section shall be inserted, namely:-

"152A. Register and index of beneficial owners to be of debenture holder: The register and index of beneficial owners maintained by a depository under section 11 of the Depositories Act, 1996, shall be deemed to be an index of members and register and index of debenture holders, as the case may be, for the purposes of this Act."

14. In Schedule II, in Part II, in clause C, after sub-clause 9, the following sub-clause shall be inserted, namely:-

"9A. The details of option to subscribe for securities to be dealt with in a depository."

PART III

Amendments to the Securities Contracts (Regulation) Act, 1956

[42 of 1956]

Amendments

1. In section 2, for clause (i) the following clause shall be substituted, namely:-

   (i) "spot delivery contract" means a contract which provides for-

      (a) actual delivery of securities and the payment of a price therefor either on the same day as the date of the contract or on the next day, the actual periods taken for the despatch of the securities or the remittance of money therefor through the post being excluded from the computation of the period aforesaid if the parties to the contract do not reside in the same town or locality;

      (b) transfer of the securities by the depository from the account of a beneficial owner to the account of another beneficial owner when such securities are dealt with by a depository."

2. Section 22A shall be omitted.

PART IV

Amendment to the Income Tax Act, 1961

[43 of 1961]

Amendment

In section 45, after sub-section (2), the following sub-section shall be inserted, namely:-

"(2A) Where any person has had at any time during previous year any beneficial interest in any securities, then any profits or gains arising from transfer made by the depository or participant of such beneficial interest in respect of securities shall be chargeable to income-tax as the income of the beneficial owner of the previous year in which such transfer took place and shall not be regarded as income of the depository who is deemed to be the registered owner of securities by virtue of sub-section (1) of section 10 of the Depositories Act, 1996, and for the purposes of-

(i) section 48, and

(ii) proviso to clause (42A) of section 2,

the cost of acquisition and the period of holding of any securities shall be determined on the basis of the first-in-first-out method.

Explanation: For the purposes of this sub-section, the expressions "beneficial owner", "depository" and "security" shall have the meanings respectively assigned to them in clauses (a), (e) and (l) of sub-section (1) of section 2 of the Depositories Act, 1996."

PART V

Amendment to the Benami Transactions (Prohibition) Act, 1988

[45 of 1988]

Amendment

In section 3, for sub-section (2), the following sub-section shall be substituted, namely:-

"(2) Nothing in sub-section (1) shall apply to-

(a) the purchase of property by any person in the name of his wife or unmarried daughter and it shall be presumed, unless the contrary is proved, that the said property had been purchased for the benefit of the wife or the unmarried daughter;

(b) the securities held by a-

   (i) depository as a registered owner under sub-section (1) of section 10 of the Depositories Act, 1996;

   (ii) participant as an agent of a depository.

Explanation : The expressions "depository" and "participants" shall have the meanings respectively assigned to them in clauses (e) and (g) of sub-section (1) of section 2 of the Depositories Act, 1996."

PART VI

Amendments to the Securities and Exchange Board of India Act, 1992

[15 of 19921]

Amendments

1. In section 2, in sub-section (2), for the words, brackets and figures "the Securities Contracts (Regulation) Act, 1956 (42 of 1956)", the words, brackets and figures "the Securities Contracts (Regulation) Act, 1956 or the Depositories Act, 1996" shall be substituted.
2. In section 11, in sub-section (2), in clause (ba) for the words "depositories, custodians", the words "depositories, participants, custodians" shall be substituted.
3. In section l2, in sub-section (1A), for the words "depository, custodian", at both the places where they occur the words "depository, participant, custodian" shall be substituted.
4. In section l6, in sub-section (1), for the words "this Act", the words and figures "this Act or the Depositories Act, 1996" shall be substituted.

Foot Notes

1 Inserted by the Securities Laws (2nd Amendment) Act, 1999.
2 Substituted by the Depositories Related Laws (Amendment) Act, 1997.
3 Substituted for "an order of the Board made" by the Securities Laws (2nd Amendment) Act, 1999.

Annexure VI

THE GAZETTE OF INDIA
EXTRAORDINARY
PART II - SECTION 3 - SUB-SECTION (ii)
PUBLISHED BY AUTHORITY
BOMBAY
THE 23 DAY OF OCTOBER 1992
NOTIFICATION
SECURITIES AND EXCHANGE BOARD OF INDIA
(STOCK-BROKERS AND SUB-BROKERS) REGULATIONS, 1992

CHAPTER I
PRELIMINARY

Short Title and Commencement

1. (1) These regulations may be called the Securities and Exchange Board of India (Stock-brokers and Sub-brokers) Regulations, 1992.

(2) These regulations shall come into force on the date of their publication in the Official Gazette.

Definitions

2. In these regulations, unless the context otherwise requires:-

[1*][(a) 'clearing corporation or clearing house' means the clearing corporation or clearing house of a recognised stock exchange to clear and settle trades in securities."

(aa) 'clearing member' means a member of a clearing corporation or clearing house of the derivatives exchange or derivatives segment of an exchange, who may clear and settle transactions in securities.]

[2*][(aaa)] "enquiry officer" means any officer of the Board, or any other person,having experience in dealing with the problems relating to the securities market, who is appointed by the Board under Chapter VI;]

(b) "form" means a form specified in Schedule I;

(c) "inspecting authority" means one or more persons appointed by the Board to exercise powers conferred under Chapter V of these regulations;

(d) "regulations" means Securities and Exchange Board of India (Stock-brokers and Sub-brokers) Regulations, 1992;

(e) "rules" means Securities and Exchange Board of India (Stock- brokers and Sub-brokers) Rules, 1992;

(f) "Securities Contracts (Regulation) Act" means the Securities Contracts (Regulation) Act, 1956 (42 of 1956);.

[3*][(fa) "self clearing member" means a member of a clearing corporation]

(g) "small investor" means any investor buying or selling securities on a cash transaction for a market value not exceeding rupees fifty thousand in aggregate on any day as shown in a contract note issued by the stock-broker.

[4*][(ga) 'trading member' means a member of the derivatives exchange or derivatives segment of a stock exchange and who settles the trade in the clearing corporation or clearing house through a clearing member;]

(h) All other words and expressions occurring in these regulations shall bear the same meaning as in the Act and the rules.

Foot notes

1. "Clauses a & aa" *inserted* by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2000 published in the Official Gazette of India dated 14.03.2000

2. Clause (a) *renumbered* as (aaa) by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2000 published in the Official Gazette of India dated 14.03.2000

3. "Clause fa" *inserted* by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2001 published in the Official Gazette of India dated 15.11.2001.

4. "Clause (ga)" *inserted* by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2000 published in the Official Gazette of India dated 14.03.2000

CHAPTER II
REGISTRATION OF STOCK BROKERS

Application for registration of stockbroker

3. (1) An application by a stockbroker for grant of a certificate shall be made in Form A through the stock exchange or stock exchanges, as the case may be, of which he is admitted as a member.

(2) The stock exchange shall forward the application form to the Board as early as possible but not later than thirty days from the date of its receipt.

(3) Notwithstanding anything contained in sub-regulation (1), any application made by a stockbroker prior to coming into force of these regulations containing such particulars or as near thereto as mentioned in the Form A shall be treated as an application if made in pursuance of sub-regulation (1) and dealt with accordingly:

Provided that the requirement of the payment of fees shall be the same as is referred to in sub-regulation (1) of regulation 10.

Furnishing Information, Clarification, etc.

4. (1) The Board may require the applicant to furnish such further information or clarifications, regarding the dealings in securities and matters connected thereto to consider the application for grant of a certificate.

(2) The applicant or, its principal officer shall, if so required, appear before the Board for personal representation.

Consideration Application

5. The Board shall take into account for considering the grant of a certificate all matters relating to buying, selling, or dealing in securities and in particular the following, namely, whether the stockbroker:

(a) is eligible to be admitted as a member of a stock exchange;

(b) has the necessary infrastructure like adequate office space, equipments and man power to effectively discharge his activities;

(c) has any past experience in the business of buying, selling or dealing in securities;

(d) is subjected to disciplinary proceedings under the rules, regulations and bye-laws of a stock exchange with respect to his business as a stock-broker involving either himself or any of his partners, directors or employees;

[5*]["(e) is a fit and proper person"]

Procedure for Registration

6. The Board on being satisfied that the stock-broker is eligible, shall grant a certificate in Form D to the stockbroker and send an intimation to that effect to the stock exchange or stock exchanges as the case may be.

Stock-Brokers to Abide by Code of Conduct, etc.

7. The stockbroker holding a certificate shall at all times abide by the Code of Conduct as specified at Schedule II.

Procedure where registration is not granted

8. (1) Where an application for grant of a certificate under regulation 3, does not fulfil the requirements mentioned in regulation 5, the Board may reject the application after giving a reasonable opportunity of being heard.

(2) The refusal to grant the registration certificate shall be communicated by the Board within thirty days of such refusal to the concerned stock exchange and to the applicant stating therein the grounds on which the application has been rejected.

(3) An applicant may, being aggrieved by the decision of the Board under sub- regulation (2) apply within a period of thirty days from the date of receipt of such intimation, to the Board for reconsideration of its decision.

(4) The Board shall reconsider an application made under sub- regulation (3) and communicate its decision as soon as possible in writing to the applicant and to the concerned stock-exchange.

Effect of Refusal of Certificate of Registration

9. A stock-broker, whose application for grant of a certificate has been refused by the Board, shall not, on and from the date of the receipt of the communication under the sub-regulation (2) of regulation 8, buy, sell, or deal in securities as a stockbroker.

Payment of Fees and the Consequences of Failure to Pay Fees

10. (1) Every applicant eligible for grant of a certificate shall pay such fees and in such manner as specified in Schedule III:

Provided that the Board may on sufficient cause being shown permit the stockbroker to pay such fees at any time before the expiry of six months from the date for which such fees become due.

(2) Where a stockbroker fails to pay the fees as provided in regulation 10, the Board may suspend the registration certificate, where upon the stockbroker shall cease to buy, sell or deal in securities as a stockbroker.

Foot notes

5. "Clause e" *inserted* by the Securities and Exchange Board of India (Stock Brokers & Sub Brokers) (Amendment) Regulations, 1998 published in the Official Gazette of India dated 05.01.1998.

CHAPTER III
REGISTRATION OF SUB-BROKERS

Application for Registration of Sub-broker

11. (1) An application by a sub-broker for the grant of a certificate shall be made in Form B.

(2) The application for registration under sub-regulation (1) above, shall be accompanied by a recommendation letter from a stock-broker of a recognised stock exchange with whom he is to be affiliated along with two references including one from his banker.

(3) The application form shall be submitted to the stock exchange of which the stockbroker with whom he is to be affiliated is a member.

(4) The stock exchange on receipt of an application under sub-regulation (3) shall verify the information contained therein and shall also certify that the applicant is eligible for registration as per criteria specified in sub-regulation (5).

(5) The eligibility criteria for registration as a sub-broker shall be as follows, namely:

(i) in the case of an individual;

(a) the applicant is not less than 21 years of age;

(b) the applicant has not been convicted of any offence involving fraud or dishonesty;

(c) the applicant has atleast passed 12th standard equivalent examination from an institution recognised by the Government;

[6*]["(d) the applicant is a fit and proper person"].

Provided that the Board may relax the educational qualifications on merits having regard to the applicant's experience.

(ii) In the case of partnership firm or a body corporate the partners or directors, as the case may be, shall comply with the requirements contained in clauses (a) to (c) of sub-regulation (i).

(6) The stock exchange shall forward the application form of such applicants who comply with all the requirements specified in sub-regulations (1) to (5) to the Board as early as possible, but not later than thirty days from the date of its receipt.

Procedure for Registration

12. (1) The Board on being satisfied that the sub-broker is eligible, shall grant a certificate in Form E to the sub-broker and send an intimation to that effect to the stock exchange or stock exchanges as the case may be.

(2) The Board may grant a certificate of registration to the appellant subject to the terms and conditions as stated in rule 5.

Procedure where Registration is not Granted

13. (1) Where an application for grant of a certificate under regulation 11, does not fulfill the requirements mentioned in regulation 11, the Board may reject the application after giving a reasonable opportunity of being heard.

(2) The refusal to grant the certificate shall be communicated by the Board within thirty days of such refusal to the concerned stock exchange and to the applicant stating therein the grounds on which the application has been rejected.

(3) An applicant being aggrieved by the decision of the Board under sub-regulation (2) may within a period of thirty days from the date of receipt of such intimation, apply to the Board for reconsideration of its decision.

(4) The Board shall reconsider an application made under sub-regulation (3) and communicate its decision as soon as possible in writing to the applicant and to the concerned stock exchange.

Effect of Refusal

14. A person whose application for grant of a certificate has been refused by the Board shall, on and from the date of the communication of refusal under regulation 13 cease to carry on any activities as a sub-broker.

General Obligations and Inspection

15. (1) The sub-broker shall:

(a) pay the fees as specified in Schedule III;

(b) abide by the Code of Conduct specified in Schedule II;

(c) enter into an agreement with the stockbroker for specifying the scope of his authority and responsibilities.

(2) The sub-broker shall keep and maintain the books and documents specified in regulation 17 except for the books and documents referred to in clauses (h), (i), (j), (k), (l) and (m) of sub-regulation (1) of regulation 17.

Application of Chapter IV, V and VI

16. The provisions of Chapters IV, V and VI of these regulations shall apply to a sub-broker as they apply in case of a stock broker.

Foot notes

6. "Clause d" *inserted* by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 1998 published in the Official Gazette of India dated 05.01.1998.

[7]*[CHAPTER III A
REGISTRATION OF TRADING AND CLEARING MEMBERS

Application for Registration of Trading Member or Clearing Member

16A (1) An application for grant of certificate of registration by a trading member of a derivatives exchange or derivatives segment of a stock exchange shall be made in Form AA of Schedule I, through the concerned derivatives exchange or derivative segment of a stock exchange of which he is a member.

(2) An application for grant of certificate of registration by a clearing member [8*][or self clearing member] of the clearing corporation or clearing house of a derivatives exchange or derivatives segment of a stock exchange, shall be made in Form AA of Schedule I, through the concerned clearing corporation or clearing house of which he is a member.

Provided that a trading member who also seeks to act as a clearing member [9*][or self clearing member] shall make separate applications for each activity in Form AA of Schedule I.

(3) The derivatives exchange or segment or clearing house or corporation as the case may be shall forward the application to the Board as early as possible but not later than thirty days from the date of its receipt.

Furnishing of Information, Clarification, etc.

16B (1) The Board may require the applicant or the concerned stock exchange or segment or clearing house or corporation to furnish such other information or clarifications, regarding the trading and settlement in derivatives and matters connected thereto, to consider the application for grant of a certificate.

(2) The applicant or its principal officer shall, if so required, appear before the Board for personal representation.

Consideration of Application

16C (1) The Board shall take into account for considering the grant of a certificate all matters relating to dealing and settlement in derivatives and in particular the following, namely, whether the applicant:

(a) is eligible to be admitted as a trading member of a derivative exchange and/or a clearing member of a derivatives exchange or derivatives segment of a stock exchange or clearing corporation or house;

(b) has the necessary infrastructure like adequate office place, equipments and manpower to effectively undertake his activities;

(c) is subjected to disciplinary proceedings under the rules, regulations and bye-laws of any stock exchange with respect to his business as a stockbroker or member of derivatives exchange or segment or member of clearing house or corporation involving either himself or any of his partners, directors or employees.

[10*][(d) has any financial liability which is due and payable to the Board under these regulations].

(2) An applicant who desires to act as a trading member, in addition to complying with the requirements of sub-regulation (1), shall have a net-worth as may be specified by the derivative exchange or segment from time to time and the approved user and sales personnel of the trading member have passed a certification programme approved by the Board;

(3) An applicant who desires to act as a clearing member, in addition to complying with the requirements of sub-regulation (1), shall have a minimum net worth of Rs.300 lakhs and shall deposit at least a sum of Rs.50 lakh or higher amount with the clearing corporation or clearing house of the derivatives exchange or derivatives segment in the form specified from time to time.

[11*][(4) An applicant who desires to act as a clearing member, in addition to complying with the requirements of sub-regulation (1), shall have a minimum net worth of Rs.100 lakh and shall deposit at least a sum of Rs.50 lakh or higher amount with the clearing corporation or clearing house of the derivatives exchange or derivatives segment in the form specified from time to time.]

