SECURITY ANALYSIS & PORTFOLIO MANAGEMENT

(DEMBB1)

(MBA 2 YEARS)

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LESSON 1

INVESTMENT DECISIONS – AN OVERVIEW

1.0 Objectives

After reading this lesson, you should be able to:

- Explain the concept of investment in general
- Distinguish investment and speculation
- Discuss the process involved in investment decisions
- Explain investment environment, alternatives and markets.

Structure

1.1 INVESTMENT: AN INTRODUCTION

The mobility and usage of assets determine the economic environment of any nation. Conductive economic environment attracts investment, which in turn influences the development of the economy. One of the essential criteria for the assessment of economic development is the quality and quantity of assets in a nation at a specific time. Real assets comprise the physical and intangible items available to a society. Physical assets are used to generate activity and result in positive or negative contribution to the owner, but are different in that they do not have a physical shape or form. In fact, intangible assets help physical assets in generating activity. Intangible assets can be said to be behind the scene with respect to

productive activities. Besides real assets, the economy is supported by another group of assets called financial assets. The major component of the financial assets is cash, also called money. Financial assets help the physical assets to generate activity. Some examples of financial assets besides are deposits, debt instruments, shares and foreign currency reserves.

Assets in any economy can be broadly grouped into physical, and intangible assets, based on their distinct characteristics. Physical assets can be classified into fixed assets and working capital assets, based on the length of their life. Fixed assets, such as land, building, machinery, and other infrastructure facilities, are utilized by the society over a long period of time when compared with working capital assets. Movable/circulating capital assets are produced and consumed by the society within a financial year. Examples of movable/circulating capital assets include materials, merchandise, durable goods, jeweler (gold) and similar items. Intangible assets are goodwill, patents, copyrights, and royalties.

In a macro sense, the government of an economy regulates financial assets. Financial assets smoothen the trade and transactions of an economy and give the society a standard measure of valuation. Money or cash is the basic financial asset created by the government of an economy. The extent of flow of this financial asset has to be regulated in an economy for the demand for and supply of funds to match.

Investment is a sacrifice of current money or other resources for future benefits. Numerous avenues of investment are available today. You can either deposit money in a bank account or purchase a long-term government bond or invest in the equity shares of a company or contribute to a provident fund account or buy a stock option or acquire a plot of land or invest in some other form. The two key aspects of any investment are time and risk. The sacrifice takes place now and is certain. The benefit is expected in the future and tends to be uncertain.

1.2 ATTRIBUTES OF INVESTMENT

For evaluating an investment avenue, the following attributes are relevant.

- Safety
- Regularity of Income
- Marketability
- Tax shelter
- Convenience

(i) Safety :

The investor, to be certain of the safety of principal, should carefully review the economic and industry trends before choosing the types of investment. Errors are unavoidable and, therefore, to ensure safety of principal, the investor should consider diversification of assets. Adequate diversification involves mixing investment commitments by industry, geographically by management, by financial type and by maturities. A proper combination of these factors would reduce losses. Diversification to a great extent helps in proper investment programmes but it must be reasonably accomplished and should not be carried out to extremes.

(ii) Regularity of Income: Regularity of income at a consistent rate is necessary in any investment pattern. Not only stability, it is also important to see that income is adequate after taxes. It is possible to find out some good securities, which pay practically all their earnings in dividends.

(iii) Marketability:

An investment is marketable or liquid if: (a) it can be transacted quickly; (b) the transaction cost is low; and (c) the price change between two successive transactions is negligible. The liquidity of a market may be judged in terms of its depth, breadth, and resilience. Depth refers to the existence of buy as well as sells orders around the current market price. Breadth implies the presence of such orders in substantial volume. Resilience means that new orders emerge in response to price changes. Generally, equity share of large, well-established companies enjoy high marketability and equity shares of small companies in their formative years have low marketability. High marketability is a desirable characteristic and low marketability is an undesirable one.

How does one evaluate the marketability of an investment like a provident fund deposit, which is non-marketable by its very nature? In such a case, the relevant question to ask is: can withdrawals be made or loans be taken against the deposit? Such an investment may be regarded as highly marketable if any of the following conditions are satisfied:

a) A substantial portion of the accumulated balance can be withdrawn without significant penalty;
b) A loan (representing a significant portion of the accumulated balance) can be raised at a rate of interest that is only slightly higher than the rate of interest earned on the investment itself.

(iv) Tax Shelter:

Some investments provide tax benefits; other do not. Tax benefits are of the following three kinds.

a) An initial tax benefit represents the tax relief enjoyed at the time of making the investment.
b) A continuing tax benefit represents the tax shield associated with the periodic returns from the investment.
c) A terminal tax benefit refers to relief from taxation when an investment is realized or liquidated.

(v) Convenience.

Convenience broadly refers to the ease with which the investment can be made and looked after. Put differently, the questions that we ask to judge convenience are:

a) Can the investment be made readily?
b) Can the investment be looked after easily?

The degree of convenience associated with investment varies widely. At one end of the spectrum is the deposit in a savings bank account that can be made readily and that does not require any maintenance effort. At the other end of the spectrum is the purchase of a property that may involve a lot of procedural and legal hassles at the time of acquisition and a great deal of maintenance effort subsequently.

1.3 TYPES OF INVESTORS:

Investors can be classified on the basis of their risk bearing capacity. Investors in the financial market have different attitudes towards risk and hence varying levels of risk-

bearing capacity. Some investors are risk averse, while some may have an affinity of risk. The risk bearing capacity of an investor is a function of personal, economic, environmental, and situational factors such as income, family size, expenditure pattern, and age. A person with a higher income is assumed to have a higher risk-bearing capacity. Thus investors can be classified as risk seekers, risk avoiders, or risk bearers. A risk seeker is capable of assuming a higher risk while a risk avoider chooses instruments that do not show much variation in returns. Risk bearers fall in between these two categories. They assume moderate levels of risk.

Investors can also be classified on the basis of groups as individuals or institutions. Individual investors operate alongside institutional investors in the investment market. However, their characteristics are different. Individual investors in any financial market are large in number, but in terms of value of investment they are comparatively smaller. Institutional investors, on the other hand, are organizations with surplus funds beyond immediate business needs or organizations whose business objective is investment. Mutual funds investment companies, banking and non-banking companies, insurance corporations, and so on are organizations with large surplus funds to be invested in various profitable avenues. While these institutional investors are fewer in number compared to individual investors, their resources are much larger. Institutional investors engage professional fund managers to carry out extensive analysis. Institutional investors and individual investors combine to make the investment market dynamic.

1.4 INVESTMENT DECISION PROCESS

As mentioned previously, the investment process describes how an investor go about making decisions with regard to what marketable securities to invest in, how extensive the investments should be, and when the investments should be made. A five-step procedure for making these decisions forms the basis of the investment process.

i) Investment policy.
ii) Security analysis.
iii) Construct a portfolio.
iv) Revise the portfolio.
v) Evaluate the performance of the portfolio.

i) Investment Policy:

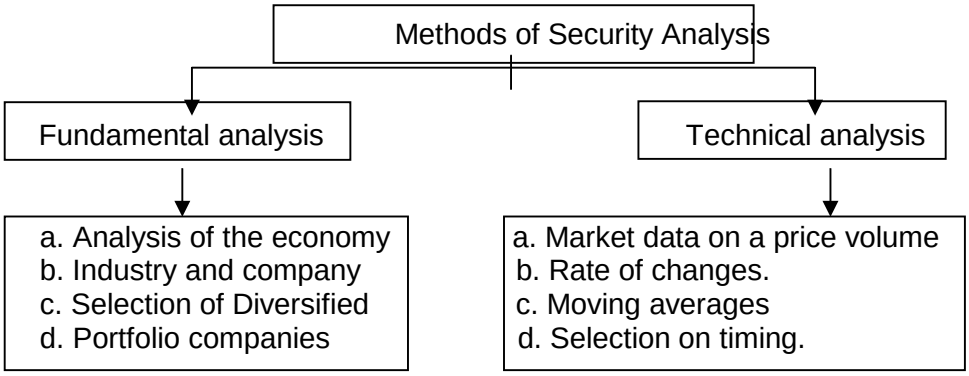
The initial step, setting investment policy, involves determining the investor's objectives and the amount of his or her investable wealth. Because there is a positive relationship between risk and return for sensible investment strategies, it is not appropriate for an investor to say that his or her objective is to "make a lot of money". What is appropriate for an investor in this situation is to state that the objective is to attempt to make a lot of money while recognizing that there is some chance that large loss may be incurred. Investment objectives should be stated in terms of both risk and return.

This step in the investment process concludes with the identification of the potential categories of financial assets for inclusion in the portfolio. This identification will be based on, among other things, the investment objectives, amount of investable wealth, and tax status of the investor. Investment policy is the cornerstone of the investment process. However, it is often the step that receives the least attention from investors.

ii) Security analysis

The second step of the investment process, performing security analysis, involves examining a number of individual securities within the broad categories of financial assets previously identified. One purpose in conducting such examination is to identify those securities that currently appear to be mispriced. There are mainly two approaches to security analysis.

a. Fundamental analysis.
b. Technical analysis



a. Fundamental analysis:.

Fundamental analysis begins with the assertion that the "true" value of any financial asset is equal to the present value of the all cash flows that the owner of the asset except to receive. Accordingly, the fundamental analyst will attempt to forecast the timing and size of these cash flows and then will convert them to their equivalent present value by using an appropriate discount factor and dividend discount model. Stocks that have a true value less than their current market price are known as overhead or overpriced, stocks, whereas those that have a true value greater than their current market price are known as undervalued, or under priced, stocks

b. Technical analysis:

In its simplest form, technical analysis involves the study of stock market prices in an attempt to predict future price movements for the common stock of a particular firm. Initially, past prices are examined in order to recurring trends or patterns in price movements. Then, more recent stock prices are analyzed in order to identify emerging trends or pattern with past ones is done in the brief that these trends or patterns repeat themselves; thus by identifying an emerging trends or pattern, the analyst will be able to predict future price movements for that particular stock.

iii. Portfolio Construction:

The third step of the investment process, portfolio construction, involves identifying those specific assets in which to invest as well as determining the proportions of the investor's wealth to put in each one. Here the issue of selectivity, timing and diversification need to be addressed by the investor. Selectivity, also known as micro forecasting, refers to security analysis and thus focuses on forecasting price movement of individual securities. Timing, also known as macro forecasting, involves the forecasting price movement of common stocks in general relative to fixed-income securities, such as corporate bonds. Diversification involves constructing the investor's portfolio in a manner such that risk is minimized, subject to certain restrictions.

iv. Portfolio Revision:

The fourth step of investment process, **portfolio revision**, concerns the periodic repetition of the previous three steps. Thus is, over time investor may change his or her investment objectives, which, in turn, may cause the currently held portfolio to be less than optimal. Perhaps the investor should form a new portfolio by selling certain securities that are currently held and purchasing certain others that are not currently held. Another motivation for revising a given portfolio is that over time the prices of securities change, meaning that some securities that initially were not attractive may become attractive and others that were attractive at one time may no longer be so. Thus the investor may want to add the former to his or her portfolio, while simultaneously deleting the latter. Such a decision will depend upon, among other things, the size of the transaction costs incurred in making these changes and the magnitude of the perceived improvement in the investment outlook for the revised portfolio.

v. Portfolio performance evaluation:

The fifth step of investment process, **portfolio performance evaluation**, involves determining periodically how the portfolio performed, in terms not only the return earned but also the risk experienced by the investor. Thus, appropriate measures of return and risk as well as relevant standards or benchmark are needed.

1.5 INVESTMENT, SPECULATION AND GAMBLING:

Speculation is well nigh impossible to define the term 'speculation' with any precision. Investment and speculation are somewhat different and yet similar because speculation requires an investment and investments are at least somewhat speculative. Investment usually involves putting money into an asset, which is not necessarily marketable in the short-run in order to enjoy a series of returns the investment is expected to yield. On the other hand, speculation is usually a short-run phenomenon. Speculators tend to buy assets with expectation that a profit can be earned from a subsequent price change and sale. Accordingly, they buy marketable assets, which they do not plan to own for very long.

Speculation involves a higher level of risk and a more uncertain expectation of returns but in many cases the investors are also in the same boat. The investor who thinks that the market fluctuations of his investments are not of interest to him because he is buying solely for income can very well be compared with the ostrich burying its head in the ground during danger and feeling he secure.

The truth of the matter is that everything we do in this world is a speculation, whether we regard it as such or not, and the man who comes out in the open and uses his judgment to forecast the probable course of events, and then acts on it, is the one who would reap the returns of his endeavor. This is a peculiar psychology that makes many investors avoid certain sound stocks or bonds because their broker speaks of "speculative possibilities". These investors judge safety by yield. If a security pays beyond certain percentage it is classed as "speculative", and is not for them.

Social definition of a speculation is to be created it must apparently include the four functions of speculation as a process:

i) Smoothening of the price fluctuation process;

ii) Maintenance of temporary equilibrium between capital supply and demand;

iii) Consideration of business prospects in determining the business value of existing capital funds; and

iv) Equating the risk to return in the infinitely varied utilizations of the social capital fund.

The several differences between speculation and investment, which have the doubtful merits of public support, may be summarized as under:

Basis	Investment	Speculation
Type of contract	Creditor	Ownership
Basis or acquisition	Usually by outright purchase	Often-on-margin
Length of commitment	Comparatively long term	For a short time only
Source of income	Earnings of enterprise	Change in market price
Quantity of risk	Small	Large
Stability of income	Very stable	Uncertain and erratic
Psychological attitude of participation	Cautious and conservative	Daring and careless
Reasons for purchase	Scientific analysis of intrinsic worth	Hunches, tips "inside dope", etc.

Gambling dates back to antiquity. Most dictionaries refer to 'gamble' as an act involving an element of risk. In particular, a gamble involves taking on risk without demanding compensation in the form of increased expected return. The Gambling exhibit some or all of the following characteristics.

i. Gambling is a typical, chronic and repetitive experience and it absorbs all other interests. ii. The gambler displays persistent optimism without winning and he never stops while winning. iii. The gambler eventually risks more than he or she can afford and seeks and enjoys a strange thrill from gambling, a combination of pleasure and pain.

People usually make investments with a future end date in mind. The length of time from the date when the investment is purchased to the final date can be called the investor's planning horizon, investment horizon, or holding period. A financial asset purchased with a very short holding period in mind probably is not really an investment. It may be a gamble or speculation.

Speculation typically lasts larger than gambles but is briefer than investments. A speculation usually involves the purchase of salable assets in hopes of making a quick profit from an increase in the price of the asset, which is expected to occur within a few weeks or months. Those involves in speculations are reluctant to refer to this activity as speculation because they dislike the annotations of the word; the prefer to refer to speculations as investment activities.

A gamble is usually a short-term investment in a game of change. The holding period for most gambles can be measured in seconds. That is the result of so-called investments is quickly resolved by the roll of the turn of card. Such activities have planning horizons that are far too brief to do the research that should precede any investment activity.

1.6 INVESTMENT ENVIRONMENT

A reading of the above sections would have provided some understanding on the basic principles of investment. Suppose you are able to frame your investment objective and also identified securities that are to be purchased. Now you need to deal with the market for the purchase and sale of securities. An understanding of the operational details of the market would be useful. Investment decisions to buy/sell securities taken by individuals and institutions are carried through a set of rules and regulations.

There are markets- money and capital – that function subject to such rules and established procedures and are, in turn, regulated by legally constituted authority. Then there are securities or financial instruments which are the objects of purchase and sale. Finally, the mechanism, which expedites comprise the investment environment. Investors have to be fully aware of this environment for making optimal investment decisions.

Discussion in the following paragraphs provides a brief overview of the three elements of the investment environment viz., instruments, institutions, and markets.

1.6.1 Financial Instruments:

Financial assets or instruments can be classified in a variety of ways. They represent a claim against the future income and wealth of others. In other words, a financial instrument is a claim, against a person or an institution, for the payment of a sum of money and/or a periodic payment in the form of interest or dividend, at a specified future date. In financial markets, a variety of investors operate. To suit their requirements, the companies and financial institutions issue different types of securities. In other words, financial markets/system promotes development of innovative financial products suited to the investment requirements of heterogeneous investors. The financial securities may be classified under two broad categories like primary securities and secondary securities.

Primary Securities are also termed as ‘direct securities’ as these are issued directly by the ultimate borrowers of funds to the ultimate savers or investors. Primary securities include equity shares, preference shares and debentures on the other hand, Secondary Securities are also termed as ‘indirect securities’ as these are not issued directly by the ultimate borrowers, rather, financial intermediaries issue these to ultimate savers. Insurance policies, units of the mutual funds, bank deposits etc., are the examples of secondary securities. There has been tremendous growth in new financial instruments since 1990’s, issued by the corporate and financial institutions. The following are some of the new innovative financial instruments devised for raising funds: Equity Warrants; Secured Premium notes; Collable Bond; Floating or Adjustable Rate Bonds; Deep Discount Bonds (DDBs); Inflation Adjusted Bonds; Regular Income Bonds; Index Bonds; Growth Bonds etc.

1.6.2 Financial Institutions:

Financial institutions are the intermediaries who facilitate smooth functioning of the financial system through the interaction of investors and borrowers meet. They mobilize savings of the surplus units and allocate them in productive activities promising a better rate of return. Financial institutions also provide services to entities (individual, business, government) seeking advise on various issues ranging from restructuring to diversification plans. They provide a whole range of services to the entities that want to raise funds from the markets or elsewhere.

Financial Institutions are also termed as financial intermediaries because they act as middlemen between the savers and lend these funds to another set of customers. Like-wise investing institutions such as General Insurance Corporation (GIC), Life Insurance Corporation (LIC), Mutual Funds etc., also accumulate savings and lend the same to borrowers, thus performing the role of financial intermediaries.

Financial institutions' role as intermediary differs from that of a broker who acts as an agent between buyer and seller of a financial instrument; thus facilitating the transaction but does not personally issue a financial instrument. While financial intermediaries mobilizes savings of the surplus units and lend them to the borrowers in the form of loans and advances. They earn profit from the difference between rate of interest charged on loans and rate of interest paid on deposits. In short, they repackage the depositor's savings into loans to the borrowers. As financial intermediaries, they meet the short-term as well as long-term needs of the borrowers and provide liquidity to the savers. Deposits are payable on demand by the customers. Banks are in a position to avoid the situation of illiquidity while borrowing for short periods and lending for long term by mobilizing savings from diversified set of depositors. The RBI also has made it mandatory for the banks to keep a certain percentage of deposits as cash reserves with itself to avoid the situation of illiquidity.

1.6.3 Financial Markets:

Securities markets can be seen as primary and secondary. The primary market or the new issue market is an informational forum with national and even international boundaries. Anybody who has funds and the inclination to invest in securities would be considered a part of this market. Individuals, trusts, banks, mutual funds, financial institutions, pension funds, and for that matter any entity can participate in such markets. Companies enter this market with initial and subsequent issues of capital. They are required to follow the guideline prescribed by the regulating agencies like SEBI from time to time unless they are expressly exempted from doing so. A prospectus or a statement-in-lieu of prospectus is a necessary requirement because this contains all material information on the basis of which the investor would from judgment to put or not to put his money. Concealment and misrepresentations in these documents have serious legal implications including the annulment of issue.

Some companies would use the primary market by using their 'in house' skill but most of them would employ brokers, broking and underwriting firms, issue managers, lead managers for planning and monitoring the new issue. New guidelines issued by the SEBI, now require the compulsory appointment of a registered merchant banker as issue manager where the amount of the capital issue exceeds Rs.50 lakhs.

Secondary markets or stock exchanges are set up under the Securities Contracts (Regulation) Act, 1956. They are known as recognized exchanges and operate within precincts that possess networks of communication, automatic information scans, and other mechanized systems. Members are admitted against purchase of a membership card whose official prices vary according to the size and seniority of the exchange.

(i) National Market:

National markets are markets within the boundary of a nation. Several local subdivisions can be made within the national market to benefit the players in the market. National markets cater to the financial requirements of the local players. Players from foreign countries are permitted to bring their financial instruments into the national market, subject to the following rules and regulations imposed by the nation. There are vast differences in the rules

and regulations of the securities market among nations. Each nation has a regulatory authority under whose scrutiny financial instruments are exchanged in that country. The regulatory authority imposes the overall procedures and guidelines to be followed by the players in the national market. National markets sometimes make a difference between pure domestic players and the participation of international players. Hence, there can be a further subdivision of the national market into a domestic segment and a foreign segment.

(ii) International Market:

International markets are usually referred to as offshore markets. Certain national markets, due to their policy regulations, do not discriminate between the securities issued in its country vis-à-vis other countries. A precise example of an international market is the Euro market, where the representation of several countries is viewed together. A firm in any one-member nation in the European subcontinent could list its securities simultaneously in other countries of the European Union. For example, firm with its headquarters in France, could simultaneously trade its securities in France, Spain, and Germany. This concept of opening the national market to other group countries came to be known as international market.

1.7 SUMMARY

Financial assets represent current/future values of real assets. They are expressed in money terms, have the characteristics of divisibility, convertibility, and reversibility. They are traded in a market and provide cash flows to the holder. A financial market is a place/system where the exchange of financial instruments takes place. Financial markets are broadly classified into money market and capital market. Capital market deals with both debt and equity instruments through the primary and secondary market segments. Money market, on the other hand, deals mostly in debt instruments of shorter duration.

The success of every instrument decision has become increasingly important in recent times. Making sound management decisions require both knowledge and skill. Skill is needed to evaluate risk and return associated with an investment decision. Knowledge is required regarding the complex investment alternatives available in the economic environment. After clarifying the meaning of investment programme and how differs from speculation and gambling. This chapter gives a brief idea of the investment programme.

1.8 KEY WORDS

Ex-ante: Before event or fact.

Ex-post: After the event of fact.

Expected return: Ex ante return on an investment.

Financial Assets: Documentary evidence of financial claim of the holder, say of shares on debentures, over the issuer.

Financial Intermediation: A function, which brings the savers and users of funds together, usually performed by specialized agencies and institutions like banks and underwriters for an agreed/stipulated commission.

Investment: Commitment of funds for a period usually exceeding one year in expectation of a required rate of return.

Investment decision: The decision to acquire, holds, or dispose asset by rational and risk-averse individual / organizations.

Marketable Securities: Financial claims, which are tradable in organized markets at the best prices.

Portfolio: A collection of two or more assets, generally employed in the context of financial assets.

Portfolio Construction: Building up a portfolio of financial assets with consideration of selectivity, timing and diversification or raising a portfolio with rational selection criteria, at the right time, and in a way that the risk is reduced to the minimum for a given level of expected return.

Portfolio revision: A review of an existing portfolio in the light of changes in risk-return dimensions.

Portfolio evaluation: Assessing the performance of a portfolio on the basis of some aptly developed norms or yardsticks.

Real Assets: Physical assets held to perform an activity with an expected income/pay off profile.

Realized return: The pay-off rate on an investment, which occurs after an event/fact i.e., the actual return.

Risk: The probability that the realized return would be different from the anticipated return of an investment.

Reis-averse investors: Rational individuals, who avoid risk and demand a compensation for assuming risk.

Risk-free rate of return: The monetary rate of return obtainable on financial assets with zero probability on principal and periodic payments, e.g. government or gilt edged securities.

Risk-return trade-off: An approach to investment decision-making whereby the utility/welfare maximizing individuals acquire assets in a way that their returns are maximized for given levels of risk or risk is minimized for given level of return.

Security Analysis: A methodology whereby forecasts of financial variables like earnings, dividends, cash flow are made for individual securities, (i.e., micro level) or for securities as a homogeneous industry group (macro-level) using either past data or a discounting approach.

Securities market: Organized and recognized trading centers, where financial claims are bought and sold as per established rules and procedures.

Zero-interest bonds: Creditorship securities on which a coupon rate is not made explicit but the compensation is provided through a discount on the purchase price or a premium on redemption.

1.9 SELF-ASSESSMENT QUESTIONS

1. Define Investment.

2. Describe the steps involved in the investment process.

3. Discuss the differences between Speculation, Investment and Gambling.

4. Explain the concept of Investment? Discuss the different channels or alternatives available to an investor for making investments.

5. What are the different characteristics of Investment?

1.10 FURTHER READINGS:

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R S R

LESSON 2

INVESTMENT RISKS

2.0 Objectives

The objectives of this lesson are to:

- Explain the concept of risk and genesis of investment risk
- Distinguish between 'systematic' and 'unsystematic' risk.
- Identify the factors that specially affect risk of investment in equity shares.

Structure

2.1 CONCEPT OF RISK

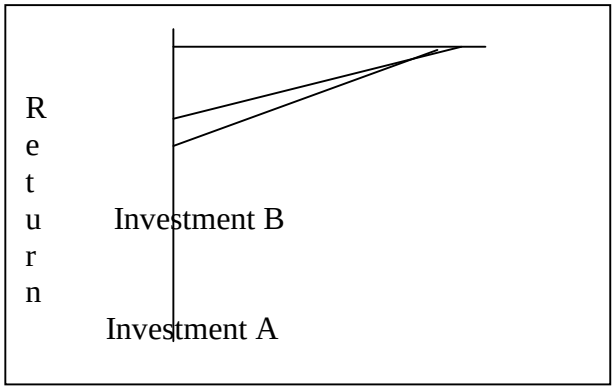
Risk is present in virtually every decision. When a production manager selects equipment, or a marketing manager an advertising campaign, or a finance manager a portfolio of securities all of them face uncertain cash flows. Assessing risks and incorporating the same in financial decision is an integral part of financial analysis. Risk is explained theoretically as the fluctuation in return from a security. A security that yields consistent returns over a period of time is termed as 'risk-less security' or 'risk-free security' on the other, a security that yields inconsistent returns over a period of time is called as 'risky assets'. For example, notice the following alternatives:

- Rs.1000, 12% 2020 Government of India Loan.
- Rs.100, 14.5% 2005 TISCO Non-Convertible Debentures.

It is state the obvious that the Government Loan would have zero risk since the Government system does not fail and interest payments as well as principal repayments are absolutely assured. In the case of TISCO debentures, there are protective covers in the form of corporate assets and continued good financial performance but there is a chance of bad performance and possibility of default.

Investment risk can be an extraordinary stress for many investors. When the secondary market does not respond to rational expectations, the risk component of such markets are relatively high and most investors fail to recognize the real risk involved in the investment process. Risk aversion is the criteria commonly associated with many small investors in the secondary market. Mainly small investors look upon the market for a definite return and when their expectations are not met, the effect on the small investors' morale is negative. Hence, these investors prefer to lock up their funds in securities that would rather give then back their investment with small returns than those securities that yield high returns on an average but are subject to wild fluctuations.

The investment environment also has risk-seeking investors. Speculators are risk seekers and would rather invest in securities that yield high returns though the certainty around such returns is very minimal. They are also termed as risk takers in the market. Both risk takers and risk-averting investors are essential for a secondary market. An investor given the following investment opportunities would definitely choose investment B to investment A in both figure 2.1(a) and 2.1(b). Investment A gives a definite flow of income, whereas, investment B is definite in the first figure while it varies in the second figure. The variation in the flow of income to investors is defined as the risk inherent in the security. Though there is risk in the second instance, the investor's preference would still be for investment B because it offers a higher return in the almost all the instances. This is also inferred as the compensatory higher return for the higher risk borne by the investor.



2.1 (a) Consistent Superior Return

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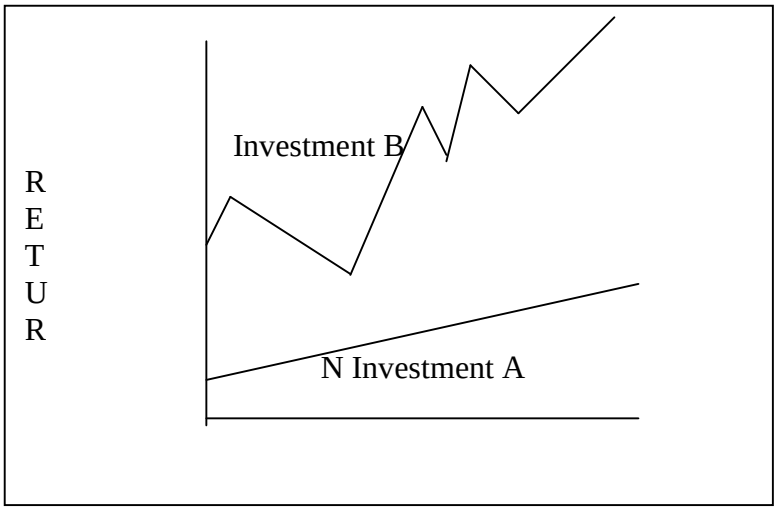


2.2 EVOLUTION OF RISK CONNOTATIONS

In the yearly years of the present century analysts would use financial statement data for evaluating the risk of securities of a company. The broad indicators used by them were the amount of debt employed by the firm. Their rule was: the higher the amount of debt the greater the risky ness of securities. Graham Dodd and Cottle, who are considered pioneers of 'security analysis' as discipline laid emphasis on 'margin of safety' as a measure of risk in the 1962 edition of their monumental work titled 'Security Analysis'. They were of the view that security analysis must calculate the 'intrinsic value' of a security independent of its market price. According to them, 'intrinsic value of a security would be security analyst's own judgment based on its earning power and financial characteristics and without reference to its market price. The difference between 'intrinsic value' and 'market price' was called the margin of safety' and the rule used for assessment of risk was: 'the higher the margin of safety the lower the risk.

Graham and Dodd not only concentrated on the individual security but also recognized the importance of its contribution to the risk of a well-diversified portfolio. It must, however, be mentioned that what brought the concepts of risk for a portfolio and a security under a clearer focus was the work of Markowitz and the later development of the capital asset price model (CAPM).

(i) Risk Vs Uncertainty:

Risk and uncertainty are used interchangeably but they differ in perception. Risk suggests that a decision marker knows the possible consequence of a decision and their related likely hoods. Uncertainty involves a situation about which likelihood of possible outcome is not known. Investors want to maximize Expected Returns subject to their tolerance and risk. The degree of risk depends upon the basis of the features of assets, investment instruments and the mode of investment.

(ii) Causes of Risk:

Some factors, which can be stated to cause risk in the investment arena, are given below:

- Wrong method of investment,
- Wrong period of investment,
- Wrong quantity of investment,
- Interest rate risk,
- Nature of investment instruments,
- Nature of industry,
- Nature of business in which investment made in,
- National and international factors,
- Nature calamities etc.