Explanation: For the purpose of [12*][sub-regulations (2), (3) and (4)] the expression 'net worth' shall mean paid up capital and free reserves and other securities approved by the Board from time to time (but does not include fixed assets, pledged securities, value of member's card, non-allowable securities (unlisted securities), bad deliveries, doubtful debts and advances (debts or advances overdue for more than three months or debts or advances given to the associate persons of the member, prepaid expenses, losses, intangible assets and 30% value of marketable securities).

Procedure for Registration

16D The Board on being satisfied that the applicant is eligible, shall grant a certificate in Form DA of Schedule I, to the applicant and send an intimation to that effect to the derivatives segment of the stock exchange or derivatives exchange or clearing corporation or clearing house, as the case may be.

Procedure where Registration is not Granted

16E (1) Where an application for the grant of a certificate under regulation 16A does not fulfil the requirements specified in 16C of the regulations, the Board may reject the application of the applicant after giving a reasonable opportunity of being heard.

(2) The refusal to grant the certificate of registration shall be communicated by the Board within 30 days of such refusal to the concerned segment of the stock exchange, or clearing house or corporation and to the applicant stating therein the grounds on which the application has been rejected.

(3) An applicant may, if aggrieved by the decision of the Board under sub-regulation (2) apply within a period of thirty days from the date of receipt of such information to the Board for reconsideration of its decision.

(4) The Board shall reconsider an application made under sub-regulation (3) and communicate its decision as soon as possible in writing to the applicant and to the concerned segment of the stock exchange or clearing house or corporation.

Effect of Refusal of Certificate of Registration

16F An applicant, whose application for the grant of a certificate of registration has been refused by the Board, shall not, on and from the date of receipt of the communication under sub-regulation (2) or sub-regulation (4) of regulation 16E, deal in or settle the derivatives contracts as a member of the derivatives exchange or derivatives segment or clearing corporation or clearing house.

Payment of Fees and Consequences of Failure to Pay Fees

16G (1) Every applicant eligible for grant of a certificate as a trading or clearing member [13*][or self -clearing member] shall pay such fee and in such manner as specified in Schedule IV.

(2) Where a trading or clearing member [14*][or self clearing member] fails to pay the fees as provided in sub-regulation (1), the Board may suspend or cancel the registration certificate after giving an opportunity of being heard, where upon the trading and clearing member [14*][or self-clearing member] shall cease to deal in or settle the derivatives contract as a member of the derivatives segment of the exchange or derivatives exchange or clearing corporation or clearing house'.

Trading member/Clearing Member [15*][or self-clearing member] to abide by the Code of Conduct, etc.

16H (1) The code of conduct specified for the stockbrokers as stipulated in Schedule II, shall be applicable mutatis mutandis to the trading member, clearing member and such members shall at all times abide by the same.

(2) The trading member and clearing member shall abide by the code of conduct as specified in the rules, bye-laws and regulations of the derivatives exchange or derivatives segment of the exchange.

(3) The trading members shall obtain details of the prospective clients in 'Know Your Client' format as specified by the Board before executing an order on behalf of such client.

(4) The trading member shall mandatorily furnish 'Risk Disclosure Document' disclosing the risk inherent in trading in derivatives to the prospective clients in the form specified by the derivatives exchange or derivatives segment.

(5) The trading or clearing member shall deposit margin or any other deposit and shall maintain position or exposure limit as specified by the Board or the concerned exchange or segment or clearing corporation or clearing house from time to time.

[16*][(6) The provisions of sub regulations (1) to (5) shall be applicable mutatis mutandis to a self clearimg member].

Chapter IV, V and VI Applicable

16I (1) The provision of Chapter IV, V and VI shall be applicable mutatis mutandis to a trading member and a clearing member [17*][or self-clearing member] and such members shall abide by the provisions of the said Chapters.

(2) In the chapters referred to in sub-regulation (1), the word 'stockbroker' shall refer to trading member or clearing member [18*][or self-clearing member] and the word 'stock exchange' shall refer to 'derivatives exchange or derivatives segment of an exchange or clearing corporation or clearing house.'

(3) The Board may issue such directions under section 11B of the Act to the trading member or clearing member [19*][or self-clearing member] as may be deemed appropriate and such member shall abide by such directions.

(4) In case of violation of any regulation, the trading or the clearing member [20*][or self-clearing member] shall be liable to penalty as specified in regulation 26.

Foot notes

7. "Chapter III A" *inserted* by the SEBI (Stock Brokers & Sub Brokers)(Amendment) Regulations, 2000 published in the Official Gazette of India dated 14.3.2000
8. "or self clearing member" *inserted* by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2001, published in the Official Gazette of India dated 15.11.2001.
9. "or self clearing member" *inserted* by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2001, published in the Official Gazette of India dated 15.11.2001.
10. "Clause d" *inserted* by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2002 published in the Official Gazette of India dated 20.02.2002.
11. "sub-regulation 4" *inserted* by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2001, published in the Official Gazette of India dated 15.11.2001.
12. *Substituted* for "(2) and (3)" by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2001, published in the Official Gazette of India dated 15.11.2001.
13. "or self -clearing member" *inserted* by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2001, published in the Official Gazette of India dated 15.11.2001.
14. or self -clearing member" *inserted* by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2001, published in the Official Gazette of India dated 15.11.2001.
15. or self -clearing member" *inserted* by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2001, published in the Official Gazette of India dated 15.11.2001.
16. "Sub-regulation 6" inserted by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2001, published in the Official Gazette of India dated 15.11.2001.
17. "or self clearing member" *inserted* by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2001, published in the Official Gazette of India dated 15.11.2001.
18. "or self clearing member" *inserted* by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2001, published in the Official Gazette of India dated 15.11.2001.
19. "or self clearing member" *inserted* by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2001, published in the Official Gazette of India dated 15.11.2001.
20. "or self clearing member" *inserted* by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2001, published in the Official Gazette of India dated 15.11.2001.

CHAPTER IV
GENERAL OBLIGATIONS AND RESPONSIBILITIES

To Maintain Proper Books of Accounts, Records etc.

17 (1) Every stock-broker shall keep and maintain the following books of accounts, records and documents namely:

(a) Register of transactions (Sauda Book);

(b) Clients ledger;

(c) General ledger;

(d) Journals;

(e) Cash book;

(f) Bank pass book;

(g) Documents register should include particulars of shares and securities received and delivered;

(h) Members' contract books showing details of all contracts entered into by him with other members of the same exchange or counterfoils or duplicates of memos of confirmation issued to such other member;

(i) Counterfoils or duplicates of contract notes issued to clients;

(j) Written consent of clients in respect of contracts entered into as principals;

(k) Margin deposit book;

(l) Registers of accounts of sub-brokers;

(m) an agreement with a sub-broker specifying the scope of authority and responsibilities of the Stock-Broker and such sub- broker.

(2) Every stock-broker shall intimate to the Board the place where the books of accounts, records and documents are maintained.

(3) Without prejudice to sub- regulation (1), every stock-broker shall, after the close of each accounting period furnish to the Board if so required as soon as possible but not later than six months from the close of the said period a copy of the audited balance sheet and profit and loss account, as at the end of the said accounting period:

Provided that, if it is not possible to furnish the above documents within the time specified, the stock-broker shall keep the Board informed of the same together with the reasons for the delay and the period of time by which such documents would be furnished.

Maintenance of Books of Accounts and Records

18. Every stock broker shall preserve the books of account and other records maintained under regulation 17 for a minimum period of five years.

[21*][Appointment of compliance officer

18A (1) Every stock broker shall appoint a compliance officer who shall be responsible for monitoring the compliance of the Act, rules and regulations, notifications, guidelines instructions, etc., issued by the Board or the Central Government and for redressal of investors grievances.

(2) The compliance officer shall immediately and independently report the Board any non-compliance observed by him.]

Foot notes

21. Regulation 18A *inserted* by the SEBI (Investment Advice by Intermediaries) (Amendment) Regulations 2001, published in the Official Gazette of India dated 29.05.2001.

CHAPTER V
PROCEDURE FOR INSPECTION

Board's Right to Inspect

19 (1) Where it appears to the Board so to do, it may appoint one or more persons as inspecting authority to undertake inspection of the books of accounts, other records and documents of the stock-brokers for any of the purposes specified in sub-regulation (2).

(2) The purposes referred to in sub-regulation (1) shall be as follows, namely:

(a) to ensure that the books of accounts and other books are being maintained in the manner required;

(b) that the provisions of the Act, rules, regulations and the provisions of the Securities Contracts (Regulation) Act and the rules made thereunder are being complied with;

(c) to investigate into the complaints received from investors, other stockbrokers, sub-brokers or any other person on any matter having a bearing on the activities of the stock-brokers; and

(d) to investigate suo-moto, in the interest of securities business or investors' interest, into the affairs of the stock-broker.

Procedure for Inspection

20. (1) Before undertaking any inspection under regulation 19, the Board shall give a reasonable notice to the stock-broker for that purpose.

(2) Notwithstanding anything contained in sub-regulation (1), where the Board is satisfied that in the interest of the investors or in public interest no such notice should be given, it may by an order in writing direct that the inspection of the affairs of the stockbroker be taken up without such notice.

(3) On being empowered by the Board, the inspecting authority shall undertake the inspection and the stock-broker against whom an inspection is being carried out shall be bound to discharge his obligations as provided under regulation 21.

Obligations of Stock-Broker on Inspection by the Board

21. (1) It shall be the duty of broker on inspection by the Board every director, proprietor, partner, officer and employee of the stock-broker, who is being inspected, to produce to the inspecting authority such books, accounts and other documents in his custody or control and furnish him with the statements and information relating to the transactions in securities market within such time as the said officer may require.

(2) The stock-broker shall allow the inspecting authority to have reasonable access to the premises occupied by such stock-broker or by any other person on his behalf and also extend reasonable facility for examining any books, records, documents and computer data in the possession of the stock-broker or any other person and also provide copies of documents or other materials which, in the opinion of the inspecting authority are relevant.

(3) The inspecting authority, in the course of inspection, shall be entitled to examine or record statements of any member, director, partner, proprietor and employee of the stock-broker.

(4) It shall be the duty of every director proprietor, partner, officer and employee of the stockbroker to give to the inspecting authority all assistance in connection with the inspection, which the stockbroker may be reasonably expected to give.

Submission of Report to the Board

22. The inspecting authority shall, as soon as may be possible submit an inspection report to the Board.

Communication of Findings etc.

23. (1) The Board shall after consideration of the inspection report communicate the findings to the stockbroker to give him an opportunity of being heard before any action is taken by the Board on the findings of the inspecting authority.

(2) On receipt of the explanation, if any, from the stockbroker, the Board may call upon the stockbroker to take such measures as the Board may deem fit in the interest of the securities market and for due compliance with the provisions of the Act, rules and regulations.

Appointment of Auditor

24. Notwithstanding anything contained above, the Board may appoint a qualified auditor to investigate into the books of account or the affairs of the stockbroker:

Provided that, the auditor so appointed shall have the same powers of the inspecting authority as mentioned in regulation 19 and the obligations of the stockbroker in regulation 21 shall be applicable to the investigation under this regulation.

CHAPTER VI
PROCEDURE FOR ACTION IN CASE OF DEFAULT

Liability for Action in Case of Default

25. (1) A stock-broker who:

(a) fails to comply with any conditions subject to which registration has been granted;

(b) contravenes any of the provisions of the Act, rules or regulations;

(c) contravenes the provisions of the Securities Contracts (Regulation) Act or the rules made thereunder;

(d) contravenes the rules, regulations or bye-laws of the stock exchange; shall be liable to any of the penalties specified in sub-regulation (2).

(2) The penalties referred to in sub-regulation (1) may be either:

(a) suspension of registration, after the inquiry, for a specified period; or

(b) cancellation of registration.

Suspension, Cancellation of Registration, etc.

26. (1) A penalty of suspension of registration of a stock-broker may be imposed if:-

(i) the stock-broker violates the provisions of the Act, rules and regulations;

(ii) the stock-broker does not follow the code of conduct annexed at Schedule II;

(iii) the stock-broker:

(a) fails to furnish any information related to his transactions in securities as required by the Board;

(b) furnishes wrong or false information;

(c) does not submit periodical returns as required by the Board;

(d) does not co-operate in any enquiry conducted by the Board;

(iv) the stockbroker fails to resolve the complaints of the investors or fails to give a satisfactory reply to the Board in this behalf;

(v) the stockbroker indulges in manipulating or price rigging or cornering activities in the market;

(vi) the stockbroker is guilty of misconduct or improper or unbusinesslike or unprofessional conduct;

(vii) the financial position of the stockbroker deteriorates to such an extent that the Board is of the opinion that his continuance in securities business is not in the interest of investors and other stock- brokers;

(viii) the stock-broker fails to pay the fees;

(ix) the stock-broker violates the conditions of registration;

(x) the membership of the stock- broker is suspended by the stock exchange:

Provided that the Board for reasons to be recorded in writing may in case of repeated defaults of the type mentioned above impose a penalty of cancellation of registration of the stock-broker.

(2) A penalty of cancellation of registration of a stockbroker may be imposed if:

(i) the stockbroker violates any provisions of insider trading regulations or take-over regulations;

(ii) The stockbroker is guilty of fraud, or is convicted of a criminal offence; and

(iii) cancellation of membership of the stock-broker by the stock exchange.

Manner of Order of Suspension or Cancellation

27. No order of penalty of suspension and cancellation shall be imposed except after holding an enquiry in accordance with the procedure specified in regulation 28.

[22*][Provided that the holding of such an enquiry shall not be necessary in cases where the stock broker:

(a) ceases to be a member of a recognised stock exchange; or

(b) is declared defaulter by the stock exchange and is not readmitted to the membership of the exchange within a period of six months from such declaration;or

(c) surrenders the membership of the stock exchange; or

(d) is declared insolvent by a Court; or

(e) fails to pay the registration or annual fees to the Board in the manner specified in the regulations; or

(f) voluntarily surrenders certificate to the Board; or

(g) is wound up by an order passed by the Court.

Provided further that no action shall be taken against the stockbroker without giving an opportunity of hearing to the stock broker].

Manner of Holding Enquiry

28. (1) For the purpose of holding an enquiry under regulation 27, the Board may appoint an enquiry officer.

(2) The enquiry officer shall issue to the stockbroker a notice at the registered office or the principal place of business of the stockbroker.

(3) The stock-broker may, within thirty days from the date of receipt of such notice, furnish to the enquiry officer a reply together with copies of documentary or other evidence relied on by him or sought by the Board from him.

(4) The enquiry officer shall, give a reasonable opportunity of hearing to the stockbroker to enable him to make submissions in support of his reply made under sub-regulation (3).

(5) Before the enquiry officer, the stockbroker may either appear in person or through any person duly authorised on his behalf:

Provided that no lawyer or advocate shall be permitted to represent the stock-broker at the enquiry.

Provided further that where a lawyer or an advocate has been appointed by the Board as a presenting officer under sub-regulation (6), it shall be lawful for the stockbroker to present his case through a lawyer or advocate.

(6) If it is considered necessary, the enquiry officer may request the Board to appoint a presenting officer to present its case.

(7) The enquiry officer shall, after taking into account all relevant facts and submissions made by the stock-broker, submit a report to the Board and recommend the penalty to be awarded as also on the justification of the penalty proposed in the notice.

Show-cause Notice and Order

29. (1) On receipt of the report from the enquiry officer, the Board shall consider the same and issue a show-cause notice as to why the penalty as it considers appropriate should not be imposed.

(2) The stockbroker shall within twenty-one days of the date of the receipt of the show-cause send a reply to the Board.

(3) The Board after considering the reply to the show-cause notice, if received, shall as soon as possible but not later than thirty days from the receipt of the reply, if any, pass such order as it deems fit.

(4) Every order passed under sub- regulation (3) shall be self- contained and give reasons for the conclusions stated therein including justification of the penalty imposed by that order.

(5) The Board shall send a copy of the order under sub-regulation (3) to the stock- broker, stock exchange of which the stockbroker is the member, [23*][***].

Effect of Suspension and Cancellation of Registration of Stock-the Stock-broker

30. (1) On and from the date of the suspension of broker he shall cease to buy, sell or deal in securities as a stock-broker during the period of suspension.

(2) On and from the date of cancellation, the stock-broker shall with immediate effect cease to buy sell or deal in securities as a stock-broker.

Publication of Order of Suspension

31. The order of suspension or cancellation of certificate passed in sub-regulation (3) of regulation 29 shall be published in atleast two daily newspapers by the Board.be published in atleast two daily newspapers by the Board.

Appeal to the Securities Appellate Tribunal

[24*]32. [Any person aggrieved by an order of the Board made, on and after the commencement of the Securities Laws (Second Amendment) Act, 1999, (i.e., after 16th December 1999), under these regulations may prefer an appeal to a Securities Appellate Tribunal having jurisdiction in the matter].

Foot notes

22. Proviso *inserted* by the SEBI (Stock Brokers and Sub Brokers) (Amendment) Regulations, 1999 published in the Official Gazette of India dated 06.07.1999.

23. "and to the Central Government" *omitted* by the Securities and Exchange Board of India (Stock Brokers and Sub brokers) Amendment Regulations, 1999 published in the Official Gazette of India dated 06.07.1999.

24. "*Substituted* for the following provision by the SEBI (Appeal to the Securities Appellate Tribunal) (Amendments) Regulations, 2000, published in the Official Gazette of India dated 28.03.2000.

SCHEDULE I – FORMS

FORM A

SECURITIES AND EXCHANGE BOARD OF INDIA

(STOCK BOKERS AND SUB-BROKERS) REGULATIONS 1992

(REGULATION 3)

APPLICATION FORM FOR REGISTRATION AS STOCK BROKERS WITH SECURITIES AND EXCHANGE BOARD OF INDIA

NAME OF THE STOCK EXCHANGE :

1. Name of Member with Code No.
2. Address of Member
3. Trade name of Member
4. Form of Organisation – Sole proprietorship, partnership, corporate body, financial institution. Please give names of proprietor/partners/directors.
5. Educational Qualifications
6. Date of admission to membership
7. Whether member of more than one Stock Exchange? If so, please give name(s) of the Stock Exchange(s) with Code Number(s).
8. Indicate Fax, Telex and Phone number(s) of office and residence.
9. In the case of members admitted on any Stock Exchange after February 21, 1992 the copy of the information given to the Stock Exchange at the time of admission.

   I declare that the information given in this form is true to the best of my knowledge and belief.

Dated : Signature

Recommendation of the Stock Exchange

This is to certify that _____ is a member of this Exchange and is recommended for registration with the Securities and Exchange Board of India.

Signature
Name
Designation

[25*]FORM AA

SECURITIES AND EXCHANGE BOARD OF INDIA
(STOCK BROKERS AND SUB-BROKES) REGULATIONS, 1992
(REGULATION 16A)

APPLICATION FORM FOR REGISTRATION AS A TRADING AND/OR A CLEARING MEMBER [26*][OR SELF-CLEARING MEMBER] WITH THE SECURITIES AND EXCHANGE BOARD OF INDIA

1. Name of the Derivatives Exchange/Segment/Clearing Corporation/Clearing House of which the applicant is the member. Please furnish the tenure of membership.
2. Name of the Member with Code No.
3. Whether the applicant is to act as a Trading member and/or a Clearing member [27*][or self clearing member].
4. If the applicant is to act as a Trading member, the applicant is required to furnish the name and details of the clearing member [28*][or self-clearing member] through whom he intend to clear and settle his trade.
5. Address of the Member
6. Trade Name of Member
7. Form of Organisation: sole proprietorship/partnership/corporate body/financial institution. (Please give names of proprietor/partners/directors)
8. Please furnish a copy of the Memorandum and Articles of Association or the Partnership Deed, as the case may be.
9. Educational Qualifications of proprietor/partners/directors, etc.
10. Whether the applicant or its sales personnel or approved user has passed any certification programme? If so, please specify the details.
11. The experience of the applicant or their two directors or partners in derivatives trading or securities market, if so, please give details.
12. Date of admission to membership to the derivatives exchange or derivatives segment / clearing corporation/clearing house.
13. Whether a member of more than one exchange or derivatives segment or clearing corporation or clearing house of any segment? If So, please give name(s) of the clearing corporation / clearing house, or any stock exchange(s) with code number(s)?
14. Networth of the applicant. Please furnish details along with necessary documents in support thereof.
15. Whether the applicant or its director or partners, any time convicted of any economic offence? If so, please furnish the details?
16. Whether the applicant or its directors or partners, declared insolvent / bankrupt or declared defaulter by any exchange? If so, please furnish details?
17. Whether the applicant or its directors or partners anytime subjected to any proceedings or penalty by the Board under SEBI Act or any of the regulations framed under the SEBI Act? If so, please furnish the details.
18. Indicate fax, telex and phone number(s)
19. Whether the application is accompanied by a requisite fee as per Schedule IV of the Regulations as applicable to the applicant.

I declare that the information given in this form is true and in the event of any information furnished is false, misleading or suppression of facts, my certificate of registration is liable to be cancelled by SEBI without assigning any reasons whatsoever.

Dated :
Signature:

Recommendation of the derivatives exchange/derivatives segment, clearing corporation/house.

This is to certify that _____ is a member of this Derivatives Exchange/Derivatives Segment or Clearing Corporation or Clearing House and is recommended for registration with the Securities and Exchange Board of India.

Signature
Name
Designation

FORM B
SECURITIES AND EXCHANGE BOARD OF INDIA
(STOCK BROKERS AND SUB-BROKERS) REGULATIONS, 1992
(REGULATION 11)

APPLICATION FORM FOR REGISTRATION AS A SUB-BROKER WITH SECURITIES AND EXCHANGE BOARD OF INDIA

1. Name of applicant sub-broker:
2. Trader name of sub-broker, firm, corporate body.
3. Form of organisation – sole proprietorship, partnership, corporate body. Please give names of proprietor, all partners, directors etc.
4. Educationalqualifications of proprietor, partners, directors etc.

Name	Status	Qualifications

5. Name of the member-broker and Stock Exchange to which applicant is affiliated.
6. Date of acquiring sub-brokership.
7. Infrastructural arrangements – indicate fax, telex, phones, number of offices and residential numbers. Also indicate the number of employees.

   Office Address
   Phone No
   Telex No
   Fax No
   Residential phone nos. of proprietor, partners, directors etc.
8. Number of branch offices and their location with phone, telex and fax numbers.

I certify that the information given in this application form is true to the best of my/our knowledge and belief.

Recommendation letter from the stock broker to whom I/we am/are affiliated and two references, including one from the banker as required are enclosed.

Signature_____

Date_____

_____

Recommendation of the Stock Exchange.

This is to certify that_____ is a sub-broker affiliated to_____ member-broker of this Exchange.

The application is recommended/not recommended for registration by the Board.

AUTHORISED SIGNATORY

Signature

_____Stock Exchange.

FORM C
SECURITIES AND EXCHANGE BOARD OF INDIA
(STOCK BROKERS AND SUB-BROKERS) REGULATIONS, 1992
RECOMMENDATION LETTER TO BE GIVEN BY THE MEMBER
WITH WHOM THE SUB-BROKER IS AFFILIATED

To,

The_____Stock Exchange

Dear Sirs,

I/We understand that_____ son of_____ aged_____ years, residing at_____ and attached to me at_____ for carrying on the shares and securities business as a sub- broker.

I/We confirm that _____ is transacting business through me for a period from _____ and he is a fit and proper person to be registered as a sub-broker.

I/We also confirm that he is known to me/us for well over_____ years and he has got good financial background, moral character and integrity. He has been transacting business frequently and was meeting the market commitments as and when they arise.

I/We hereby recommend his application for granting registration for carrying on shares and securities business as sub-broker. I/We also wish to state that whatever the information that has been submitted is true to the best of my/our knowledge and if at a later date if any material information comes to my/our knowledge subsequent to the submission of this application, I/We undertake to keep informed about the same.

I/We member/s of _____Exchange hereby agree to recommend the above mentioned applicant.

Yours faithfully,

Signature of Member/s.

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FORM D
SECURITIES AND EXCHANGE BOARD OF INDIA
(STOCK BROKERS AND SUB-BROKERS) REGULATIONS, 1992
(REGULATION 6)
CERTIFICATE OF REGISTRATION

In exercise of the powers conferred by sub-section (1) of section 12 of the Securities and Exchange Board of India Act, 1992 read with the rules and regulations made thereunder, the Board hereby grants a certificate of registration to _____ a member of the _____ Stock Exchange(s) as a Stock Broker for carrying on the activities of buying, selling or dealing in securities and carrying on such other activities as are permitted by such Stock Exchange(s) subject to conditions prescribed in the rules and in accordance with the regulations.

Registration number allotted is as under: _____

This certificate shall be valid till it is suspended or cancelled in accordance with the regulations.

Date:_____

By Order For and on behalf of Securities and Exchange Board of India

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[29*]FORM DA
SECURITIES AND EXCHANGE BOARD OF INDIA
(STOCK BROKERS AND SUB BROKERS) REGULATIONS, 1992
(REGULATION 16 D)

CERTIFICATE OF REGISTRATION

In exercise of the powers conferred by sub section (1) of section 12 of the Securities and Exchange Board of India Act, 1992 read with the rules and regulations made thereunder, the Board hereby grants a certificate of registration to _____ a member of the _____ derivatives exchange/derivatives segment/clearing corporation/clearing house as trading/clearing member for carrying on the activities of dealing in derivatives/clearing & settlement of derivatives trades and for carrying on such other activities as are permitted by such exchange(s)/segment(s)/clearing corporation/clearing house subject to the conditions prescribed therefore, from time to time, by the Board.

Registration number allotted is as under: _____

This certificate shall be valid till it is suspended or cancelled in accordance with the Regulations.

Date : _____

By order For and on behalf of Securities and Exchange Board of India

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FORM E
SECURITIES AND EXCHANGE BOARD OF INDIA
(STOCK BROKERS AND SUB-BROKERS) REGULATIONS, 1992
(REGULATION 12)
CERTIFICATE OF REGISTRATION

In exercise of the powers conferred by sub-section (1) of section 12 of the Securities and Exchange Board of India Act, 1992 read with the rules and regulations made thereunder, the Board hereby grants a certificate of registration to _____ as a Sub-Broker subject to the Rules and in accordance with the regulations.

Registration number allotted is as under: _____

This certificate shall be valid till it is suspended or cancelled in accordance with the regulations.

Date:_____

By Order for and on behalf of Securities and Exchange Board of India

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Foot notes

25. "Form AA" *inserted* by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2000 published in the Official Gazette of India dated 14.03.2000.
26. "or self -clearing member" *inserted* by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2001, published in the Official Gazette of India dated 15.11.2001.
27. "or self -clearing member" *inserted* by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2001, published in the Official Gazette of India dated 15.11.2001.
28. "or self -clearing member" *inserted* by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2001, published in the Official Gazette of India dated 15.11.2001.
29. "Form DA" *inserted* by the SEBI (Stock Brokers & Sub Brokers) (Amendment) Regulations, 2000 published in the Official Gazette of India dated 14.3.2000.

SCHEDULE II
SECURITIES AND EXCHANGE BOARD OF INDIA
(STOCK BROKERS AND SUB-BROKERS) REGULATIONS, 1992
CODE OF CONDUCT FOR STOCK BROKERS
(REGULATION 7)

A. GENERAL

(1) **Integrity:** A stock-broker, shall maintain high standards of integrity, promptitude and fairness in the conduct of all his business.

(2) **Exercise of Due Skill and Care:** A stock-broker, shall act with due skill, care and diligence in the conduct of all his business.

(3) **Manipulation:** A stock-broker shall not indulge in manipulative, fraudulent or deceptive transactions or schemes or spread rumours with a view to distorting market equilibrium or making personal gains.

(4) **Malpractices:** A stock-broker shall not create false market either singly or in concert with others or indulge in any act detrimental to the investors interest or which leads to interference with the fair and smooth functioning of the market. A stock-broker shall not involve himself in excessive speculative business in the market beyond reasonable levels not commensurate with his financial soundness.

(5) **Compliance with Statutory Requirements:** A stock-broker shall abide by all the provisions of the Act and the rules, regulations issued by the Government, the Board and the stock exchange from time to time as may be applicable to him.

B. DUTY TO THE INVESTOR

(1) **Execution Of Orders:** A stockbroker, in his dealings with the clients and the general investing public, shall faithfully execute the orders for buying and selling of securities at the best available market price and not refuse to deal with a Small Investor merely on the ground of the volume of business involved. A stock-broker shall promptly inform his client about the execution or non-execution of an order, and make prompt payment in respect of securities sold and arrange for prompt delivery of securities purchased by clients.

(2) **Issue of Contract Note:** A stockbroker shall issue without delay to his client a contract note for all transactions in the form specified by the stock exchange.

(3) **Breach of Trust:** A stockbroker shall not disclose or discuss with any other person or make improper use of the details of personal investments and other information of a confidential nature of the client which he comes to know in his business relationship.

(4) **Business and Commission:**

(a) A stockbroker shall not encourage sales or purchases of securities with the sole object of generating brokerage or commission.

(b) A stockbroker shall not furnish false or misleading quotations or give any other false or misleading advice or information to the clients with a view of inducing him to do business in particular securities and enabling himself to earn brokerage or commission thereby.

(5) **Business of Defaulting Clients:** A stockbroker shall not deal or transact business knowingly, directly or indirectly or execute an order for a client who has failed to carry out his commitments in relation to securities with another stock-broker.

(6) **Fairness to Clients:** A stockbroker, when dealing with a client, shall disclose whether he is acting as a principal or as an agent and shall ensure at the same time, that no conflict of interest arises between him and the client. In the event of a conflict of interest, he shall inform the client accordingly and shall not seek to gain a direct or indirect personal advantage from the situation and shall not consider clients' interest inferior to his own.

(7) **Investment Advice:** A stockbroker shall not make a recommendation to any client who might be expected to rely thereon to acquire, dispose of, retain any securities unless he has reasonable grounds for believing that the recommendation is suitable for such a client upon the basis of the facts, if disclosed by such a client as to his own security holdings, financial situation and objectives of such investment. The stockbroker should seek such information from clients, wherever he feels it is appropriate to do so.

[30*][(7A) Investment Advice in publicly accessible media:

(a) A stockbroker or any of his employees shall not render, directly or indirectly, any investment advice about any security in the publicly accessible media, whether real - time or non real-time, unless a disclosure of his interest including the interest of his dependent family members and the employer including their long or short position in the said security has been made, while rendering such advice.

(b) In case, an employee of the stock broker is rendering such advice, he shall also disclose the interest of his dependent family members and the employer including their long or short position in the said security, while rendering such advice.]

(8) **Competence of Stock Broker:** A stockbroker should have adequately trained staff and arrangements to render fair, prompt and competent services to his clients.

C. STOCKBROKERS VIS-A-VIS OTHER STOCKBROKERS

(1) **Conduct of Dealings:** A stockbroker shall co-operate with the other contracting party in comparing unmatched transactions. A stockbroker shall not knowingly and wilfully deliver documents which constitute bad delivery and shall co-operate with other contracting party for prompt replacement of documents which are declared as bad delivery.

(2) **Protection of Clients Interests:** A stockbroker shall extend fullest co-operation to other stock-brokers in protecting the interests of his clients regarding their rights to dividends, bonus shares, right shares and any other right related to such securities.

(3) **Transactions with Stockbrokers:** A stock-broker shall carry out his transactions with other stock-brokers and shall comply with his obligations in completing the settlement of transactions with them.

(4) **Advertisement and Publicity:** A stock-broker shall not advertise his business publicly unless permitted by the stock exchange.

(5) **Inducement of Clients:** A stock-broker shall not resort to unfair means of inducing clients from other stock- brokers.

(6) **False or Misleading Returns:** A stock-broker shall not neglect or fail or refuse to submit the required returns and not make any false or misleading statement on any returns required to be submitted to the Board and the stock exchange.

SECURITIES AND EXCHANGE BOARD OF INDIA
(Stock Brokers and Sub-Brokers) Regulations, 1992
CODE OF CONDUCT FOR SUB-BROKERS
(REGULATION 15)

A. GENERAL

(1) **Integrity:** A sub-broker, shall maintain high standards of integrity, promptitude and fairness in the conduct of all investment business.

(2) **Exercise of Due Skill and Care:** A sub-broker, shall act with due skill, care and diligence in the conduct of all investment business.

B. DUTY TO THE INVESTOR

(1) **Execution of Orders:** A sub-broker, in his dealings with the clients and the general investing public, shall faithfully execute the orders for buying and selling of securities at the best available market price. A sub-broker shall promptly inform his client about the execution or non-execution of an order and make payment in respect of securities sold and arrange for prompt delivery of securities purchased by clients.

(2) **An Issue of Purchase or Sale Notes:**

(a) A sub-broker shall issue promptly to his clients purchase or sale notes for all the transactions entered into by him with his clients.

(b) A sub-broker shall issue promptly to his clients scripwise split purchase or sale notes and similarly bills and receipts showing the brokerage separately in respect of all transactions in the specified form.