2.3 SOURCES OF RISK

An investor is always concerned with the risk attached with an investment. He is faced with several questions. In order to understand risk, he should know: What makes the

investments a risky proposition? What are different factors or sources from where the investments assume risk? There are different sources that contribute to variations in return from an investment. Each of these sources constitutes an element of risk. The different sources of risk in investments are as follows:

(i) Market Risk.

Market prices of investments, particularly equity shares may fluctuate within a short span of time even though the earnings of the company are not changing. The reasons for this change in prices may be varied. Due to one factor or the other, investors' attitude may change towards equities resulting in the change in market price. Change in market price causes the return from investment to vary. This is known as market risk. The market risk refers to variability in return due to change in market price of investment. Market risk appears because of reaction of the investors to different t events. There are different social, political economic and firm specific events, which affect the market prices of equity shares. Market psychology is another factor affecting market prices. In bull phases, market prices of all shares tend to increase, while in bear phases, the prices tend to decline. In such situations, the market prices are pushed beyond far out of line with the fundamental value.

(ii) Interest-Rate Risk.

Interest rates on risk-free (government) securities and the general interest rate level are related to each other. If the risk-free rate of interest rises or falls, the rate of interest on other bond securities also rises or falls. The interest rate risk refer to the variability in return caused by the change in market price of fixed income securities, i.e., bonds and debentures. Security (bonds and debentures) prices have an inverse relationship with the level of interest rates. When the interest rate rises, the prices of existing securities fall and *vice versa.* Changes in the level of interest rates directly affect the prices of bonds and debentures and also indirectly affect the price of equity shares.

(iii) Inflation Risk.

The inflation risk refers to the uncertainty of purchasing power of cash flows to be received out of investment. It shows the impact of inflation or deflation on the investment. The inflation increases, the interest rates also tend to increase. The reason being that the investors wants an additional premium for inflation risk (resulting from decrease in purchasing power). Thus, there is an increase in interest rates.

Investment involves a postponement of present consumption. If an investor makes an investment, he foregoes the opportunity to buy some goods or services during the investment period. If, during this period, the prices of goods and services go up, the investor loses in terms of the purchasing power. The inflation risk arises because of uncertainty of purchasing power of the amount to be received from investment in future.

The three sources state above is the basic sources of risk. In addition to these, there are other sources of risk also. These are:

(iv) Business Risk.

Business risk refers to the variability in incomes of the firms and expected dividend there from, resulting from the operating condition in which the firms have to operate. For example, the earnings or dividends from a company are expected to increase say, by 6%, however, the actual increase is 10% or 2%. The variation in actual earnings than the expected earnings refers to business risk. Some industries have higher business risk than others. So, the securities of

higher business risk firms are more risky than the securities of other firms, which have lesser business risk.

(v) Financial Risk.

Financial risk refers to the degree of leverage or degree of debt financing used by a firm in the capital structure. Higher the degree of debt financing, the greater is the degree of financing risk. The presence of interest payment brings more variability in the earnings available for equity shares. This is also known as financial leverage. A firm having lesser or no debt financing has lesser or no financial risk. Debt financing increases the risk of equity shares by increasing the variability of returns of equity shares, and risk of non-receipt of capital in case of winding up of the company.

(vi) Social or Regulatory Risk:

The social or regulatory risk arises where an otherwise profitable investment is impaired as a result of adverse legislation, harsh regulatory climate, or in extreme instance nationalization by a socialistic government.: The profits of industrial companies may be reduced by price controls, and rent controls may largely destroy the value of rental property held income or as a price-level hedge. The social risk is really political and thus unpredictable, but under a system of representative government based on increasing government intervention in business affairs, no industry can expect to remain exempt from it.

(vii) Other Risks:

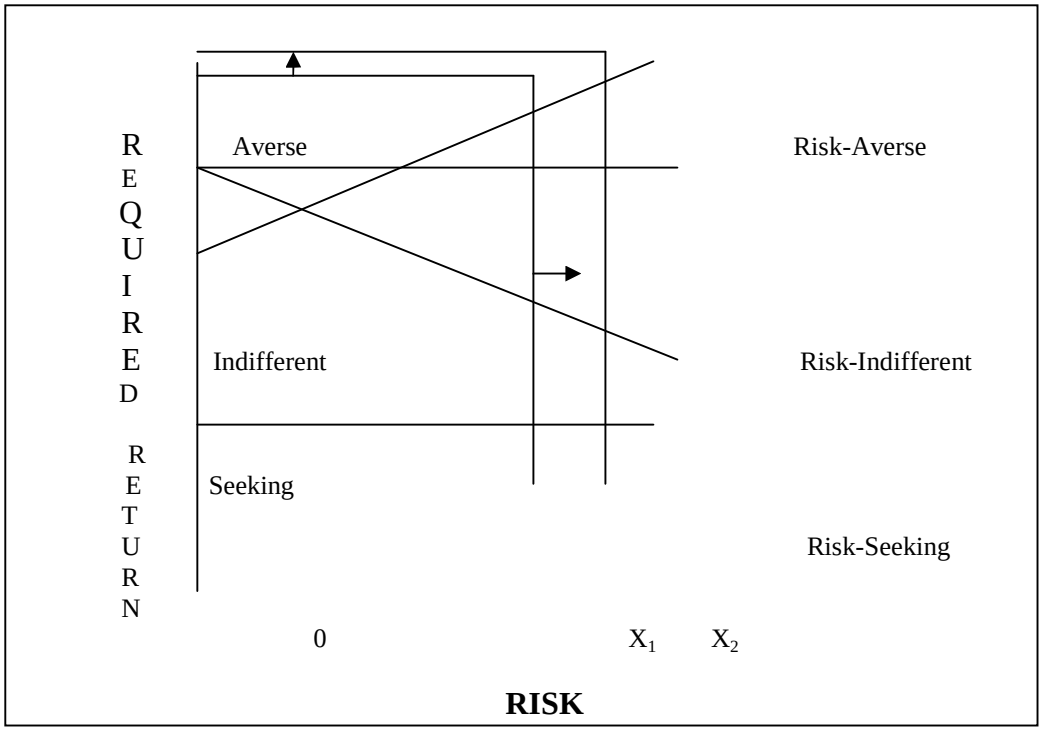
Other types of risk, particularly those associated with investment in foreign securities, are the monetary value risk and the political environment risk. The investor who buys foreign government bonds or securities of foreign corporations often in an attempt to gain a slightly higher yield than obtained on domestic issues, runs the calculated risk of:

(1) a change in the foreign government and repudiation of outstanding debt,
(2) nationalization of business firms, that is, seizure by government, or
(3) the desire but inability of the foreign government or corporation to handle its indebtedness.

The investor should weigh carefully the possibility of the additional risks associated with foreign investments against his expected return either in the form of interest or dividends or capital gains, when investing in foreign securities rather than domestic securities.

Risk Preferences:

Feelings about risk differ among managers (and firms). Thus it is important to specify a generally acceptable level of risk. The three basic risk preference behaviors- risk-averse, risk-indifferent, and risk seeking – are depicted graphically in the following figure.



- For the risk-indifferent manager, the required return does not change as risk goes from x_1 to x_2. In essence, no change in return would be required for the increase in risk. Clearly, this attitude is nonsensical in almost any business context.

- For the risk-averse manger, the required return increases for an increase in risk. Because they shy away from risk, these mangers require higher expected returns to compensate them for taking greater risk.

- For the risk-seeking manger, the required return decrease for an increase in risk. Theoretically, because they enjoy risk, these managers are willing to give up some return to take more risk. However, such behaviour would not be likely to benefit the firm.

Most managers are risk-averse; for a given increase in risk, they require an increase in return. They generally tend to be conservative rather than aggressive when accepting risk for their firm. Accordingly, a risk-averse financial manager requiring higher returns for greater risk is assumed.

2.4 TYPES OF RISK

Out of the five sources of risk in the investments, the first three sources, i.e., market risk, interest rate risk and inflation risk, are external to the firm and cannot be controlled. These are all-passive in nature and affect all the firms. On the other hand, the last sources of risk, i.e., business risk and financial risk are controllable and internal to a particular firm. On the basis of this analysis, the risk may be classified into systematic and unsystematic risk.

(i) Systematic Risk.

Systematic risk refers to that portion of the variability in return which is caused by the factors affecting all the firms. This vast of risk cannot be reduced through diversification. The examples of systematic risk are:

- The government changes the interest rate policy.
- The corporate tax rate is increased.
- The government resorts to massive deficit financing.
- The inflation rate increase.
- The Reserve Bank of India promulgates a restrictive credit policy.
- Government fails to attract FIIs.

(ii) Unsystematic Risk.

The systematic risk represents the fluctuations in return from an investment due to factors, which are specific to the particular firm and not the market as a whole. This part of the risk can be totally reduced through diversifications, and it is called unsystematic, or unique risk. The examples of unsystematic risk are:

- Workers declare strike in a company.
- The R&D expert of the company leaves.
- A formidable competitor enters in the market.
- The company loses a big contract in a bid.
- The company makes a breakthrough in process of innovation.
- The government increases custom duty on the material used by the company.
- The company is not able to obtain adequate quantity of raw material used by the company.

2.5 CONCEPT OF RETURN:

The total return on an investment for a given period is:

$$\text{Total return} = \frac{\text{Cash Payment received during period} + \text{Price change over the period.}}{\text{Price of the investment at the beginning}}$$

All items are measured in rupees. The rupee cash payment received during the period may be positive or zero. The rupee price change over the period is simply the difference between the ending price and the beginning price. This can be positive (ending exceeds the beginning price) or zero (ending price equals the beginning price) or negative (ending price is less than the beginning price).

$$R = \frac{C+(P_E - PB)}{P_B}$$

Where R= total return over the period
C= cash payment received during the period

P_E = ending price of the investment
P_B = beginning price

To illustrate, consider the following information for an equity stock:

- Price at the beginning of the year: Rs.70.00
- Dividend paid at the end of this year: Rs.5.00
- Price at the end of the year: Rs.80.00

The total return on this stock is calculated as follows:

$$\frac{5.00 + (80-70)}{70} = 0.214 \text{ or } 21.4\%$$

2.6 CONCEPT OF RISK

Risk refers to the possibility that the actual outcome of an investment will differ from the expected outcome. Put differently, risk refers to variability or dispersion. If an asset's return has no variability, it is risk less. Suppose you are analyzing the total return of an equity stock over a period of time. Apart from knowing the mean return, you would also like to know about the variability in returns.

Variance and Standard Deviation:

The most commonly used measures of risk in finance are variance or its square root the standard deviation. The variance and the standard deviation of a historical risk are defined as follows:

$$\sigma^2 = \left[\frac{\sum_{i=1}^{n} (R_i - \bar{R})}{n-1} \right]$$

Where σ^2 = Variance of Return
R_i = return from the stock in period I(I=1,….,n)
$\bar{R}$ = arithmetic return
n = number of periods

To illustrate, consider the returns from a stock over a 6-year period:

R_1=16%, R_2=12%, R_3=20%, R_4 = -13%, R_5 =15%, R_6 = 10%

The variance and standard deviation of returns are calculated as below:

Period	Return Deviation	Square of deviation
▪		--
▪		

		$(R_i - R)$	$(R_i - R)^2$
1	16	6	36
2	12	2	4
3	20	10	100
4	-13	-23	529
5	15	5	25
6	10	0	0
	$\sum R_i$= 60		694

$$\sigma^2 = \frac{694}{6-1} = 108.8$$

$$\sigma = \sqrt{108.8} = 10.43$$

Looking at the above calculations, we find that:

- The difference between the various values and the mean values are squared. This means that values that are far away from the mean value have a much more impact on standard deviation than values, which are close to the mean value.
- The standard deviation is obtained as the square root of the average of squared deviations. This means that the standard deviation and the mean are measured in the same units and hence the two can be directly compared.

2.7 MEASURING EXPECTED RETURN AND RISK

So far we looked at the historical (ex facto) return and risk. We now discuss expected (ex ante) return and risk.

(i) Probability Distribution:

When you invest in a stock you know that the return from it can take various possible values. For example, it may be 5 percent, or 15 percent, or 35 percent. Further, the likelihood of these possible returns can vary. Hence, you should think in terms of a probability distribution.

The probability of an event represents the likelihood of its occurrence. Suppose you say that there is a 4 to 1 chance that the market price of a stock A will rise during the next fortnight. This implies that there is an 80 percent change that the price of stock A will increase and a 20 percent chance that it will not increase during the next fortnight. Your judgment can be represented in the form of a probability distribution as follows:

Outcome	Probability
Stock price will rise	0.80
Stock price will not rise	0.20

Another example may be given to illustrate the notion of probability distribution. Consider two equity stocks, Bharat Foods stock and Oriental Shipping stock. Bharat Foods stock may provide a return of 15 percent, 20 percent, or 25 percent with certain probabilities

associated with them, based on the state of economy. The second stock, Oriental Shipping stock, being more volatile, may earn a return of 20 percent, 10 percent, or 40 percent with the same probabilities, based on the state of the economy. The probability distributions of the returns on these two stocks are shown in the following Exhibit.

State of Economy	Probability of occurrence	Rate of Return (%)	
		Bharat Foods	Oriental Shipping
Boom	0.30	16	40
Normal	0.50	11	10
Recession	0.20	06	-20

Based on the probability distribution of the rate of return, you can compute two key parameters, the expected rate of return and the standard deviation of rate of return.

(ii) Expected Rate of Return:

The expected rate of return is the weighted average of all possible returns multiplied by their respective probabilities. In symbols:

$$E(R) = \sum_{i=1}^{n} R_i P_i$$

Where,

$E(R)$ = expected return from the stock

R_i = return from stock under state i

P_i = probability that the state i occurs

n = number of possible states of the world

From the above equation, it is clear that E(R) is the weighted average of possible outcomes – each outcome is weighted by the probability associated with it. The expected rate of return on Bharat Foods stock is:

$E(R_B) = (0.30)\ (11\%) + (0.50)\ (16\%) + (0.20)\ (6\%) = 11.5\%$

Similarly, the expected rate of return on Oriental Shipping stock is:

$E(R_O) = (0.30)\ (40\%) + (0.50)\ (10\%) + (0.20)\ (-20\%) = 13.0\%$

(iii) Standard Deviation of Return:

Risk refers to the dispersion of a variable. It is commonly measured by the variance or the standard deviation. The variance of a probability distribution is the sum of the squares of the deviations of actual returns from the expected return, weighted by the associated probabilities. In symbols,

$$\sigma^2 = \sum P_i\ (R_i - E(R))^2$$

Where,

σ^2 = Variance

R_i =return for the ith possible outcome

P_i = Probability associated with the ith possible outcome

E (R) = Expected return

Since variance is expressed as squared returns it is somewhat difficult to grasp. So its square root, the standard deviation, is employed as an equivalent measure.

$\sigma = (\sigma^2)^{½}$

Solution:

Bharat Foods Stock						
State of the Economy	P_i	R_i	$P_i R_i$	$R_i - E(R)$	$(R_i - E(R))$	$P_i (R_i - E(R))^2$
Boom	0.30	16	4.8	4.5	20.25	6.075
Normal	0.50	11	5.5	-0.5	0.25	0.125
Recession	0.20	6	1.2	-5.5	3.25	6.050

$E(R) = \sum_{i=1}^{n} R_i P_i = 11.5$

$\sigma^2 = \sum P_i (R_i - E(R))^2 = 12.5$

$\sigma = (\sum P_i (R_i - E(R))^2)^{1/2} = 3.5\%$

Oriental Shipping Stock						
State of the Economy	P_i	R_i	$P_i R_i$	$R_i - E(R)$	$(R_i - E(R))$	$P_i (R_i - E(R))^2$
Boom	0.30	40	12.0	27.0	729.0	218.7
Normal	0.50	10	5.0	-3.0	0.25	4.5
Recession	0.20	-20	-4.0	-33.0	1089.0	217.8

$E(R) = \sum_{i=1}^{n} R_i P_i = 13.0$

$\sigma^2 = \sum P_i (R_i - E(R))^2 = 441.0$

$\sigma = (\sum P_i (R_i - E(R))^2)^{1/2} = 21.0\%$

2.8 SUMMARY

Most investors are risk averse and attempt to maximize their wealth at the minimum risk. It is established, can be reduced to a minimum but cannot be completely erased or eliminated. Risk and return are related. The higher the risk a person is willing to accept, the better the returns he is able t achieve. Risks are of many kinds. They can be classified as systematic or unsystematic. Systematic risks cover the risks of market, interest rate risk and purchasing power risk, and unsystematic risk consists of business financial risk. The systematic risk is, therefore, affecting the total environment and is outside the control of any one firm or individual.

Unsystematic risk is inherent to the system. It may be due to bad financial planning or wrong management decisions. These risks are internal and can be avoided or controlled.

- The (holding period) return from an investment is the change in market price, plus any cash payments received due to ownership, divided by the beginning price.
- The risk of security can be viewed as the variability of returns from those that are expected.
- The expected return is simply a weighted average of the possible returns, with the weights being the probabilities of occurrence.
- The conventional measure of dispersion, or variability, around an expected value is the standard deviation, σ. The square of the standard deviation, σ^2, is known as the variance.
- The standard deviation can sometimes be misleading in comparing the risk, or uncertainty, surrounding alternative investments if they differ in size. To adjust for the size, or scale, problem, the standard deviation can be divided by the expected return to compute the coefficient of variation (CV) – measure of "risk per unit of expected return".
- Investor are, by and large, risk averse. This implies that they demand a higher expected return, the higher risk.

2.9 KEY WORDS:

Bear Market: A period (measured generally in months) during which the market indexes and prices of most shares decline in a given market. This phase is characterized by pessimism and low volume.

Bull Market: A period during which the market indexes and prices of most shares rise in value in a given market and when optimism prevails.

Coupon Rate Risk : The probability of the coupon rate of interest printed on the face of a debt security as a percentage of its face value being changed in successive short periods.

Diversifiable Risk: Variability of return caused by factors that are unique to one or a few securities. Such variability is averaged out to zero in a diversified portfolio and can, therefore, be eliminated.

Default Risk: The variability of returns to investors caused by changes in the probability that the company issuing securities might default. Also known as financial risk and/or bankruptcy risk.

Illiquid Assets: Assets including securities, which cannot be readily sold unless deep price discounts and/or commissions are given.
Liquidity Risk: The probability that securities will not be sold out for cash without price discounts and/or commission.

Management Evaluation: An assessment of a firm's management and its aggressiveness, growth-orientation, research and development plans, utilization of board of directors depth, flexibility, ability to earn profits and stay abreast of modern developments, experience, education, and compensation plans.

Non-Diversifiable Risk: Variability in the investor's rates of return arising out of common and macro-level factors like an economic downturn, general rise in prices. Increase in interest rates, and bull/bear phases of the securities market. All returns of securities are systematically affected by these factors. Hence, the risk is also known as 'systematic risk'.

Product Obsolescence: An old product suffering from reduced demand owing to superior technology of competitors and/or shifts in consumer taste.
Quality Ratings: Quality grades developed by rating firms and agencies, which indicate the relative probability that a security issue will default. Different combinations of alphabets indicate these grades.

Recession: A period during which general business activity declines for several months or even a few years.

2.10 SELF-ASSESSMENT QUESTIONS

1. Write short notes on:
    a. Expected value return
    b. Difference between Expected Return and Realised Return.
    c. Interest Rate Risk.
    d. Risk Premium.
2. What do you mean by risk? How is it different from uncertainty?
3. What are the sources of risk in an investment? Explain and elucidate.
4. How the return of an investment can be measured? What are the elements of risk?
5. Explain the following terms:
    a) Diversifiable interest rate risk
    b) Liquidity risk
    c) Market risk
6. Distinguish between
    a) Financial risk and business risk
    b) Diversifiable risk and non-diversifiable risk
    c) Market interest rate risk and coupon rate risk

7. Prashanth is considering investing in a security that has the following distribution of possible one-year returns:

Probability of occurrence	.10	.20	.30	.30	.10
Possible return	-.10	.00	.10	.20	.30

a. What is the expected return and standard deviation associated with the investment?
b. Is there much “downside” risk? How can you tell?

8. You are thinking of acquiring some share of Sravya Limited. The rates of expectations are as follows:

Possible rate of return	Probability
0.06	0.20
0.11	0.40
0.08	0.10
0.12	0.30

Compute the expected return and risk on the investment?

2.11 FURTHER READINGS

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R S R

LESSON 3

VALUATION OF EQUITY

3.0 Objectives

The main objectives of this lesson are to:

- Explain the fundamentals of valuation of securities.
- Know the concept of present value in valuation of equity shares.
- Examine valuation methodology employed by equity investors.
- Analyze the risk and return of equity investment.

STRUCTURE:

3.1 Introduction

The investor takes a number of decisions in the process of investment and to decide about his risk tolerance level and the nature of assets to be bought whether they are financial or physical assets. Once he decides to invest in a financial asset, he has to select it from different alternatives and analyses the risk and return of holding that asset, known as security analysis. Fundamental analysis is based on the premise that each share has an intrinsic worth or value which depends upon the benefits that the holder of a share expects to receive in future from the share in the form of dividends and capital appreciation. The investment decision of the fundamental analyst to buy or sell a share is based on a comparison between the intrinsic value of a share and

its current market price. A share whose current market price is higher than its intrinsic value would be considered as overpriced and hence sold.

The fundamental analyst believes that the market price of a share is a reflection of its intrinsic value. Though, in the short run, the market price may deviate from intrinsic value, in the long run the price would move along with the intrinsic value of the share. The investment decision of the fundamental analyst is based on this belief regarding the relationship between market price and intrinsic value. The market price of a share and its intrinsic value are thus the two basic inputs necessary for the investment decision. Market price of a share is available from the quotations of stock exchanges. The intrinsic value is estimated through the process of stock or share valuation.

3.2 Normal Return:

The return from the stock includes both current income and capital gain caused by the appreciation of the price. The income and capital gain are expressed as a percentage of money invested in the beginning. The historical returns or expost returns are derived from the cash flow received as well as the price changes that occur during the period of holding the stock or any asset. The income flow is the dividend he receives during the holding period.

3.1 Example:

Lakshmi Health Care's share price on November 23, 2005 was Rs. 401(P) and the price on August 22, 2006, was Rs. 480(Pt+1). Dividend received was Rs. 35(D). What is the rate of return?

Solution: Now the return (r):

$$r = \frac{P(t+1) - P(t) + D}{Pt} = \frac{480 - 401 + 35}{401} = \frac{114}{401} \times 100 = 28.43\ \%$$

In terms of formula, it can be expressed as:

$$r = \frac{\text{Price Change + Cash Dividend}}{\text{Purchase Price}} \times 100$$

To find out the expost or historical average return of the stock, the common arithmetic mean is used.

$$r = 1/n\ (r1 + r2 + r3 + \ldots\ldots + rn)$$

r1, r2, r3, indicate the returns that occur in different periods of the stock. Now, let us consider the following example. The return of stock A for four quarters is as follows:

I (10), II (8), III(-4), IV (20).

The average return for the year is: (10 + 8 - 4 + 20)/4 = 8.5

3.3. Anticipated Return:

The historical return can be calculated by a direct method. The calculation of the anticipated or exp0ected return is different. The ex-ante or future returns are calculated with the help of probability. The probability describes the likelihood occurrence of an event, i. E., the likelihood of getting a certain rate of return. The value of the probability ranges from 0 to 1.The

expected rate of return of any stock is the weighted average rate of return. The probabilities of the rate of returns are the weights of the respective periods.

$$E(R) = (\text{Probability } Pt)\ (\text{Return } Rt)$$

This can be explained with the help of the following example:

3.2 Example:

Return (Rt)	Probability (Pt)	(Pt) (Rt)
10%	0.1	1.0
11%	0.2	2.2
12%	0.4	4.8
13%	0.2	2.6
14%	0.1	1.4

		(Pt) (Rt) = 12.0

3.4 Present Value of the Return:

The present value concept is a fundamental concept used in the share valuation procedure. An understanding of this concept is necessary for studying the share valuation process. Money has a 'time value', which implies that a rupee received now is worth more than a rupee to be received after one year, because the rupee received now can be deposited in a bank at 10 per cent interest rate to receive Rs. 1.10 after one year. The time value of money suggests that earlier receipts are more desirable than later receipts, because earlier receipts can be reinvested to generate additional returns before the later receipts come in. Hence, the present value of a sum to be received in future can be calculated by discounting the future cash flows with the required rate of return.

3.5 Problems of Valuation of Equity:

The fundamental analysis is centered on presented value, which is computed as the discounted value of future stream of benefits. In the case of equity shares, the future stream of earnings poses two problems. *One,* it is neither specified nor perfectly known in advance as an obligation and consequently, future benefits and their timing have both to be estimated in a probabilistic framework. *Two*, there are at least three other variables which are used as alternative measures of such benefits viz., dividends, cash flows and earnings. The answer to the first issue is offered by past data, which is appropriately modified for future projections for which the investors need to modify the past data by taking into account the current reality and then measure the growth rate.

The second problem can also be viewed as a case of the three alternatives not really conflicting with each other. Here, the real problem is which cash flows are appropriate in the valuation of equity shares. Now, if you buy equity shares and place them in a trust for you and your

heir's perpetual benefit, what cash flows will be received in the trust fund. The answer is 'dividends' because this is the only cash distribution, which a company makes to its shareholders. Even though earnings per share in any year do belong to the shareholders, companies do not distribute them all.

3.6 Value-Price Relationship:

Present value, also known as intrinsic value or economic value, determines price. We have said this in the preceding section. But how does it happen? Again, a hint to the answer for this question has been stated in the foregoing paragraph. You should have noted the role of 'buying and selling pressures', which make prices more toward value. Now, you would ask: 'what these pressures are and how do they occur? You will briefly understand that 'investor action' in the wake of revisions of values spurs such pressures.

You would recall that investment strategies could be 'passive' or 'active'. Following this, investors and investment managers can also be broadly grouped in 'passive' and 'active' categories. You should note that buying and selling pressures dominantly originate with active investors. And they follow certain rules of the game which are outlined below:

Rule l: Buy when value is more than price. This underlines the fact that shares are under priced and it would be a bargain to buy now and sell when prices move up toward value.

Rule 2: Sell when value is less than price. In a situation like this, shares would be overpriced and it would be advantageous to sell them now and avoid less when price later moves down to the level of the value.

Rule 3: Don't trade when value is equal to price. This is a state when the market price is in equilibrium and is not expected to change.

3.7 The Dynamic Valuation Process

You should have by now understood the dynamic nature of valuation. Estimates of present value, riskiness and discount rates, future income, and buy-sell action have to be reviewed from time to time in response to new bits and sets of information. Figure 3.2 depicts the dynamic valuation process, which is an ever-continuing phenomenon. The investors start with their estimates of intrinsic value using the present value procedure. Working on the trading rules, they buy sell or don't trade. In the process, buying and selling pressures are generated and prices either move up or down. In either case the latest market price reacting to buying/selling pressures will influence future return. This will require present values to be reworked. The process will thus go on.

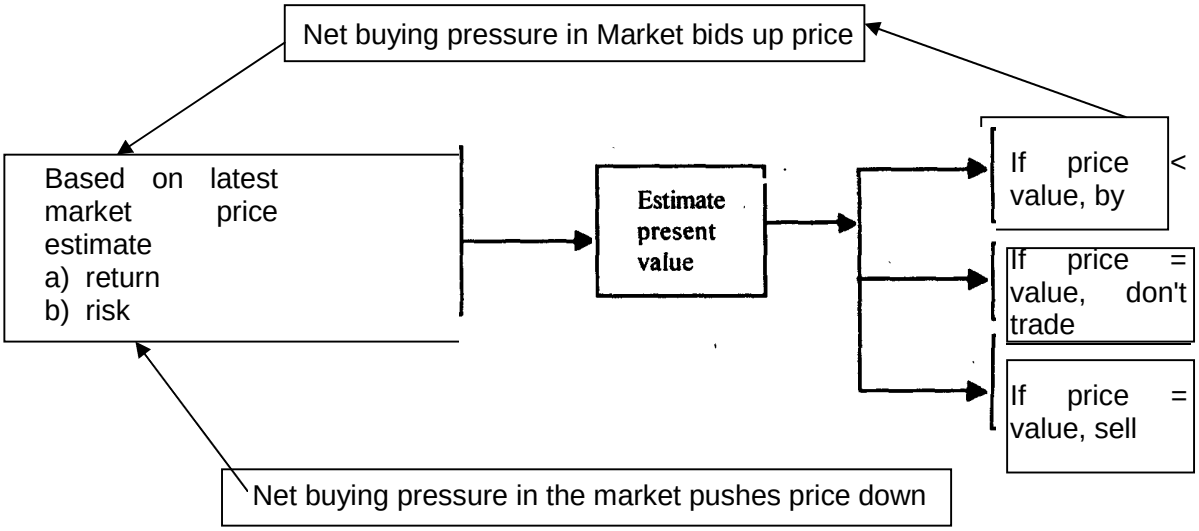

Figure 3.2: The Dynamic Valuation Model

3.8 The Basic Valuation Model

Value of an asset is equal to the present value of its expected future returns. This is true particularly when you expect that the asset you own provide a stream of returns during the period of time. To covert this expected stream of returns to value a security, you must discount the stream of cash flows at your required rate of return. This process of estimation of the value requires:

(a) The estimated stream of expected cash flows, and

(b) The required rate of return on the investment.

The required rate of return varies from security to security on account of differences in risk level associated with securities. Given a risk-adjusted discount rate and the future expected earnings flow of a security in the form of interest, dividend earnings or cash flow, you can always determine the present value of an asset as under:

$$PV = \frac{CF1}{1+r} + \frac{CF2}{(1+r)^2} + \frac{CF3}{(1+r)^3} + \frac{CFn}{(1+r)n}$$

Where,

PV = Present value
CF = Cash flow, interest, dividend, or earnings per time period up to 'n' number of periods.
r = risk-adjusted discount rate (generally the interest rate)

Expressed in the above manner, the model looks simple, but the practical difficulties do make the use of the model complicated. For instance, it may be quite difficult to assume that every investor in the market exactly measures the value of cash flows and risk adjusted required rate of return. Further, investors' expectation on compensation for risk may also different between different types of investors. A small change in these measures will also cause a change in the value and thus, it may not be possible to generate a single value. You will realize that market operations would become tedious with a range of values. Secondly, return, risk, and value would tend to change over time.