(c) A sub-broker shall only split the contract notes client-wise and scripwise originally issued to him by the affiliated broker into different denominations.

(d) A sub-broker shall not match the purchase and sale orders of his clients and each such order must invariably be routed through a member-broker of the stock exchange with whom he is affiliated.

(3) **Breach of Trust:** A sub-broker shall not disclose or discuss with any other person or make improper use of the details of personal investments and other information of a confidential nature of the client which he comes to know in his business relationship.

(4) **Business and Commission:**

(a) A sub-broker shall not encourage sales or purchases of securities with the sole object of generating brokerage or commission.

(b) A sub-broker shall not furnish false or misleading quotations or give any other false or misleading advice or information to the clients with a view of inducing him to do business in particular securities and enabling himself to earn brokerage or commission thereby.

(c) A sub-broker shall not charge from his clients a commission exceeding one and one-half of one percent of the value mentioned in the respective sale or purchase notes.

(5) **Business of Defaulting Clients:** A sub-broker shall not deal or transact business knowingly, directly or indirectly or execute an order for a client who has failed to carry out his commitments in relation to securities and is in default with another broker or sub-broker.

(6) **Fairness to Clients:** A sub-broker, when dealing with a client, shall disclose that he is acting as an agent and shall issue appropriate purchase/sale note ensuring at the same time, that no conflict of interest arises between him and the client. In the event of a conflict of interest, he shall inform the client accordingly and shall not seek to gain a direct or indirect personal advantage from the situation and shall not consider clients' interest inferior to his own.

(7) **Investment Advice:** A sub-broker shall not make a recommendation to any client who might be expected to rely thereon to acquire, dispose of, retain any securities unless he has reasonable grounds for believing that the recommendation is suitable for such a client upon the basis of the facts, if disclosed by such a client as to his own security holdings, financial situation and objectives of such investment. The sub-broker should seek such information from clients, wherever they feel it is appropriate to do so.

[31*][7A – Investment Advice in publicly accessible media –

(a) A sub-broker or any of his employees shall not render, directly and indirectly any investment advice about any security in the publicly accessible media, whether real – time or non real-time, unless a disclosure of his interest including his long or short position in the said security has been made, while rendering such advice.

(b) In case, an employee of the sub-broker is rendering such advice, he shall also disclose the interest of his dependent family members and the employer including their long or short position in the said security, while rendering such advice.]

(8) **Competence of Sub-Broker:** A sub-broker should have adequately trained staff and arrangements to render fair, prompt and competent services to his clients and continuous compliance with the regulatory system.

C. SUB-BROKERS VIS-A-VIS STOCK BROKERS

(1) **Conduct of Dealings:** A sub-broker shall co-operate with his broker in comparing unmatched transactions. A sub-broker shall not knowingly and wilfully deliver documents which constitute bad delivery. A sub-broker shall co-operate with other contracting party for prompt replacement of documents which are declared as bad delivery.

(2) **Protection of Clients Interests:** A sub-broker shall extend fullest co-operation to his stock-broker in protecting the interests of their clients regarding their rights to dividends, right or bonus shares or any other rights relatable to such securities.

(3) **Transactions with Brokers:** A sub-broker shall not fail to carry out his stockbroking transactions with his broker nor shall he fail to meet his business liabilities or show negligence in completing the settlement of transactions with them.

(4) **Legal Agreement between Brokers:** A sub-broker shall execute an agreement or contract with his affiliating brokers which would clearly specify the rights and obligations of the sub-broker and the principal broker.

(5) **Advertisement and Publicity:** A sub-broker shall not advertise his business publicly unless permitted by the stock exchange.

(6) **Inducement of Clients:** A sub-broker shall not resort to unfair means of inducing clients from other brokers.

D. SUB-BROKERS VIS-A-VIS REGULATORY AUTHORITIES

(1) **General Conduct:** A sub-broker shall not indulge in dishonourable, disgraceful or disorderly or improper conduct on the stock exchange nor shall he wilfully obstruct the business of the stock exchange. He shall comply with the rules, bye-laws and regulations of the stock exchange.

(2) **Failure to give Information:** A sub-broker shall not neglect or fail or refuse to submit to the Board or the stock exchange with which he is registered, such books, special returns, correspondence, documents, and papers or any part thereof as may be required.

(3) **False or Misleading Returns:** A sub-broker shall not neglect or fail or refuse to submit the required returns and not make any false or misleading statement on any returns required to be submitted to the Board or the stock exchanges.

(4) **Manipulation:** A sub-broker shall not indulge in manipulative, fraudulent or deceptive transactions or schemes or spread rumours with a view to distorting market equilibrium or making personal gains.

(5) **Malpractices:** A sub-broker shall not create false market either singly or in concert with others or indulge in any act detrimental to the public interest or which leads to interference with the fair and smooth functions of the market mechanism of the stock exchanges. A sub-broker shall not involve himself in excessive speculative business in the market beyond reasonable levels not commensurate with his financial soundness.

Foot notes

30. Clause 7A *inserted* by the SEBI (Investment Advice by Intermediaries) (Amendment) Regulations 2001, published in the Official Gazette of India dated 29.05.2001.

31. Clause 7A *inserted* by the SEBI (Investment Advice by Intermediaries) (Amendment) Regulations 2001, published in the Official Gazette of India dated 29.05.2001.

SCHEDULE III
SECURITIES AND EXCHANGE BOARD OF INDIA
(STOCK BROKERS AND SUB-BROKERS) REGULATIONS, 1992
(REGULATION 10)

I. FEES TO BE PAID BY THE STOCK-BROKER

1. Every stock-broker shall subject to paragraphs 2 and 3 of this Schedule pay registration fees in the manner set out below:

(a) Where the annual turnover does not exceed rupees one crore during any financial year, a sum of rupees five thousand for each financial year or;

(b) Where the annual turnover of the stock-broker exceeds rupees one crore during any financial year, a sum of rupees five thousand plus one hundredth of one percent of the turnover in excess of rupees one crore for each financial year;

[32*][(bb) Notwithstanding anything contained in clause (b) it is clarified that the fee shall be recoverable as computed as under:

(i) in respect of jobbing transactions that is to say all transactions which are squared off during the same day which have not been undertaken by the broker on behalf of clients, the fees shall be computed at the rate of one two hundredth of one percent in respect of the sale side of such transactions;

(ii) in respect of transactions in Government securities, the bonds issued by any Public Sector Undertaking and the units traded in a similar manner, the fee payable shall be computed at the rate of one thousandth of one percent of the turnover;

(iii) in case of carry forward, renewal or badla transactions the fees shall be computed at the rate of one hundredth of one percent of the turnover and the reverse off setting transactions shall not be counted as part of the turnover.

(iv) if brokers are carrying out transactions in securities without reporting them to the stock exchange, those transactions shall be taken into account for the purpose of turnover and the fees shall be computed at the rate of one hundredth of one percent of the turnover;

(v) the trade put through on other stock exchanges shall be included in the turnover of that exchange if market for that security does not exist on the exchange of which he is a member and the fees shall be computed at the rate of one hundredth of one percent of the turnover;

(vi) activity such as underwriting and collection of deposits shall not be taken into account for the purpose of calculating the turnover'.]

(c) After the expiry of five financial years from the date of initial registration as a stock- broker, he shall pay a sum of rupees five thousand for [every]2 block of five financial years commencing from the sixth financial year after the date of grant of initial registration to keep his registration in force.

2. Fees referred to in clause (a) and (b) of paragraph 1 above shall be paid:

(a) in respect of the financial year 1992-1993 within one month of the commencement of these regulations;

(b) in respect of the financial year beginning on the 1st day of April, 1993 and the following financial years, on or before the first day of October of the financial year to which such payment relates, and such fees shall be computed with reference to the annual turnover relating to the preceding financial year.

3. Every remittance of fees referred to in clauses (a) and (b) of paragraph 1, shall be accompanied by a certificate as to the authenticity of turnover on the basis of which fees have been computed duly signed by the stock exchange of which the stock-broker is a member or by a qualified auditor as defined in Section 226 of the Companies Act, 1956.

Explanation: For the purposes of paragraphs 1, 2 and 3 "annual turnover" means the aggregate of the sale and purchase prices of securities received and receivable by the stock broker either on his own account as well as on account of his clients in respect of sale and purchase or dealing in securities during any financial year.

[33*][4. Where a corporate entity has been formed by converting the individual or partnership membership card of the exchange, such corporate entity shall be exempted from payment of fee for the period for which the erstwhile individual or partnership member, as the case may be, has already paid the fees subject to the condition that the erstwhile individual or partner shall be the wholetime Director of the corporate member so converted and such Director will continue to hold minimum 40% shares of the paid-up equity capital of the corporate entity for a period of atleast three years from the date of such conversion].

[34*]["Explanation: It is clarified that the conversion of individual or partnership membership card of the exchange into corporate entity shall be deemed to be in continuation of the old entity and no fee shall be collected again from the converted corporate entity for the period for which the erstwhile entity has paid the fee as per the regulations"].

[35*][4A. Where a stock exchange has formed a subsidiary company, which has become a stock broker of another stock exchange, then the turnover of the stock broker who is buying, selling or dealing in securities, through the subsidiary company as a sub-broker, shall be excluded from the turnover of the subsidiary company, only if the stock broker has paid five years turnover based fees plus fee for a block of five years in accordance with the regulations, on the concerned stock exchange which has formed the subsidiary company.]

[36*][5. If a stock broker fails to remit fees in accordance with paragraph 1 and 2, he shall be liable to pay interest @ 15% per annum for each month of delay or part thereof;

Provided that the liability to pay interest as aforesaid may be addition to any other action which the Board may take as deem fit against the stock broker under the Act, or the Regulations;

Provided further that if the liability of the stock broker on account of payment of interest works out to be Rs.100 or less the same may be waived off by the Board taking into consideration the administrative cost involved in recovering the said amount].

II. FEES TO BE PAID BY SUB-BROKER

(a) A Sub-broker shall pay a fee of rupees one thousand for each financial year for an initial period of five years.

(b) After the expiry of the five years mentioned above, the sub-broker shall pay a fee of rupees five hundred for each financial year as long as the Certificate remains in force.

III. MANNER OF FEES TO BE PAID

The fees indicated above shall be paid on or before the 1st day of October each year payable by [37*][draft] in favour of [38*][the Securities and Exchange Board of India" at Bombay or at the respective regional office].

Foot notes

32. "Clause bb" inserted by the SEBI (Stock-brokers and Sub-brokers) (Amendment) Regulations, 2002, published in the Official Gazette of India dated 20.02.2002.

33. "Paragraph 4" inserted by the SEBI (Stockbrokers and Sub-brokers) (Second Amendment) Regulations, 1998 published in the Official Gazette of India dated 21.01.1998.

34. "Explanation" inserted by Securities and Exchange Board of India (Stockbrokers and Sub Brokers) (Amendment) Regulations, 2002, published in the Official Gazette of India dated 20.02.2002.

35. "Paragraph 4A" inserted by the Securities and Exchange Board of India (Stock Brokers and Sub Brokers) (Third Amendment) Regulations, 1998 published in the Official Gazette of India dated 30.08.2000.

36. "Paragraph 5" inserted by Securities and Exchange Board of India (Stock Brokers and Sub Brokers) (Amendment) Regulations, 2002 published in the Official Gazette of India dated 16.12.1998.

37. Substituted for "a cheque or" by the SEBI (Payment of Fees) (Amendment) Regulations, 1995 published in the Official Gazette of India dated 28.11.1995.

38. "the Securities and Exchange Board of India" at Bombay or at the respective regional office" inserted by rthe SEBI (Payment of Fees) (Amendment) Regulations, 1995 published in the Official Gazette of India dated 28.11.1995.

[39*]SCHEDULE IV
SECURITIES AND EXCHANGE BOARD OF INDIA
(STOCK BROKERS AND SUB-BROKERS) REGULATIONS, 1992
[REGULATION 16G(1)]

FEES TO BE PAID BY THE TRADING OR CLEARING MEMBER [40*][OR SELF-CLEARING MEMBER] OF DERIVATIVES EXCHANGE/DERIVATIVES SEGMENT/CLEARING CORPORATION/CLEARING HOUSE.

1. A clearing member shall pay a fee of Rs.25,000 every year till his registration is in force, in the manner specified below:

   (a) for the first financial year along with the application for registration;

   (b) for the subsequent financial years before 1st June of that financial year.

2. A trading member shall pay every year a fee till his registration is in force, in the manner specified below:

   (a) where the annual turnover does not exceed Rs.500 crore in the financial year, a sum of Rs.10,000 for each financial year; and

(b) where the annual turnover exceeds Rs.500 crore in the financial year, a sum of Rs.10,000 plus 10 paisa per Rs.1,00,000 of turnover, for the turnover in excess of Rs.500 crore in the financial year.

Explanation: For the purpose of clause 2, the expression ' annual turnover' shall mean the aggregate value of all trades executed by the trading member on the derivatives exchange or the derivatives segment and shall also include the value of trades settled on the expiration of derivatives contracts.

[41*][However, for option contracts, the 'annual turnover' shall be computed on the basis of the premium traded for the option contracts and in case where the option is exercised/assigned, the 'annual turnover' shall be computed on the basis of the notional value of the option contracts exercised/assigned, in addition to the annual turnover' computed on the basis of premium traded].

[42*][2A The "self-clearing member" shall pay every year a fee as specified in clause 1 & 2. The provisions of clauses 3 to 6 shall be applicable mutatis mutandis to a self-clearing member.]

3. Every remittance of fees by a trading member as specified in clause 2 shall be made every financial year as under:

   (a) For the first financial year in which certificate of registration is granted a sum of Rs.10,000 shall be paid along with the application for registration.

   (b) For the subsequent financial years from the initial registration:

      (i) A sum of Rs.10, 000 shall be paid before 1st June of that financial year; and

      (ii) A balance fee of the preceding financial year for the turnover in excess of Rs.500 crore shall be paid before the 1st June of the financial year.

   (c) The remittance shall be accompanied by a certificate authenticating the turnover by the concerned derivatives exchange or derivatives segment.

4. A trading member who also acts as a clearing member shall pay the annual fee separately, as applicable to each category as specified in clause 2 and 3 above.

5. The fees indicated above shall be paid by draft in favor of 'Securities and Exchange Board of India, Mumbai'. Such draft shall be forwarded to the Board through the concerned derivatives exchange or derivatives segment or "clearing corporation or clearing house".

6. The financial year shall mean the year commencing from 1st April and ending on 31st March of the following year.

(F.NO: 20 / 7 / SE / 92)

sd/-
(G. V. RAMAKRISHNA)
Chairman
(Securities and Exchange Board of India)

Foot notes

39. "Schedule IV" *inserted* by the SEBI (Stockbrokers & Sub-brokers) (Amendment) Regulations, 2000, published in the Official Gazette of India dated 14.03.2000

40. "or self-clearing member" *inserted* by the SEBI (Stockbrokers & Sub-brokers) (Amendment) Regulations, 2000, published in the Official Gazette of India dated 15.11.2001.

41. Paragraph *added* by the SEBI (Stockbrokers & Sub-brokers) (Amendment) Regulations, 2000, published in the Official Gazette of India dated 15.11.2001.

42. Paragraph 2A inserted by the SEBI (Stockbrokers & Sub-brokers) (Amendment) Regulations, 2000, published in the Official Gazette of India dated 15.11.2001.

Glossary

Accrued Interest : The interest that has been earned by an investor but that has not yet been paid to the investor. Bond buyers pay bond sellers accrued interest whenever a bond is purchased on a date that is not a scheduled coupon interest payment date. Thus, if a bond were sold between its semi-annual interest payment dates, the purchaser should pay the market price of the bond plus the appropriate fraction of the accrued coupon interest earned but not yet received by the party selling the bond.

Active Stocks : These are shares which are actively traded in the stock exchange, i.e. those for which the highest number of bargains are recorded. These are reported separately as 'A' class shares in the business section of newspapers and magazines.

Adjusted Futures Price : The cash price equivalent reflected in the current futures price. This is calculated by taking the futures price times the conversion factor for the particular financial instrument (for example, bond or note) being delivered.

A-D Index or Advance-Decline Index : A tool used for detecting bullish or bearish trend in the stock market wherein one divides the number of traded shares which have risen in price by those which have fallen. For example, if 400 shares have advanced and 100 declined on a particular day the A-D index is 4. If the A-D index is more than 1, it indicates a bullish trend and if it is less than 1, it indicates a bearish trend.

A-Group Securities (also known as specified shares, cleared securities, alpha shares) : Most widely traded shares, usually of large, well-established companies where forward trading is allowed.

Aggregate Exercise Price : The exercise price of an option contract multiplied by the number of units of underlying covered by the option contract.

Alligator Spread : Any spread in the options market that 'eats the investor alive' because of its high commission costs. The term may be used when a broker advocates or arranges a combination of calls and puts that generate so much commission that the client is unlikely or unable to obtain a profit net of commission even if the markets move as anticipated.

All-or-nothing Options : Digital options that pay out a set amount if the underlying asset is above or below the strike price at expiry. (The amount the option is in-the-money is irrelevant since it is a fixed amount that is paid out.)

Allotment Letter : A communication sent by a company (or its issue house) stating the number and value of the securities allotted to the investor in response to his application.

Allotment of Shares : After a company has issued prospectus and application forms, it receives applications from investing community for varying number of shares. If the number of shares applied for exceeds the number available i.e., oversubscription, allotment is made by a random draw or by a proportional allocation.

Alpha Factor : It measures the inherent volatility of a share. A share with an alpha factor of, say, 1.25 is expected to rise in price by 25% in a year on its inherent strength, such as growth in earnings per share, irrespective of the behavior of the market.

American Option : An option that can be exercised at any time prior to expiry.

Amortization : Writing-off of the assets of a company over a number of years, not necessarily depending on the life of the assets, for the purpose of their replacement or renewal.

Annuity : An equal amount paid every year in lieu of a lump sum payment for a certain fixed period or for life. Some investment schemes offered by banks, Life Insurance Corporation, Unit Trust, etc., offer annuity payments.

Ante-Date : To date a document before the date on which it is drawn up.

Application Money : The amount an investor is asked to pay with the application for new issues, usually less than the full value of the shares, the remainder being either fully or partly collected on actual allotment.

Appreciation : Increase usually in the price of share, or the value of capital assets which is called capital appreciation.

Arbitrage : Making use of the difference in the price of the same commodity (for instance, shares) traded in different markets to make profit, by buying in the lower market and selling in the higher market. It is non-speculative because an arbitrager will only switch from one market to another if the prices in both the markets are known and if the profit to be gained outweighs the cost of the operation.

Arbitration : The settlement of disputes between brokers, clients, authorized assistants, and sub-brokers through arbitrators.

Ascending Tops : It is a tool used in Technical Analysis. Ascending Tops are formed when price movement of a particular share traces a number of peaks, each higher than the preceding one, indicating a bullish trend.

Asked Price : The price at which a share is offered for sale on the floor of the stock exchange. It is the price at which the Jobber sells for a small difference in price. This is responded by the bid price.

Assign : To make options, sellers perform their obligations in assuming short futures positions or selling the underlying cash market (as sellers of call options) or long futures positions or buying the underlying cash market (as sellers of a put option).

At Best : An instruction to a broker to buy or sell shares, stocks, commodities, currencies, etc., as specified, at the best possible price. It must be executed immediately irrespective of market movements.

At Call : Denoting secured money that has been lent on a short-term basis and must be repaid immediately on demand.

At Limit : An instruction to a broker to buy or sell shares, stocks, commodities, currencies, etc., as specified at a stated limiting price. When issuing such an instruction the principal should also state for how long the instruction stands for example, for a day, a week, etc.

At Par : A price equal to the face value of a share or other security for example, if the face value of a share is Rs.10 or Rs.100 it is being issued or sold at Rs.10 or Rs.100. If the market value of a share exceeds the par value it is said to be above par; if it falls below the par value it is below par. It is not the market price.

At Premium : A price higher than the face value, i.e. above par. When a well-established company issues new shares, either as rights or to the public, it may ask for a higher price.

At a Premium (Foreign Exchange and Currency Deposit Markets) : A currency which is more expensive to purchase forward than for spot delivery.

At-the-Money Option : A call or put option in which the exercise price is approximately the same as the current market price of the underlying security.

Authorized Share Capital : The total amount of capital that a company is authorized to raise according to its articles of association.

Backwardation : It is also known as 'Ulta Badla' or 'Undha Badla'. The payment to be made by a seller to a buyer for the loan of securities for which the seller wishes to defer deliveries. When a bear sells in anticipation of a fall in prices in the immediate future but the fall doesn't happen within the accounting period, he has to have his sales carried over to the next accounting period on payment of 'undha badla' or backwardation charges to the buyer.

Backspreads : Calls and puts can be combined on the basis of a ratio whereby the number of calls (or puts) purchased exceeds the number of calls (or puts) written. This is achieved by reversing the call ratio spread (or put ratio spread) thereby creating backspreads.

Bad Delivery : A delivery of a share certificate together with a deed of transfer considered defective.

Badla : Permitted only in specified securities, badla involves carrying forward of a transaction from one settlement period to the next. The carry forward is done at the making-up price, which is usually the closing price of the last day of settlement. A badla transaction attracts the following payments/charges: (a) 'margin money' specified by the stock exchange board; and (b) contango or badla charges (interest charges) determined on the basis of demand and supply forces.

Bar Charts : A tool of Technical Analysis, wherein vertical bars represent each day's price movement. Each bar covers the distance between the day's highest price to the day's lowest price, with an 'X' to mark the closing price.

Bargain : The transaction between two members of an exchange. Other terms which have the same meaning are 'dealing' and 'contract'.

Basis : The difference between the spot price of a commodity and it futures price.

Basis Grade : The grade of a commodity used as the standard of the futures contract.

Basis Point : 1/100th of one percentage point.

Basis Price : Agreed price between buyer and seller of an option at which the option may be taken up. Also called a strike (or striking) price, or an exercise price.

Basis Quote : Offer/sale of cash commodity as a difference above or below a futures price.

Basket Option : An option that gives the holder the right to buy or sell a basket of assets (usually currencies) against a base asset (currency).

Bear : A dealer on a stock exchange, currency market, or commodity market who expects prices to fall. A bear market is one in which prices are falling or expected to fall, for example, a market in which a dealer is, more likely to sell securities, currency, or goods than to buy them. A bear may even sell securities, currency or goods without having them. This is known as selling short or establishing a bear position. The bear hopes to close (or cover) a short position by buying at a lower price the securities, currency or goods previously sold. The difference between the purchase price and the original sale price represents the successful bear's profit. A concerted attempt to force prices down by one or more bears by sustained selling is called a bear raid. A successful bear raid will produce a sharply falling market, known as bear slide. In a bear squeeze, sellers force prices up against someone known to have a bear position to cover.

Bearer Bond : A bond which does not have the owners name on it and is redeemed at maturity to anyone who presents it.

Bear Spread (Futures) : In most commodities and financial instruments, the term refers to selling the nearby contract month, and buying the deferred contract, to profit from a change in the price relationship.

Bear Spread (Options) : This strategy offers profits if the market falls slightly. If it is thought that the market is more likely to fall than to rise it offers profits at lower cost than a put option.

Best Price : The price which a stockbroker thinks is the most advantageous to his client. A best price order to buy or sell gives the stockbroker the free option to buy or sell at his discretion.

Beta : A measure of a security's performance in relation to the general movement of the market. A share with a beta of 1 rises and falls corresponding exactly to the market. The rise or fall in a security with a beta higher than 1 is more than that of the market and the rise or fall in a security with a beta less than 1 is less than the rise or fall in the market index.

Beta Shares : Shares of listed companies which are not frequently traded because of low equity base.

Bid : An indication of willingness, made at a given moment, to buy a futures or options contract, or other asset, at a specific price.

Bid-offer Spread : The amount by which the offer price exceeds the bid price. Also called bid-ask spread.

Bid Price : A price which a prospective buyer of a share is prepared to pay on the floor of the stock exchange at a particular auction. This is in response to the jobber's 'Asked Price'.

Black Options Pricing Model : A model for evaluating European options on futures contracts.

Black-Scholes Options Pricing Model : A model for evaluating European options on non-dividend paying equity.

Blank Transfer : A share transfer form in which the name of the transferee is left blank. A person depositing shares with a stockbroker for immediate or eventual sale signs a blank transfer form. The form is signed by the registered holder of the shares so that the holder of the blank transfer has only to fill in the missing details to become the registered owner of the shares.

Blue Chips : Shares of well-established, financially sound companies with good future prospects.

Bond : An instrument of loan raised by the government or a company, against a specified interest rate and a promised date of repayment. Debentures are bonds secured by mortgage against company assets as distinguished from fixed deposits which are unsecured.

Bond Volatility : It is the absolute value of the percentage change in bond price for a given change in yield to maturity.

Book Value : In general, it is the value at which an asset is carried on a balance sheet. The book value of a share is given by dividing the equity reserves of the company by the number of shares issued.

Boom : The height of a favorable trade cycle, represented by upward movement of share prices. Booms often tend to end suddenly.

Bottom Line : The net profit or loss figures in an analysis of a company's performance.

Bourse : The Bourse usually refers to the stock exchange in Paris (see Paris Bourse), but other continental stock markets are also known by this name.

Breadth of the Market : It is the percentage of shares involved in an upward or downward movement of the stock market. If two-thirds of the shares listed in a stock exchange participate during a trading session, the trend it shows is said to be representative, and is not influenced by the price of a few heavily traded shares.

Break out : When shares move between the Support Level and the Resistance Level for some time and then move upwards or downwards beyond the line, they make a break out from their price limits.

Broker : A stock exchange member licensed to buy or sell shares on his own or on his clients' behalf. Commission brokers just execute buy or sell orders against a commission whereas full service brokers offer facilities such as offering investment advice, safe keeping of securities, managing portfolios, etc.

Bull : A person who holds an optimistic view of the market and expects the prices to rise. A bull with a long position hopes to sell his purchases at a higher price after the market has risen.

Bull Market : A strong or rising market in which a dealer is more likely to be a buyer than a seller, even to the extent of buying without having made a corresponding sale, thereby establishing a bull position or a long position.

Bull Spread (Futures) : In most commodities and financial instruments, the term refers to buying the nearby month, and selling the deferred month, to profit from the change in the price relationship.

Bull Spread (Options) : The most popular bullish trade, it offers profits if the underlying asset rises slightly. If it is thought that the market is more likely to rise than to fall it offers profits at lower cost than a call option.

Buy-Back : Repurchase of convertible or non-convertible debentures or the non-convertible part of partly convertible debentures before the stipulated period, at par or at a discount, by companies or banks.

Buying In : When a seller on the stock exchange fails to deliver shares ordered by a buyer in due time, the buyer may buy in wherever he can get the shares and the seller is responsible for the additional cost.

Buy In : Making a purchase to cover a previous sale, often called covering.

Buy on Margin : An investor buys on margin when he borrows money from the stockbroker for the purpose of investment.

Buy on the Bad News : A contrarian investment strategy which involves buying shares of a company which has posted bad results or which is in trouble, thinking that the share price has reached the bottom and will appreciate as conditions improve. If the adverse conditions are temporary the buyer gains when the situation improves.

Buy Order : An order to the stockbroker to buy a share or shares either at the Best Price, or within a particular price limit.

Buy-Sell Decision Rules : Rule 1: If the market price of share is lower than its intrinsic value, buy.

Rule 2: If the market price of a share is higher than its intrinsic value, sell.

Rule 3: If the market price of a share equals its intrinsic value, hold.

Call : A period at the opening and the close of some futures markets in which the price for each futures contract is established by auction.

Call Feature : The ability of the issuer of a bond or other instrument to redeem it prior to maturity. This will occur with dual-dated bonds, where they may be redeemed at any time between the two dates.

Call Option : An option that gives the holder the right (but not the obligation) in exchange for payment of a premium, to buy the underlying asset at a specific price, and obligates the seller to sell the underlying asset at a specific price, should the option be exercised. If the option is an option on a future the holder will obtain a long futures if exercise takes place and the writer a short futures position, both at the exercise price.

Call Over : A meeting of commodity brokers and dealers at fixed times during the day in order to form a market in that commodity. The call over is usually used for trading in futures, in fixed quantities on a standard contract, payments usually being settled by differences through a clearing house. Because traders usually form a ring around the person calling out the prices, this form of market is often called ring trading. This method of trading is also called open outcry, as bids and offers are shouted out during the course of the call over.

Call Spread (Options) : A call purchase reduced by the sale of another call at a higher exercise price. This is a long bull spread. Advantageous if the purchaser thinks that there is only limited upside potential.

Capital Appreciation : As the price of a share increases over a period of time, there is an increase in the capital value of the share which is the most obvious reason for investing in them. Generally, the price of shares always moves upwards, barring periodic corrections.

Capitalization of Reserves : The accumulated undistributed profits of a company which are put aside as reserves can be converted into share capital by issuing bonus shares.

Capital Loss : The loss incurred when investments are sold at a price below the purchase price. If the sale is within a year of the purchase, it is a short-term capital loss; if it is after a year long-term capital loss is sustained. Long-term capital losses can only be set-off against long-term capital gains, whereas short-term capital losses can be set-off against short-term capital gains or against current income from other sources.

Capital Market : It is a source of long-term capital raised for the development of companies. The stock exchange is a part of the capital market and helps investors to trade in their shares and thus maintain the liquidity of their investments. The capital market is distinct from money market – banks and lending institutions provide short-term finance.

Capital Reserves : It is different from Free Reserves or reserves distributable through dividends or bonus shares. The capital reserves of the company are retained indefinitely as part of the capital of a company. These reserves arise out of share premium, capital redemption reserve, and revaluation of assets.

Carry Basis : The difference between the cash price and the fair futures price. It reflects the net carrying cost. Actual basis is the sum of carry basis and value basis.

Carrying : General term covering both borrowing and lending.

Cash and Carry : An arbitrage where the simultaneous purchase of a cash instrument or commodity is made with borrowed money, and the item sold through a futures contract. An arbitrage profit is made if the futures price is higher than its theoretical price, that is, if the premium of futures over spot price exceeds the cost of carry.

Cash Commodity : An actual physical commodity someone is buying or selling, for example, soyabeans, corn, gold, silver, etc. Also referred to as actuals or physicals.

Cash Contract : A sales agreement for either immediate or future delivery of the actual product.

Cash Settlement : The delivery of securities against payment where the settlement date is the same as the 'trade date'. The term is typically used in the US money markets. Known as 'same-day settlement' in the UK.

Carry Over Margin : The amount which operators must deposit in order to carry over their transactions from one settlement period to another. Stock exchange authorities periodically impose such margins in order to curb excessive speculation.

Cartel : A restrictive trade association of a number of persons grouping together to monopolize a market by entering into agreements amongst themselves with respect to price, supplies, etc. so as to make unfair profits.

Cash Cow : An investment which yields a consistently high rate of current income but which does not have bright growth prospects and is therefore used to fund other enterprises.

Cash List : Group B securities, Unspecified shares, Non-cleared securities.

Cash Ratio : The ratio of cash and marketable securities to a company's current liabilities. The ratio indicates how soon a company can pay back its creditors.

Cash Shares : See Non-cleared Securities.

CB or Cum-Bonus : The buyers of such shares receive the bonus shares distributed by a company on registration of their shares before the record date.

CD or Cum-Dividend : The buyer of a share is entitled to the dividend declared if he buys the share before the closure of the company's books. CD shares are usually sold at a slightly higher price than XD shares, reflecting the value of the dividend to the buyer.

Clearing House : The clearing house of the stock exchange is the agency for effecting delivery and settlement of contracts between the members.

Clearing Member : A member of an exchange who is also a member of the clearing house. A member who is not a member of the clearing house is called a non-clearing member.

Closing a Market : It involves reducing the spread between the asked price and the bid price by a jobber.

Closing a Position : Taking a long or short position that offsets a pre-existing position.

Closure of Lists : This is the date up to which applications from the public for an issue of shares/debentures would be accepted.

Collar : Two interest-rate options combined to protect an investor against wide fluctuations in interest rates. One, the cap, covers the investor if the interest rate rises against him or her, the other, the floor, covers the investor if the rate of interest falls too far.

Collateral : Collateral is the security given to secure a loan. Debentures and other loans taken by companies are often collateralized (secured) by stocks or fixed assets of the company.

Commission : Commission is the amount paid to a broker for the purchase or sale of shares and is usually a percentage of the purchase/sale price of the share.

Common Stock : Term used in the USA for ordinary shares to differentiate from preference or redeemable stock.

Commodity Warrant : A warrant giving the holder the right to purchase a commodity. See warrant.

Compound Option : An option on an option. These are so far based mostly on interest rate option products such as caps and floors, and also on currencies. They provide hedging opportunities for corporates with contingent interest rate or currency exposures. Premiums are priced off the underlying asset and not the underlying option, and if exercised can add as much as 50% to the overall premium cost. They are relatively expensive because their volatility is magnified by that of the underlying option. Consequently, they are also used by speculators, since downside risk is limited to the premium whilst high volatility means very sharp price movements.