Thus, security prices may rise or fall with buying and selling pressures respectively and this may affect capital gains and hence returns expected. Consequently, estimates of future income will have to be revised and values reworked and similarly, the risk complexion of the security may also change over time. The firm may over borrow and face financial risk or engage in a risky venture and face operating risk. Hence, an increase in risk in any of these forms would raise the discount rate and lower value. It would then seem to be a continuous exercise and the new information will affect the values and the buying and selling pressures, which keep prices in continuous motion, would drive them continuously close to new values

3.9 Dividend Valuation Model

Dividend valuation model is the generalized form of equity stock valuation. The concept of this model is that many investors do not contemplate selling their share in the near future. They want to hold the share for a very long period, say infinity. In this case, the present value of the share is the capitalized value of an infinite stream of future dividends. Thus, the future dividends are discounted at the required rate to get the value of share. Here, there are three possible situations on future dividend.

a) Dividends do not grow in future i.e., the constant or zero growth assumption,

b) Dividends grow at a constant rate in future, i.e., the constant-growth assumption,

c) Dividends grow at varying rates in future time periods i.e., multiple-growth assumption.

Under these three situations, the dividend valuation model is now discussed as under:

a) The Zero-growth Model

In this case, dividends are assumed to remain the same forever and hence, the cash flows paid for the share are assumed to be the same over an indefinite period of time. However, the earnings growth is estimated to be internally applied in projects which pay an end value to the investor that is apart from the cash flow of dividends. Since the company discounts future constant cash flows in addition to the market price of the share, the formula is revised as:

$$V = (DI + Pl/(l+k))$$

Where,

PI is the market price of the company in future.

This formula can be modified if the investor is aware of the time duration for which the shares are likely to be held.

For example, if the shares are presumed to be held for a five-year duration, the value of shares will be computed using the following equation:

V = (dl/(l + k)) + (d2/(l + k)^2) + (d3/(l + k)^3) + (d4/(l + k)^4) + ((d5 + P5)/(1 + k)^5)

Mostly, zero-growth shares are the preference shares issued by companies which carry a constant dividend payment not subject to any variation over a period of time.

3.3 Example:

There are about 10 crore shares outstanding of a company's 8 per cent preferred capital.! par value is Rs 100 and the dividend is paid every quarter. Assuming that the discount rate is 10 per a compute the value of the share.

Dividend payment every quarter will be 100 * .08/4 = Rs 2. The annual dividend can be computed us the real rate of dividend. Nominal rate is 8 per cent per annum. The real rate of dividend payment every year will be:

[(1 + (r/4))^ 4 - 1] = 1.0824 - 1 = 0.0824 or 8.24%.

The annual dividend to be paid on the preference shares is Rs 8.24.

Using the zero-growth model, dividend payment will be divided by the discount rate, assuming indefinite flow of Rs 8.24. The value of the preference shares will be:

108.24/1.1 =Rs 98.40

For the same illustration, if we assume that the discount rate is 6 per cent. The value of the preference share in the revised expectation will be:

108.24/1.06 =Rs 102.11

Higher the expected discount rate, lower will be the value of the company; and lower the expectation given the same cash flows from the company, higher will be the valuation.

Alternatively, given the market price of the company's traded preferred share, the investor can also compute the dividend yield and compare it with the expected returns. Investment decisions can be made accordingly as to whether the dividend yield is higher or lower than the expected returns of the investor. For computing the dividend yield the future expected dividend is divided by the market price of the share.

The following formula is applied.

Dividend yield = Dl/Po

Where,

Po is the current market price/traded price of the share.

Assuming the current market price of the preference share is Rs 107, the dividend yield is computed as (8.24/107)*100 = 7.70%.

b) The Constant-growth Model

In this case the dividends grow in all future periods at a uniform rate 'g' and the discount rate (k) is assumed to be greater than the dividend growth rate. The growth in dividends imply that payment to shareholders from the company keeps increasing at the rate of g.

In this model, the formula for the value of a share is:

$$V = Dl/(k-g)$$

When 'g' is 0, the constant growth model becomes a zero-growth model.

A constant growth is difficult to achieve in the real world. However, the model could be used as an approximation for companies that experience normal growth over an indefinite period. For the valuation of shares over a long duration, this model would measure the market price better than the zero-growth model.

3.4 Example:

In January 2006, an investor bought a share (Face Value Rs 100) with an expected annual return of 12 per cent. The dividends for the year are as follows: 1st quarter: Rs.1.5, 2nd quarter: Rs 1.52, 3rd quarter: Rs 1.55, 4th quarter: Rs 1.57. Assuming a dividend growth rate of 6 per cent per annum, estimate the value of the share in January 2006.

Present dividend for the year = Do = Rs.6.14 = [1.5 + 1.52 + 1.55 + 1.57].

Annualized growth rate = [(1+ (.06/4))^4 - 1] = 0.061 =6.1%

Expected rate = 12%

Value of the shares = 6.14 (1 + .061)/(0.12-0.061) = 6.25/0.059 = Rs 105.93.

Since the current year dividend payments are given, the first step is to identify the expected dividend payment, which will be Do * (1 + g). The quarterly dividend rates have been growing at an annualized rate of 6.1 per cent. Hence, 'g' the growth rate for the dividend payment is 6.1 per cent per annum. For the same problem, given the current market price the yield can be identified. The formula for computing the yield is as follows:

$$\text{Dividend yield} = (Dl/P) + g$$

For the illustration, dividend yield for the assumed current price of Rs 98 will be:

$$(6.25/98) + .061 = .064 + .061 = .125, 12.5\%.$$

For example: If the closing price happens to be Rs 102, the dividend yield will be computed as:

$$[(6.25/102) + .061] = .061 + .061 = 0.122, 12.2\%$$

The implied discount rate for the share is 12.2 per cent

Thus, according to this model, the intrinsic value of a share is equal to next year's expected dividend divided by the difference between the appropriate discount rate for the stock and its expected dividend growth rate.

c) The Multiple-Growth Case:

The constant growth assumption may not be realistic in many situations. The growth in dividends may be at varying rates, i.e., in some years it may be an extraordinary growth and after which it will change to a normal level and a two-stage growth model can represent this situation. If dividends of a firm are expected to grow at multiple growth rate during the periods when it is experiencing very high demand for its products and then, the dividend grow at a normal rate when the demand reaches the normal level, the constant growth equation has to be suitably modified to find out the present value of a share.

The multiple-growth assumption has to be made in a vast number of practical situations. The infinite future time-period is viewed as divisible into two or more different growth segments. The investor must forecast the time 'T' up to which growth would be variable and after which

only the growth rate would show a pattern and would be constant. This would mean that present value calculations will have to be spread over two phases viz., one phase would last until time T' and the other would begin after 'T' to infinity. The present value of all dividends forecast up to and including time 'T' V would be:

$$V1 = \frac{D1}{(1+k)1} + \frac{D2}{(1+k)2} + \frac{Dn}{(1+k)n}$$

This may be summarized as:

$$V1 = \frac{Dt}{(1+k)}$$

The second phase present value is denoted by *V2* and would be based on constant-growth model, because the dividend growth is assumed to be constant during the second phase. The position of the investor at *time* N, after which the second phase commences, can be viewed as a point in time when he is forecasting a stream of dividends for time periods N + 1, N + 2, N + 3, and so on, which grow at a constant rate, g. The second phase dividends would be :

$$Dn+1 = Dn\ (l+g)^1$$

$$Dn+2 = Dn\ (l+g)^2$$

$$Dn+3 = Dn\ (l+g)^3$$

and so on to infinity.

. The present value of the second phase stream of dividends from period N+1 to infinity can be calculated using Gordon share valuation model as Dn(1+g)/(k-g). It may be noted that this value is the present value at time N of all future expected dividends from time period N+1 to infinity. When this value has to be viewed at time 'zero' time for the second phase dividend stream. When so discounted the present value of the second phase dividend stream viewed at 'zero' time may be expressed as:

$$V2 = \frac{Dn\ (1+g)}{(k-g)\ (1+k)n}$$

Now, the two present values of phase V1 and V2 can be added to estimate the intrinsic value of an equity share that has pass through a multiple growth situation. The following describes the summation procedure of the two phases:

$$V = V1 + V2$$

3.5 Example

Laxmi & Co. Ltd., paid dividends amounting to Rs.0.75 per share during the last year and it is expected to pay Rs. 2.00 per share during the next year. Investors forecast a dividend of Rs. 3.00 per share in the year after that. At this time, the forecast is that dividends will grow at 10% per year into an indefinite future. Would you buy/sell the share if the current price is Rs. 50.00 and the required rate of return is 15%.

Solution

This is a case of multiple-growth. The values V1 and V2, can be calculated as follows:

Since, Vp = V1 + V2 , the two values can be summed to find the intrinsic value of a Laxmi & Co. equity share at the time 'zero'. This is given below:

Vp = Rs. 4.0 +Rs. 49.91 =Rs. 53.92 At the current price ofRs. 50.00, the share is under-priced and hence you will buy the stock.

d) The Abnormal-growth Model

Abnormal-growth rates occur when a company faces super normal growth pattern or negative growth pattern. The company may not experience such abnormal-growth rates for an indefinite duration. Such abnormal-growth rates compel valuation of companies in stages. The computation is similar to that of multiple-growth model.

3.10 Earnings Capitalization Model :

Price-earnings ratios are used to estimate the value of the stocks by the investors rather than adopting the discounting models. When the earnings of the firm are stable or when there is an expansion situation, the value of an equity share can be determined by capitalization of earnings. A popular approach to valuation of equity shares known as P/E ratio uses earnings as its basis. Unlike dividend capitalization model, the P/E approach is fairly simple and widely followed in the stock market.

The price/earnings ratio models have three distinct advantages over the discounting models.

i) P/E ratio indicates pride per rupee of share earnings and this would help to compare the prices of stocks, which have different earnings per share.
ii) P/E ratios are helpful in analyzing the stocks of the companies that do not pay dividend but have earnings. It should be noted that when there is a loss, the P/E ratio analysis is difficult to use.
iii) The variables used in P/E ratio models are easier to estimate than the variables in the discounting model.

With the P/E ratio models the investor can only find the relative positions of the different stocks and it does not indicate what price is appropriate for a particular stock. The conceptual framework of the P/E ratio arises from the constant growth model. The constant growth model can be easily written in price-earnings model.

$$P = d / (r - g)$$

Dividing both the sides with E, $P/E = (d-e) / (r – g)$

Where, d /e is the pay out ratio. Now, the P/E ratio is the function of the pay out ratio, the discount rate and the growth rate and thus all these factors affect the price earnings multiples.

The most practical way of using P/E model is first computing the industry average P/E or P/E of similar *firm* and then multiplying the same with the expected or actual earning of the stock. The P/E of an industry is expected to be high when the industry is in high growth industry and it will be low if the industry or firm is expected to show a low growth rate.

The price earnings ratio is also affected by the risk associated with the earnings of the stocks. The following table shows the growth rate of sales, profit after tax and P/E ratio of few select companies.

Sales Growth, Net Profit Growth and P/E Ratio of Large Indian Companies

Company Name	Sales Growth	NP Growth	P/E Ratio
Zee Tele films Ltd.	37%	77%	56.20
Infosys Technologies Ltd.	86%	99%	36.44
Hindustan Lever Ltd.	2,8%	41%	30.17
Larsen. &. Toubro Ltd.	13%	-2%	12.23
Reliance Industries Ltd.	30%	16%	11.64
Bajaj Auto Ltd.	6%	-3%	11.48
Bharat Heavy Electricals Ltd.	7%	5%	10.76
Tata Iron & Steel Co. Ltd,	4%	4%	8.32
Hindalco Industries	13%	11%	7.05
Tata Engg. & Locomotive Co. Ltd.	3%	-181%	-5.%

Note: Sales and Net Profit Growth values are average growth values of five years (1997-2001)

Though, the growth rates and the P/E ratios are not perfectly correlated, they give some idea about the influence of fundamentals on the P/E ratio. There are several other factors that determine the price earnings ratios.

3.11 SUMMARY:

The basic objective of this lesson is that the value of an asset is a function of future expected cash flows from the asset. The general valuation mode! is discounting the future cash flows at the required rate of return. The model can be relatively easier to apply on fixed income securities because there is some amount of certainty on the future cash flows. In fixed income securities, the general valuation model is used to judge the valuation of fixed income securities. On the other hand, the value of a share at any point of time is the present value of a series of cash dividends in future time periods with assumptions about varying growth levels and situations being introduced to make calculations usable in practice. Therefore, the dividend valuation models with zero growth; constant growth and super-normal growth assumptions are found useful for the valuations of equity shares. The discount rate in all these models is the required rate of return of the investor appropriately adjusted for the time value of money and riskiness of returns. A much simplified and practical valuation model is price-earnings model. Of

course, the analysts can't use the P/E model blindly because there are several other factors, which determine the value of the stock.

3.12 Key Words

Constant Growth Model: A version of the dividend valuation model, which assumes that dividends are expected to grow at a constant rate overtime. It can be used to solve the current price of a share.

Current Yield : The yield on a security resulting from dividing the dividend payment by the current market price of the security.

Dividend Valuation Model: A widely used model to value equity shares. The model states that the current price of a share is equal to the discounted value of all future dividends.

Earnings Multiplier : The P/E approach which states that the price of a share is equal to the product of its earnings and a multiplier.

Expected Return : The ex-ante return expected by investors over some future holding period. The expected return often differs from the realized return.

Holding Period Return : The total return from an investment for a given period of time, including both yield and capital gain or loss.

Multiple Growth Model: A type of dividend valuation model in which dividends are assumed to grow at different rates over specifically defined time periods.

P/E Ratio : The ratio of share price to earnings using historical, current or estimated data. This ratio is also referred to as multiplier.

Security Analysis : A component of the investment process that involves determining the prospective future benefits of a security, the conditions under which such benefits will be received, and the likelihood of such conditions occurring.

3.13 Self -Assessment Questions :

1. Explain the concepts of ' return' , 'normal return' and 'anticipated return'.
2. How would you estimate the anticipated return of a security?
3. Explain Dividend valuation model with suitable illustration. Discuss advantages of it.
4. Illustrate the two-stage growth model of share valuation with an example.
5. Describe the Earnings Capitalization share valuation model.
6. How would you determine the discount rate to be applied in the present value models of share valuation?
7. A company is expecting to declare a dividend of Rs. 3.50 per share during the next year. Investors forecast a dividend of Rs. 4 in the year after that, and Rs. 4.50 in the next year. Thereafter, it is expected that dividends will grow at 10 per cent per year into an indefinite future.

The investor's required rate of return is 20 per cent. What is the maximum price .that an investor should pay for the share?

8. GVK Ltd. just paid Rs. 3.33 as dividend. The company had paid a dividend of Rs. 2.25 eight years ago. What has been the annual, growth rate in dividends during this period? If the growth rate continues to be the same, how much will you be willing to pay for a share if you require a return of 12 per cent?

9. Prathiba &Co paid a dividend of Rs. 1.50 five years ago and has just paid an annual dividend of Rs. 2.42; you expect dividends to grow at the same annual rate for the next four years. After that, you expect dividends to grow at an annual rate of 15 per cent. How much will you be willing to pay for a share if you require 20 per cent rate of return?

10**.** Alfa Ltd., paid a dividend ofRs.2.00 per share for the year ending March 31,2005. A constant growth of 10% per annum has been forecast for an indefinite future period. Investors required rate of return has been estimated to be 15%. You want to buy the share at a market price of Rs. 60 quoted on July 1,2005. What would be your decision?

3.14 Further Readings

1. Juttle, Donald L., (ed.), The Revolution in Techniques for Managing Bond Portfolios: The Institute of Chartered Financial Analyst, Chulottesville.

2. Lorie, James H., and Hamilton, Mary T., The Stock Market: Theories and Evidence, Homewood III: Richard D. Irwvin, New York

3. Fischer, Donald E., and Jordan, Ronald J., Security Analysis and Portfolio Management; Prentice Hall of India Ltd., New Delhi.

4. Farrell, James L., Jr., Portfolio Management: Theory and Application, McGraw-Hill, New York.

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LESSON 4

VALUATION OF FIXED INCOME SECURITIES

4.0 Objectives

After reading this lesson, you should be able to:

- know the concept of fixed income securities
- explain various types and methods of issue of debt securities
- understand the risks of debt securities
- present the valuation of different debt securities

Structure

4.1. Introduction

Traditionally, debt has been considered as a long-term source of fund for a corporate enterprises, which is generally offered a fixed rate of interest and debt holders have a claim on the issuer of the security for the payment of the principal amount. Both government and private enterprises that need long-term financial assistance issue fixed interest securities in all countries. Government participants could be the central government, state governments, or any other government agent.

4.2. Kinds of Debt Securities:

Bonds and debentures are two kinds of major debt securities, which are long-term fixed income securities. In India, the public sector undertakings are generally issued bonds, where as the private sector organizations are raised debt through debenture issue from the public. When public sector enterprises issue bonds, they are also usually categorized as government bonds since they have characteristics similar to government bonds. The issue of government bonds is often most crucial since it reflects the monetary policy of the country.

The eurobonds are another type of debt instruments, which are issued in a currency that is not the currency of the country of issue. The eurobonds market has been the most innovative of all debt instruments and they are different from foreign bonds which are denominated in domestic currency and issued in that country by foreign corporate enterprises or non-residents.

4.3. Methods of Debt Issue:

The traditional method of issue of government bonds is a sale by tender in which the government offers a specified quantity of debt instruments for sale on a specific day at a minimum price and invites bids. The government may also choose the auction method to issue the instruments in the market. In this method no minimum price is set and the bonds are sold to the highest bidder at the price they bid. After debt instruments are issued in the stock exchanges, they subsequently come into the secondary market for trading. The secondary market trading systems are either "quote-driven" or "order driven", or have a mixed nature. In an order-driven market, trade takes place when dealers can match orders to buy and sell

4.4. Costs of Debt Instruments:

The cost of buying and selling securities are twofold. The cost besides the price of the security includes the charge by the dealer as commission, which is calculated as a certain percentage of the value of the transaction of the deal, subject to a minimum/maximum amount. The price of the security will usually have a bid price and an offer price. The bid price is the price at which the dealer will buy and this is always below the price at which the dealer will sell or offer the security. The difference between these two prices is called the spread. The lower the spread, the better is the market mechanism and the equilibrium price is within this narrow range.

4.5. Risks in Debt Securities:

Debt is considered to be less risky than equity issues; nevertheless they are not entirely risk free. Two types of risk are associated with investment in debt securities, namely default risk and interest rate risk. Risk is the possibility of variation in returns. The actual returns realized from a debt issue may vary from the expected returns either because of a default on the part of the issuer to pay the interest or principal, or because of changes in market interest rates. The investor has to assess the impact of these two sources of risk on the returns from a debt issue before investing in the debt securities.

(i) Default Risk

Default risk refers to the possibility that a company may fail to pay the interest or principal on the

stipulated dates. Poor financial performance of the company leads to such default. A part of the interest and principal may not be received at all or may be received after a long delay. In either case the investor suffers a loss, which goes to reduce his return from the debentures. Credit rating of debt securities is a mechanism adopted for assessing the default risk involved.

The credit rating process involves a qualitative analysis of the company's business and management and a quantitative analysis of the company's financial performance. It also considers the specific features of the debentures being issued. Credit rating services have developed rapidly in India. Now there are different institutions engaged in credit rating of debt securities. An investor may rely on the rating provided by these credit rating agencies or, alternatively, do his own credit rating, to assess the default risk of a bond.

(ii) Interest Rate Risk

Another reason for variation in the returns from debt securities is the change in market interest rates. An investor in debt securities receives interest annually or semi-annually. He reinvests these interest amounts each year at the market interest rate. Thus, interest is earned on the interest received from the debentures each year. Finally, at the end of a certain holding period, the investor may sell off the debentures at a price, which is equal to its face value. During the holding period of a debenture, meanwhile, the market interest rates may change. If the market interest rate moves up, the investor would be able to reinvest the annual

(iii) Purchasing Power Risk

Debt instrument investors have to look at the real rate of return, or the actual return minus the rate of inflation. Rising inflation has a negative impact on the real rates of return, because inflation reduces the| purchasing power of the investment income and principal.

(iv) Price Risk

Investors who need their principal prior to maturity have to rely on the available market for the securities, j Although investors in debt securities may take advantage of the exchange listing to sell their instruments j prior to maturity, the price received may be more or less than the purchase price as a result of market risk factor (demand and supply for funds).

(v) Liquidity Risk

The exchange listing of debt securities does not guarantee liquidity, which is mostly influenced by the demand and supply situation for that instrument by the market players. The differential demand and supply might induce the price received in a sale prior to maturity to be more or less than the liquidation value or principal amount and more or less than the amount an investor originally paid. A bond investor can try to minimize these risks in a bond portfolio by a process called immunization. In other words, if an investor gets back a yield from the bond which is at least the computed yield from holding the bond till its maturity period, then the bond investment is said to have been immunized.

Maturity of bonds play a vital role in the measurement of bond yield. However, the inherent risk of the instruments makes coupon rates much more important than the maturity period. For instance, a 10-year bond with a 5 per cent coupon rate will be considered more sensitive to interest

rate changes than a 10-year bond with an 8 per cent coupon rate. Similarly, a five-year zero coupon bond may be viewed as more sensitive than an eight-year 6 per cent bond. Since, for a given maturity period, coupon rates are subject to different volatility, the yield to maturity becomes an easy way of comparing bond performance. Similarly, for similar yield instruments, the duration becomes an easy way of comparing bond performance.

4.6. Valuation of Debt Securities:

In the case of debt securities, both the cash flow streams, i.e., interest and principal and the maturity period are well specified and fixed. This makes debt valuation easier than stock valuation. Debentures valuation is less glamorous than stock valuation for two reasons. First, the returns from investing in debentures are less impressive and fixed. Second, debenture prices fluctuate less than equity prices. As the uncertainty associated with the cash flows occurring to a debenture holder is less, the emphasis is more on fine-tuned calculations and analysis. An investor in debt instruments should be on the look out for even small differentials in prices and returns.

4.7. Methods of Valuation of Debt Securities:

Since debt instruments mature at a definite time duration in the future, the valuation of debt instruments is the present value of all future cash flows discounted at an expected rate of return. The general formula used for the valuation of debt instruments is:

$$V_d = \sum_{i=1}^{n} \frac{I_j}{(1+k)_j} + \frac{P_n}{(1+k)^n}$$

where,

V_D = value of debt instrument
Ij = Interest due at time j
P_n = Par value at redemption time
k = Discount rate per annum.
n = Maturity time of the debt instrument

Most debt instruments are priced using this formula since it accommodates for change in interest rates, change in par value, and also change in discount rates over a period of time. However, debt instruments such as the zero coupon bonds do not have the characteristic of interest payment. Hence, their valuation will be based on the discounted par value at the redemption time alone. The formula for the valuation of zero coupon bonds is

$$V_d = \frac{P_n}{(1+k)^n}$$

In the above methods, the value of 'k' is presumed. That is, the investors' expectation of the return from the debt instrument is assumed considering the time value of future returns. When the return expectation varies from investor to investor, the price/value of the instrument also tends to be

different across investors. To overcome this, the bond yield is computed considering the traded price of the debt instrument as the current value of the debt instrument.

4.7.1 Current Yield

The current yield measures the annual return accruing to a debenture holder who purchases the debentures from the secondary market and sells it before maturity, presumably at the same price at which he bought the security. It does not measure the entire returns accruing from a debenture held till maturity. More specifically, it does not consider the reinvestment of annual interest received from the debenture and the capital gain or loss realized on maturity..

The current market price of a debenture in the secondary market may differ from its face value of the debenture. If the face value of a debenture is Rs. 100, which may be selling at a discount, at say Rs. 90 or it may be selling at a premium at Rs. 115. In this context the current yield relates the annual interest receivable on a debenture to its current market price is calculated as under:

$$\text{Current yield} = \frac{I_n}{P_0} X100$$

Where,

I_n = Annual interest.

P_0 = Current market price.

For example, if a debenture of face value Rs. 1000 and a coupon rate of 10 per cent, is currently selling for Rs. 900, the current yield of the debenture can be calculated as follows:

$$\text{Current yield} = \frac{100}{900} X100 = 11.11 \text{ percent}$$

The current yield would be higher than the coupon rate of interest when the debenture is selling at a discount as in our example. Where as the current yield would be lower than the coupon rate for a debenture selling at a premium. The debenture holder in our example would realize a capital gain of Rs. 100 on maturity, as the debenture, which was purchased from the market for Rs. 900, would be redeemed at the face value of Rs. 1000 on maturity.

4.7.2 Spot Interest Rate:

There are debt instruments that do not pay any interest and they are termed as zero coupon bonds. Zero coupon bonds are a special type of bond, which does not pay annual interests. The return on this bond is in the form of a discount on issue of the bond. For example, a two- year bond of face value Rs. 1000 may be issued at a discount for Rs. 797.19. The investor who purchases a Rs. 1000 bond for Rs. 797.19 would receive Rs. 1000 two years later.

This type of bond is also called pure discount bond or deep discount bond. The return received from a zero coupon bond or a pure discount bond expressed on an annualized basis is the spot interest rate. Mathematically, spot interest rate is the discount rate that makes the present value of the single cash inflow to the investor equal to the cost of the bond. Thus, the discount

rate in the case of a two year bond of face value Rs. 1000, issued at a discount for Rs. 797.19 is caluculated as under:

$$797.19=\frac{1000}{(1+k)^2}$$

The equation can be rearranged as:

The spot interest rate is 12 per cent per annum, which is an annual rate. To understand the calculation of spot interest rate, let us take another example. Consider a zero coupon bond hose face value is Rs. 1000 and maturity period is five years. If the issue price of the bond is Rs. 519.37, the spot interest rate can be calculated as shown below:

$$519.37=\frac{1000}{(1+k)^5}$$

$$(1+k)^5=\frac{1000}{519.37}=1.9254$$

$$(1+k)=1.9254=1.14$$

$$k=1.14-1=0.14 \text{ or } 14 \text{ per cent}$$

The spot interest rate in this case is 14 per cent.

(a) Bond Duration:

A measure used to make a comparison across different coupon rates is the bond duration. Bond duration compares the sensitivity of the instruments to changes in interest rates. Bond duration is the average amount of time required by a security to receive the interest and the principal. Duration, hence, is the weighted average of the times that interest payments and the final return of principal are received. These weights are the present values of the payments, using the bond's yield to maturity as the discount rate.

The duration thus calculates the weighted average of the cash flows (interest and principal payments) of the bond, discounted to the present time. The bond duration helps in determining the need for additional cash flows or surplus cash positions. As duration increases, the risk of recovering the full value of the bond also increases.

The duration measure will predict how much a bond's price should change given a 1 per cent change in interest rates. Thus, a bond with a duration of 5 years, will decrease 5 per cent in price if yields rise by 1 per cent. For example, if interest rates rise from 6 per cent to 7 per cent, an investor holding a 6 per cent bond priced at Rs 100 with a duration of 5 years, will see the price of that bond drop by 5 per cent to 95. Duration thus helps an investor to identify the percentage change in the price of a bond. The duration of the bond can be computed using the following formula:

Duration = (Present value of cash flows * times to cash flows)/ (Present value of cash flows)

The duration formula estimates a bond's movement along this price-yield curve. However, the duration formula is only a linear approximation of movement along the curve. It follows that for large changes in yields (interest rates), the duration formula will consistently underestimate the amount of price movement. Duration overestimates the price decline associated with a large upward change in yield (interest rates) and underestimates the price rise associated with a large downward change in yield.

4.7.3 Yield to Maturity (YTM):

This is the most widely used measure of return on bonds, which is defined as the compounded rate of return an investor is expected to receive from a bond purchased at the current market price and held to maturity. The yield to maturity (YTM) depends upon the cash outflow for purchasing the bond, that is, the cost or current market price of the bond as well as the cash inflows from the bond/ namely the future interest payments and the terminal principal repayment. The YTM is the discount rate that makes the present value of cash inflows from the bond equal to the cash outflow for purchasing the bond.

The relation between the cash outflow, the cash inflow and the YTM of a bond can be expressed as:

$$MP=\frac{C_t}{(1+YTM)^t}+\frac{TV}{(1+YTM)^n}$$

Where,

MP = Current market price of the bond.
Q = Cash inflow from the bond throughout the holding period.
TV = Terminal cash inflow received at the end of the holding period.

Through a process of trial and error the value of YTM that equates the two sides of the equation may be determined. Let us consider a bond of face value of Rs. 1000 and a coupon rate of 15 per cent. The current market price of the bond is Rs. 900. Five years remain to maturity and the bond is repaid at par. Then:

$$900 = \frac{150}{(1+YTM)^t}+\frac{1000}{(1+YTM)^5}$$

What is required is a value of YTM that makes the right hand side of the equation equal to Rs. 900. Since the market price is lower than the face value, it indicates that YTM would be higher than the coupon rate. In order to equate the above equation, it may start with 20 per cent as the value of YTM. The right hand side of the equation then becomes Rs. 150 x present value annuity factor (5 yrs, 20%) + Rs. 1000 x present value factor (5 yrs, 20%) = (150 x 2.9906) + (1000 x 0.4019) = 448.59 + 401.90 = Rs. 850.49

Since the value obtained is lower than the current market price of Rs. 900, a lower discount rate has to be tried. Taking YTM as 18 per cent, the right hand side of the equation becomes:

(150 x 3.1272) + (1000 x 0.4371) = 469.08 + 437.10 = 906.18

The value obtained is higher than the required amount of Rs. 900. Hence, YTM lies between 18 per cent and 20 per cent. It can be estimated using interpolation as shown below.

$$\text{YTM} = 18 + \frac{906.18-900}{[906.18/-850.49]\ (20-18)}$$

$$= 18 + \left[\frac{6.18}{5569} x 2\right]$$

$$= 18 + 0.22 = 18.22 \text{ per cent}$$

YTM concept is a compound interest concept. It is assumed that all intermediate cash inflows in the form of interest are reinvested at YTM. The investor is thus assumed to earn interest on interest at YTM throughout the holding period. Hence, when the intermediate inflows are reinvested at a rate lower than YTM, the yield actually realized by the investor would be lower than YTM.

The tedious calculations involved in determining YTM can be avoided by using the following formula, which gives an approximate estimate of YTM.

$$\text{YTM} = \frac{I+[MV-C]_n}{[MV+C]^2}$$

Where,

I = Amount of annual interest.

MV = Maturity value at the end of the holding period.

C = Cost or current market price of the bond.

n = Holding period till maturity.

Using this formula, YTM for the bond in the example given above can be calculated as follows:

$$\text{YTM} = \frac{\text{Rs.}150+(\text{Rs.}1000-\text{Rs.}900)/5}{(\text{Rs.}1000+\text{Rs.}900)/2}$$

$$\text{YTM} = \frac{150+20}{950} = 0.1789$$

$$= 17.89 \text{ per cent}$$

Examples

1. Essar Oil pays 12 per cent per annum quarterly interest rates due every March, June, September and December end. The quoted price in the market is Rs 86 on January 24, 2003. Determine the accrued interest as on this date.