Consortium : A combination of two or more large companies formed on a temporary basis to quote for a large project, such as a new power station or dam. The companies would then work together on agreed terms, if they were successful in obtaining the work. The purpose of forming a consortium may be to eliminate competition between the members or to pool skills, not all of which may be available to the individual companies.

Contango : The consideration or interest charge paid by the buyer to carry over a transaction from one settlement period to the next.

Contingent Option : An option where the premium, while higher than usual, is only paid if the value of the underlying asset reaches a specified level. Also known as a contingent premium option.

Contract Note : Given by the stockbroker to the buyer of shares, embodying an agreement reached between them to buy or sell the specified shares at the stated price. The broker sends the note after executing the customer's order as an agreement of delivery. The contract note must be preserved carefully, as it is a document providing evidence to the income tax authorities in the computation of short-term capital gains or losses.

Contrarian : An investor who follows the Theory of Contrary Opinion, doing just the opposite of what others are doing, for example, buying shares when everyone is trying to get out of the market and selling when others are buying. The contrarian believes that the market does the opposite of what investors assume and hence acts against the majority opinion.

Conversion : Allotting a fixed number of shares, at their par value or at a premium, in exchange for a debenture or its convertible part. On conversion, shares issuing out of debentures rank *pari passu* with the other shares of the company.

Convertible Debenture : Fixed interest secured loan certificates which carry a provision of conversion into a certain number of shares at par or at a premium on a certain date. When only a part of the loan is converted the certificate is called a partly convertible debenture, and when the entire amount is converted it is called a fully-convertible debenture.

Cornering Shares or Cornering the Market : It involves buying a share in large numbers so that its price can be manipulated. A speculator who has short sold has then to pay a high price to cover his position.

Correction : A short and sharp reversal usually downwards, in share prices. Corrections usually occur during any long-term move upwards or downwards as share prices generally do not move straight up or down.

Coupon : The interest payment on a bond or debenture.

Covered Call Option : This is a short call option position where the writer holds the underlying asset. If the option is exercised, the asset is surrendered to fulfill the contract. This reduces the risk of the position and changes the expiry profile to that of a short put option. Income is made if the underlying asset rises in price equivalent to the premium income. If the asset rises spectacularly it will be surrendered through exercise and such gains foregone. If the asset falls in value the option will not be exercised and the premium income retained, but since the asset itself is held it must be marked down in value. This is a strategy that can be followed by persons holding the underlying asset long-term and believing that the market will not rise, as a means of adding extra income to a portfolio. Also called a buy write.

Covered Option : A written option is said to be covered if it is matched by an opposing cash or futures position in the underlying asset, or by an opposing option position in the underlying asset, or by an opposing position of specific characteristics.

Covered Warrant : A warrant issued by a company or securities house that enables the holder to buy shares in another company. It is referred to as covered because the issuer should have made arrangements to hold or obtain the underlying shares when the warrant is exercised.

Credit Risk : The risk that a loss may be experienced because of a default by the counterparty.

Cross-currency Cap : A cap where the pay-out to the holder is spread between two currency base rates (say sterling Libor and dollar Libor) minus a strike spread, where this exceeds zero. It can thus be considered as a strip of options on forward spread agreements.

Currency Contract : A futures or options contract for a currency, quoted in terms of another.

Currency Convertible : A bond that includes a put feature together with a currency option. The currency option gives the holder the right to convert the currency of issue into another currency at a fixed exchange rate at redemption.

Currency Option : The option to buy or sell a specified amount of a given currency at a stated rate at or by a specified date in the future.

Currency Warrant : A warrant giving the holder the right to purchase a currency.

Current Yield : Dividend or interest received calculated as a percentage of a share's or debenture's current market price.

Cyclical Shares : Share whose price movements are dependant on the state of the national and international economy and also affected by natural phenomena.

Daily Margin : The amount which members must deposit with the stock exchange authorities in case they exceed their prescribed level of trading. Like Carry Over Margin, daily margin is another method used by the stock exchange authorities to curb excessive speculation.

Dalal Street : Popular name of the Bombay Stock Exchange, which is located there. The BSE is housed in Jeejeebhoy Towers.

Day Order : An order given to a stockbroker to buy or sell particular shares, which holds good only for that particular day the order is placed.

Day Trade : A trade that is entered into and closed on the same day.

Dealer Option : A put or call on a physical commodity, not originating on or subject to the rules of an exchange, in which the obligation for performance rests with the writer of the option.

Debt Warrant : Warrant enabling the holder to buy a bond or debt at a fixed price over a given period of time.

Defensive Shares : Shares providing a safe return on the investor's money and comparatively more stable than others.

Deferred Futures : The futures, of those currently traded, that expire during the most distant months; also called forward months.

Delivery : This is the actual handing over of the share certificates and the transfer form duly signed and witnessed.

Delta : A measure of how much an option premium changes, given a unit change in the underlying futures or cash price.

Derivatives : Instruments derived from securities or physical markets, essentially futures and options. Thus, options on equities or futures on commodities are derived from the underlying cash markets and hence may be termed derivatives.

Descending Top : A share price chart pattern indicating a bearish trend with each new high price of a share at a lower level than the preceding high.

Dividend : Dividend is the portion of the company's profit that is distributed to the shareholders. This is usually declared as a percentage of the face value of the share and is in effect the income the shareholder earns on his investment.

Dividend Cover : The number of times a company's dividends to ordinary shareholders could be paid out of its net profits after tax in the same period. For example, a net dividend of Rs.40,000 paid by a company showing a net profit of Rs.1,00,000 is said to be converted 2 1/2 times.

Double Bottom : A share price chart pattern which shows a drop in price, a subsequent recovery and another drop and recovery. The double bottom level is regarded as the support level and if the price falls again and penetrates this level it is likely to fall further.

Double Top : A share price chart pattern which shows two successive tops (high price) after declines, indicating that the price has met with its resistance level. If, at the next rise the price penetrates this level, it is likely to continue to rise.

Double Option : An option which gives the buyer or person taking the option the right either to buy from or sell to the writer of the option or the person who gives it the underlying instrument at the strike price.

Dual-currency Bond : A bond where the coupon interest is payable in one currency, but it is redeemed in another currency.

Dual-currency Option : An option that allows the holder to buy either of two currencies.

Dual Listing : The listing of a share on more than one stock exchange, increasing the share's liquidity and volume of trading.

Duration : The alternative measure of the length of a bond which represents the weighted average of the time periods to maturity.

EPS or Earnings Per Share : A widely used indicator reflecting a company's earnings on its shares. It is a ratio arrived at by dividing the net profit after tax by the number of shares. Preference dividends, if any, are to be deducted from net profit after tax.

Earnings to Equity Ratio : A ratio indicating how profitably a company is making use of its capital and is arrived at by dividing the net profit after tax (less preference dividends) by net worth.

Economic Indicators : The trends in the national economy which influence share prices, are shown by indicators such as GNP (or Gross National Product, the sum total of goods and services produced in a country in a year), employment figures, agricultural production, industrial production, bank deposits, imports and exports, money supply, index of wholesale prices, and interest rates.

Efficient Market Hypothesis : The hypothesis that holds that the financial market is in possession of all available information influencing the price of a share or financial security, which results in perfect competition in the financial market. Perfect competition in the stock market context implies that buyers and sellers have perfect knowledge and neither are in possession of any information unknown to others.

Eligible Securities : Shares, debentures and bonds which banks are ready to accept as collateral for loans. Only listed shares are eligible, although banks tend to make their own rules about what they place in the category of eligible securities.

Equities : Shares in companies, unlike other kinds of investment, such as gold, real estate, debentures, fixed deposits, units in mutual funds, government bonds, etc.

Equity Shares : Equity or ordinary shares are the shares that have the right to the profits of a company after preferential shareholders have been paid and between which the assets of a company are distributed after all other claims have been satisfied.

Equity Warrant : A warrant, usually attached to a bond but capable of being separated and/or trading separately, entitling the holder to purchase shares. The shares are usually those of the warrant issuing company but not always.

Euro-commercial Paper : A generic term applied to the market for Euronotes issued on a non-underwritten basis. Euro-commercial paper is commonly issued on a continuous tap basis by one or more dealers. See Eurosecurity.

Euro-dollars : US dollars on deposit with a bank outside of the US and, consequently, outside the jurisdiction of the US. The bank could be either a foreign bank or a subsidiary of a US bank.

Euronote : A short-term fully-negotiable bearer promissory note typically of up to six months maturity. Euronotes are commonly distributed by an auction between members of a tender panel. See Eurosecurity.

European Option : An option that can be exercised only on the expiry date.

Eurosecurity : A security denominated in a currency other than that of the market in which it is issued, for example, a dollar-denominated bond issued in the UK or Germany.

Eurobond : A bond issued in a Eurocurrency, which is now one of the largest markets for raising money. The reason for the popularity of the eurobond market is that secondary market investors can remain anonymous, usually for the purpose of avoiding tax. For this reason it is difficult to ascertain the exact size and scope of operation of the market. There are various kinds of eurobonds. An ordinary bond, called a straight, is a fixed-interest loan of 3 to 8 years duration; others include floating-rate notes, which carry a variable interest rate based on the London Inter Bank Offered Rate; and perpetuals.

Eurocurrency : A currency held in European country other than its country of origin. For example, dollars deposited in a bank in Switzerland are eurodollars, yen deposited in Germany are euroyen, etc.

Eurodeposit : A deposit using the currency of another country, for example, a transaction in the eurocurrency market.

Ex : "Ex" means without and shares are sometimes quoted as "ex bonus" or "ex dividend" or "ex right". This occurs when shares are purchased after the books are closed but before the actual dividend or rights or bonus is paid. Investors purchasing shares at this time purchase them without a right to the dividend or bonus or right as the case may be.

Exchange Rate : The domestic price of one unit of foreign currency. For example, if it takes Rs.31.50 to purchase one American dollar, the dollar-rupee exchange rate is 31.50.

Exchange Rate Futures : Futures contracts for currencies.

Exercise : To 'exercise an option' is to use the right to buy or sell the underlying asset at the strike price.

Exercise Notice : A notice in writing delivered to a clearing house on or by a specific time giving notice of intent from an option holder (buyer) that they wish to make or take delivery of the underlying instrument or commodity.

Exercise Price : In the case of a call option, the exercise price is the price at which the buyer of the option has the right to purchase the underlying securities. For put options, it refers to the price at which the option buyer has the right to sell the underlying securities.

Expiration Date : This is the date at which the option expires. If an option has not been exercised before the expiration date, it ceases to exist. Options on different underlying securities normally have different expiration dates and expire according to different cycles – monthly, quarterly, etc. These features are determined by the conditions in the market in which the options are traded.

Extinguishable Option : An option where the holder's right to exercise is canceled if the value of the underlying passes a specified level.

Face Value (FV) : The nominal value printed on the face of a share, debenture or bond. This is also known as the par value. It may be more or less than the market value.

Fair Futures Price : The theoretical price of a future calculated such that there is no cash and carry arbitrage opportunity.

Financial Year : It begins on 1st April and ends on March 31st for income tax purposes, although previously companies could choose one-year periods of their convenience.

Fixed Income Investments : Investments such as fixed deposits, non-convertible debentures, monthly income plans, or any other government bonds or certificates which yield a fixed rate of interest. When the rate of inflation is low, these may provide a steady and adequate return. With high inflation, both their capital value and yield value are eroded.

Flag : A share price chart pattern wherein the share prices move up and down in a narrow range, forming sort of a parallelogram, with a sharply rising or a falling mast at the beginning. A flag formation at the top of the mast indicates a sharp rise; at the bottom of a mast it indicates a sharp fall.

Floating Stock : The fraction of a company's paid-up capital which normally participates in day-to-day trading.

Floor Broker : A person who actually does the buying and selling of shares on behalf of a member of the stock exchange for a small share of the commission charged by a broker.

Floor Trader : A member of the stock exchange who trades on the floor of the exchange on his own account. He buys neither for the public, nor for the broker, but looks for profitable buying or selling opportunities for himself.

Forward Contract : A contract in which a seller agrees to deliver to a buyer sometime in the future. Forward contracts, in contrast to futures contracts, are privately negotiated and are not exchange traded or standardized. There is no margin paid over between the counterparties, only a settlement on the agreed date.

Forward Dealing : Contracts to buy or sell specific quantities of goods, currency, or freight at a stated price and a stated time in the future. These contracts are made in trade, by buyers who wish to cover themselves against price fluctuations, and sellers who wish to benefit from them.

Forward Purchase : A forward purchase is when one agrees to purchase shares at a future period at a certain price. He does this in the belief that the prices will fall in future.

Forward Rate : Discount rate for a future time period.

Forward Rate Agreement (FRA) : A contract to provide a given interest rate, for a given maturity, from a date in the future. FRAs are both purchased and sold. Quotations are made on the basis of bid and offer yield levels for the period of the FRA. They are labelled on the basis of the number of months to the start and end of the FRA.

Forward Start Option : An option that provides the purchaser the right, after a contracted period of time, to hold a standard put or call option with an at-the-money exercise price at the time the option is granted rather than when it is activated.

Fully Paid Shares : Fully paid shares are those shares which have been fully paid for (the face value).

Fundamental Analysis : A method of anticipating future price movement using supply and demand information.

Futures : A term used to designate all contracts covering the purchase and sale of physical commodities or financial instruments for future delivery on a commodity exchange.

Futures at Discount to Cash : A backwardation in the market. Futures prices are lower than the current market price.

Futures at Premium to Cash : A contango or carrying charge market where futures prices are higher than the current market price.

Futures Market : A market where contracts for future delivery of commodities and certain financial instruments are traded.

Gaps : Price patterns on charts where the highest (lowest) price of one day is followed by the lowest (highest) price of the next day being significantly higher (lower) leaving a gap in the chart.

Gilt-Edged : Usually government securities and bonds; a very safe asset to hold, as the government is responsible for the payment of interest and refund.

Globalization : The process that has enabled investment in financial markets to be carried out on an international basis. It has come about as a result of improvements in technology and deregulation; as a result of globalization, for example, investors in London can buy shares or bonds directly from Japanese brokers in Tokyo rather than passing through intermediaries.

Good Delivery : A share certificate together with its transfer form meeting all the necessary requirements of a transfer. The buying broker is obliged to accept such a delivery.

Growth Fund : A mutual fund which invests only in securities which have scope of good capital growth, rather than current income.

Growth Shares : These are shares of companies which show increasing and higher than average earnings per share than the industry. Although the current yield of such shares is negligible.

Growth Rate : The growth rate is measured by the increased earning of a company over its previous achievement, expressed in percentage and determines the price of a share.

Hand Delivery : A transaction in shares wherein delivery by the seller must be made on the date stipulated in the contract, or on another date not exceeding fourteen days after the contract.

Hawala : The rate fixed by the stock exchange for the purpose of working out the liabilities between member-brokers at the end of the settlement period in respect of unfulfilled contracts in specified securities which are to be carried to the subsequent period. For determining the liabilities of members vis-a-vis the unfulfilled contracts, the stock exchange decides a rate for each specified share, known as the hawala rate, generally fixed at the level of the closing price of the share on the last working day of the settlement period.

Head and Shoulders : A share price chart pattern with two short peaks on either side of a large peak resembling the head and shoulders of a person. As the price moves down from the head to the right shoulder, it is regarded as a signal for a further fall in prices. In the reverse pattern, the head and shoulders forming below the line, when the price in the right shoulder has touched the baseline, it is a signal for a continued rise.

Hedge : Protecting the price of a financial instrument or commodity at a date in the future by undertaking an offsetting position using futures, options or another instrument. If the move in the cash market is adverse to the needs of the investor, producer or consumer, then opposite moves in the derivatives market position will eliminate or reduce the risk and loss.

Hedging : Offsetting or guarding against investment risk. A perfect hedge is a no-risk-no-gain precaution.

Hedge Ratio (Futures) : The number of contracts required to hedge the value of the asset that underlies one contract.

Hedge Ratio (Options) : The delta of an option derived from an option valuation model. It tells the proportion of options and underlying assets that will create a theoretically riskless hedge.

Holding Period Return (HPR) : The rate of return for the period of holding of an investment.

Horizontal Price Movement : A share price movement with a narrow range of ups and downs over an extended period, say six months.

Illiquid Investments : Any form of investment which cannot be readily converted into cash, which are not regularly traded remained inactive most of the time, so that the investor may not find a ready buyer, or has to sell at a disadvantage.