.

The accrued interest is (12/4) * (24/97) = 3 * 0.2474 = Rs 0.74

2. Hotel Lee's 10 per cent per annum half-yearly interest rates are due every March and September end and has a current quoted price of Rs 44 on February 3. What should be the price at which the debentures will be exchanged in the market on this date?

The accrued interest amount is (10/2) * (126/182) = 5 * 0.6923 = Rs 3.46
Exchange price (Dirty price) = 44 + 3.46 = Rs 47.46.

3. The Tata Investment Bond 2002 was issued in January 2003 with a maturity of two years. The coupon payment is 6 per cent per annum made every six months (face value Rs 100). If the current market price on January 15, 2003, is Rs 96, what is the yield to maturity?

96 = (3/(l+x)^l) + (3/(l+x)^2) + (3/(l+x)^3) + (3/(l+x)^ 4 + (100/(1 + x)^4); x = 0.04
(r/2) = x Hence, the annual return from the bond (r) = 0.08(8%).

4. Jindal debt instruments (face value Rs 10) are zero coupon bonds issued at Rs 6.30, encashable at the end of two years. Compute the return for the debenture instrument.
6.3 = (l0/1+r)^2); (1+r)^2 = 1.5873; 1+r = 1.2599; r = 0.2599-25.99%

5. Vidhi Dyeslu has its bonds traded in the Bombay Stock Exchange. The clean price of the instrument as on March 30 is Rs 188.50. An interest of 6 per cent is paid half yearly at the end of March and September. The book closure dates are March 28 and September 27. If the instruments are exchanged as on March 30, what will be the accrued interest? What is the dirty price of the instrument?

Accrued interest = (6/2) * [(2-3)/184]) = (3 * -0.0054) = -0.0163

Dirty price = clean price + accrued interest = 188.50 - 0.0163 = *Rs* 188.4837

Besides the concept of YTM, other yield measures are also useful to investors in identifying a possible investment opportunity. They are the running yield, simple yield to maturity, and holding period yield.

4.7.4 Redemption Yield:

Redemption yield considers the fact that coupon payment received over the lifetime of the bond can be reinvested, as well as any capital gain or loss that might occur between purchase and redemption. The redemption yield is the return that equates the discounted values of the bond's cash flows back to its dirty price. This can also be called the internal rate of return for the debt instrument. This can be stated mathematically as

$$Y_r = \frac{c + \frac{M - P}{n}}{\frac{M + P}{2}}$$

where

M-market exchange price of the debt instrument.

This equation gives an approximate redemption yield and is a good approximation for long-term debt instruments having a maturity of more than 15 years.

Assume a Rs 100 20-year 5 per cent debt instrument has a market exchange price of Rs 114.67, while the clean price of the instrument is Rs 112.59. The redemption yield can be determined approximately as follows:

[5 + (2.08/20)]/[227.26/2] = 5.104/113.63 = 0.0449 = (4.49%)

For short-or medium-term debt instruments, a trial and error method could be used to determine the yield to maturity. This method uses the following equation to determine the redemption yield for a debt instrument.

$$M_d = \left(\frac{1}{(1+1/mY_r)^{n/Td}} \right) x \left(\sum_{t=0}^{q-1} \frac{C/m}{(1+1/mY_r)} + \frac{RP}{(1+1/mY_r)^{q-1}} \right)$$

Here,

Md = market exchange price (dirty price) of the debt instrument
n = number of days between the current date and the next coupon payment
Yr = redemption yield
q = number of coupon payments before redemption
m = number of times coupon payments are made
Td = total number of days between two coupon payments
RP = redemption price.

Holding period yield

$$M_d x(1+1/mY_{h)}{}^{nm} = (c/m)x(1+1/mi_{1)}{}^{nm-1} + (c/m)x(1+1/mi_2)^{nm-2}$$

Where
Y_h = holding period yield
I_1 and i_2 = rates of interest at which the first coupon, second coupon, and so on
P_1 = the price at which the debt instrument will be sold by the investor

The above equation can be restated as follows

$$Y_h = \left(\left[\frac{(c/m)x(1=1/mi_1)^{nm-1} + .. + (C/m) + P_1}{M_d} \right] - 1 \right) \text{x } m$$

The first part of the equation uses the redemption yield to discount the future cash flows back to the next coupon payment date but, the next coupon payment date could be any fraction of a coupon payment duration. Hence, it is discounted back to the present.

Examples:

1. Anup buys a five-year 6 per cent bond with a maturity period of three years on October 13 for Rs 98.56. The coupon payments are made semi-annually at the end of April and October. By trial and error it can be seen that the redemption yield will be between 0.0754 and 0.0756. The redemption yield can be identified as 7.8%.

[(l/(l+(.5*Yr))^(18/180))] * [(3/1+(.5*Yr)^t) {t =0 to 5} + (l00(1+.5*Yr)^5)]= 98.56

2. Rama buys a 10-year 4 per cent bond with a maturity period of seven years on September 15, for Rs 103.42. The coupon payments are made semi-annually, at the end of June and December. The redemption yield for the bond will be:

*[(1/(l+(.5*Yr))^(107/180))] * [(2/(1+(.5 * Yr))^t) {t=0 to 13} + (100/(1+.5*Yr)^13)] =*
103.42

Yr = 3.55%.

3. A 14-year 8 per cent bond is bought at Rs 97.34 on May 7. The bond can be redeemed after 12 years, The interest is paid at the end of every March, June, September, and December. The redemption yield for the bond is

[(l/(l+(.25*Yr))^(54/90))] * [(2/(l+(.25*Yr))^t) {t = 0 to 47}+ (l00/(l+.5*Yr)^)]

Yr = 8.45%

The redemption yield makes two assumptions that may not hold well in all situations. One, it assumes that the investors will hold the debt instrument till maturity which, may not be true. It takes into account the effect of compound interest on the coupons when they are reinvested and in this it assumes that the coupons can be reinvested at the constant redemption yield. This assumption might not hold when the interest rates are fluctuating in the market.

4.7.5 Holding Period Yield:

The holding period yield further refines the return computations by considering different reinvestment rates and by recognizing a holding time period which can be different from the maturity date. The equation for computing the holding period yield is as follows:

Md x (1 + l/mYh)nm[1] = (C/m) x (1 + l/rnii)""[1]-[1] + (C/m) x (1 + l/mi:,)[1]""--[2] + ... + (C/m) + P, ' where,

Y[, = holding period yield . ii andiz = rates of interest at which the first coupon, second coupon, and so on can be reinvested P; = the price at which the debt instrument will be sold by the investor.

M=	fy [c] .]	+ [pc]
	^'(l+Yc)'	(1 + Yc)"

where

Yc = yield to call C = coupon

amount Pc = Call price/put price

M = Market exchange price (dirty price) of the debt instrument n

= the number of years to call/put date.

Similar to call bonds, a company may also issue put bonds. The valuation of put bonds is similar to call bonds. The price at call will be replaced by the price at put. The put bond gives an investor the right to redeem the bond prior to maturity.

Examples:

1. A 15-year 8 per cent (quarterly interest) bond, issued on call after five years, has the following call prices for the Rs 100 face value instrument. Year 5, call price Rs 103. Year 6, call price Rs 102, Year 7, call price Rs 101. Year 8 onwards call price is Rs 100. The current cum coupon price is Rs 171. What is the yield on call if the company exercises its call option in the sixth year?

171 = (^/(l+tYcM})^) + (^/(l+Yc)^)

i = 1 to 24 Solving for the above equation,

Yc = .09 or 9%

2. A 10-year 6 per cent (half-yearly interest) bond issued on call after three years has the following put prices for the Rs 100 face value instrument. Year 3, put price Rs 101. Year 4, put price Rs 100.50. Year5 onwards, put price Rs 100. The current market price is Rs 124. What is the yield on put if the investor exercises its put option in the third year?

124 = *CL(3/(l+[^p/2])^)* + (lOl/O+Yp)^)

i = 1 to 6 Solving for the above equation,

Yp = .07 or 7%

4.8 Summary

The basic objective of this lesson is to discuss the nature of fixed income securities and different types of debt instruments. The various types of risks involved in debt securities as a form of investment also explained. The general valuation model is discounting the future cash flows at the required rate of return, which applies to all financial assets investment. This valuation model is relatively easier to apply on fixed income securities because th3ee is some amount of certainty on the future cash flows. In case of fixed income securities, like debentures and bonds, the general valuation model is also used to compute the yield to maturity to compare the same with the current yield of similar securities to judge under or over valuation of debentures. Besides, the other methods of valuation of fixed income securities, like Current Yield, Spot Interest Rate, Redemption Yield, Holding Period Yield are also discussed.

4.9 Key Words:

Current Yield : The yield on a security resulting from interest payments by the current market price of the security.

Holding Period Return : The total return from an investment for a given period of time, including both yield and capital gain or loss.

Interest Rate Risk : The uncertainty in the return on a fixed-income security caused by unanticipated fluctuations in the value of the asset due to changes in interest rates.

Yield-to-Maturity: The yield-to-maturity on a bond calculated assuming that all promised cash flows are received on a full and timely basis.

4.10 Self-Assessment Questions:

1. What is interest rate risk of a bond? Explain how the risk arises.
2. How is the current yield of a bond calculated?
3. What is spot interest rate? Illustrate with an example.
4. What is 'yield to maturity'? How is it calculated?
5. The value of a bond is equal to the present value of its expected cash flows. Elucidate with example.
6. Write short notes on:
   (a) Coupon rate
   (b) Yield to call
   (c) Zero coupon rate

7. Assume a Rs. 1000 par value bond with 8.5 per cent coupon rate and a maturity period of 6 years. Determine the duration of the bond, if the current market interest rate is 10 per cent.

8. A bond of Rs. 1000 was issued five years ago at a coupon rate of 6 per cent. The bond

had a maturity period of 10 years and as of today, therefore, five more years are left for final repayment at par. The market interest rate currently is 10 per cent. Determine the value of the bond.

9. A 20 year, 10 per cent coupon interest rate bond has Rs. 1000 face value. The market rate of interest is 8 per cent. Compute the intrinsic value of this bond if it has five years to maturity. Assume that interest is paid annually.

10. An investor recently purchased a bond with Rs. 1000 face value, 10 per cent coupon rate, and six years to maturity. The bond makes annual interest payments. The investor paid Rs. 1032.50 for the bond.

(a) What is the yield to maturity of the bond?
(b) If the bond can be called two years from now at a price of Rs. 1080, what is its yield to call?

11. A company issues a deep discount bond of face value of Rs. 5000 at an issue price of Rs. 3550. The maturity period of the bond is 7 years. Determine the spot interest rate of the bond.

4.11 Further Readings:

1. Graham, Benjamin, The Intelligent Investor, Harper & Row, New York.

2. Juttle, Donald L., (ed)., The Revolution in Techniques for Managing Bond Portfolios: The Institute of Chartered Financial Analyst, Chulottesville.

3. Lorie, James H., and Hamilton, Mary T., The Stock Market: Theories and Evidence, Homewood III: Richard D. Irwvin, New York

4. Fischer, Donald E., and Jordan, Ronald J., Security Analysis and Portfolio Management; Prentice Hall of India Ltd., New Delhi..

5. Farrell, James L., Jr., Portfolio Management: Theory and Application, McGraw-Hill, New York.

LESSON 5

SECURITY MARKETS IN INDIA

5.0 Objectives

After reading this lesson, you should be able to:

- Distinguish between primary market and secondary market.
- Highlight various types of traded securities, market players and trading arrangement, which exist in India.
- To discuss organization and functioning of primary and secondary markets for various types of securities in India.

Structure

5.1 INTRODUCTION

A security market or financial market, can define as a mechanism for bringing together buyers and sellers of financial assets in order to facilitate trading. One of its main functions is "price discovery" i.e., to cause security prices to reflect currently available information. The more quickly and accurately price discovery is achieved, the more efficiently financial markets will direct capital to its most productive opportunities, thereby leading to greater improvement in public welfare. Secondary markets involve the trading of financial assets.

5.2 SECURITIES MARKET IN INDIA – AN OVERVIEW:

In recent years, the financial markets and institutions have undergone significant changes keeping in pace with the changing need of market participants. To a great extent the institutions that dominated global finance in earlier decades- commercial banks and supranational organizations like the International Monetary Fund (IMF) have been displaced by disinter mediated, private finance. There has been an enormous shift of expertise and market power away from banks towards corporations. The latter increasingly issue securities like

commercial paper, bonds and notes, and manage their financial risks internally. Some have created finance subsidiaries that have become powerful financial service firms in their own right. All successful market participants must have a far more sophisticated understanding of financial risks and of the tools to manage them than was once the case.

To keep pace with the global markets, the financial markets in India have gone through various stages of liberalization that has increased its degree of integration with the global markets. This has been possible with measures like opening up the economy for investment and trade, decontrol of interest rate and exchange rate, setting up sound regulatory institutions to ensure safety of the system, etc. The securities market in India witnessed several policy initiatives during the year 2002-03 that further refined the market microstructure, modernized operations and broadened investment choices for investors. The securities market has been thriving ahead despite the experience of the irregularities in the securities transactions in the last quarter of 2000-01 due to the introduction and implementation of several reforms.

The Joint Parliamentary Committee set-up to look into the irregularities and manipulations in the securities market, including insiders trading, relating to shares and other financial instruments and the role of banks, brokers and promoters, stock exchanges, financial institutions, corporate entities and regulatory authorities submitted its final report on December 19, 2002 with many recommendations like speeding up of the process of dematerialization and corporations of stock exchanges to implement the decision to separate ownership, management and operation of stock exchanges and to effect legislative changes for investor protection, and to enhance the effectiveness of SEBI as the capital market regulator, etc.

The securities market moved to T+2 settlement system from April 2003. All the deferral products such as carry forward were banned from July 2002. Trading index options commenced in June 2001. The year 2002-03 has also been eventful for equities, debt as well as derivatives markets in India. The securities market witnessed reforms and other market developments during last one decade or so. These developments in the securities market, which support corporate initiatives and facilitate management of financial risk, hold out necessary impetus for growth, development and strength of the emerging market economy of India.

5.3 FINANCIAL MARKETS AND PARTICIPANTS:

Financial markets are the centers or arrangements of facilitating buying and selling of financial claims, assets services and securities. Banking and non-banking financial institutions, dealers, borrowers and lenders, investors and savers, and agents are the participants on demand and supply side in the markets. Financial market may be a specific or location, e.g., stock exchange, or it may be just an over-phone market.

Table 5.1: Market Participants in Securities Market

Participants	Number as on March 31, 2003
Securities Appellate Tribunal	1
Regulators	4
Depositories	2
Stock Exchanges with equity trading	23
Listed Securities	9,413
Brokers	9,519
Sub-brokers	13,291
FIIs	502

Portfolio Managers	54
Custodians	11
Share Transfer Agents	143
Merchant Bankers	124
Bankers to an Issue	67
Debenture Trustees	35
Underwriters	43
Venture Capital Funds	43
Mutual Funds	38
Collective Investment Schemes	0

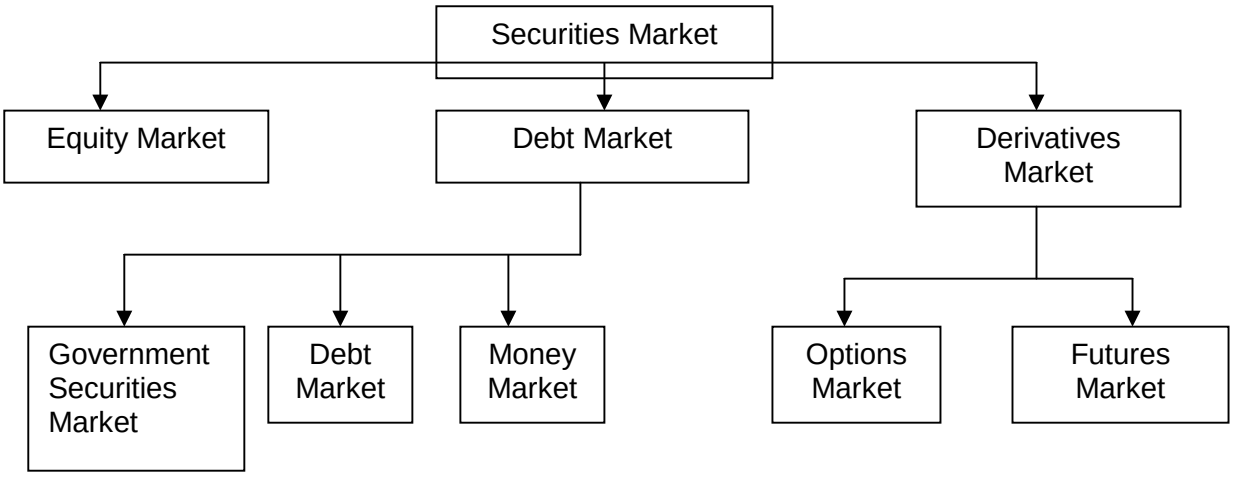
***Source: Date Collected from DCA, DEA, RBI* & SEBI**

The Indian securities market comprises of a number of participants as described below:

(i) Regulators: The key agencies that have a significant regulatory influence , direct or indirect, over the securities market are currently as follows:

- The Company Law Board (CLB), which is primarily responsible for the administration of the Companies Act, 1956.
- The Reserve Bank of India (RBI), which is primarily responsible, inter alia, for the supervision of banks, money market and government securities market.
- The Securities Exchange Board of India (SEBI), which is responsible for the regulation of the capital market.
- The Department of Economic Affairs (DEA), an arm of the Government, which, inter alia, is concerned with the orderly functioning of the financial markets as a whole.
- The Department of Company Affairs (DCA), an arm of the government, which is responsible for the administration of corporate bodies.

Chart 5.1 Structure of Securities Market



(ii) Stock Exchanges: A stock exchange is an institution where securities that have already been issued are bought and sold. Presently there are 23 stock exchanges in India, the most important ones being the NSE and BSE.

(iii) Listed Securities: Securities that are listed on various exchanges and hence eligible for being traded there are called listed securities.

(iv) Depositories: A depository is an institution, which dematerialized physical certificates, and effects transfer of ownership by electronic book entries. Presently there are two depositories in India, viz., the National Securities Depository Limited (NSDL) and the Central Securities Depository Limited (CSDL).

(v) Brokers: Brokers are registered members of the stock exchanges through whom investors transact. There are about 10,000 brokers in India.

(vi)Foreign Institutional Investors: Institutional investors from abroad who are registered with SEBI to operate in the Indian capital market are called foreign institutional investors. There are about 500 of them and they have emerged as a major force in the Indian market.

(vii) Merchant Bankers: Firms that specialize in managing the issue of securities are called merchant bankers. They have to be registered with SEBI.

(viii) Primary Dealers: Appointed by the RBI, primary dealers serve as underwriters in the primary market and as market makers in the secondary market for government securities.

(ix) Mutual Funds: A mutual fund is a vehicle for collective investment. It pools and manages the funds of investors. There are about 30 mutual funds in India.

(x) Custodians: A custodian looks after the investment back office of a mutual fund. It receives and delivers securities, collects income, distributes dividends, and segregates the assets between schemes.

(xi) Underwrites: An underwriter agrees to subscribe to a given number of shares (or any other security) in the event the public subscription is inadequate. The underwriter, in essence stands guarantee for public subscription.

(xii) Bankers to an Issue: The bankers to an issue collect money on behalf of the company from the applicants.

(xiii) Debenture Trustees: When a company issues debentures, a debenture trustee has to be appointed to ensure that the borrowing firm fulfills its contractual obligations.

(xiv) Credit Rating Agencies: A credit rating agency assigns ratings primarily to debt securities.

5.4 TYPES OF SECURITY MARKETS AND THEIR TRENDS

On the basis of credit requirement for short-term and long-term purposes, financial markets are divided into two categories:

- Money Market
- Capital Market

5.4.1 Money Market:

The money market is a market for short-term loans, i.e., less than one year. The very name, in fact, suggests that it is money that is being bought and sold. Business firms use it for the purchase of inventories, the sales finance companies use it to finance as consumer credit, the banks, use it to bridge the gap between tax receipts and expenditure (in other words, for deficit financing). A noteworthy point is that in the money market we deal not in money but near money assets. The money market is not a place but activity, the transactions are carried out by telephone, mail, etc., among people who have never met one another. Almost all big cities have local money markets, say in Bombay there is the Bombay Money Market, in New York; there is the New York Money Market.

It is one big market that comprises of all such above-mentioned sub-markets. All markets are closely linked and there is free movement of funds from one market to another like treasury bills to inter-corporate deposits etc. The money market is mostly regional in nature. The volume traded will be wholesale and huge.

(i) Characteristics of an efficient Money Market:

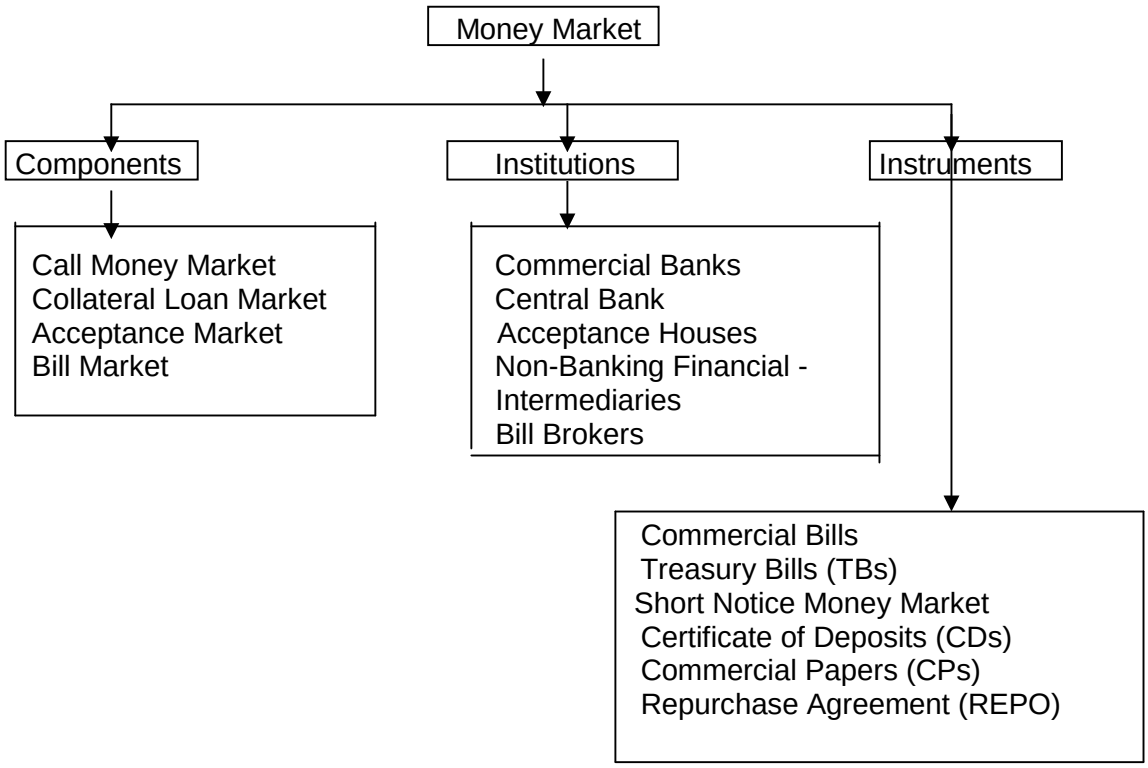
There are wide varieties of instruments available which channelize savings to productive investments (like working capital). It provides fund mobility and facilitates implementation of money. Money market is a market for short-term financial assets that can be turned over quickly at low cost and provides avenue for equilibrating the short-term surplus funds of lenders and borrowers requirements. The duration of the instruments (Money Market) is less than one year.

(ii) Functions of the Money Market:

The money market performs the following functions:

- The basic function of money market is to facilitate adjustment of liquidity
- Position of commercial banks, business corporations and other non-bank financial institutions.
- It provides outlets to commercial banks, business corporations, non-bank financial concerns and other investors for their short-term surplus funds.
- It provides short-term funds to the various borrowers such as businessmen, industrialists, traders etc.
- Money market provides short-term funds even to the government institutions.
- The money market constitutes a highly efficient mechanism for credit control. It serves as a medium through which the Central Bank of the country exercise control on the creation of credit.
- It enables businessmen to invest their temporary surplus for a short period.
- It plays a vital role in the flow of funds to the most important uses.

Chart 5.2
Structure of Money Market:



The money market is not homogeneous in character. This is a loosely organized institution with a number of divisions and sub-divisions. Each particular division or sub-division deals with a particular type of credit operation. All the sub-markets deal in short term credit.

Call money market refers to the market for very short period not exceeding 7 days providing loans at a very low rate of interest. The loans backed by securities, stocks and bonds are called collateral loans. The acceptance market refers to the acceptances of bills, which leads to the discounting of bills. The bill market refers to buying and selling of bills. All these four sub-markets are the components of money market. The institutions of money markets are those, which deal in lending and borrowing of short-term funds. The institutions of money market are not the same in all the countries of the World; rather they differ from country to country.

Debt instruments, which have a maturity of less than one year at the time of issue, are called money market instruments. These instruments are highly liquid and have negligible risk. The major money market instruments are TBs, CDs, CPs and REPOs.

(iii) Recent Trends:
(a) Money Market:

To facilitate the operation of monetary policy the efficiency of the transmission mechanism has to improve. Therefore, RBI initiated measures to develop the money market. The reforms included of new instruments (different maturities of Treasury Bills, Commercial Papers, Certificate of Deposits and Inter Bank participation certificates) and development of dealers (primary and secondary).

In the call money market, major reforms were undertaken from 1991 onwards though some measures had been initiated in 1987. To develop the call money market, non-bank participants were allowed to operate and inter-bank liabilities were freed from reserve requirements to facilitate emergence of a smooth yield curve and reduce volatility in the call rates. To regulate short-term liquidity in the system, the RBI introduced Repurchase Agreements (Repo) on December 10, 1992 and a Liquidity Adjustment Facility (LAF) on 5th June, 2000 under which it absorbs (Repo) or injects liquidity (reverse Repo) in the system on a daily basis. The development of the money market has led to the emergence of an interest rate structure that is market related which is presented in Table 5.2

Table 5.2 Structures of Interest Rates – Short Term.

Year	Bank Rate	Treasury Bills – 91-day	Call Money Rate-Bombay
1	2	3	4
1960-61	4.00	2.65	4.24
1970-71	6.00	3.08	6.38
1980-81	9.00	4.06	7.12
1990-91	10.00	4.60	15.85
2000-01	7.00	8.74	9.15
2003-04	6.00	4.38	4.37

Source: Handbook of Statistics on Indian Economy, 2004, RBI.

(b) Government Securities Market:

The fiscal policy compulsions rendered internal debt management policy passive before 1991 the RBI, as a debt manager, had little control on some of the essential features of debt management like the volume, maturity term structure or the yield curve but had to support the floatation in terms of initial subscription. In the 1980s the volume of long-term debt expanded rapidly (Singh, 2005b). The maturity of market loans remained highly skewed at the longer end, with the weighted average maturity of 16.1 years of outstanding loans in 1991. Total amount of debt securities increased from Rs.185.4 billion (or 12.9 percent of GDP) at end-march 1981 to Rs.861.4 billion (15.2 percent) at end-March 1991 and to Rs.8,811.5 billion (31.8 percent) at end-March 2004. Government outstanding debt accounted for 78.9 percent of the total outstanding debt in the market as at end of March 2004.

To develop the government securities market, an active internal debt management policy was pursued from 1992. To offer market-related yield to suit investor expectations, 5-year dated securities were auctioned, for the first time, on June 3 and August 3, 1992 respectively. Since then the auction system has increasingly been used and new instruments have regularly been introduced including zero coupon bonds, floating rate bonds and capital indexed bonds. The maturity profile of government bonds underwent a change and the maximum maturity between 1991 and 1992, was reduced from 20 years to 10 years. On improvement in the market conditions and in consideration of the absorptive capacity of the market, the maximum maturity of Central government securities was extended to 20 years in 1997-98, 25 years in 2001-02, and finally to 30 years in 2002-03, while that for the State government loans continues at 10 years.

To develop the secondary market, primary and satellite dealerships were established in 1995 and 1996, respectively, and in January 2003, trading of Government securities on the

stock exchanges was also initiated. A highly liquid and vibrant secondary market requires a transparent system of trading and a secure system of payment and settlement. A negotiated dealing system (NDS) operationalized from February 15, 2002, provides on-line electronic bidding in primary/OMO/LAF auctions, screen based electronic dealing and reposting of transactions in money market instruments, secondary market transactions in government securities, and dissemination of information on trades in real time. NDS facilitates paperless settlement of the transactions in government securities with connectivity to the Clearing Corporation of India Limited (established in April 2001 and operational since February 15, 2002) and the Delivery versus Payment settlement system at the Public Debt Office. The Real Time Gross Settlement system has been operational since March 2004.

In the secondary market for dated securities, Central government securities dominate trading while the share of State government papers is marginal (0.5 to 1.0 percent) (Singh, 2005b).

Table 5.3 Interest Rates on Central and State Government Dated Securities

Year	Central Government Securities		Inflation Rate (Wholesale Price Index	State Government Securities	
	Range	Weighted Average		Range	Weighted Average
1	2	3	4	5	6
1980-80	5.98-7.50	7.03	18.20	6.75	6.75
1990-91	10.50-11.50	11.41	10.30	11.50	11.50
1995-96	13.25-14.00	13.75	8.10	14.00	14.00
2000-01	9.47-11.70	10.95	7.20	10.50-12.00	10.99
2003-04	5.03-6.33	5.71	5.40	5.78-6.40	6.13

Sources: (a) Annual Report, Various Issues, Reserve Bank of India.
(b) Handbook of Statistics o Indian Economy, 2004, Reserve Bank of India.

5.4.2 CAPITAL MARKET

The term 'Capital Market' refers to the institutional arrangements for facilitating the borrowing and lending of long-term funds. In the widest sense, it consists of a series of channels through which the savings the community are made available for industrial and commercial enterprises and public authorities. It is concerned with those private savings, individual as well as corporate, that are turned into investments through new capital issues and also new semi-government bodies. It may be defined as an organized mechanism for effective and efficient transfer of money capital or financial resources from the investing parties, i.e., individuals or institutional savers to the entrepreneurs engaged in industry or commerce in the business either be in the private or public sectors of an economy.

(i) Objectives and Importance:

An efficient capital market is a pre-requisite of economic development. An organized and well developed capital market operating in a free market economy, (1) ensures best possible coordination and balance between the flow of savings on the one hand and the flow of investment leading to capital formation on the other; (2) directs the flow of savings into most

profitable channels and thereby ensures optimum utilization of financial resources. Thus, an ideal capital market is one where finance is used as a handmaid to serve the needs of industry. Finance is available at a reasonable rate of return for any proposition, which offers a prospective yield sufficient to make borrowing worthwhile. The development of any capital market is depended on public savings, proper organization of intermediary institutions and entrepreneurial qualities of the people. The capital market must facilitate the movement of capital to the point of highest yield. Thus, a capital market strives for (a) the mobilization or concentration of national savings for economic development, and (II) the mobilization and import of foreign capital and investment to augment the deficit in the required financial resources so as maintain the expected rate of economic growth.

(ii) Functions of Capital Market:

- Mobilization of financial resources on a nation-wide scale.
- Securing the foreign capital and know-how to fill up the deficit in the required resources for economic growth at a faster rate.
- Effective allocation of the mobilized financial resources, by directing the same to project yielding highest yield or to the projects needed to promote balanced economic development.

The capital Market consists of the primary market and secondary markets and there is a close link between them. The primary market creates long-term instruments through which corporate entities borrow from the capital market. But secondary market is the one, which provides liquidity and marketability to these instruments. These Markets interact.

The Indian Capital Market can be classified into:

- Primary Market
- Secondary Market

5.5 PRIMARY MARKET

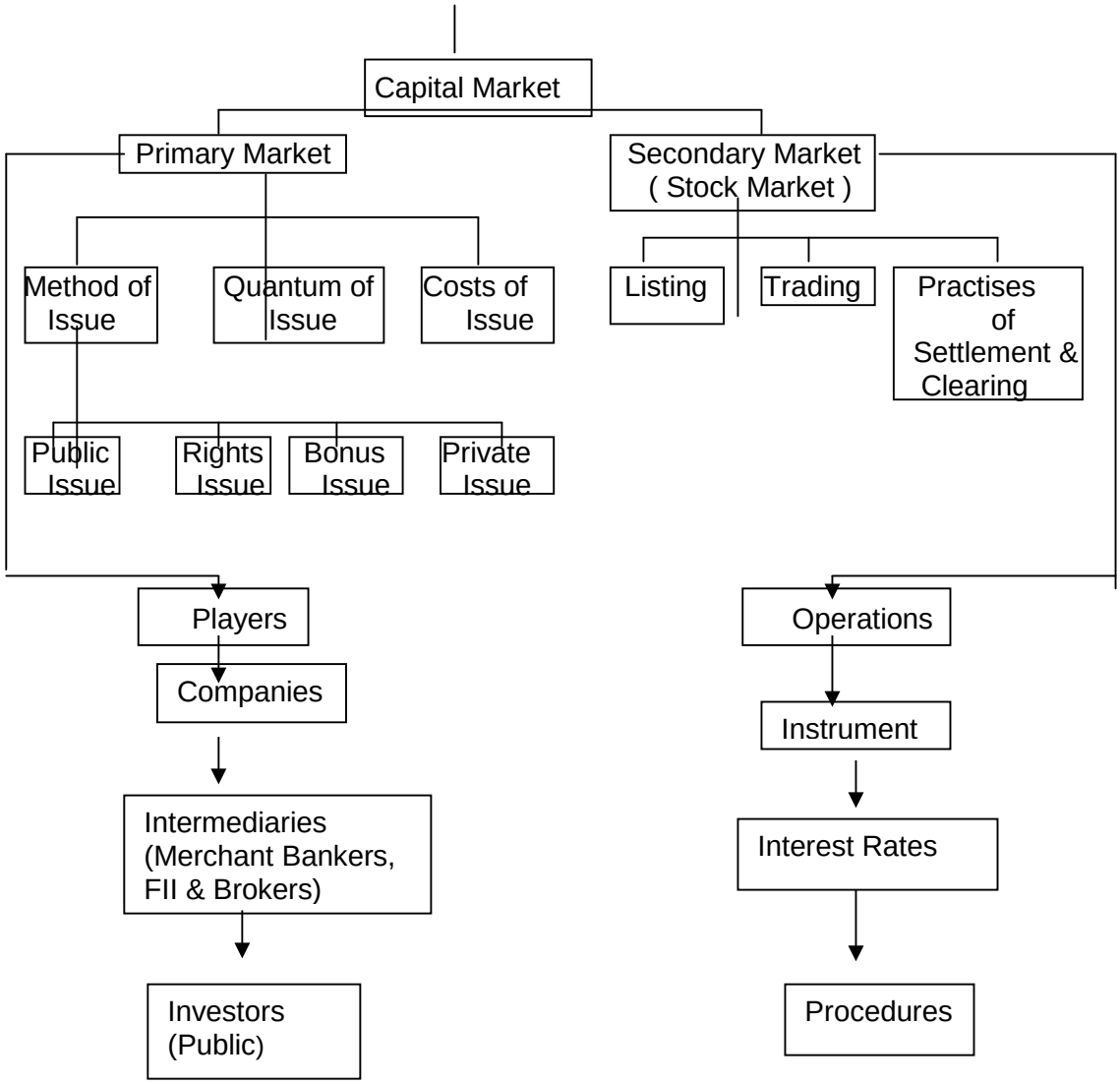
Companies, in order to meet the financial requirements of its projects raises capital through issue of securities (shares and debentures) in the primary market. The Capital Issue Control Act, 1947, controlled capital issues of companies. The Controller of Capital issues determined pricing of the issues. The CCI Controls on issue of capital by the companies have been substituted by the transparent and simplified guidelines by the *Securities and Exchange Board of India* under the SEBI Act, 1992. SEBI has issued elaborate guidelines on matters relating to public issues, rights issues, bonus issues, issue of debentures, underwriting, private placement, pricing of issues, etc. As far as the *Companies Act, 1956* is concerned; capital issued by a company should comply with the provisions relating to prospectus, allotment, issue of shares at premium/discount, further issue of capital, etc.

A total of Rs.2,520,179 million were raised by the government and corporate sector during 2002-03 as against Rs.2,269,110 million during the preceding year. Government raised about two third of the total resources, with central government alone raising nearly Rs.1,511,260 million.

(i) Type of Issues in Primary Market:

- **Public issue** – It involves raising of funds direct from public
- **Rights issue** – It is the method of raising additional finance from existing members by offering securities (shares and debentures) to them on prorate basis.
- **Bonus issue** – Some companies distribute profits to existing shareholders by way of way of fully paid bonus shares in lieu of dividend.
- **Private placement and preference allotment** – Private placement and preference allotment involve sale of securities to a limited number of sophisticated investors such as financial institutions, mutual funds, venture capital funds, banks and so on. The difference between Private Placement and Preference Allotment is: Private Placement refers to sale of equity or equity related instruments of an unlisted company or sale of debentures of a listed or unlisted company; whereas Preference Allotment refers to sale of equity or equity related instruments of a listed company.
- **Bought-out deals** – A Company initially places its equity shares, which are to be offered to the public at a later date, to a sponsor/merchant banker, who in turn offloads the shares at the appropriate time.

C h a r t 5 . 3 STRUCTURE OF THE CAPITAL MARKET



5.6 SECONDARY MARKET

The secondary market is that segment of the capital market where the outstanding securities (securities already issued) are traded. From the investors point of view the secondary market imparts liquidity to the long-term securities held by them by providing an auction market for these securities. The secondary market operates through the medium of stock exchanges, which regulates the trading activities in this market, and ensures a measure of safety and fair dealing to the investors.

(i) Dematerialization: The depositories act envisages transfer ownership of securities electronically by book entry with out making the securities move from person to person. The act has made the securities of all public limited companies freely transferable by restricting the company s right to use discretion in effecting the transfer of securities, and dispensing with the transfer deed and other procedural requirements under the Companies Act.

(ii) Differences between Primary Market and Secondary Market

Primary Market	Secondary Market
1. Market for new securities. 2. No fixed geographical location. 3. Results in raising fresh resources for the corporate sector. 4. All companies enter NIM 5. No tangible from or administrative set-up. Recognized only by the services it renders. 6. Subject to outside control by SEBI, Stock Exchanges and the Companies Act.	1. Market for existing securities. 2. Located at a fixed place. 3. Facilitates transfer of securities from one corporate investor to another. 4. Securities of only listed companies can be traded at stock exchanges. 5. Has a definite administrative set-up and a tangible form. 6. Subject to control both from within and outside.

(iii) Relationships between Primary Market and Secondary Market.

Despite the above differences there is close interconnection between the activities of NIM and stock exchanges. It is experienced in India, as elsewhere, that NIM flourished during the buoyancy in the stock market and new issues are very difficult when stock market conditions are depressed. Relationship between the two markets has been explained below:

1. Securities traded at stock exchanges are those, which have first been issued by the companies, i.e., securities first, pass through primary market and only thereafter enter the secondary market.
2. While issuing prospectus for fresh issue of capital, the companies stipulate in the prospectus that application has been made or will be made in due course for listing of share with the stock exchanges.
3. Stock exchanges exercise significant control over the organization of new issues through their regulatory framework as a precondition for listing of shares.
4. Stock exchanges provide liquidity to the securities which have passed through NIM, and thus help expanding NIM. Many original allottees of securities transfer/sell them to other investors and use the proceeds for subscribing to fresh securities in NIM.
5. A period of rising activity in stock exchanges is accompanied with higher activity in NIM resulting in larger number of successful issues, and *vice versa.*

6. In a period of rising prices in stock exchanges, premiums are high in NIM and over-subscription becomes a common phenomenon. Conditions in stock exchanges set tone of the market as a whole and influence the prices and acceptability of new issues.

5.7.1 Problems of Indian Capital Market:
(i) Problems of Equity Market

According to Ajay Shah, in the pre-reform phase (i.e., the pre 1991 period) the Indian equity market was confronted with a number of problems, the chief among them being as follows:

1. As of 1992, the Bombay Stock Exchange (BSE) was a monopoly. It was an association of brokers, and imposed entry barriers, which led to increased costs of intermediation.

2. Trading took place by 'open outcry' on the trading floor, which was inaccessible to users. It was usual for brokers to charge the investor a much higher price from that actually traded at.

3. As with all trading-floors, there was no price-time priority, so users of the market were not assured that a trade was executed at the best possible price.

4. A variety of manipulative practices prevailed, so that external users of a market often found themselves at the losing end of price movements. No strict action could be taken against errant brokers.

5. Retail investors, and particularly users of the market outside Mumbai, accessed market liquidity through a chain of intermediaries called 'sub-brokers'. Each sub-broker in the chain introduced a markup in the price and the investor thus had to pay a much higher price than the actual trade price.

6. The markets used 'future-style settlement' with fortnightly settlement. This means that trading was supposed to take place for a fortnight until a pre-determined 'expiration date'. Open positions on the expiration date only would go into actual settlement where funds and securities were exchanged.

7. A peculiar market practice call ***Badla*** allowed brokers to carry positions across settlement periods. In other words, even open positions at the end of the fortnight did not always have to be settled.

8. The efficiencies of the exchange-clearing house only applied for the largest 100 stocks. For other stocks, clearing and settlement were done bilaterally, which introduced further inefficiencies and costs.

9. Floor based trading, inefficiencies in clearing and settlement, entry barriers into brokerage, and low standards of technology and organizational complexity led to an environment where order execution was unreliable and costly. It was typical for below 50 per cent of orders to obtain execution on a given day.

10. The final leg of the trade was physical settlement, where share certificates were printed on pager. This was intrinsically vulnerable to theft, counterfeiting, inaccurate signature verification, administrative inefficiencies and other

malpractices. Moreover, the entire process of share transfer was time consuming and cumbersome. For investors outside Mumbai, the entire process could well take six months.

(ii) Problems of the Debt Market:

According to Ajay Shah, the Indian debt market faced the following important problems in the pre-reform phase.

1. In 1992, debt trading took place without an exchange in the picture. Trades were bilaterally struck between known counter parties without anonymity. Personal and political influences impacted upon trade prices; each leg of the transaction was exposed to the credit risk of the other; dealer markets suffered from a fragmentation of orders and trades; and there was no price-time priority to ensure that each trade took place at the best price in the country.

2. The problem of credit risk served to narrow the market down to a 'club market', a set of participants with homogeneous risk.

3. The lack of anonymity made it easier to form and enforce cartels, which would indulge in a lot of manipulative practices.

4. The debt market relied on dealers who, as with the Bombay Stock Exchange, did not unbundled their intermediation price from the transaction price. Therefore one could not shop around looking for a dealer with the lowest intermediation charges. Also, there was no guarantee of obtaining the best price, owing to the absence of price-time priority.

5. Trading took place by telephone in Mumbai. Hence, the debt market was effectively restricted to Mumbai.

6. There were serious problems with the settlement of trades. The Reserve Bank tracks ownership of government securities in a database call the SGL. SGL was maintained manually.

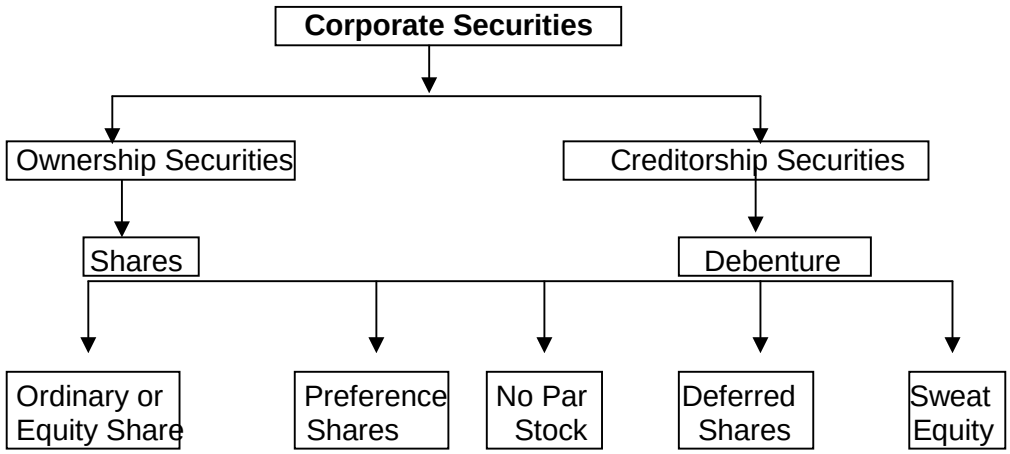
7. Since trades took place bilaterally, trade prices were not centrally reported and observed, even ***ex post.***

8. The protracted delays involved in settlement, coupled with the 'open interest' in the form of outstanding IOUs, led to grave reconciliation problems in the back offices of banks.

5.7 CAPITAL MARKET INSTRUMENTS

Primary market is a market for raising long-term sources of finance by the issue of new corporate securities. The corporate securities that are dealt in primary market can be classified under two categories:

Chart 5.4 Classification of Corporate Securities



The term 'ownership securities' also known as 'capital stock' represents shares. Shares are the most universal form of raising long-term funds from the market. Every company, except a company limited by guarantee, has a statutory right to issue shares. The capital of a company is divided into a number of equal parks known as shares.

(i) Kinds of Ownership Securities:

(a) Equity Shares: Equity Shares provide permanent capital to the company and cannot be redeemed during the lifetime of the company.

(b) Preference Shares: Preference shares enjoy preference as to the repayment of capital at the time of liquidation and payment of fixed rate of dividend over the equity shareholders.

(c) No Par Stock/Shares: No Par Stock means, shares having no face value. The capital of a company issuing such shares is divided into a number of specified shares without any specific denomination.

(d) Deferred Shares: These shares were earlier issued to promoters or founders for services rendered to the company. These shares rank last so far payment of dividend and return on capital is concerned.

(e) Sweat Equity: The term 'sweat equity' means equity shares issued by a company to its employees or directors at a discount or for consideration other than cash for providing know-how or making available rights in the nature of intellectual property rights, by whatever name called.

(ii) Creditorship Securities:

The following are the different types of Creditorship instruments discussed as under:

(a) Debentures:

A company may raise long-term finance through public borrowings. The issue of debentures raises these loans. A debenture is a document under the company's seal, which provides for the payment of a principal sum and interest thereon at regular intervals.

(b) Bonds:

Bonds are similar to the debentures but they are issued by the public sector undertakings. The coupon rate is contractual involving the terms and conditions of the issuance of the debt security. Being contractual it cannot be changed during the tenure of the instrument. The investors are not affected by lowering of the bank rates. When the bank rates are lowered, the value of the bonds, which are carrying interest rates above the bank rate, would appreciate.

5.8 CAPITAL MARKET REFORMS

In terms of financial sector reforms, it was considered necessary for investors' confidence that capital market should be encouraged to grow under the supervision of a strong regulatory body frame work. Therefore, in January 1992, the Securities and Exchange Board of India (SEBI) was accorded statutory status as an autonomous body to protect investors' interest and promote the development of the capital market. In the primary market, all government controls relating to pricing of equity issues and their timing have been removed since then. Interest rate restrictions on debentures and their timing have been removed since then. Interest rate restrictions on debentures and bonds issued by public sector enterprises was rescinded in August 1991.

In the secondary market, the traditional open outcry system has been replaced with a transparent, screen-based computerized trading system, which can be accessed by trading members (9,368 as at end of March 2004) across India (357 cities as at 2000-01, according to a Survey conducted by SEBI in 2001), mainly located in urban areas. The process of dematerialization of physical securities is completed. To reduce risks in the market and protect the interest of investors, in line with international best practices, rolling settlement on T+2 basis is in use since April 1, 2003.

The clearing and settlement system is being emphasized by the SEBI and many stock exchanges in India are setting it up now. The disclosure standards are being strengthened to protect the interests of the investors. The number of stock exchanges increased from 11 in 1990 to 23 in 2003 while listed companies on the stock exchanges has increased from 6,229 in 1990-91 to 9,413 in 2002-03. In March 2001, the government proposed that all the 23 stock exchanges that are owned and managed by the brokers would be corporative where by ownership, management and trading membership would be segregated. Consequently, the boards of some stock exchanges in India have been revamped and broadened so that they represent diversified interests.

Consequent to the reforms, resource mobilization in the primary market increased from 2.5 percent of GDP in 1990-91 to 3.8 percent in 2000-01, but since then the markets have been depressed for multiple reasons – high real interest rates, poor performance of mutual funds, lack of confidence of the investors due to high incidence of vanishing companies and consequently stringent conditions imposed by the regulator on public issues. The table 5.4 explains resources mobilization from the primary market.

Table 5.4 Resource mobilization from the Primary Market

	1990-91	1991-92	1992-93	1995-96	2000-01	2002-03
Total Corporate Securities	2.5	2.5	3.1	3.1	3.8	2.8
1. Domestic Issues	2.5	2.5	3.1	3.0	3.6	2.7
(a) Non-Govt. & Public	0.8	0.9	2.6	1.4	0.2	0.1

Companies						
(b) PSU Bonds	1.0	0.9	0.1	0.2	0.0	0.0
(c) Government Companies	0.0	0.0	0.1	0.1	0.0	0.0
(d) Banks and FIs	0.0	0.0	0.0	0.3	0.1	0.1
(e) Private Placement	0.7	0.7	0.2	1.1	3.2	2.5
2. Euro Issues	0.0	0.0	0.1	0.1	0.2	0.1

Source: Indian Journal of Economics and Business.

In the secondary market reforms have led to increased activity except for some period during March 2000 to May 2003 because of domestic reasons and international reasons. Market capitalization increased from Rs.4,000 billion in 1993-94 to reach a peak at Rs.11,926 billion in 1999-00 and after declining for three years increased to Rs.13,188 billion in 2003-04 while the turnover increased from Rs.2,037 billion in 1993-94 to peak at Rs.28,810 billion in 2000-01 and since then it has been low as shown in Table 5.5

Table 5.5 Secondary market – Selected indicators

Year	Number of		Market Capitalization Ratio (% of GDP)	Turnover Ratio (% of Market Capitalization)
	Brokers	Listed Cos.		
1	2	3	4	5
1990-91	---	6,229	20.6	---
1995-96	8,476	9,100	47.0	39.7
1999-00	9,192	9,871	84.7	173.3
2000-01	9,782	9,954	54.5	374.7
2001-02	9,687	9,644	36.4	119.6
2002-03	9,519	9,413	28.5	153.3
2003-04	9,368	---	52.3	122.2

Source: Indian Journal of Economics and Business.

5.9 SUMMARY

Financial market consists of capital market and money market and constitutes one of the major elements of the corporate firms' operating environment. These firms use capital market in raising long-term funds to take up their capital budgeting proposals. The money market is a large, wholesale market where crores of rupees of low-risk, unsecured, short-term, zero coupon debt instruments that are highly liquid are issued actively traded every day. It has no geographical constraints and relates to all dealings in money or monetary assets.

After 1992, the Indian capital market has witnessed astronomic growth in volume of funds raised as well as of transactions. The changes in economic scenario and the economic growth have raised the expectations of Indians as well as Foreign Institutional Investors (FIIs) from the Indian capital market. The capital market in general may be bifurcated into Primary Market and Secondary Market (i.e., stock exchanges). The Primary Market, which is also called as new issue market, derives its name as new issue market from the fact that it makes available a new block of securities for public subscription. It deals with securities, which where not earlier made available to the investing public. Primary Market is a mechanism through which these securities are issued directly to the individual investors as well as institutional investors**.**

5.9 Keywords:

Financial Assets: these are shares, debentures, lease obligations, borrowings from banks, financial institutions, etc.

Carry forward / Badala: Provide the facility for carrying forward the transactions from one settlement to another settlement.

Stock Market Index: It is barometer of market behavior and it reflects market directions. It is also an indicator of day-to-day fluctuations in stock prices.

Equity share: the right to receive dividend and residual claim**.**

Bonus Shares: these are issued to the existing shareholders in addition the dividend out of the reserves

Preference shares: they have fixed dividends but have a perpetual liability on the companies.

5.10 SELF-ASSESSMENT QUESTIONS:

1. What are the basic constituents of the securities market in India.
2. What are the different types of security markets? What are their role and functions?
3. Write a note on different categories of players operating in primary and secondary markets?
4. What is primary market? How it is different from secondary market?
5. List the capital market instruments available to an individual investor in India? Explain them briefly?
6. Write a note on different categories of players who are participated in securities market?
7. What is money market? What are its functions?
8. What functions does money market perform? Discuss the features of Indian money market?
9. State whether each of the following statement is True (T) or False (F).
   (i) Financial system in India is consisting of moneylenders and capital market.
   (ii) Money market operates as a part of capital market.
   (iii) Merchant bankers are not a part of financial system.
   (iv) RBI is the apex institution in the capital market.
   (v) SEBI has no role to play in the money market.
   (vi) Credit rating is a type of financial services.
   (vii) Financial system helps in enhancing the liquidity of financial claims.
   (viii) Rates of interest in unorganized financial market are relatively higher.

5.11 FURTHER READINGS

1. Bombay Stock Exchange Official Directory, Bombay Stock Exchange, Bombay.
2. Gupta, L.C. 1992, Stock Exchange Trading in India-Agenda for Reform, Society for Capital Market Research and Development, New Delhi.
3. SEBI Act and Regulations on various intermediaries and capital offerings.

R S R

LESSON 6

REGULATION OF SECURITY MARKETS

6.0 Objectives

After reading this lesson, you should be able to:

- Highlight the history of regulation of securities of market in India.
- Discuss the current status of regulation relating to securities market in India.
- Trace out the origin, functions, organization and activities of Securities Exchange Board of India.

Structure

6.1 INTRODUCTION:

The four main legislations governing the securities market are: (a) the SEBI Act, 1992 which establishes to protect investors and develop and regulate securities market; (b) the Companies Act, 1956, which sets out the code of conduct for the corporate sector in relation to issue, allotment and transfer of securities, and disclosures to be made in public issues; (c) the Securities (Regulation) Act, 1956, which provide for regulation of transactions in securities through control over stock exchanges; and (d) the Depositories Act, 1996 which provides for electronic maintenance and transfer of ownership of demat securities.

(a) Capital Issues (Control) Act, 1947:

The Act had its origin during the war in 1943 when the objective was to channelize resources to support the war effort. It was retained with some modifications as a means of controlling the raising of capital by companies and to ensure that national resources were channeled into proper lines, i.e., for desirable purposes to serve goals and priorities of the government and to protect the interests of investors. Under the Act, any firm wishing to issue securities had to obtain approval from the Central government which also determined the amount type and price of the issue. As a part of the liberalization process, the Act was replaced in 1992 paving way for market-determined allocation of resources.

(b) Securities Contracts (Regulation) Act, 1956:

It provides for direct and indirect control of virtually all aspects of securities trading and the running of stock exchanges and aims to prevent undesirable transactions in securities. It gives Central regulatory jurisdiction over (i) stock exchanges, through a process of recognition and continued supervision, (ii) contracts in securities, and (iii) listing of securities on stock exchanges. As a condition of recognition, a stock exchange complies with conditions prescribed by Central Government. Organized trading activity in securities takes place on a specified recognized stock exchange. The stock exchanges determine their own listing regulations, which have to conform to the minimum listing criteria set out in the Rules.

(c) Companies Act, 1956:

It deals with issue, allotment and transfer of securities and various aspects relating to company management. It provides for standards of disclosure in public issues of capital, particularly in the fields of company management and projects, information about other listed companies under the same management, and management perception of risk factors. It also regulates underwriting, the use of premium and discounts on issues, rights and bonus issues, payment of interest and dividends, supply of annual report and other information.

(d) SEBI Act, 1992:

The SEBI Act provides for the establishment of a board to protect the interests of the investors in the securities, to promote the development and to regulate the market. Chapter I deal with the preliminaries and definitions. Chapter II deals with the establishment; incorporation and management of the board; terms and conditions of the services of the chairman and members, removal process of member from the office, the procedure for conducting the meetings, appointment process for the officers and employees of the board. Chapter III contains the process of transfer of asset and liabilities of the existing board. The substantive part of the powers and functions of the board are incorporated in Chapter IV. The Registration process of stock brokers, sub-brokers, share transfer agents, banker to an issue are presented in Chapter V. Chapter VI deals with the grants provided by the government to the board. Chapter VII contains all the miscellaneous factors regarding the powers of the Central Government to issue the directions, powers, appeals, savings, employees of the board who are treated as public servants, penalties, exemptions from tax on wealth, income, cognizance of offences by courts, offences by company's power to exempt, power to make rules and regulations etc.

(e) Depositories Act, 1996:

The Depositories Act, 1996 provides for the establishment of depositories in securities with the objective of ensuring free transferability of securities with speed, accuracy and security by (i) making securities of public companies freely transferable subject to certain exceptions; (b) dematerializing the securities in the depository mode; and (iii) providing maintenance of ownership records in a book entry form. In order to streamline the settlement process, the Act envisages transfer of ownership of securities electronically by book entry without making the securities move from person to person. The Act has made the securities of all public limited companies freely transferable, restricting the company's right to use discretion in effecting the transfer of securities, and the transfer deed and other procedural requirements under the Companies Act, have been dispensed with.

6.2 SECURITIES EXCHANGE BOARD OF INDIA (SEBI)

The Government of India set up the SEBI on April 12, 1998 for the regulation and orderly function of the capital markets. It is likely to measure the fair-trading in the securities and to protect the rights of the investors. Initially the SEBI was established as an interim body under the administrative control of the Finance Ministry. Later it was given the statutory powers. The SEBI is the most powerful organization in the security industry. It is the watchdog of the stock market. The tremendous growth in the capital markets led to the establishment of the SEBI. Until May 1992, the issue of capital by the Companies was controlled by the Central Government through the office of the Controller of Capital Issues (CCI). The CCI regulated the pricing of the issues. These controls were removed with the repeal of the Capital Issues Contract Act on May 1992.

The SEBI has emerged as an important constituent of the Indian Financial System (IFS). The powers of the IFS have been delegated to the SEBI. The constituents of the IFS; the Companies Act, 1956; the Securities Act 1956, the Capital Issues Act, 1947. The Companies Act deals with the financial and non-financial aspects of the corporate sector. The aim of the act is to develop an integrated relationship among the promoters, investors and company management. The act seeks to protect the interest of the shareholders. The act contains specific provisions of the regulations such as issue of share capital, dividend distribution, capital structure, voting rights, Inter corporate investments, shareholders meetings, format of the annual accounts, allotment process of shares, issue of share certificates, issue of shares at premium, par or discount, Issue of non-voting shares, buyback of their own shares.

The Department of Company Affairs and the Company Law Board administer the Act. All these wings are working under the control of the Ministry of Law, Justice and Company Affairs. The provisions of the Companies Act from section 55 to 68A relate to the issue of prospectus. If any, prospectus is issued in contravention of section 57 or 58, the Company and every responsible person would be punishable with a fine up to Rs.5000. The Register of companies will not register the prospectus unless it satisfies with the requirements of Sec.55 to 58. The shares allotment of a company should be in accordance with the Sections 76,77, 78, 80, 80A, 81, 85, 86, 113 of the Companies Act.

The Securities Contract Act, 1956 deals with the Secondary Market operations. Section 3 deals with the recognition of the Stock Exchanges. Any stock exchange for the purpose of recognition should apply to the Central Government in a prescribed proforma. A copy of the byelaws of the stock exchange should accompany it. The Central Government is empowered under Section 4 to grant the recognition. According to Section 5, the Central Government has to power to withdraw the recognition. According to SCRA, every recognized stock exchange should submit its annual report before 31 January of every year. The Annual report should contain all the activities of the stock exchange, about its trading securities, change in rules, bye-laws, changes in the governing body, admission or re-admission, resignation of members, defaults, securities de-listed, etc.

The Capital Issues Control Act 1947 has been playing an important role in the functioning of the India Capital Market since 1947. The Controller of Capital Issues in the Ministry of Finance, Department of Economic Affairs, administers its provisions. The SCRA mainly regulates the Secondary Market. The primary market is mostly regulated the Secondary Market. The primary market is mostly regulated by the Capital Issue Control Act 1947. The objectives of the act are to protect the investors, no mal-practice by the corporate sector, better

financial position, no undue congestion of public issue, to monitor the foreign investment. The Capital Issue Control act provisions have now become the power and functions of the SEBI. The CCI was repealed and the office was abolished in 1992. Certain powers and sections of the SCRA and the Companies Act were delegated to the SEBI. The regulatory power of the SEBI has increased the Securities laws. The SEBI has now become a very important constituent of the financial regulatory framework in India. It was established on the same pattern of the Securities Exchange Commission in USA.

(i) Organization of the SEBI:

The SEBI restructured its organization. It has divided its activities into the following seven departments, each headed by officials of the rank of Executive Directors. All these departments are further subdivided.