Immunization : Immunization is the process of constructing a bond portfolio so that the realized return will always at least equal the promised return.

Inactive Shares : Shares which are seldom bought and sold in the stock exchange, although they are listed. A share which is transacted less than four times a year may be called inactive or dead. It is quite difficult to find a buyer or a seller for such shares. The Spread between buying and selling prices can be large.

Income Fund : A mutual fund with investments mostly in debentures, bonds and high dividend shares. This type of fund attracts investors interested in income rather than growth of their investment.

Income Shares : Income shares usually have a low P/E and a low price. Yet these yield fairly good dividends, sometimes equalling or exceeding the rate of return from fixed deposits, etc. The companies follow a policy of high payouts and as a result have low reserves for growth.

Index Futures : Futures contracts on an index, example, stock index futures.

Inflation Risk : The risk arising from decline in purchasing power on account of inflation.

Initial Margin : The amount required to be deposited as margin initially, that is, at the time of taking a position.

Insider : A person working in a particular company in an important position in possession of crucial facts about the company such as contracts won, takeover bids, current results, etc., which the public are unaware of. Insiders include owners, executives and consultants of a firm. It is illegal for an insider to indulge in speculative trading in the company's shares.

Insider Trading : An illegal activity in which persons in a company have unpublished price sensitive information, such as expansion plans, financial results, takeover bids, etc., take advantage of such information to make a profit on the stock exchange by buying or selling shares.

Institutional Investor : Mutual funds, Unit Trust, Life Insurance Corporation of India, banks, and other institutions which invest their members' money in shares and bonds, are institutional investors. They trade in large volumes, and often play a supportive role in a falling market.

Interest Rate Option : Option to pay, or receive, a specified rate of interest on or from a predetermined date.

Interest Rate Risk : The changes in the relative yields of debentures and equity shares due to changes in interest rates.

Inter-market Spread : The sale of a given delivery month of a futures contract on one exchange and the simultaneous purchase of the same delivery month and a related futures contract on another exchange.

Interval : The standard differential or interval between the exercise or strike prices of traded options contracts.

Interim Dividend : An advance installment of the dividend finally declared. It is generally paid once but sometimes, two such payments are made. The final dividend is often at least equal and sometimes more. The interim dividend gives an idea of a company's profitability during the year.

Inverted Market : Market in which futures prices decrease with increasing maturity.

Jobbers : Members of a stock exchange who stand ready to buy and sell shares in which they specialize are called jobbers. A jobber quotes his 'bid' price (the price at which he is willing to buy) and 'ask' price (the price at which he is willing to sell). The difference between the two is known as the jobber's spread.

Kerb Dealings : Transactions done among members after the closing of the official trading hours, eventhough such trading among the members is not strictly legal. Such an unofficial trading carried out outside the stock exchange premises is known as 'Kerb Trading'. Kerb trading accounts for a sizeable percentage of total trading in the Indian stock exchanges.

Ladder (Options) : A table top, i.e., buy a call, sell a higher strike call and sell an equally higher strike call, or sell a put, sell a higher strike put and buy an equally higher strike put.

Lagging Indicators : Market indicators showing the general direction of the economy and confirming, or denying the trend, implied by the leading indicators.

Lambs : A stock market slang for gullible investors, looking for quick, illusory gains.

Leading Indicators : Market indicators that signal the state of the economy for the coming months. Some of the leading indicators include average manufacturing work-week, lay-off rate of manufacturing workers, inflation-adjusted new orders for consumer goods and material, speed of delivery of new goods, rate of net business formation, contracts for plant and equipment, change in inventories on hand, change in crude material prices, prices of stocks, change in total liquid assets, change in money supply.

Letter of Regret : A letter of regret is a communication received from a company informing one of the company not allotting him any shares.

Letter of Renunciation : A document issued by a company to a shareholder in a rights issue, by means of which the shareholder can renounce, in part or in full, his right to additional shares in favor of a third party. These letters of renunciation can be sold in the market, if the company's shares are sought after and the terms of the rights offer are attractive.

Leverage : A company's long-term debt in relation to equity in its Capital Structure. The larger the long-term debt, the higher the leverage.

Libor : The London inter bank offered rate, or the rate at which banks will offer funds. Rates exist for overnight, 1-month, 3-months, 6-months, etc., out to 5 years, and for euro-currency deposits. Libid-Libor is the bid-offer spread. It is widely used as a reference rate for payments on floating-rate instruments.

Limit Order : When a client gives the stockbroker a price limit above which he cannot buy or below which he cannot sell it is called a limit order.

Limit Price : Largest permitted price fluctuation in a futures contract during a trading session, as fixed by the contract market's rules. Also known as maximum price fluctuation.

Line Charts : Line charts simply connect successive days' closing prices unlike bar charts which show daily price movements.

Listed Shares : Shares which are registered by a stock exchange for trading on its floor. Listed shares are very liquid whose prices are determined fairly in a fair market place. There is a continuous reporting of their prices with strict regulation for the protection of investors trading in such shares.

Lot : A fixed minimum number in which shares are bought and sold. Trading lots are in 5, 10, 50 or 100 shares, depending on the face value of shares. Such numbers make round lots, anything less makes odd lots.

Lyons Range : A common name for the Calcutta Stock Exchange.

Maintenance Margin : The floor below which the balance in margin account is not allowed to fall. When the balance falls below the maintenance margin amount, a margin call is made on the holder of the account to make up the balance to the level of the initial margin.

Margin : The amount collected from people who trade in securities, whether shares and debentures or derivatives like futures by exchanges. It is generally based on the maximum daily price fluctuation of the security.

Marketable Securities : An item appearing in company balance sheets, denoting assets which can be easily converted into cash; for example, government securities, short-term investments, and other money market instruments. These are shown at the lower of cost or current market value.

Market Capitalization : The total market value at the current prices of the total number of equity shares issued by a company.

Market Indices : There are five stock market indices widely used by investors in India: The Bombay Stock Exchange (BSE) Sensitive Index, BSE National Index, the Economic Times Index, the Financial Express Index and Business Standard Index.

Market-maker : An individual or organization which, in exchange for reduced dealing fees and other concessions, commits in certain securities, contracts or markets to continuously make two-way prices (i.e. bids and offers) at an agreed minimum spread differential and for an agreed minimum volume, during market hours.

Markowitz Model : A method of selecting the optimum investment portfolio, devised by H M Markowitz. It makes use of the concepts of a market portfolio (containing all available investments in amounts proportional to the total market value of each individual security) and a graph (the capital market line) of alternative combinations of risk and return, resulting from investing fixed sums in the market portfolio.

Maturity : i. Period within which a futures contract can be settled by delivery of the actual commodity.

ii. The period between the first notice day and the last trading day of a commodity futures contract.

iii. The due date of a loan, note, bond, or, in the USA a mortgage-backed security

Merchant Bank : Merchant banks, have been concerned with import and export trade, although they have recently expanded their activities by raising finance, at home and abroad, for industry, including high-risk hire-purchase financing. These banks also float shares on behalf of companies or underwrite them. They are increasingly involved in takeover bids and mergers, offering specialized advice to the bidders.

Money-back Option : An option guaranteed to repay at least the original option premium at expiry. This results in the gearing being greatly reduced compared with a standard option.

Moving Average : An average of share prices for specified periods showing trends of price movements, rather than daily fluctuations. A monthly moving average will take a month's prices till yesterday and for tomorrow's average it will drop the earliest day and include today in its place.

Multi-index Option : An option that gives the holder the right to buy the asset that performs best out of a number of assets, i.e., a call on the best performing index. The indices would all be rebased for comparison and the currency may or may not have a fixed exchange rate. This product was introduced by Mitsubishi Finance.

Mutual Funds : Investment companies and banks, which collect money from shareholders and invest in a large variety of securities like shares, debentures, bonds set-up for a limited period, or with no winding-up date. The investors thus have the advantage of owning a truly diversified portfolio which offers attractive annual dividends and a reasonable price appreciation with minimum risk involved.

Naked Option : A Call Option wherein the seller does not own shares but hopes to buy from the market, expecting the price to fall. If it does, he makes a profit on the difference; if it doesn't and rises, the seller is caught in a naked position and must sustain a loss by buying at the higher price.

Net Asset Value (NAV) : Term used by mutual funds, Master shares and other investment trusts to indicate the net tangible asset value of each share on a particular date. It can also mean the total market price of all the shares held by a mutual fund less any liabilities, divided by the total number of outstanding shares on a particular date. With every change in share prices the NAV of mutual funds shares changes.

Net Change : The difference in the last trading price and the next day's closing price of a share.

Net Dividend : The dividend paid by a company to its shareholders, after excluding the tax credit received by the shareholders.

Net Worth : It is the total of equity share capital and reserves. It is also the value of total assets minus total liabilities.

Nominal Price : Price quotations for a futures period in which no actual trading took place, usually an average of bid and asked prices.

Nominal Value : The nominal value is the face value of share. If the face value of a share is Rs.10 then it may also be stated that its nominal value is Rs.10.

Non-Cleared Securities : Shares which are traded directly between brokers, and not cleared through the stock exchange clearing house. They are also known as Non-specified Securities, B-group Securities, or Cash Shares.

Odd Lots : An odd lot is a small number of shares one may get as a result of a bonus or rights issue or on the conversion of debentures. They are not in marketable lots (there is a minimum quantum of shares that is usually traded which is known as marketable lot – 50 or 100 shares). They are usually difficult to sell. On Saturdays in the major stock markets odd lots are traded. The price is, however, lower than the normal price of the share (about 10%). The small investors more often than not buy fewer than 100 shares of a given stock i.e., an odd lot and such buyers and sellers are called 'odd lotters'.

Odd Lot Dealer : Brokers specializing in buying and selling of odd lots, pay less than the market price for buying and charge more for selling, the difference constituting their profit. They also put together the odd lots into market lots or help investors to make up their own market lots.

Offer : Indicates a willingness to sell a futures or options contract, or other asset, at a given price.

Off-Balance Sheet Finance : The use of company funds to hire or lease an expensive piece of equipment rather than purchasing it. This enables a company to make use of the equipment without having to invest capital. The item does not appear on the balance sheet as an asset and therefore the capital employed will be understated, although the profit and loss account will show the rental payments.

Official List : The list of share prices published by the stock exchange at the end of the day's trading. It is different from stock prices reported in newspaper and financial journals, which are sometimes erroneous.

Offshore Fund : A fund held outside the country of residence of the holder.

Open Contracts : Contracts which have been bought or sold without the transaction being closed or completed by subsequent sale or purchase, or by making or taking actual delivery of the commodity, or exercising the option.

Open-end Fund (Mutual Fund) : A form of unit trust in which the managers of the trust may vary the investments held without notifying the unitholders.

Open Interest : The total number of long or short positions outstanding in a market.

Opening a Position : Taking a long or short position in a security without any pre-existing position in it.

Option : A legally binding agreement that confers the right, but not the obligation, to the holder to buy (in the case of a call option) or sell (in the case of a put option) an underlying asset (which may be a financial instrument, commodity, or futures contract) at a price agreed now (the exercise or strike price) by a specified expiry date in the future (if it is an American-style option) or on a specified date in the future (if it is a European-style option). The writer or seller of the option has the obligation to fulfill the contract if the holder wishes to exercise the option (take up the rights). This option is obtained in exchange for payment of a premium. There are exchange traded options available as well as over-the-counter varieties.

Option Buyer : A person who obtains the right conveyed by the option. Sometimes he is referred to as the holder. Only the option buyer has the right to exercise an option.

Option-dated Forward Contract : A forward foreign exchange contract with an option to select the date of the exchange.

Option Group : Options in the same three-month interval and with the same exercise price.

Option Holder : Someone who has bought an option.

Option on a Future : An option, the exercise of which results in a futures position rather than a claim directly on an underlying security or asset. The exercise of a call results in a long futures position for the buyer (a short position for the seller or writer). The exercise of a put results in a short futures position for the buyer (a long position for the writer).

Option Premium : The going (market) price for an option.

Option Spread : The simultaneous purchase and sale of one or more option contracts, futures, and/or cash positions.

Option Writer : The writer of an option is obligated – if and when he is assigned an exercise – to perform according to the terms of the option. The option writer is sometimes referred to as option seller.

Over the COUNTER or OTC : Market for shares outside the control of the official stock exchange.

Oversubscribed : A company may offer for sale a certain number of shares. If applications are received for shares in excess of the number offered, the issue is termed to be oversubscribed.

Overvalued Shares : The shares which impress investors and who therefore are willing to pay a price for them which is not justified by their EPS or P/E ratio.

Paper Market : A market in forwards, futures or options as distinct from the physical cash commodity market.

Par : Par is another term for the face or nominal value of the share. When an issue of Rs.10 shares are offered at par it means that the Rs.10 shares are being offered at Rs.10 per share.

Partial Delivery : A situation in which the broker does not deliver the entire quantity of shares ordered by an investor.

Partly Active Shares : These are shares which are not traded very frequently and on an average are partly active. They are not easy to buy and sell and the spread between buying and selling prices can be large.

Partly Paid : Partly paid shares are those whose nominal value has not been fully paid-up. If only Rs.5 has been paid on a Rs.10 share it is termed as partly paid-up.

Participating Option : An option where the buyer foregoes a certain percentage of potential profits in return for a reduced premium.

P/D Ratio or Price-Dividend Ratio : The current market price of a company share divided by the dividend per share for the previous year. It is a measure of the investment value of the share.

P/E Ratio or Price-Earnings Ratio : An indicator of how highly a share is valued in the market. Arrived at by dividing the price of a share by the Earnings Per Share (EPS).

Pennant : A share price chart pattern resembling a pointed triangular flag. It emerges when successive peaks and rallies almost disappear. Not only are price fluctuations less pronounced, the volume of business also falls. A pennant formation signals an imminent rise or fall which cannot be predicted.

Perpetual Bond : A bond with no pre-determined redemption date. Many have a date after which they may be redeemed by the issuer, such as UK government 2% Consols (1923 and after). Effectively, they have an open-ended issuers' call.

Pivotal Shares : Shares of some blue chip companies act as a pivot on which the market is balanced. If they turn bearish the market follows; if they turn bullish, the market looks up.

Point : i. Minimum price unit in which a commodity price is quoted, or minimum price movement of a future.

ii. One percent of the nominal value of a security; for example, one hundred basis points.

Point and Figure Chart : A Technical Analysis graph which records the share price movements disregarding the element of time. Every time a share price moves up an X is put on the graph above the previous point. Every time the share price moves down an O is placed on square down in the next column. This chart helps one to study the trend of movement of a share price for a period of time.

Portfolio : The combined holding of many kinds of financial securities – shares, debentures, government bonds, Unit Trust certificates, and other financial assets. The object of forming a portfolio is to reduce risk by diversification and maximize gains.

Portfolio Manager : A professional who manages investment portfolios with the objectives of profitability, growth and risk minimization. He is expected to manage the investor's assets prudently and chooses particular investment avenues, with a view to maximize profits.

Position : A market commitment. A buyer of a futures or options contract is said to have a long position and, conversely, a seller of futures or options contract is said to have a short position. A position is having an exposure in the market by either buying or selling derivatives or the cash market asset or commodity.

Position Limit : The maximum position a trader is allowed to hold.

Premium :
i. The excess of one futures contract price over that of another, or over the cash market price.
ii. The amount a price would be increased to purchase a better quality commodity.
iii. A futures delivery month selling at a higher price than another, as in 'July is at a premium over May'. See contango and backwardation.
iv. Cash prices that are above the future, such as in foreign exchange. If the forward rate for Italian lira is at a premium to spot lira, it is selling above the spot price.
v. The money the buyer pays to the writer for granting an option contract

Primary Market :
i. A market for new issues of shares, debentures and bonds, where investors apply directly to the issuer for allotment and pay application money to the issuer's account. It is different from the secondary market where investors trade in shares on the stock exchange through brokers.
ii. The market in which securities are first issued to investors. See secondary market.

Principal : A market-maker or dealer who is committed to giving a price (rate) for a deal or trade which is readily available to be taken.

Put-option : An option to sell is called a put-option and is bought in the expectation of a falling price or to protect a profit on an investment.

Put Spread : A purchased put where the purchase cost is offset by the sale of another put at a lower exercise price. This results in a long bear spread. Advantageous if a market fall is expected.

Quick Ratio (Acid-Test Ratio) : A measure of the liquidity of a company, showing whether the company can meet its obligations from the current assets. It is arrived at by subtracting inventory from current assets and divide the remainder by current liabilities. Ratios below 1:1 are considered low. However, high ratios may simply mean that although the company is cash rich, it is not using its assets effectively.