1. Primary Market Department,
2. Issue Management and Intermediaries Department,
3. The Secondary Market Department,
4. The Secondary Market Department (Administration),
5. The Institutional Investment Department,
6. Legal Department, and
7. Investigation Department.

(ii) Objectives of the SEBI:

- Regulate the business in stock exchanges and any other securities markets.
- Register and regulate the working of capital market intermediaries (brokers, merchant bankers, portfolio managers and so on).
- Register and regulate the working of mutual funds.
- Promote and regulate self-regulatory organizations.
- Prohibit fraudulent and unfair trade practices in securities market.
- Promote investors' education and training of intermediaries of securities markets.
- Prohibit inside trading in securities.
- Regulate substantial acquisition of shares and takeovers of companies.
- Perform such other functions as may be prescribed.

6.3 REFORMS OF THE CAPITAL MARKET – ROLE OF SEBI

The capital market in India has witnessed a spectacular growth during the decade. The trend has been overwhelming till recently. The market is being broadened further with the listing of securities. Therefore, the SEBI has taken several initiative steps to promote, develop and regulate the capital market. These reforms include Primary and Secondary Markets. They are presented below:

1. A bridged prospectus
2. Proportional allotment might be allowed in case of over subscribed issues.
3. Insider trading is illegal.
4. All the financial intermediaries are to be registered with the SEBI.
5. Credit rating is made compulsory.
6. Underwriting for issues is made mandatory.
7. Deployment of Issue proceeds.

8. Fixation of promoters' contribution.
9. Risk factors are to be disclosed in the prospectus.
10. Lock in period for promoters' quota shares.
11. Capital adequacy norms are to be prescribed for the stockbrokers.
12. Circuit breaker system should be introduced at the exchange.
13. Forward trading and carry over system are banned.
14. Uniform settlement system.
15. Flexibility in Issue Pricing.
16. Guidelines for the DFI for disclosures and investors protection.
17. Brokers should keep the client's money in a separate bank account.
18. Audit inspection on the books of the Stock Exchange members.
19. Introduction of Jumbo transfer deeds.
20. Precautions in the transactions between clients and brokers.
21. Norms for multiple memberships in the stock exchanges.
22. Guidelines for preferential allotment of shares.
23. PSU bonds should be brought under the purview of the SEBI.
24. Private Mutual Funds should be permitted.
25. Constitution of the governing councils of the stock exchanges.

6.3.1 BUY BACK SECURITIES:

The SEBI has allowed the Companies to buy-back its own securities by the following methods:

- Buy back through tender offer.
- Buy back through open market.

(a) Tender Offer:

According to the rules and regulations, a Company can buy its securities from the existing shareholders or any other through negotiated deals. A company may also buy its shares through any private arrangement. The SEBI would not permit the insider trading in this aspect. If any company is interested to buy its own securities from any source, a special resolution should be made. The copy of the special resolution should be filed with the SEBI and the concerned stock exchanges within seven days from the date of passing the resolution. The notice for the special resolution should be served along with the company's explanation regarding the buyback of its shares. The explanation document contains the following matters:

- The date of approval of the proposal at the meeting.
- The situation for the buy back of the shares.
- The mode of the buyback of the companies of the securities.
- The sufficient provision of money for buy backs the securities.
- The base point for the fixation of the buy back price.
- The number of securities to be purchased by the company.
- The intention of the promoters regarding this scheme.
- The details regarding the repayment of loans to FI/Banks.
- The details regarding the refunding of fixed deposits debentures etc.,
- The auditors' report addressed to the board of directors.
- The details regarding the repayment of Preference shares.
- The assurance of the board of directors regarding the company affairs.
- The details regarding the general meeting of the shareholders.

- The board of directors should give assurance that is state of affairs would not become insolvent within a period of one year from that date.

The tender method of option to buy back its own securities from the existing securities holders on proportional basis, in addition to the above information, they should furnish some additional information regarding the buy back price of the securities. If a company wants to buy back its shares, it should make a public announcement in at least one English daily, one Hindi and one regional language.

(i) Payment of the Consideration:

After the closure of the offer, the company is required to open a special account with a banker and there in deposit such sum together with the amount lying in the Escrow Account. This must be utilized the payment of consideration in cash to those security shareholders whose offer has been accepted or returned.

(ii) Destruction of the Share Certificates:

After the payment of consideration to the accepted shareholder, the company may collect the shares by hand and destroy the security certificates bought back in the presence of merchant banker/STA/Registrar and the statutory auditor within 7 days from the date of acceptance of the securities. If the buyback securities are in the form of “Dematerialized”, they should be extinguished and destroyed according to the act of the SEBI (Depositories and Participants) Regulation 1996 and bye-laws. The company should submit a certificate to the SEBI signed by a Registrar/Merchant banker and MD with the statutory auditor of the Company within 7 days of the extinguishments and destruction of the certificates. The company should maintain a separate account for cancelled and destroyed certificates. The destroyed certificates should be submitted to the concerned stock exchange within 7 days.

6.3.2 Buyback from the Open Market:

A company can buy its own securities through the Open Market. The shares may be further categorized as:

(i) Book Building Process
(ii) Stock Exchange
(iii) Odd-Lot Buyback

(i) Book Building Process:

The company with a special resolution can make the buyback of securities through the book building process. The company should pass a special resolution by specifying the maximum price. The Company should make a public announcement at least 7 days prior to the commencement of the buyback. The company has to appoint a Merchant Banker for this purpose. It has to deposit in the Escrow account before the date of public announcement. After the announcement of the book building process, the company has to submit a copy to the SEBI along with the specified fees within two days. The public announcement should reveal the following matters:

a. The methodology of book building process.
b. The manner of acceptance.

c. The format of acceptance.
d. The details of the bidding centers.

The book building involves with the latest technology and transparency. For this, the company should arrange the bidding centers with a minimum number of 30. There should be a computer terminal connecting all the bidding centers. The offer should be open to the security holders for a period of 15 days but should not exceed 30 days. The company should decide the buy back price along with the Merchant banker's opinion. The offer price should be paid to all the holders who accept the buy back method.

(ii) Stock Exchange:

The company through the stock exchanges repurchases the shares. For this purpose, the company should pass a special resolution. The resolution should specify the maximum offer price. The shares cannot be purchased from the promoters or interested parties. If a company wants to buyback its shares through the Stock Exchange process it should make a public announcement at least 7 days prior to the commencement of the buy back. The Company has to appoint a Merchant Banker. A copy of public announcement should be submitted to the SEBI within two days along with the specified fees. The announcement should reveal all the information regarding the details of the brokers and stock exchanges etc.

(iii) Odd Lot Buyback:

The rules and regulations pertaining to the buyback scheme through the odd-lot method are applicable in the same manner, which the earlier method followed.

6.3.3 CREDIT RATING:

Credit rating is increasingly a requirement for debenture issues, fixed deposits and commercial paper issues. At present, there are credit rating agencies: Credit Rating and Information Services India Limited (CRISIL), Investment Information and Credit Rating Agency of India (ICRA), Credit Analysis and Research (CARE).

6.3.4 LEASING:

The leasing market in India is growing rapidly, with about Rs.10 billion worth of assets being leased annually and about Rs.8 billion being provided for hire purchase. Lease finance is normally provided for a period raging from 3 to 8 years, it is currently being provided by all India Financial Institutions such IDBI, IFCI, ICICI, state level institutions and various leasing companies in the private and joint sector.

6.4 MEASURES IN THE SECONDARY MARKET

Deficiencies in the secondary market include the weakness and irregular functioning of the stock exchanges right at the level of the governing boards. Since these boards had been by and large dominated by a majority of member brokers, they generally tended to decide matters normally in their favor vis-à-vis investors. The stock exchange which are conceived to function as Self Regulatory Organizations (SRO) have hardly done so when it came to regulating the brokers/dealers and their organizations. SEBI had, therefore, to issue an order under SCRA with a view to bring about a broad based constitution of the governing boards of Exchanges as

also their disciplinary, arbitration and default committees mainly by having equal representation of members by way of brokers on one side and public representatives on the other side.

Another area in which investor's interest is sought to be protected is by bringing about improvements in trading systems and settlement periods. The trading hours have since been increased for various stock exchanges and settlement periods have been reduced to a weekly cycle for non-specified scrips. Greater transparency in trading practices by brokers has also been sought to be brought about by prescribing compulsory issue of contract notes to the clients detailing separately transaction price and the brokerage. A code of conduct has also been laid down statutorily for stockbrokers and sub-brokers.

6.5 STOCK EXCHANGES IN INDIA:

Despite the fact that unorganized stock market existed in Calcutta since 1830, the first organized stock exchange was set up at Bombay in 1877 under the name of 'Native Stock and Share Brokers Association'. The next stock exchange, which emerged in the country, was 'Ahmadabad Share and Stock Brokers Association' which was founded in 1894. The third stock exchange was set up at Calcutta in the year 1908. Though some more stock exchanges were set up before independence but there was no All India Legislation to regulate their working. Every stock exchange followed its own method of working. There were only nine recognized stock exchanges in the country until 1981-82. At Present, there are 24 recognized stock exchanges in the country. Further, Over the Counter Exchange and National Stock Exchange have also started functioning in our country.

6.5.1 SEBI's Role in a Stock Exchange:

Securities and Exchange Board of India has been set up under the SEBI Act, 1992 to protect the interest of investors in securities and to promote the development of and regulate the securities market and for matters connected there with or incidental thereto. SEBI's role in stock exchange is being examined below.

6.5.2 SEBI's Power in Relation to Stock Exchange:

The SEBI ordinance has given it the following powers:

I. It may call periodical return from stock exchanges.
II. It has the power to prescribe maintenance of certain documents by the stock exchange.
III. SEBI may call upon the exchange or any member to furnish explanation or information relating to the affairs of the stock exchange or any members.
IV. It has power to approve byelaws of stock exchange for regulation and control of the contracts.
V. It can amend byelaws of stock exchange.
VI. In certain area it can license the dealers in securities.
VII. It can compel a public company to list its shares.

6.6 OVER THE COUNTER EXCHANGE OF INDIA (OTCEI)

The OTCEI is primarily meant for small size companies and investors. The exchange has the merits of transparency, fast settlements and potential to reach the nooks and corner of

the country, which could make it the premier niche exchange in India. Investors benefit due to cleaner deals and easy reach and small companies have a safer route to the stock market.

OTCEI was incorporated in October 1990 under the Companies Act 1956. A consortium of premium financial institutions including UTI, ICICI, IDBI, IFCI, LIC, SBI CAPITAL MARKETS LIMITED, GIC and subsidiaries, and Canara Bank Financial Services Limited promoted it. OTCEI is a recognized stock exchange under the Securities Control (Regulation) Act and became operational in 1992. It is the first stock exchange in India which introduced state-of-the-art screen based automated ring less trading system. Companies listed on OTCEI enjoy the same listing status as available to companies listed on any other recognized stock exchange in the country. However, the companies listed on OTCEI cannot be listed/traded on any other stock exchange in India.

(i) Features of OTCEI:

Following are the salient features of OTCEI:

(a) Nation-wide Trading.

OTCEI has nation-wide network. By listing on just OTCEI the securities of a company can be traded across the country through centers in different cities.

(b) Compulsory Investor Registration.

An investor must obtain 'INVESTOTC Card' for buying and selling shares on OTCEI by making an application at any of the counter of OTCEI.

(c) Ring less Trading.

OTCEI does not have any trading ring/hall. Dealers quote, query and transact through a central OTC computer connected with computers at different centers/counters across the country.

(d) Transparent computerized trading.

Entire trading at OTCEI is done in a transparent and speedy manner through computers. This makes market more disciplined.

(e) Exclusive Trading

Companies listed at OTCEI were not listed on other stock exchanges. Rules in this regard have now been relaxed.

(f) Sponsorship

The companies sponsored by members of OTCEI are listed.

(g) Closeness to investors

There is large number of inter-connected counters throughout the country. Facility for trading is available at the counters of the sponsor. The address of Additional Market

Makers is given in the new issue application attached to offer for sale document and with all the dealers of OTCEI.

(h) Only Authorized Dealers

Only those members and dealers who are authorized and approved by the OTCEI can deal on it.

(i) Transfer by Counter Receipt

The investors have to submit counter receipt at any of the OTCEI counters for transfer of shares. Shares are automatically transferred in the name of the investors if the consolidated holding of the shares is within the limit of 0.5 per cent of the issued capital of the company.

(j) Greater Liquidity

Share the sponsor and the Additional Market Maker offer tow-way quotes within specified margin, the securities can be purchased and sold any time.

(h) Trading Mechanism for Permitted Securities:

The securities, which are listed on other stock exchange, can be granted special permission for being traded on OTCEI under permitted category and enjoy the benefit of transparent computerized trading. The trading mechanism is basically as follows:

1. Trading document is the share certificate with a valid Transfer Deed (TD).
2. The counters doing market making in these scrips give two-way quotes voluntarily. The depth quantity should be in multiples of the market lot for the scrip.
3. Counters can give quotes even without having inventory of the scrip. They can also modify or withdraw their quotes before the deal is struck not after that.
4. Selling investors are issued Purchased Confirmation Slips (IPCSs) and the purchasing investors are given Sale Confirmation Slips (SCSs) by the counters at the time of finalization of the transaction.
5. While accepting shares certificates, the counter has to ensure that it is in market lots.
6. The counters have to ensure that the share certificates are accompanied by valid TDs with dates later than the previous book closure date, signature of the transferor is genuine, it is in good condition, and meets all the requirements of a good delivery.
7. All delivering brokers have to affix on the reverse of the TD a rubber stamp giving the following:
    (a) Broker's name and code number,
    (b) Name of the exchange,
    (c) SEBI registration of the delivering broker, and
    (d) The amount of the transaction.

The counter has also to certify that any person other than the final transferee does not fill the TD.

(k) Settlement Procedure:

The settlement procedure is different for listed securities and permitted securities and has been briefly described below:

(l) Listed Securities.

OTCEI does not permit short selling or forward buying in listed securities. All deals get completed after the CRs SCs and AASs are confirmed, matched and issued. The settlement process is based on a rolling T+3 settlement system and can be divided into two trading patterns:

(a) transfer of security is not intended, and
(b) transfer of security takes place.

In case the transfer of security is not intended, only a list of CR holders is periodically sent to the company. In case the investor wants that the security should be transferred in his name and his name should appear in the list of members in the register of the company, the untransformed PCR and duly filed TD is sent to the custodian/settler who makes a record of signatures. On T+3 day, the counter prepares a pay-in for the securities purchased and sends to the register with relevant documents. On T+4 day after confirming, the signatures of the seller.

Based on Dave Committee recommendations, SEBI allowed shifting the settlement system from the T+3 system to the T+5 system where the pay-in takes place on the fifth day and the pay-out on the sixth day.

(m) Permitted Securities.

Salient features of settlement of deals in permitted securities are as follows:

i) Settlement mechanism has a five-day trading cycle.
ii) Short selling and squaring up by the counters is to be completed within the trading cycle.
iii) Delivery and payment is on net basis, not on trade basis.
iv) A transaction generates a single confirmation slip for any value of transaction.
v) Certificates must be delivered to the investors within a fortnight from the date of purchase of the security.

6.7 SUMMARY

In this lesson we have discussed the legal and regulatory framework applicable to the securities market in India. The four main legislations governing the securities market are: (1) the SEBI Act, 1992 which establishes SEBI to protect investors and develop and regulate securities market; (2) the Companies Act, 1956, which sets out the code of conduct for the corporate sector in relation to issue, allotment and transfer of securities; and disclosures to be made in public issues; (3) The Securities Contracts (Regulation) Act, 1956, which provides for regulation of transactions in securities through control over stock exchanges; and (4) the Depositories Act, 1996 which provides for electronic maintenance and transfer of ownership of demat securities. Government has framed rules under the SEBI Act and the Depositories Act for registration, and regulation of all market intermediaries, and for prevention of unfair trade practices, insider

trading etc. Under these Acts, government and SEBI issue notifications, guidelines, and circulars, which need to be complied with by market participants. The SROs like stock exchange have also laid down their rules of game. This lesson also discussed the origin, functions, organization activities of SEBI and OTCEI at some length.

6.8 Key Words

Arbitrage: Taking advantage of the difference in the price of a security traded on two or more stock markets, by buying in one and selling in the other (or vice versa).

Arbitration: Settlement of claims, differences, or disputes between on member and another, and between members and their clients, sub-brokers, and so on through arbitrators.

At best: An instruction form the client to the brokers that authorizes the latter to use their discretion and try to execute an order at the best possible price. An “at best” order is valid only for the day it is placed.

Averaging: The process of proportionately buying more and more securities in a declining market (or selling in a rising market) in order to average out the purchase (or sale) price.

Badla: Carrying forward of a transaction from one settlement period to the next without effecting delivery or payment.

Bear: An individual who expects prices in the stock market to go down.

Bear Market: A weak or falling market, characterized by the absence of buyers.

Blue Chips: Shares of large, well-established, and financially sound companies with impressive records of earnings and dividends.
Book Closure: Dates between which a company keeps its register of members closed for updating prior to the payment of dividends or issue of new shares or debentures.

Bull: An individual expecting a rise in prices of shares so that he can later sell a higher price.

Bull Market: A rising market with an abundance of buyers and few sellers.

Cash Settlement: Cash payment for transactions on the due date.

Clearing Days or Settlement Days: Dates fixed in advance by the exchange for the first and last business days of each clearing. The intervening period is called the settlement period, which is normally one weak in the case of “specified” shares and ten days in the case of “non-specified” securities.

Correction: Temporary reversal of trend in share prices. This could be a reaction (a decrease following a consistent rise in prices) or a rally (an increase following a consistent fall in price)

Delivery: Handing down of share certificates that have been traded in the market.

Jobbers: Member brokers of a stock exchange who specialize in buying and selling of specific securities from and to fellow members. Jobbers do not have any direct contact with the public, but they render a useful function of imparting liquidity to the market.

Listed Company: A public limited company which satisfies certain listing conditions and signs a listing agreement with the stock exchange for trading in its securities. One important listing condition is that 25 per cent of the company's issued capital should be offered to the public.

Long Position: A trading position to buy the share from the market.

Market Order: A market order does not specify a price: it is executed at the best possible price available. A marker order can keep the investor from "chasing' a market.

Selling Short: Normally, a security is bought and then sold later. This is described as going long and is profitable in rising markets. The reverse process – selling a security first and then buying it later – is called selling short. This is profitable in a declining market.

Specified Shares: For the purpose of trading, in BSE a security is categorized either as a "specified" share or a "non-specified" security. Stock exchange authorities determine this differentiation. Specified share are 'A" group securities.

Unit or Trading: The minimum number of shares of a company which are accepted for normal trading on the stock exchange. All transactions are generally done in multiple of trading units. Odd lots are generally traded at a small discount.

Volume of trading: The total number of shares that change hands in a particular company's securities. It is the sum of either purchase or sales that necessarily equal. This information is useful in explaining and interpreting fluctuations in share prices.

6.9 SELF-ASSESSMENT QUESTIONS

1. Effective regulation is an essential condition for orderly growth of securities market discuss.
2. Write a brief note on the history of regulation of SEBI.
3. Discuss the objectives and functions of SEBI.
4. What measures have been adopted in India to protect investors' interest in the securities market?

6.10 FURTHER READINGS

1. Casey, John., Ethics in the financial Market Place, New York: Scudder, Stevens & Clark, 1990.
2. Hammer, Richard M., Gilbert Simonetti Jr., and Charles T Crawford, eds. Investment Regulation around the world, Somerset, N.J:Ronald Press, 1983.
3. Web Sites:

- U.S. Security Exchange Commission: www.sec.gov
- Financial Service Authority, UK: www.fsa.gov.uk
- SEBI, India: www.sebi.gov.in

4. NCFM, NSE's Certification in Financial Markets.

R S R

LESSON 7

ECONOMIC ANALYSIS

7.0 Objectives

The objective of this lesson is to enable to:

- explain the relevance of economy analysis for equity investment decision.
- discuss the usefulness of this analysis for an efficient market set up.
- suggest steps that could form part of the economy,

Structure

7.1 Introduction

The objective of fundamental security analysis is to appraise the intrinsic value of the security. The intrinsic value is the true economic worth of a financial asset. Fundamental analysis is really a logical and systematic approach to estimating the future dividends and share price. It is based on the basic premise that share price is determined by a number of fundamental factors relating to the economy, industry and company. The focus here is on economic analysis.

The physical boundary is the overall economic environment in which all companies and the performance of a company depends on the performance of the economy. When the economy

expands, most industry groups and companies are expected to benefit and grow. When the economy declines, most of the industry groups and companies usually face survival problems and the investors are concerned with those variables in the economy which affect the performance of the company in which they intend to invest. Hence, to predict share prices, an investor has to spend time and exploring the forces operating in the overall economy. The selection of a country for investment has to focus itself to the examination of a national economic scenario.

The major variables commonly used to describe the state of the economy are:

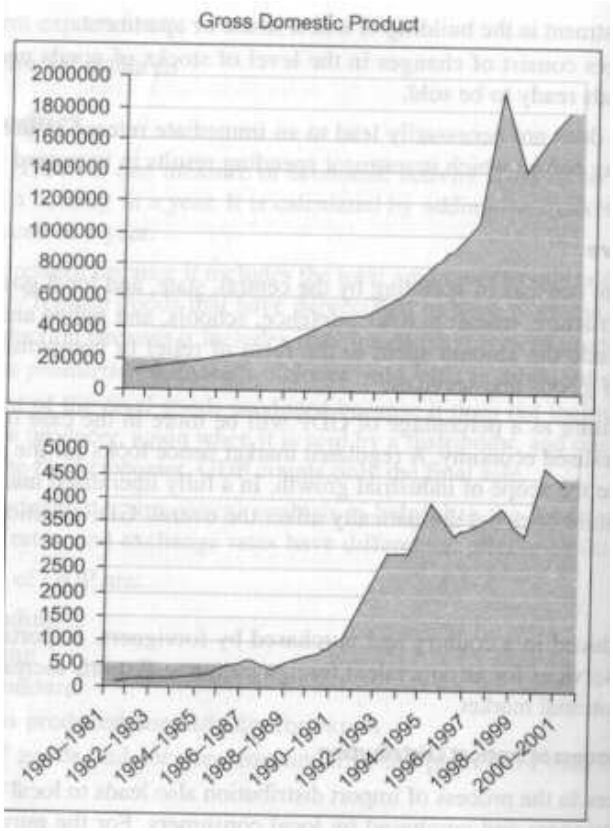
7.2 Growth rate of the Economy:

For investment perspective, the current state of the nation's economy must be determined. The rate of growth of the national economy is an important variable to be considered by an investor. GNP (Gross National Product), NNP (Net National Product) and GDP (Gross Domestic Product) are the different measures of the total income or total economic output of the country as a whole. The growth rates of these measures indicate the growth rate of the economy. The estimates of GNP, NNP and GDP and their growth rates are made available by the Government from time to time. The GDP is the total amount of goods and services produced in a country in a year. It is calculated by adding the market values of all the final goods and services produced in a year.

The estimated growth rate of the economy would be a pointer towards the prosperity of the economy. An economy typically passes through different phases of prosperity, known as the different stages of the economic or business cycle. The four stages of an economic cycle are depression, recovery, boom and recession. The stage of the economic cycle through which a country passes has a direct impact on the performance of industries and companies. Depression is the worst of the four stages. During a depression, demand is low and declining. Inflation is often high and so are interest rates. Companies are forced to reduce reproduction, shut down plant and lay off workers. During Recovery stage, the economy begins to revive after a depression. Demand picks up leading to more investments in the economy. Production, employment and profits are on the increase.

The Boom phase of the economic cycle is characterized by high demand. Investments and production are maintained at a high level to satisfy the high demand. Companies generally post higher profits. This phase gradually slow down. The economy slowly begins to experience a downturn in demand, production, employment, etc. The profits of companies also start to decline. This is the recession stage of the business cycle.

Fig 7.1 Average BSE Index



7.3 Consumption Spending

The production of those domestic goods and services which are consumed by the public is known as consumption spending. It is often sub classified into spending on durable goods, non-durable goods and services.

- Durable goods are items such as cars, furniture and household appliances, which are used for several years.
- Non-durable goods are items such as food, clothing and disposable products, which are used for a short time.
- Services include the rent paid on premises, airplane tickets, legal advice and medical treatment and so on.
-

7.4 Investment Spending

Using the capital for future productive purpose is known as Investment Spending. It consists of non-residential fixed investment, residential investment and inventory changes.

Non-residential fixed investment is the creation of tools and equipment to use in the production of other goods and services, for example, the establishment of factories, installation of new equipment and machines. Residential investment is the building of a new house or apartment. An inventory change consists of changes in the level of stocks of goods necessary for production and finished goods ready to be sold.

Investment spending does not necessarily lead to an immediate release of productive goods and services. There is a time lag before which investment spending results in increased profitability for companies.

7.5 Government revenue, expenditure and deficits

Governments play an important role in most economies, including developing economies like India. The Central Government Budget consists of information on revenues, expenditures and deficit. The Government expenditure consists of spending by the Central, State and local governments on goods and services such as infrastructure, research, roads, defense, schools and police and fire departments. Expenditure by the government stimulates the economy by creating jobs and generating demand. Since a major portion of demand in the economy is generated by Government spending, the nature of government spending is of great importance in determining the fortunes of many industries.

Governmental revenues come from both direct as well as indirect taxes. Direct taxes such as income tax and indirect taxes such as excise duty and customs duty. However, when Government expenditure exceeds its revenue, there occurs a deficit. This deficit is known as budget deficit. Most of the developing countries suffer from budget deficits as governments spend large amounts of money to build up infrastructure. But budget deficit is an important determinant of inflation, as budget deficit leads to deficit financing which fuels inflation.

7.6 Exports

Exports are items produced in a country and purchased by foreigners. Exports lead to an exchange of productive goods and services for an equivalent foreign currency. Exports increase the purchasing power of a nation in an international business.

7.7 Consumption in the process of Import Distribution

Consumption of services in the process of import distribution also leads to local productivity. Imports are items produced by foreigners and purchased by local consumers. The sources of growth identify industries or sectors deserving closer scrutiny for possible investment.

7.8 Exchange rates and Balance of Payments

The performance and profitability of industries and companies that are major importers or exporters are considerably affected by the exchange rates of the rupee against major currencies of the world. A depreciation of the rupee improves the competitive position of Indian products in foreign markets, thereby stimulating exports. The exchange rates of the rupee are influenced by the

balance of trade deficit, the balance of payments deficit and also the foreign exchange reserves of the country. The balance of payment deficit is equal to balance of trade deficit (imports minus exports).

Plus balance on invisibles like tourism and interest rates, plus balance on account of capital account. A balance of payments deficit depletes the forex reserves of the country and has an adverse impact on the exchange rate; on the other hand a balance of payment surplus augments the forex reserves of the country and has a favorable impact on the exchange rate. The exchange rates of the rupee against the major currencies of the world are published daily in the financial express. An investor has to keep track of the trend in exchange rates of rupee. An analysis of the balance of trade deficit, balance of payments deficit and the foreign exchange reserves which help to project the future trends in exchange rates.

7.9 Interest Rates

Interest rates determine the cost and availability of credit for companies operating in an economy. Interest rates vary with maturity, default risk, inflation rate, productivity of capital, special features and so on. A low interest rate stimulates investment by making credit available easily and cheaply. Moreover, it implies lower cost of finance for companies and thereby assures higher profitability. On the contrary, higher interest rates result in higher cost of production which may lead to lower profitability and lower demand. The interest rates in the organized financial sector of the economy are determined by the monetary policy of the government and the trends in money supply. These rates are thus controlled and vary within certain ranges. But the interest rates in the unorganized financial sector are not controlled and may fluctuate widely depending upon the demand and supply of funds in the market. Further, long term interest rates differ from short-term interest rates. An investor has to consider the interest rates prevailing in the different segments of the economy and evaluate their impact on the performance and profitability of companies.

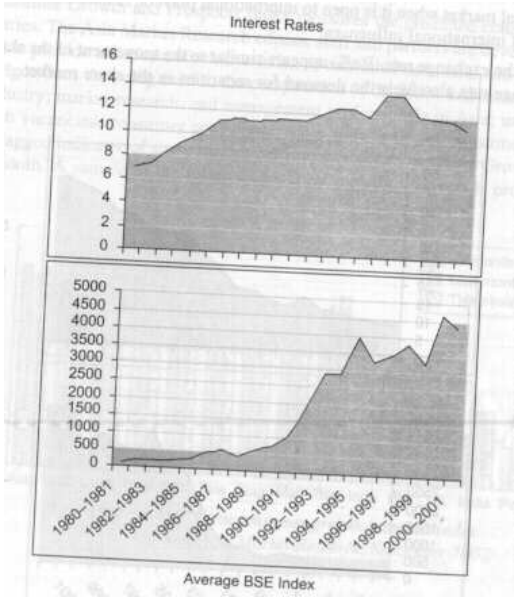


Fig. 7.2 Average BSE Index

7.10 Monetary Policy and Liquidity

Industries need access to funds in order to borrow, raise capital and investment in assets. In the same way, individuals also may need access to funds to borrow to purchase house, car and other high-priced durable goods. If the monetary policy is very tight and banks have little excess reserves to lend, the sources of capital become scarce and economic activity may slow down or decline. Although a good monetary policy and liquidity is essential for the economy, excess liquidity can be harmful. Excess money supply can lead to inflation, higher interest rates and higher risk premiums leading to costly sources of capital and slow growth.

7.11 Inflation

Inflation prevailing in the economy has considerable impact on the performance of companies. Higher rates of inflation upset business plans, lead to cost escalation and

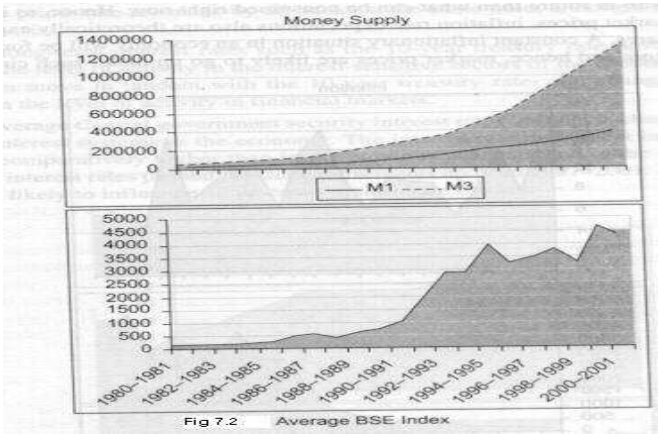


Fig 7.2

result in a Squeeze on profit margins. On the other hand, inflation leads to erosion of purchasing power in the hands of consumers. This will result in lower demand for products. The effect of inflation on capital markets is numerous. In terms of valuing financial assets, inflation reduces the value of fixed-income securities. An increase in the expected rate of inflation is expected to cause a nominal rise in interest rates. Also, it increases uncertainty of future business and investment decisions, which in turn, increases risk premiums. Inflation increases, it results in extra costs to business, thereby squeezing their profit margins and leading to real declines in profitability.

Inflation is measured both in terms of wholesale prices through the wholesale price index (WPI) and in terms of retail prices through the consumer price index (CPI). These figures are variable on weekly or monthly basis. As part of the fundamental analysis, an investor should evaluate the inflation rate prevailing in the economy currently as also the trend of inflation likely to prevail in the future.

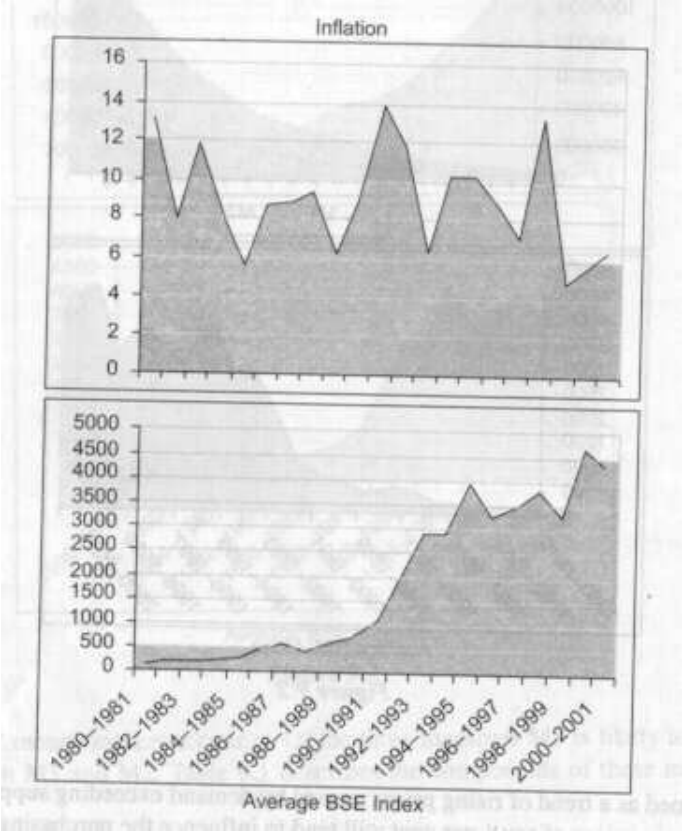


Fig. 7.4 Average BSE Index

7.12 Infrastructure

The development of an economy depends very much on the infrastructure available. Industry needs electricity for its manufacturing activities, road and railways to transport raw materials and finished goods, communication channels to keep in touch with suppliers and customers. The availability of infrastructural facilities such as power, transportation and communication systems affects the performance of companies. Inadequate or bad infrastructure leads to inefficiencies lower productivity, wastage and delays. An investor should assess the status of the infrastructural facilities available in the economy before finalizing his investment plans.

7.13 Monsoon

The Indian economy is essentially an agrarian economy and agriculture forms a very important sector of the Indian economy. Because of the strong forward and backward linkages between agriculture and industry, performance of several industries and companies are dependent on the performance of agriculture. Moreover, as agricultural income rise, the demand for industrial products and services will be good and industry will prosper. But the performance of agriculture to a very great extent depends on the Monsoon. The adequacy of the monsoon determines the

success of failure of the agricultural activities in India. Hence, the progress and adequacy of the monsoon becomes a matter of great concern for an investor in the Indian context.

7.14 Political and Economic Stability

A stable political and economic environment is necessary for steady and balanced growth. No economy or industry can grow and prosper in the midst of political turmoil. Stable long term economic policies are what are needed for industrial growth. Such stable policies can emanate only from stable political systems as economic and political factors are interlinked. A stable government with clear cut long-term economic policies will be conduct to good performance of the company.

7.15 Consumer Sentiments

The consumer sentiment is usually expressed in terms of the future expenditures planned and the feeling about the future economy. The sentiment of consumer and businessmen can have an important bearing on economic performance. Higher consumer confidence leads to higher expenditure on big ticket items. Higher businessmen confidence gets translated into greater business investment that has a stimulating effect on the economy. These sentiments influence consumption and investment decisions and have a bearing on the aggregate demand for goods and services. The Asian Consumer Growth and Prospects Index measure the predicted consumer demand growth in 14 Asian countries. The Asia Market Research editors, staff and partners are developing this index. The index is designed to provide a forecast of relative index of consumer sentiment and demand for a year. This consumer Growth Prospect Index is prepared every month.

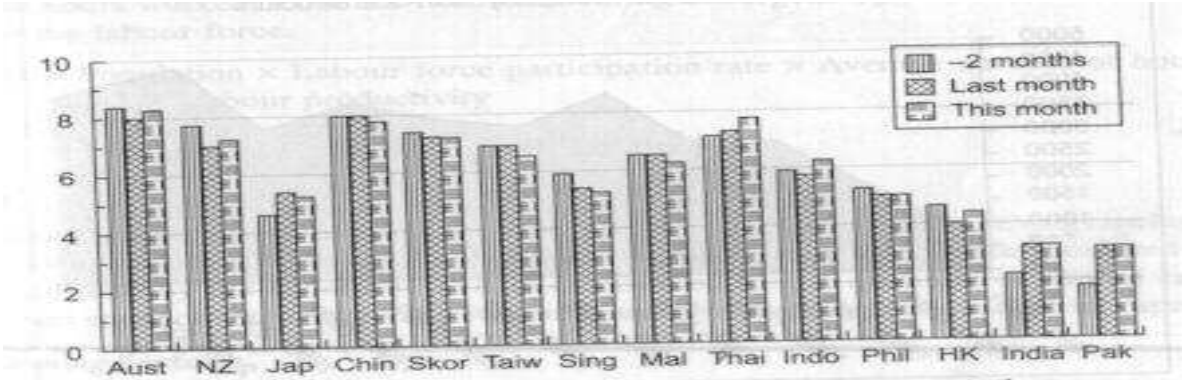


Figure 7.5 *AMR Asian consumer growth prospects index*
Source: Asia Market Research, September 2002

7.16 Fiscal Policy

The fiscal policy of any government involves the collection and spending of revenue. In particular, fiscal policy refers to efforts by the government to stimulate the economy directly, through spending. Fiscal Policy mostly affects short-run demand. Government spending can directly affect economic sectors and geographic regions. Assuming all other parameters as constant, some economists believe that a larger than expected increase in government spending may increase short-run demand and vice-versa. Tax changes strongly influence the incentives to save and invest and may, therefore, affect both short-term expectations as well as long term supply.

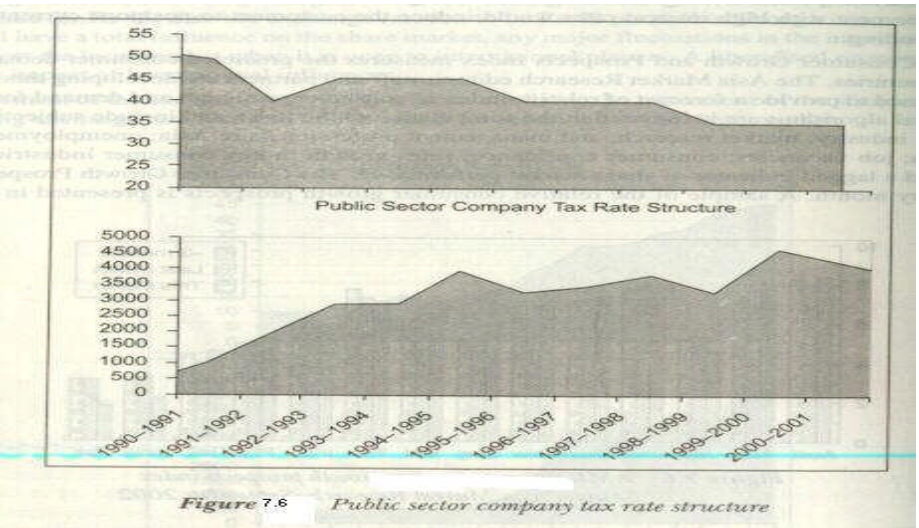


Figure 7.6 Public sector company tax rate structure

7.17 International Influences

Rapid growth in the overseas market can create surges in demand for exports, leading to growth in export sensitive industries and overall GDP. In contrast, the erection of trade barriers, quotas, nationalistic fervor and currency restrictions can hinder the free flow of currency, goods and services and harm the export sector of an economy. The business cycles of the developed, developing and less developed nations do not rise and fall together. Therefore, a strong economy such as that of the US can, at times, assist economies experiencing a recession by importing their products and vice versa.

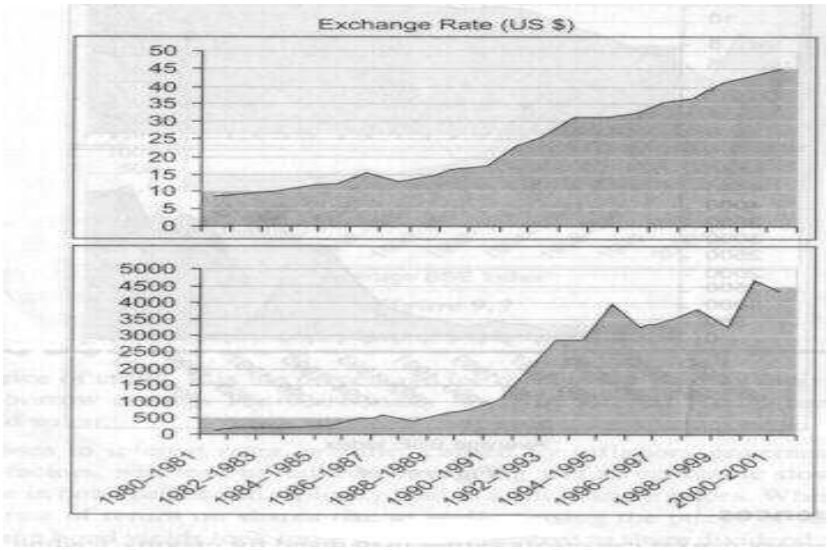


Fig 7.7Average BSE Index

One important measure of influence of international economies is the exchange rate – the rate at which one currency may be converted into another.

Table 1.1

Behavior of Economic Indicators and their Suggestive Impact on the Share Market

Economic Indicator	Situation	Impact on the share market
1. Gross Domestic Product	Growth Decline	Positive (Bullish Market) Negative (Bearish Market)
2. Inflation	Constant Prices Inflationary / deflationary prices	Positive (Bullish Market) Negative (Bearish Market)
3. Unemployment	Increase Decline	Negative (Bearish Market) Positive (Bullish Market)
4. Individual Savings	Increase Decline	Positive (Bullish Market) Negative (Bearish Market)
5. Interest Rate	High Low	Negative (Bearish Market) Positive (Bullish Market)
6. Exchange Rate	Favorable (strong against foreign currency) Unfavorable (weak against foreign currency)	Positive (Bullish Market) Negative (Bearish Market)
7. Domestic Corporate tax Rate	High Low	Negative (Bearish Market) Positive (Bullish Market)
8. Balance of Trade	Positive trade balance (exports greater than imports) Negative trade balance (imports greater than exports)	Positive (Bullish Market) Negative (Bearish Market)

Source :

The above table is relevant assuming all other economic indicators do not change for a given situation. A combination or set of these economic conditions defines an economy at any point of time. Hence, any economic indicator need not necessarily support the share market behaviour suggested earlier, though theoretically it might be possible. In addition, a change in one economic variable has a multiple impact on other economic indicators either positively or negatively. Investors can workout a qualitative set of economic situations and the possible investment. An examination of these variables will give an investor a handy reference in interpreting the direction of the economy and the stock market.

7.18 Summary

In this Unit, we have discussed the relevance of economy for equity investment decision. We have also noted the usefulness of fundamental analysis in efficient market set up. It is highlighted in this unit that the nature of economy analysis and discusses economic forecasting techniques viz., anticipatory surveys, barometric or indicator approach and the econometric model building approach.

7.19 Self Assessment Questions

1. What is the purpose of Economy Analysis?
2. What are the sources of information for Economy Analysis?
3. How does inflation affect savings and investment?
4. How does economy analysis help in investment decisions?

7.20 Further Readings

- Fisher, D.E. and R.J.Jordon, 1991, Security Analysis and Portfolio Management, 5th ed., PHI, New Delhi.
- Graham, B and D.L. Dodd, Security Analysis, McGrawHill, 1996
- Graham B, D.L. Dodd, S.Cottle and C.Tatham, Security Analysis, New York, McGraw Hill, 1962.

B K S P

LESSON 8

INDUSTRY ANALYSIS – INVESTMENT DECISION

8.0 Objectives

- Explain the relevance of industry analysis for equity investment decision.
- Discuss the various stages of industry life cycle and the investor behaviour.
- Know the influencial factors while investing the equity in various industries.
- Discuss the various techniques to evaluate different industry analyses.

Structure

8.1 INTRODUCTION

After conducting analysis of the economy and identifying the direction it is likely to take in the short, intermediate and long term, the analyst must look into various sectors of the economy in terms of various industries. An industry is a homogenous group of companies, i.e., companies with similar characteristics can be grouped into one industrial group. A broad concept of industry would include all the factors of production, transportation, trading activity and public utilities. The broad classification of industry, however, would not be relevant for an investor who would like to ensure that he does not lose from the investment that he makes. It is, therefore, essential to qualify the industry into some characteristics homogeneous group.

Usually, the industry is classified based on process and stage of its development. It may also be classified according to work group that it identifies to. In India, the broad classification of industry is made according to stock exchange list which gives a distinct classification to industry to industry in different forms. There are many-a-basis on which grouping of companies can be done. For example, traditional classification is generally done product wise like pharmaceutical,

cotton textile, synthetic fiber industry, etc., though this classification is useful but it does not help much in investment decision-making. This categorization broadly gives the investor some kind of headway and he may then analyze the industry and find out whether it is profitable to make an investment or not.

The characteristics of industrial growth begin with certain important factors. One of the important factors is technology, which keeps on changing. The investors should carefully view the technological changes. A product with frequent technological changes may be useful for the investor to notice as product obsolescence may erode his investment. The second factor is the type of competition that an industry faces in the country. The amount of profit earning is expected to be more in a company which has less pressure of competition. The investor is always likes to invest his hard earned money in a company where the possibility of gain through less competition is more. Another factor is the kind of environment and customer activity in a country. In a less developed nation, where cheaper products would be sold and demand for these products will be higher than quality and long lasting products. Whereas, in case of advanced nations the customers will expect more quality products even with higher prices. Therefore, while investing funds in these industry groups, the investor should carefully evaluate these factors.

8.2 CLASSIFICATION OF INDUSTRIES

The classification of industries into different groups is based on their development. There are generally three groups an industry in their categorization. . As an investor, from the investment decision point of view, this classification is very important in his investment decision making, which are explained as follows:

(i) Growth industry:

This is the industry, which is expected to grow persistently, and its growth is likely to exceed the average growth of the economy. The growth of the industry mainly depends on the technological change.

(ii) Cyclical industry:

In this category of the industry, the firms included are those that move closely with the rate of industrial growth of the economy and fluctuate cyclically as the economy fluctuates. The growth and the profitability of the industry move along with the business cycle. During the boom period they enjoy growth and during depression they suffer a set back.

(iii) Defensive industry:

It is a grouping that includes firms, which move steadily with the economy and decline less than the average decline of the economy in a cyclical downturn. The firms belongs to this group expand and earn income in the depression period too, under the government's umbrella of protection and are counter-cyclical in nature.

(iv) Declining industry:

This is that category of firms, which either generally decline absolutely or grow less than the average growth of the economy.

8.3 INDUSRY ANALYSIS

The objective of this analysis is to assess the prospects of various industrial groupings. Admittedly, it is almost impossible to forecast exactly which industrial groupings will appreciate the most. Yet careful analysis can suggest which industries have a brighter future than others and which industries are plagued with problems that are likely to persist for a while.

Concerned with the basis of industry analysis, this section is divided into three parts:

- Industry life cycle analysis
- Study of the structure and characteristics of an industry.
- Profit potential of industries: Porter model.

8.3.1 Industry Life Cycle Stages:

Industry should also be evaluated or analyzed through its life cycle, which may be explained through the industrial life cycle state. 'Grodinsky' has defined these stages of an industry as the pioneering stage, expansion stage and stagnation stage. Industries with different stages of their life cycle development exhibit different characteristics. In fact, each development stage is quite unique. Grouping firms with similar characteristic of development helps investors to properly evaluate different investment opportunities in the companies. Based on the stage in the life cycle, industries may be discussed as under:

(i) Pioneering Stage:

The industrial life cycle as defined by Grodinsky has a pioneering stage when the new inventions and technological developments take place. Being the first stage, the technology and its products are relatively new and have not reached a stage of perfection. At this stage the profits are also very high as the technology is new. There is a lot of demand for its products in the market, thereby; the profits opportunities are in plenty. This is a stage where the venture capitalists take a lot of interest and enter the industry and sometimes organize the business.

At this stage the risk of many firms being out of the industry is also more; hence, mortality rate is very high in the industry, with the result that if an industry withstands the risk of being out of the market, the investors would reap the rewards substantially or else substantial risk of loss of investment exists. As the profits are more at this stage, there was a mushroom growth of companies during this period. But as the competition grew among firms, lease rentals reduced and came down to a level where it became difficult for a number of companies to survive. This period saw many companies that could not survive the onslaught of competition and only those, which could tolerate this onslaught of price war, could remain in the industry.

(ii) Fast growing stage:

This is the second stage when the chaotic competition and growth that were the hallmark of the first stage is more or less over. Firms that could not survive this onslaught have already died down and the surviving firms now dominate the industry. The demand of its product still grow faster in the market leading to increasing amount of profits companies could reap. At the industry level, however, sales and earnings will grow at an extremely rapid rate, because the new product has not yet saturated its market. Thus, it is the stage where companies grow orderly and rapidly and thus these companies provide a good investment opportunity to the investors. The investor will find that this is the best time to make an investment.

In fact, as the firms during this stage of development grow faster, they sometimes break the records in various areas like payments of dividends etc., thus becoming more and

more attractive for investment. At this stage, the firms begin to expand themselves both through external means of financing through loans and public issue of shares as well as through internally generated funds. This is the period of security and safety and this is also called period of maturity for the firm.

(iii) Maturity and stabilization stage:

The third stage where industries grow roughly at the rate of the economy and are fully developed reach a stage of stabilization. Looked at differently, this is a stage where the ability of the industry to grow appears to have more or less lost. As compared to the competitive industries, rate of growth in the industry is slower. Sales may still be rising, but at a lower rate. It is at this stage that the industry is facing the problem of what Grodinsky called "latent obsolescence" a term used to describe a situation where earliest signs of decline have emerged. During this stage, the investor will find that although there is increase in sales of an organization, this is not in relation to the profits earned by the company. Firms at this stage sometimes are characterized as cash cows, having reasonably stable cash flow but offering little opportunity for profitable expansion.

Therefore, the investors have to be very cautious to examine and interpret these signs before they took the investment decision. The firms begin to change their course of action and plan to sell away their investments and find better avenues in those firms where the expansion stage has set in. There are several reasons for a firm to come to this stabilization stage, which are discussed as under:

a) Changes in social habits and attitudes: The social change may arise from the prosperity with which the people are able to spend more so that new products have more demand and the existing ones have less market. Besides, the creation of awareness also leads to changes in the consumption of certain commodities to improve their health. All these factors brought about a change in social habits in the country.

b) Government Policies: From time to time, the government has been changing its policies and thereby all these will have an impact the industry and the consumption of goods and services. Further, the foreign policy also has its impact on the working of the domestic industrial units and their marketing of products and services.

c) Technology Up gradation: One of the important reasons for having different stages in the life of the industry is due to technological changes. These technological developments result to new models/designs, more quality and durability, less cost of production, etc. With all these developments the existing technology will become out datedness and obsolescence and decline in the existing products market.

d) Labour Cost: One of the reasons which brings about a decline of industry is the labour cost. During the expansion stage because of more demand for products, the firms begin to pay more wages to its workers. On the other hand, during the period of depression the payment of wage is low due to less demand of the products.

. **(ii) Relative Decline stage:**

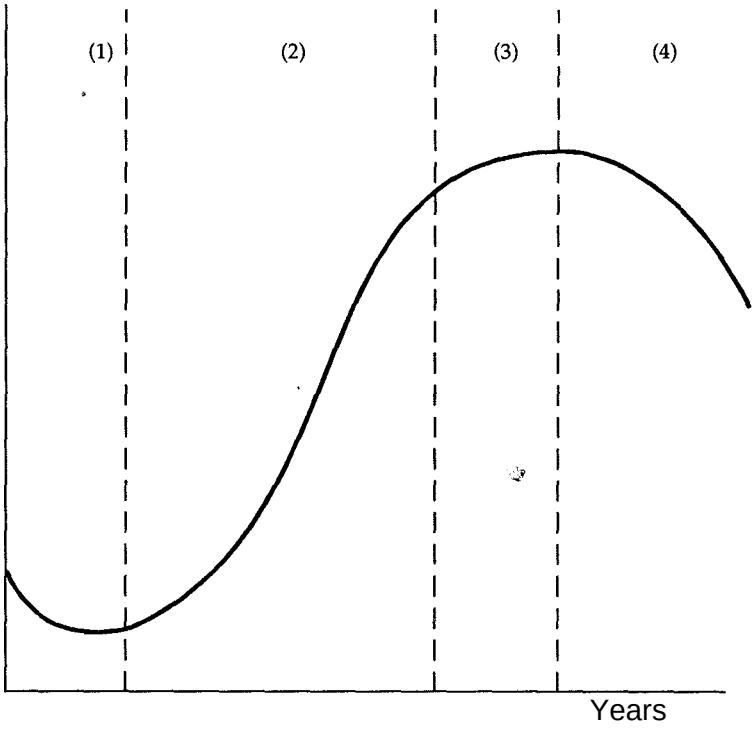
The fourth stage of industrial life cycle development is the relative decline stage. In this stage, the industry might grow at less than the rate of the overall economy, or it might even shrink. This could be due to obsolescence of the product, competition from new products, or competition from new low-cost suppliers. Industry at this stage has grown old and therefore,

new products, new technology has come in the market. Customers have changed their habits, styles, likings etc. Its products are not much in demand as was in the earlier stages. Still, the industry can continue to exist for some more time. Consequently, the industry would grow less than the average growth of the economy during the best of the times of the economy. But as is expected, the industry would decline much faster than the decline of the economy in the worst of times.

The peculiar characteristic of different stages of life cycle development of industries has a number of implications for investment decision. For example, Pioneering stage is very risky stage. And as you know that risk and returns are positively correlated, investment at this stage is quite rewarding. However, for an investor looking for steady long-term returns with risk aversion, it is suggested that he should in general avoid investing at this stage. These are good for venture capitalists. But if he is still keen to invest, he should try to diversify or disperse his investment in order to reduce the risk. It would be quite prudent on his part to look for companies that are in the second stage of development i.e., fast growth. This probably explains the prevalent higher stock prices of the companies of this industry.

From the investment point of view, selection of the industries at the third stage of development is quite crucial as it is the future growth of the industry that is relevant and not its past performance. There are a number of examples where the share prices of a company in declining industry have been artificially hiked up in the market. This is justified on the basis of good record of its performance. But the fact of the matter is that a company in a declining industry would sooner or later feel the pinch of its features and an investor investing in companies at this stage would experience reduction in the value of his investment in due course.

Figure 8.1 Industry Life Cycle Stages



(1) Pioneering stage (2) Expansion stage (3) Stagnation stage (4) Decay Stage

Having discussed various investment implications, it may be pointed out that one should be careful while using this classification. This is because the above discussion assumes that the investor would be able to identify various stages in the industrial life' cycle. In practice, it is a very difficult proposition to detect which stage of development an industry is at. Needless to say, it is only a general framework that is presented above and he can use it for meaningful analysis with suitable modifications.

In order to strengthen the analysis further, it is essential to study the unique features of the industry in detail. Due to its unique characteristic, unless the specific industry is studied properly and in depth with regard to these, it will be very difficult to form an opinion for profitable investment opportunities. Given below are some of the features that could be considered for a detailed investigation while selecting an industry for investment. These features broadly relate to the operational and structural aspects of the industry.

8.3.2 Characteristics of the Industry

In the industry analysis, there are a number of significant characteristics that should be considered by the analyst. These characters are broadly divided into operational and structural aspects. In the following paragraphs some of the important featurs are discussed:

i) Demand Supply Gap

The demand for a product usually tends to change at a steady rate, whereas the capacity to produce that product tends to change at irregular intervals, depending upon the installation of the additional production capacity, which may result excessive or inadequate supply. The excess supply reduces the profitably of the industry the inadequate supply tends to improve the profitability Thus, the difference between demand and supply in an industry is a fairly good indicator for its future prospects. As part of industry analysis, the investor should estimate the demand supply gap in the industry.

ii) Competitive Position:

Another significant factor to be considered in the industry analysis is the competitive environment in the industry, which includes barriers to entry, threat of substitution, bargaining power of the buyers and suppliers and the rivalry among the competitors. The barriers to entry may arise because of product differentiation, absolute cost advantage or economy of scale. The new inventions are always taking place and better products are always replaced the existing ones. The industry that can be replaced by new products or substitutes is through it in a weak position. In an industry, where buyers' market prevails, who have more bargaining power; force to reduce the prices, eroding profitability in the industry, which also leads to a weak competitive position. On the contrary, an industry where the sellers have higher bargaining power is expected to do well and be in a good position.

Questions most often asked in this context are:

- Which firm in the industry play a leadership role and how firms compete among themselves?
- How is the competition among domestic and foreign firms both in the domestic and the foreign markets? . How do the domestic firms perform there?
- Which type of products is manufactured in this industry? Are these homogenous in nature or highly differentiated?

- What is the nature and prospect of demand for the industry? This may also incorporate the analysis of classifying major markets of its products: Customer-wise and geographical area-wise, identifying various determinants of the demand of its products, and assessing the likely demand scenarios in the short, intermediate arid long run.
- Which type of industry is it: growth, cyclical, defensive or relative decline industry

iii) Labour Conditions:

The state of labour conditions in the industry under analysis is another important consideration, where the labour unions are very powerful. If the employees in a particular industry is violent in behaviour and rebellious in their attitude and inclined to resort to strikes/bundhs very often, the prospects of that industry cannot become bright.

iv) Attitude of Government

As a regulatory authority, the government attitude towards an industry has a significant impact on its prospects, which may encourage the industries by way of providing assistance or through favourable legislation. On the other hand, the government may look certain industries with disfavor by imposing different kinds of legal restrictions on its development. Therefore, a prospective investor should consider the role of the government, which is likely to play in the industry.

v) Supply of Raw Materials:

The availability of raw materials is another factor, which dictates the fate of the industry. In some industries there may not be any difficulty in obtaining the raw materials as they may be indigenously available in plenty, whereas, in some industries, they may have to depend on a few suppliers, who may create trouble in supplying their inputs. Therefore, the analyst must take into consideration the availability of raw materials and its impact on the industry prospects.

vi) Cost Structure

Another factor to be considered in the industry analysis is the cost structure of the industry, which affects the prospects of the industry. In case of high fixed cost component, more sales volume is necessary to obtain the break-even point. The industrial analyst would consider favorably the selection of the industry, which has a lower break-even point. The worth of a share depends on its return, which in turn depends on profitability of the company. Interesting part here is that growth is an essential variable but its mere presence does not guarantee profitability. Profitability depends upon the state of competition prevalent in the industry, cost control measures adopted by its constituent units and the growth in demand for its products.

While conducting an industry analysis from the point of view of cost and profitability, some relevant aspects to be investigated are: How is the cost allocation done among various heads IIKC raw materials, wages and overheads? Knowledge about the distribution of costs under various heads is very essential as this gives an idea to the investors about the controllability of costs. Some industries have overhead costs much higher than others. Likewise, labor cost is another area that requires close scrutiny. This is because finally whether labor is cheap or expansive depends on the wage level and labor productivity. Labor that apparently look cheaper may turn out to be costlier when its productivity is taken into account.

- Price of the product of the industry
- Capacity of production - installed, used, unused etc.
- Level of capital expenditure required to maintain or increase the productive efficiency.

Profitability is another area that calls for a thorough analysis on the part of investors. This requires a thorough analysis on the part of investors. No industry can survive in the long run if it is not making profits. This requires a thorough investigation into various aspects of profitability. However, such an analysis can begin by having a bird's eye view of the situation. In this context ratio analysis has been found quite useful. Some of the important ratios often used are:

- Gross Profit Margin ratio
- Operating Profit Margin ratio
- Rate of Return on Equity
- Rate of Return on Total Capital

Ratios are not an end in themselves. But they do indicate possible areas for further investigation. Thus, the industrial analyst should analyze all the above said factors before making an investment decision.

vii) Technology and Research:

Due to increasing competition in general, technology and research play a crucial part in the growth and survival of a particular industry. However, technology itself is subject to change; sometimes, very fast, leading to obsolescence. Thus only those industries, which are updating themselves in the field of technology, could have a competitive advantage over others in terms of the quality, pricing of products etc. The relevant questions to be probed further by the analyst in this respect could include the following:

- What is the nature and type of technology used in the industry?
- Are there any expected changes in the technology in terms of offering new products in the market leading to increase in sales?
- What has been the relationship of capital expenditure and the sales over time? Whether more capital expenditure has led to increase in sales or not?
- What has been the amount of money spent in the research and development activities of the firm? Does the amount on the research and development in the industry relate to its redundancy or otherwise?
- What is the assessment of this industry in terms of its sales and profitability in the short, intermediate and long run?

In this age of rapid technological change, the permanence of an industry is more depended on how it equipped with the latest technology. Thus, the permanence is a phenomenon related to the products and the technology used by the industry. If the analyst feels that the need for a particular industry will vanish in a short period, or that the rapid technological changes would render the products obsolete within a short period, it would be foolish to invest in such an industry. The impact of all these factors have to be finally translated in terms of two most crucial numbers i.e., sales and profitability - their level and expected rate of change during short, intermediate and long run.