Quote : The highest bid and lowest offer for a share.

Quoted Price : The price at which a share was last bought and sold on the stock exchange.

Quoted Shares : The shares of a company which are officially registered on a stock exchange, and whose prices are quoted on the official list.

Quotation : The current price available on the market at which purchases or sales may be executed.

Rally : A strong raise in the price of a share, or in the share market index, after a period of stagnancy or declining trend.

Random Walk : This hypothesis states that in a perfectly competitive market, investors take stock of all the factors influencing share price movements and hence further changes are caused randomly and no systematic prediction can be made. The risk of random walk can be reduced by diversification of one's portfolio.

Range (Price) : The price span during a given trading session, day, week, month, year, etc.

Rate of Return : It is calculated as the dividend received divided by the price of the share, multiplied by a hundred. The total return on an investment is the sum of dividend received and the increase in the price of one's shares.

Rating : The evaluation of credit risk of fixed income securities.

Reaction : A drop in share prices for poor performance of the company, equity dilution, profit taking, etc.

Real Assets : Land, houses, gems, gold appreciate in value faster than equity shares, although their acquisition is difficult due to the large size of investment, storage cost and insurance. It is not easy to acquire them while there are a hundred ways of being dispossessed.

Real Interest Rate : Current interest rate less the rate of inflation.

Realized Return : The actual return earned on a bond which may differ from the promised YTM if the assumptions underlying the YTM are violated.

Real Rate of Return : Return on an investment adjusted for inflation.

Redemption : The repayment at maturity of a bond or other document certifying a loan by the borrower to the lender. In the case of debentures or preference shares, redemption means paying back the investor, either in cash, or through equity shares. Thus, the redemption date specifies when repayment takes place and is usually printed on the bond certificate itself.

Redemption Date : Date on which loan instruments like debentures are due to be paid-off.

Reinvestment Rate : The rate at which the interest payments are reinvested.

Relative Strength : The comparison of a share with other shares or the share price index based on its price.

Relative Strength Indicator (RSI) : A charting measure that indicates a market is overbought or oversold.

Resistance Level : A term in technical analysis indicating the level at which the increase in the price of a share has repeatedly halted as there are more sellers at that particular price than buyers. If at a subsequent rise the price penetrates the line, it is supposed to signify a bull phase, taking the price upwards.

Return on Capital Employed (ROCE; Return on Imputed Capital) : The profits of an organization expressed as a percentage of the capital employed. This is an important indicator of the efficiency with which the assets of the organization are used; it provides a useful comparison of companies in the same industry or, for the investor, a comparison between various industrial sectors. However, it is important to know what is meant by capital. Frequently, return on capital is calculated by comparing the profits with the book value of the net assets. This tends to undervalue the assets, so that a capital figure based on market value would be more helpful, although not as readily obtainable. It is also important to know whether the profit given is before or after tax and whether or not adequate provision has been made for any bad debts.

Return on Equity (ROE) : The net income of an organization expressed as a percentage of its equity capital.

Reversal : A continuous fall of share prices from a peak.

Rigging : The manipulation of share prices in order to attract gullible investors to buy or sell shares.

Rights Issue : The issue of additional equity shares to the existing shareholders on a pre-emptive basis. Typically, the subscription price of a rights issue is significantly below the market price of the old shares.

Risk : The chance of an outcome not occurring as planned. This may be due to an actual return differing from a previously predicted return. The variability of such predicted returns can be estimated using statistical tools such as standard deviations and probability distributions. In addition, risk may arise from interest rate or foreign exchange rate changes, counterparty failure, issuer default and many other causes.

Risk Factors : A measurement of an option position or premium in relation to the underlying instrument.

Risk Management : The practice of continuously assessing and controlling all known exposures and hedging such risks to a sustainable level or where applicable maximizing profitable returns.

Return on Investment (ROI) : The profits of an organization on its investment. For instance, an investment yielding a 5% yearly dividend and 3% in the form of increased market value in the year of investment would have returned 8% provided that investment had been turned back into cash at the end of a year.

Round Lot : The minimum number of shares in a trading lot; 100 or 50 in the case of Rs.10 shares and 10 or 5 for Rs.100 shares. Any number less than the trading lot is called an odd lot, for which the selling price for the investor is lower than normal, but the buying price is higher.

Saucer : A share price chart pattern forming a saucer-like bottom and moving up, indicating further rise. If the chart pattern is an upside down saucer, the signal is for a further fall.

Scrip : This is another term for ‘share’ or ‘stock’.

Secondary Market : It is a place where shares already issued are traded. It is different from the primary market wherein the issuer sells shares directly to the investor.

Secured Debt : A debt instrument, like a bond or a debenture, whose principal amount is secured by tangible assets as collateral. The creditor can lay a claim on the assets in the event of default by the issuer.

Securitization : The process that enables borrowing and lending by banks to be replaced by the issue of such securities as eurobonds. A bank borrows money from savers (investors) and lends to borrowers, charging fees to both for its service as well as making a turn on the interest payments. If a borrower can borrow directly from an investor, by issuing them with a bond (or equity), the costs to both borrower and lender can be reduced. Securitization has occurred increasingly in the 1980s as technology has improved and investors have become more sophisticated.

Security : A security is a document that gives its owner, specific claim of ownership of particular assets. The two main types of securities are bonds and shares. The bondholder gets an assured interest only for the period of holding, while the shareholder is part-owner of the company and has invested in its future with a corresponding share in its profits or losses.

Seller's Market : A market characterized by a shortage of shares in the market considering their demand and consequent high prices, indicating a Bull Market.

Settlement Period : For administrative purposes, stock exchanges divide the year into a number of settlement periods which are usually of two weeks duration.

Settlement Price : The official price for a financial or commodity derivative at which all open positions on an exchange are revalued for the purposes of profit and loss and subsequent margin calculation at the end of each business day. The settlement price is a calculated value that takes into consideration the closing offer and bid price, the last actual traded price and a weighted average of prices traded during the last few minutes of the close of trading.

Shake-out : If there are many companies trying to market the same class of goods or services and there are more sellers than buyers, there will be a shake-out and many companies will be eliminated. Many leasing companies, were shaken out in the mid-eighties when there were too many of them.

Share Certificates : Share certificates are the documents proving a person's ownership of shares in a company. It states the number and class of shares owned by the shareholder and the serial number of the shares.

Share Splitting : The division of the share capital of a company into smaller units. The effect of a share split is the same as a scrip issue although the technicalities differ. Share splits are usually carried out when the existing shares reach such a high price that trading in them becomes difficult.

Share Transfer : An investor purchasing shares from the broker will receive the certificates along with share transfer forms having the transferor's attested signature. The buyer of the shares, the transferee, will fill in these forms, affix share transfer stamps and send the certificates for registration in his name.

Short Covering : A short seller borrows shares from others for his operation; when he actually buys them to replace what he had borrowed at the time of short sale, he is covering his short position.

Short Position : Shares which a person has sold short, by delivering borrowed certificates, but which he has not yet covered by actually buying shares to repay the loan as on a particular date.

Short Sale : A short sale occurs when a person believing that the prices of shares will fall, sells shares that he does not own with the intention of purchasing the shares at a lower price at the time delivery has to be made. This is also known as forward sale.

Stop Loss Order (SLO) : An order placed with a broker in a security or commodity market to close an open position at a specified price in order to limit a loss. It may be used in a volatile market, as a means of reducing one's loss, while waiting for the market to recover.

Slump : The bottom of a trade cycle when prices and employment are at their lowest, reflected in the downward movement of share prices.

Small Investor : An investor trading in small quantities and although he may be a part of a very large crowd, his individual importance to the company or to the stockbroker is near non-existent.

Specified Shares : The most widely traded shares, also known as group securities, cleared securities, transactions made through the clearing house of the stock exchange.

Speculation : An activity, in which a person assumes high risks, not bothered about the safety of his invested principal, to achieve large capital gains. The time span in which the gain is sought to be made is usually very short.

Split : This occurs when the shares are divided into shares of smaller denomination. Rs.100 shares may be split into ten Rs.10 shares. It usually happens when the price becomes unwieldy.

Spot : Spot purchase or sale implies that the deal is for immediate cash and the shares are to be delivered immediately.

Spot Commodity : The actual commodity as distinguished from futures. Same as actuals or cash commodity.

Spot Delivery : When the payment for the delivery of shares is done on the same day or on the following day, it is called a spot delivery.

Spot Rate : It is the discount rate or required return quoted for the current period.

The actual commodity as distinguished from futures. Same as actuals or cash commodity.

Spread : Another type of combination position that an option buyer can take. This involves being both the buyer and the writer of the same type of option – put or call – on the same underlying security with the options having different exercise prices and/or expiration dates.

Spread (Futures) : Refers to a simultaneous purchase and sale of futures contracts for the same commodity or financial instrument for delivery in different months or in different but related markets.

Spread (Options) : The purchase and sale of different series of options by the same principal.

Spread Margin : The margin required for a spread. Because a spread reduces risk, the margin requirement may be lower than for each contract involved separately.

Stock Dividend : The distribution of additional shares to current shareholders in lieu of cash dividends with a view to conserving cash within the company.

Stock Exchange : A market place where shares are traded. It is usually a building where members of the exchange, acting as brokers or dealing on their own, buy and sell shares, sometimes as bulls and sometimes as bears.

Stock Index : An indicator used to measure and report value changes in a selected group of stocks. How a particular stock index tracks the market depends on its composition, the sampling of stocks, the weighting of individual stocks, and the method of averaging used to establish an index.

Stock Option : It is the right to buy or sell a share at a particular price within a particular period, in order to hedge the investment.

Strongly Efficient Market : A market in which all information (and not just publicly available information) about a share is reflected in its price. Such a market is hypothetical as all information about a share's price is hardly ever accessible. However, if the hypothesis of a strongly efficient market is accepted, it follows that expectations of future price changes will be revised randomly and share prices will take a random walk, upwards or downwards.

Support Line : A trendline drawn on a price chart through the troughs of an upward price movement in a market. It indicates the points where the market is finding support.

SWOT Analysis : A type of fundamental analysis of the health of a company by examining its strengths (S), weaknesses (W), business opportunities (O) and any threats (T) or dangers it might be exposed to.

Systematic Risk : An investment risk which applies to all securities of the same class, which cannot be avoided by diversifying one's portfolio. Economic, social or political factors will cause price fluctuations of all shares alike. Hence, the prices of shares in the market tend to rise and fall together.

Target Price : An investor while buying a share has a price in mind which he thinks the share will reach. This price is the target price. It is wise to have a target price for every share bought, so that it can be sold at that price.

Technical Analysis : A method of forecasting share price movements based on a study of price charts on the assumption that share price trends are repetitive, that seems investor psychology follows certain pattern, what is seen to have happened before is likely to be repeated. The technical analyst is only concerned about investor and price behavior.

Theoretical Value : Option value generated by an option valuation model.

Trading Pattern : It helps in identifying the long-term direction of a share price. A line is drawn connecting the peaks and the lows and the direction of the trend gives the trading pattern.

Transfer Deed : A transfer deed is the document that records the transfer of shares and debentures. It should be remembered that the validity of a transfer deed is only up to the date of the book closure of the company.

Treasury Bill : A short-term government debt instrument with a maturity of one year or less. Bills are sold at a discount to face value (or par value) with the interest earned being the difference between the face value received at maturity and the price paid.

Trend : The general direction in which prices are moving.

Trendline : A straight line drawn to connect the highest or lowest prices of a share over a period. If there is a price reversal, for example, if the price rises above a downward trendline or drops below an upward trendline, technical analysts conclude that a new direction is emerging.

Triangle : A share price chart pattern wherein there are two base points and an apex on the left. If the apex is on the right, it makes a reverse triangle. If a share's price breaks out of the triangle formation, it indicates that the rise or fall (depending whether the formation is upwards or downwards) will continue for sometime.

Turnaround : A change for the better in a company's performance. Turnaround situations in companies is a good opportunity for investors to pick up shares when their price is still low.

Undersubscribed : This is used to describe an issue when all the shares offered by a company for sale are not subscribed for.

Undervalued Shares : These shares sell below their book value or the price earning ratio which they deserve. The reasons would be that the industry is out of favor, or the company has current labor trouble. Fundamental analysts often identify and recommend such shares before they become fully priced. Companies with undervalued shares are often targets of takeovers as their shares can be acquired cheaply.

Underwrite : Underwriting is effectively a guarantee wherein the underwriter (usually a bank, broker or financial institution) agrees to purchase a certain number of shares in the event the issue is undersubscribed for a certain fee.

Undha Badla : See Backwardation.

Unlisted Share : Shares in companies that are not on an official stock exchange list. They are, therefore, not required to satisfy the standard set for listing.

Unsystematic Risk : Risk that can be diversified away.

Uptick : An increase in price.

Value of an Option : The value of any option is made up of two parts i.e. the intrinsic and the time values. Intrinsic value reflects the amount, if any, by which the price of an option differs from that of the underlying security. Time value is whatever value the option has in addition to its intrinsic value and reflects what a buyer would be willing to pay for the option in the hope that at sometime prior to expiration, its value will increase because of a favorable change in the price of the underlying securities.

Variability of Return : The degree to which the return on an investment varies unpredictably. An investment whose holding period return varies widely from period to period is a riskier investment than one whose holding period return does not vary much.

Variation Margin : The amount to be paid in to bring up the balance in a margin account to the level of initial margin.

Venture Capital : Capital invested in a project in which there is a substantial element of risk (but with above average prospect of reward), especially money invested in a new business in exchange for share in the business.

Vertical Line Charting : The charting of the movement of the price of a share with a vertical line representing the high and the low, and a horizontal bar across the point where the day's trading has closed. There is a line for each day or each week or each month depending on the breadth of analysis. The chart gives an idea, not only of the trend of price movements, but also the range of fluctuation of the share's price.

V Formation : A chart pattern which forms a V, indicating that the share price has bottomed out and is on an upward course. A reverse V will indicate the opposite trend.

Volatile : A share subject to frequent and violent fluctuations is said to be volatile. If the volatility of a share is due to inherent factors like variability in its earnings, smallness of the issue, it is measured by the alpha factor. But, if the volatility is market related, it is measured by the Beta Factor.

Volatility : A measurement of the variability rate (but not the direction) of the change in price over a given time period.

Volume : The number of contracts executed for a given period (usually a day) in any given instrument or market.

Wall Street : A popular name for New York Stock Exchange, which is located at the corner of Board Street and Wall Street.

Warrant : A stock market security with a market price of its own that can be converted into a specific share at a predetermined price and date. The value of the warrant is thus determined by the premium (if any) of the share price over the conversion price of the warrant. There are also warrants available on gold and oil, where they are convertible into these commodities.

Weak Market : A market in which there are more sellers than buyers, resulting in a decline in prices.

Wedge : A share price chart pattern like a triangle, with a difference. In a triangle one line rises while the other falls, whereas in a wedge both the lines move in the same direction, for example, both rise or fall until the distance between the peaks and the trough closes. A wedge indicates a temporary interruption in the rising or falling trend.

W Formation : A share price chart pattern, forming a W, showing that a share's price has hit the support level (the two bottoms of a W) twice, and is now likely to move up.

Writing an Option : Selling an optiong.

Yield : Yield is the return earned by the investor or shareholder on his investment.

Yield Curve : The curve that depicts the yields of bonds with differing maturities.

Yield Gap : The difference between the average annual dividend yield on equities and the average annual yield on long-dated gilt-edged securities. Before the 1960s equity yields usually exceeded gilt yields, reflecting the greater degree of risk involved in an investment in equities. In the 1960s, rising equity prices led to falling dividend yields causing a reverse yield gap. This was accepted as equities were seen to provide a better hedge against inflation than fixed-interest securities; thus their greater risk element is compensated by the possibility of higher capital gains.

Yield-to-call : The discount rate that equates the present value of the cash flow to first call of a callable bond to its market value.

Yield-to-maturity :

i. The return obtained on holding a bond to maturity. The yield-to-maturity assumes that any coupon payments received before redemption can be reinvested at this yield. This implies a flat yield curve and is hence not a realistic assumption.

ii. The discount rate that equates the PV of the cash flow to its market value.

Zero-Coupon Bond : A bond that has no coupon payments, just a single maturity payment. It will be sold at a discount to face value and will be more volatile than a coupon carrying bond of the same maturity or yield.

Zero Interest Bonds/Debentures : A new type of security permitted to be issued by the companies. These bonds or debentures offers no interest payments and the same will be either fully or partly convertible into equity shares of the company at the choice of the bond/debentureholder or they will be redeemable debentures/bonds.