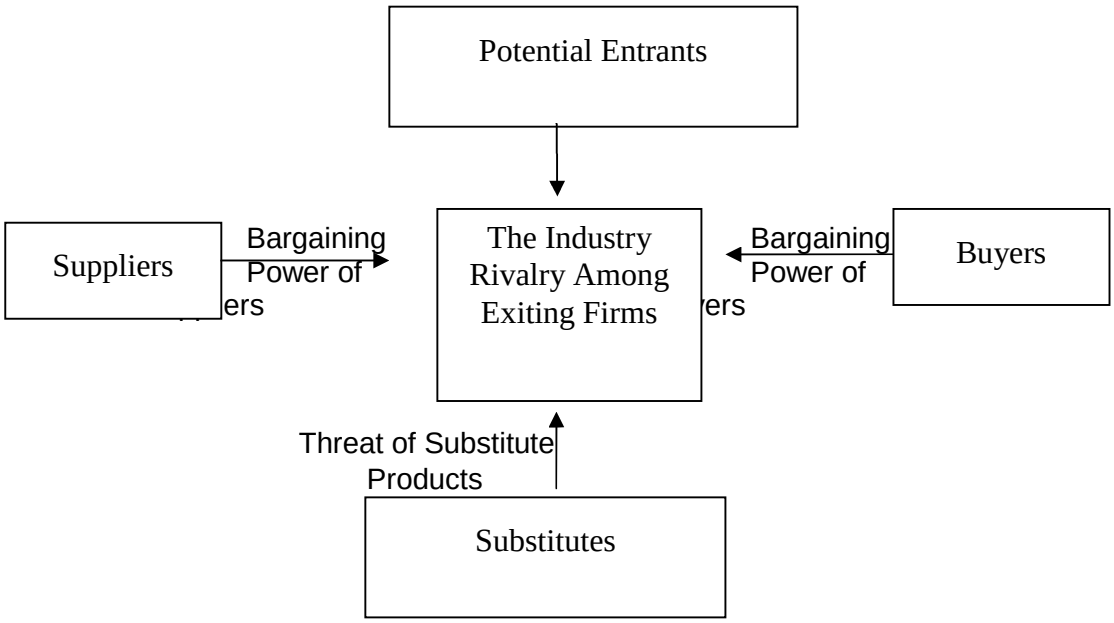
8.3.3 Profit Potential of Industries: Porter Model

Michael Porter has argued that the profit potential of an industry depends on the combined strength of the following five basic competitive forces:

- Threat to new entrants
- Rivalry among the existing firms
- Presssure from substitute products
- Bargaining power of buyers
- Bargaining power of seller

Figure 8.2 shows diagrammatiocally the forces that drive competition and determine industry profit potential.

Figure 8.2 Forces Driving Industry Competition



i) Threat of New Entrants: New entrants add capacity, inflate costs, push prices down, and reduce profitablity. Hence, if an industry faces the threat of new entrants, its profit potential would be limited. The threat from new entrants is low if the entry barriers confer an advantage on existing firms and deter new entrants. Entry barriers are high when:

- The new entrants have to invest substatial resources to enter the industry.
- The government policy limits or even prevents new entrants.
- Economies of scale are enjoyed by the industry.

ii) Rivalry between Existing Firms: Firms in an industry compete on the basis of price, quality, promotion, service, warranties, and so on. Generally, a firm's attempts to improve its competitive position provoke retaliatory action from others. If the rivalry between the firms in an

industry is strong, competitive moves and countermoves dampen the average profitability of the industry. The intensity of rivalry in an industry tends to be high when:

- The number of competitors in the industry is large.
- The industry growth is sluggish, prodding firms to strive for a higher market share.

iii) Pressure from Substitute Products: In a way, all firms in an industry face competition from industries producing subsittute products. Performing the same function as the product of industry, substitute products may limit the profit potential of the industry by imposing a ceiling on the prices that can be charged by the firms in the industry. The threat from substitute products is high when:

- The price-performance tradeoff offered by the substitute products is attractive.
- The switching costs for prospective buyers are minimal.

iv) Bargaining Power of Buyers: Buyers are a competitive force. They can bargain for price cut, ask for superior quality and better service, and induce rivalry among competitorsw. If they are powerful, they can depress the profitability of the supplier industry. The bargaining power of a buyer gruoup is high when:

- Its purchases are large relative to the sales to the seller,
- Its switching costs are low
- Its poses a strong threat of backward integration.

v) Bargaining power of Suppliers: Suppliers, like buyers, can exert a competitive force in an industry as they can raise prices, lower quality, and curtail the range of free services they provide. Powerful suppliers can hurt the profitability of the buyer industry. Suppliers have strong bargaining power when:

- Few suppliers dominate and the supplier group is more concentrated than the buyer group.
- There are hardly any viable subsitutes for the products supplied.
- The switching costs for the buyers are high.

8.4 TEHCHNIQUES OF INDUSTRY ANALYSIS

Up till now, we have discussed about various factors that are to be taken into account while conducting industry analysis. Now, we turn our attention to various techniques that help us to evaluate the factors mentioned above:

i) End Use and Regression Analysis:

It is the process whereby the analyst or investor attempts to diagnose the factor that determines the demand for the output of the industry. This is also known as end-use or product-demand analysis. In this process, the investor hopes to uncover the factors that explain the demand. Some of the factors found to be powerful in explaining the demand for the industry are: GNP, disposable income, per capita consumption, price elasticity of demand, per capita income. In order to identify the factors which affect demand, statistical techniques like regression

analysis and correlation have been often used. These help identify the important factors/variables. However, one should be aware of their limitations.

ii) Input Output Analysis:

This analysis helps us understand demand analysis in greater detail. Input output analysis is very useful technique that reflects the flow of goods and services through the economy, including intermediate steps in the production process as the goods proceed from the raw material stage through final consumption. This information is reflected in the input-output table that reflects the pattern of consumption at all stages - not just at the final stage of consumption of final goods. This is done to detect any changing patterns or trends that might indicate the growth or decline of industries.

8.5 SUMMARY

Industry analysis helps in both selections of industry and to diversify investments suitably to fit the specific risk requirements of investors. Though there ought to be a definite link between industry and economy, some industries outperforms the economy while others under perform the expectations. As part of industry analysis, it is pointed out that more than product wise classification; life-cycle stage-wise classification of industries is more useful for investment decision. Besides, there are various other factors also to be considered at the time of taking the investment decision by the investor. Techniques that are used for an industry analysis are end use and regression analysis, input and out put analysis, etc.

8.6 KEY WORDS

Capital Gain (Loss): The difference between the current market value of an asset and the original cost of the asset, with adjusted for any improvement or depreciation in the asset.

Earning per share: A corporation's accounting earnings divided by the number of its common shares outstanding.

Earnings-price ratio: The reciprocal of the price-earnings ratio.

Rate of return: The percentage change in the value of an investment in a financial asset (or portfolio of financial asset) over a specified time period.

Variance: The squared value of the standard deviation.

8.7 SELF-ASSESSMENT QUESTIONS

1. Discuss the classification of Industries.

2. What is the process of Industry analysis?

3. What are the techniques used in the industry analysis?

4. Explain the concept of industry life cycle. Describe the different stages in the industry life cycle.

5. Describe the various characteristics of an industry that an analyst must consider while doing industry analysis.

6. Why is Industry Analysis important? Why should it follow the economic analysis?

8.8 Further Readings

- Fischer, D.E. and R J Jordan, 1995, Security Analysis and Portfolio Management, Prentice Hall of India, New Delhi.
- Elton, Edwin J., and Martin J. Gruber, Modern Portfolio Theory and Investment Analysis, John Wiley & Sons, New York.
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LESSON 9

COMPANY ANALYSIS

9.0 Objectives

After reading this lesson, you should be able to:

- Know the need for and importance of Company analysis
- understand the concept and estimation of equity price.
- Explain the quantitative and qualitative methods of equity valuation
- discuss the methods of forecasting Earnings per share.
- Assess the various non-financial indicators for valuation of the equity

Structure

9.1 INTRODUCTION:

The economic and industrial analysis enable us to shortlist the industries for the purpose of investment. But a specific industry and economic environment may enhance the performance of a company for a period of time and ultimately the company's own strengths will judge its performance over the period of time. Even though the industry might be doing well, yet some companies in the industry may not be doing so well or rather may be doing poorly. Hence, the company analysis is the final stage of fundamental analysis which decides the company in which the investor should invest the money. The company analysis deals with the estimation of return and risk of investment by seeking information from many pieces, which influences the investment decision. The company analysis is a method of assessing the competitive position of a firm, its earning and profitability position, the efficiency with which it operates, its financial condition and future prospects with respect to the earnings of its shareholders.

In the preceding two lessons, it has discussed on the economy and industry analysis and their relevance while taking the investment decision. Now, in this lesson an attempt is made on to explain the company analysis to provide a proper base for an investor to take an investment decision given his goal of maximisation of wealth. To attain this objective the common sense decision of an investor is:

- Buy the share at a low price, and
- Sell the share at a high price.

In practice, it is very difficult to understand and apply this decision rule due to some problems faced by the investor in finding out, whether the price of a company's share is high or low and also the benchmark to use for comparison of the price of the share. Of course the fist question becomes easier if some benchmark is agreed upon with which the prevailing market price can be compared.

9.2 NEED FOR COMPANY ANALYSIS:

As it is already discussed that the fundamental analysis helps the investor by providing a benchmark in terms of intrinsic value. This value is dependent upon economy, industry and company fundaments and out of this three, the company analysis provides a direct link between the investor's action and his investment goal in operational terms. This is because an investor buys the equity share of a company and not that of industry and economy. The industry and economy framework indeed provide him with proper background against which he buys the shares of a particular company.

A company which has a high intrinsic value is not necessarily the best stock to buy. It may not have any growth prospects or it may be overpriced. Similarly, a company that performs well during any one year may not be the best to buy, rather a company which has been doing badly for sometime might have turned the corner and it may be the best buy as its shares may be under priced

and it has good prospects of growth so an analyst should not be guided by one or a few indicators but has to consider the performance of die whole company, that too over a period of tune. Besides, a company is to be judged in die background of the industry's performance, product nature, prospects of die industry etc.

Thus, to identify those companies which are doing relatively well in die industry a penetrating analysis of the financial and non-financial strengths and weaknesses is to be made. A careful examination of the company with its quantitative and qualitative fundamentals is therefore, very essential.

9.3 ESTIMATION OF FUTURE PRICE:

Before attempting to discuss the approach that can be adopted for company level analysis, let us be clear about the objective of investor and how it can be quantified?

It is to reiterate the proposition that an investor looks for increasing his returns from the investment. These returns are composed of capital gains and a stream of income in the form of dividends. Assuming he wants to hold equity shares for a period of one year only, i.e. he sells it at the end of the year; the total return received by him would be equal to the capital gains plus dividends received at the end of the year, i.e.

$$R_t = (P_t - P_{t-1}) + D_t$$

Where,

P_t = Price of the share at the end of the year
P_{t-1} - Price of the share at the beginning of the year
D_t = Dividend received at the end of the year
R_t = Return for the holding period, t.

In order to calculate the return received by him on his original investment (i.e. purchase price), total returns should be divided by P_{t-1}. These are expressed in percentage terms and known as holding period yield (HPY). Thus,

$$HPY\ (\%) = \frac{(P_t - P_{t-1}) + D_t}{P_t - 1} \times 100$$

The above computation is quite simple so long as the value of the variables is available. In actual practice, however, the investor would know the beginning price of the share, as this is the price he has paid to buy the shares but the price at the end of the year i.e. selling price as well as dividend income to be received would have to be estimated. This is where the problem lies and how to estimate the future price of the share as well as dividends is the main challenge. Time series data relating to dividends paid by companies provide us useful clues in estimating the dividends likely to be declared by companies. Thus, an investor would be able to estimate dividend receipts at the end of the year with reasonable degree of accuracy under normal circumstances. It has been found that company management is very conservative in increasing the amount of

dividend paid to the shareholders. Management does not increase the dividend unless this increase is sustainable in the long run, but the opposite is true in case of a dividend cut. In actual practice, he amount of dividend does not form a part of the total return of the investor, which is true in many profitable companies. Nevertheless, it is an important constituent, as indicated above. The estimation of future price of the share that contributes a major portion in the total company. In order to estimate future price of share, it may adopt two approaches, namely: Quantitative and Qualitative analysis, which are elaborated as under:

9.4 QUANTITATIVE ANALYSIS:

This approach helps us to provide a measure of future value of equity share based on quantitative factors. The two methods commonly used under this approach are:

- Dividend discounted method, and
- Price-earnings ratio method

9.4.1 Dividend Discounted Method

The dividend-discounted method is based on the premise that the value of an investment is the present value of its future returns. The present value (PV) is calculated by discounting the future returns, which are dividend receipts. The formula, thus, is

$$PV = \frac{D1}{(1+k)} + \frac{D2}{(1+k)^2} + \text{----------} + \frac{Dn}{(1+k)n}$$

Under the constant growth assumption, this boils down to

$$PV = D1 / (k – g)$$

Where,

K = discount rate
G = growth rate
Further,
DPS = EPS x (1 – b)

Where,

DPS = Dividend Per Share
B = proportion of earnings retained such that (1 – b) is the dividend payout

Substituting the above in the formula, it becomes

PV = EPS(1-b) / (k-g)

On the basis of the above model, the following inferences can be drawn:

1) Higher the EPS, other things like b,k,g remaining the same, higher would be the value of the share.

2) Higher the b, retention rate, or lower the 1 - b i.e. dividend payout, higher would be the value of share.

3) Higher the k, i.e. discount rate, other things like EPS, b,g remaining the same,

lower would be the value of the equity.

4) Higher the growth rate, g, other things like EPS,b,k remaining constant, higher would be the value of the equity.

These inferences clearly highlight the effect of various variables on the future price of equity share.

While applying this approach, one has to be careful about using the discount rate, k. A higher value of discount rate would unnecessarily reduce the value of an equity while a lower value would unreasonably increase it, that will have implications to invest/disinvest the shares. A discount rate is based on the risk free rate and risk premium. That is,

Discount rate = risk free rate + risk premium

$$K = rf + rp$$

Where,

rf = risk free rate of return

rp = risk premium

Thus, higher the risk free interest rate with Rp remaining the same would increase the discount rate, which in turn would decrease the value of the equity. In the same way, higher risk premium with ff remaining the same would increase the overall discount rate and thus decrease the value of the equity. Like discount rate, growth rate is equally critical variable in this method of share valuation. It may be pointed out that growth from internal sources depends on the amount of earnings retained and return on equity. Thus, higher is the retention rate; higher would be the value of the firm, other things remaining constant. Likewise, higher return on equity would lead to higher value of equity with other things remaining constant.

9.4.2 Price-Earnings Approach

According to this method the future price of equity is calculated by multiplying the P/E ratio by the EPS. Thus,

P - EPS x P/E ratio.

The P/E ratio or multiple is an important ratio frequently used by analyst in determining the value of a share. It is frequently reported in the financial press and widely quoted in the investment community. In India too, you could verify its popularity by looking at various financial magazines/newspapers. This approach seems quite straight and simple. There are, however, important problems with respect to the calculation of both P/E ratio and EPS and the pertinent questions often asked are regarding the calculation and the determinants of the P/E ratio.

The problems often confronted in calculating this ratio are: which of the earnings-past, present or future are to be taken into account in the denominator of this ratio? Like wise, which price should be put in the numerator of this ratio? These questions need to be answered while using this method. Indeed, both these methods are inter-related. In fact, if we divide the equation of dividend discounted method under constant growth assumption by Eo (Earnings per shares), we get:

$$\frac{Po}{Eo} = \frac{Do/Eo\,(1+g)}{(K-g)}$$

Here, $Do(1+g) = D1$

Based on the above model, decision rules become:

DECISION RULES:

* Higher the P/E ratio, other things remaining the same, higher would be the value of an equity.

* Lower the P/E ratio, other things remaining the same, lower would be the value of an equity.

Looking at the above decision rules, it is not uncommon to find that investors prefer shares of companies with higher P/E multiple.

You will appreciate that the usefulness of the above model lies in understanding the various factors that determine P/E ratio. P/E ratio is broadly determined by:-

- Dividend payout
- Growth
- Risk free rate
- Business risk
- Financial risk

Thus, other things remaining the same,

1) Higher would be the P/E ratio, if higher is the growth rate or dividend payout or both.

2) Lower would be P/E ratio, if higher is:

a) Risk free rate,

b) Business risk,

c) Financial risks.

The foregoing presentation helps us provide a quantitative measure of the value of an equity share. However, there still remains the problem of estimating earning per share, which has been used in both the methods discussed, above. This is a key number, which is being quoted, reported and used most often by company management, investors, analysts, financial press etc. It is this number every body is attempting to forecast. The starting point to forecast earnings per share, however, is to understand the chemistry of earnings as described in the previous unit. We shall describe various approaches to forecast earnings per share in the following section:

9.5 FORECASTING EARNINGS PER SHARE

Earnings are the most important number in the arsenal of the investor. The most important and the principle source of getting information about the earnings of the company is its financial statements. Analyst must be aware of the fact that there is more to the financial statements than what meets his eyes. Out of the two statements, Balance Sheet and Income statement, it is the income statement that is more often used in order toassess the future state of the firm. Research studies have indicated the significance of this number in influencing the share prices and dividends. The research study conducted by Niederhoffer and Regan for example found that the share prices are strongly dependent on the changes in the earnings, both absolute and relative to the analysts' estimates. The above study and some others indicate the importance of the forecast of earnings is the most important variable to work on in the investment decision making process. The critical aspect of the earnings relate to its level, trend and stability.

There are various methods employed to assess the future outlook of the revenue, expenses and the earnings of the firm given the economic and industry outlook. These methods can be broadly classified into two categories, namely, traditional and modem. Under the traditional approach, the forecaster obtains the estimate of single value of the variable. While in the case of modern approach, he gets the range of values with the probability of each occurrence. Let us discuss these two approaches in detail.

9.6 TRADITIONAL METHODS OF EPS FORECASTING

Under the traditional approach the following methods of forecasting are adopted:

- ROI approach
- Market share approach
- Independent estimates approach

Before starting the discussion on the forecasting techniques, il will not be out of place to briefly mention the way the earnings per share is measured from the financial statements. This will provide us an understanding of its changes. Broadly, operating and financing decisions affect changes in earnings. Both these decisions are, however, interdependent. But attempts are generally made to separate the two decisions so that the effect of each is studied separately. Various companies do this by presenting the information in the income statement reflecting both types of decisions. Given below is the format, which analysts use to calculate the earnings per share.

Income Statement for the year ended...

1) Sales Revenue

2) Less Operating Expenses

3) Earnings before interest and tax (EBIT)

4) Less Interest expenses

5) Earnings before tax (EBT)

6) Less Taxes
7) Earnings after tax (EAT)
8) Number of shares outstanding
9) EPS = EAT/ number of shares outstanding

Let us now explain the ROI approach to forecast earnings per share.

9.6.1 ROI Approach

Under this approach, attempts are made to relate the productivity of assets with the earnings. That is, returns earned on the total investment (assets) arc calculated and estimates regarding earnings per share are made. Simply slated,
Return on Assets = EBIT/Assets

Return on assets is a function of the two important variables viz. turnover of assets, and margin of profit.

Return on Assets = Assets Turnover * Profit Margin
ROA = (Sales/Assets) * (EBIT/Sales)

Where,

Asset Turnover = Sales/Assets
Profit Margin =EBIT/Sales

ROA is thus a function of (1) number of times the asset base is utilized and converted into sales (asset turnover) and (2) profit? earned on the sales (profit margin).

This is a simple but crucial relationship. The two ratios mentioned above can he used by the management in order to achieve a certain targeted ROA. It is possible that two firms may earn the same ROA but have different strategies in terms of assets utilization and productivity of sales.

Leverage is the use of borrowed funds in the enterprise with a fixed cost. More is the use of such funds, higher is said to be the leverage. As borrowed funds are of a fixed rate/cost and if the firm is earning profits, it is profitable to use more of borrowed funds. However, there is limit beyond which use of borrowed funds can increase the earnings per share. It is often said that as borrowed funds increase in relation to equity funds in the total financing mix, borrowing costs (1) increase, and (2) increase more rapidly than the amounts borrowed. This happens because the suppliers of funds now perceive the Business more risky when borrowed funds are utilized beyond a certain point. Interesting part of the increase in the cost of debt financing is its impact on the increase in the cost of equity financing. This happens because the earnings available to equity shareholders go down as more leverage is used beyond a certain point

Thus, Rate of Return on Equity = R +/- (R – I)L / E

Where,

R = Return on Assets

I = Effective t interest rate

L/E = Total outside liabilities/equity

If we multiply the above equation with equity capital, we can find out the earnings before taxes.

Thus,

$$EBT = (R + (R -1) L/E) E \text{ , and}$$

Growth in EBIT = Retention rate (b) x ROA

As forecasting of earnings is the central theme/focus in the company level analysis, it requires an understanding of the earnings formation process. The ROI approach provides a framework for analyzing the effects and interaction between the return a firm earns on its assets and the manner it is financed. Once the analyst understands this return generating power, he can forecast the key variables in the model and substitute the forecasted values into the model and forecast EAT.

Based on the chemistry of earnings, the analyst can further use the following equations to calculate the earnings per share:

$$EPS = [(I – T){ R + (R – I) L / E }E]+ [\text{Number of shares outstanding}]$$

likewise, the DPS can be calculated as $DPS = (I – b) (E P S)$

The above model is quite simple but its importance will be realised if we keep the variables in the functional forms as shown below:

Earnings per share and its changes are a function of:

1) Utilization of asset base

2) Productivity of sales (Profit Margin)

3) Effective cost of borrowed funds (I) = $\frac{\text{Interest expenses}}{\text{Total outside liabilities}}$ (effective rate of interest)

4) Debt equity ratio (L / E) = Total outside liabilities /equity

5) Equity base (E)

6) Effective tax rate (T) = Tax expenses/EBT

7) Return on assets i.e. EBIT/Assets

The model can be used to forecast earnings in the future holding period. For this purpose, the analyst has to collect the information relating to the financial variables, like: Net sales, Other Incomes, Cost of Sales, EBIT, INT exp, Taxes**,** EAT, Average share outstanding, EPS, DPS. Other relevant information with regard to the financial position is on: Total Assets, Current Debt, Long term Debt, Equity shares, Total Debt and Equity.

9.6.2 Market Share Approach

This approach emanates from the industry analysis. Once the estimate about the future prospects of the industry is completed, the analyst would then look into the firms, which are the leaders and pacesetters in the industry and would then find out the market share of the firm to be analyzed. The following steps can be adopted to implement this

method.

1) Estimate the industry's total sales

2) Estimate the firm's share in the total sales in the industry i.e. market share

3) Estimate the profit margin

4) Multiply sales by profit margin to get total earnings

5) Divide earnings by number of shares outstanding to get EPS.

6) Multiply EPS by P/E ratio.

7) Holding period yield (HPY) = [(P1 – Po) + D1] / Po

In order to estimate the profit margin under this approach, the analyst has to understand the mark up and behaviour of cost and prices during the relevant range of activity. This calls for having an understanding of profit-volume relationship of the firm. The analyst should look into various components of costs like: fixed and variable cost, and the level of sales volume the firm is likely to attain during the forecast period.

9.6.3 Independent Estimates Approach

Under this approach, each and every item of revenue and expense is estimated separately and summed up to arrive at the future EPS.

All the three approaches are traditionally utilized by security analysts. However, these are not mutually exclusive approaches. But one important and common limitation of these approaches is that they indicate point estimate of EPS and HPY and therefore, attach 100% probability of outcome.

9.7 MODERN METHODS OF EPS FORECASTING:

Under modern approaches to forecasting earnings of a company, statistical techniques are used. The following techniques are generally included in this category:

- Use of regression and correlation analyses
- Use of trend analysis
- Decision tree analysis

Let us briefly discuss each of these.

9.7.1 Regression and Correlation Analysis

In order to find out the interrelationships of relevant variables, the techniques of regression and correlation analyses are used. When the interrelationship covers two variables, simple regression is used and for more than two variables, multiple regression technique is used. Using this approach, security analysts may find out the interrelationship between the variables belonging

to the economy, industry and the company.

Major advantages in its application relate to deriving the forecasted value as well as testing the reliability of the estimates.

9.7.2 Trend Analysis

While using this technique, the relationship of only one variable is tested over time using the regression technique. In a way, it is the simple regression technique where the interrelationship of a particular variable is tested vis a vis time. That is why the name trend analysis. It is quite useful to understand the historical behaviour of the variable for the purpose of the security analysis.

9.7.3 Decision Tree Analysis

The above two methods are considered superior to the traditional methods employed to forecast the .value of earnings per share. However, an important limitation remains. Both these methods provide only point estimate of the forecast value. In order to improve decision making process, information relating to the probability of occurrence of the forecast value is quite useful. Thus a range of values of the variable with the probabilities of occurrence of each value will go a long way to improve decision by the investor. To overcome these limitations, decision tree and simulation techniques are used.

Under the decision tree analysis the decision is assumed to be taken sequentially with probability of each sequence. Thus, in order to find out the probability of the final outcome, given various sequential decisions along with probabilities, the probabilities of each sequence is to be multiplied and summed up. In practice, whenever security analyst attempts to use decision tree analysis in conducting analysis of the securities, he starts with estimating the sales.

9.8 QUALITATIVE ANALYSIS:

As mentioned earlier, the quantitative approach helps us to provide a quantitative measure of the value of an equity. But caution is required to base one's decision only on the figure derived by such analysis. Therefore, the analyst is required to bear in mind qualitative/subjective factors, while conducting the analysis. An alert analyst would be able to gather such information from the various sources, like: company's financial statements, financial press, magazines, etc. Besides, the information relating to the availability of infrastructure, inventory-size and value, order book position, product risk, marketing & distribution strategies, components of different costs, availability of raw material and their cost, quality of personnel and management, future plans, etc. can be known through the company's officials.

With the qualitative factors in mind, an investor/analyst can judge whether the quantitatively derived measure of value of an equity is reasonable or not and accordingly take the decision to invest or disinvest shares of a company. Of all the qualitative factors, quality of management is most important. We may however point out here some critical aspects of company management which every investor must carefully probe. These are commitment and competence, future orientation, image building, investor friendliness and government relation building. As far as

commitment is concerned, the investors must look up the past record of management to particularly see that it did not indulge in premature diversion of funds from one company to another. The competence of the management may be viewed in terms of the composition of the board, professional qualifications and experience of the members of board and the chief executive.

Another aspect of company management, which is particularly important in a country like India, characterized by high degree of government regulation, is its track record of managing relations with the government. How many capacity renewals/expansions could it win from the government? And in how much time? The answers to these questions can be fairly insightful about the capability of the company management to manage government relations which holds very high significance particularly in an economy characterized by wide-spread government regulation of business and industry.

We may conclude by stating that management, though most difficult to evaluate, holds the real key to the quality of equity investment decision. As part of fundamental analysis, company management must be evaluated for its commitment, competence and capacity to manage operations of the company and shareholder, community and government relations. Past track record of the management in this regard can come handy. The problem is particularly challenging where it is a new management, without having past track record. Such a situation would perhaps demand venture capitalist skills.

9.9 NON-FINANCIAL INDICATORS:

In addition to the financial parameters, the investor has to analyze non financial indicators also. Some important non financial indicators are:

i) Business of the Company:

The investor should know whether the company is a well established one. The industry or industries in which company is operating should have good growth prospects. The products should be in continuous demand e.g. consumer non-durable goods. The future of the company and prospects of die industry are interlinked.

ii) Market Share of the Company:

The market share of the company should be substantial. The larger the share, me better me prospects of cont the market and profit margins and expanding me operations.

iii) Product Range:

Progressive companies create competition for existing products by launching new products with regular frequency. In' must examine whether the company under review belongs to this group or not.

iv) Diversification:

The company must be well diversified into areas of growth potential. To reduce the degree of business risk and improve profitability many companies resort to diversification. A well diversified

company Hindustan lever is a good buy at anytime. Hence, this issue is to be ca examined by the investor.

v) Expansion Policy:

The company's policy of expansion she consistency and have a long term perspective. Its assets growth should be reasonably good reflecting its expansion goals. Growth helps the industry to stabilize it?, earnings from undue fluctuations and help the diversification process.

vi). **Foreign Collaboration:**

Where a company has entered into technical collaboration with a foreign company, the investor must find out more about me nature of me collaboration agreement.

vii) Research and Development:

Progressive companies spend substantial sums of money on R & D to upgrade their existing products, introduce new products, achieve import substitution etc. such companies have bright future prospects. ;

viii) New Millennium Trends:

The sectors which come to limelight in the new Millennium are knowledge based industries, satellite telecommunications, interest trading business and E-commerce, Multimedia, Robotics, Informatics, Biotech and Hi-tech Industries. The fastest growing sector at present is I.T. software sector

9.10 SUMMARY:

The analysis of a company is important as it is in the shares of a company that an investor invests. This requires forecasting both future price of the share as well as dividends. Future price of the share can be calculated using two approaches: discounted dividend model and P/E ratio approach. Earnings per share is the most important and widely used variable in valuing equity share. Forecasting EPS is very crucial for investment decision making. There are traditional as well as modern methods of forecasting EPS. Traditional methods are ROI approach. Market share approach, and independent estimation approach. These methods provide a point estimate of the forecasted variable. Modem forecasting methods are: regression. correlation analysis, trend analysis, decision tree analysis and simulation. Decision tree and simulation methods provide a range of values with probability of their outcomes. Such information are quite useful in making investment decisions. However, this calls for generating information regarding probabilities of occurrence of various outcomes. The common limitation of these approaches is teat these are quantitative in nature. Investor must try to find the reasonableness of the value c the share by taking into account the qualitative factors. Company management constitutes most difficult, yet most critical, qualitative factor to be analyzed by the investor or investment analyst Past track record of the company management would come handy here. However, to analyze a new management, without having past track record, perhaps the skills of the venture capitalist are needed.

9.11 Key Words:

Earning per share: A corporation's accounting earnings divided by the number of its common shares outstanding.

Earnings-price ratio: The reciprocal of the price-earnings ratio.

Rate of return: The percentage change in the value of an investment in a financial asset (or portfolio of financial asset) over a specified time period.

9.12 SELF-ASSESSMENT QUESTIONS :

1) What do you think about Company analysis? How it is important for equity investment decision?
2) 'Estimation of equity price is the main challenge in the entire process of equity investment decision'. Comment.
3) Discuss the different methods of quantitative analysis which are used for equity investment decision? How do they differ from qualitative analysis?
4) How do you forecast the EPS? Which method of forecasting of EPS do you consider best and why?
5) Write short notes on the following :

a) Dividend Discounted Method b) Price-Earnings Approach c) ROI Approach

9.13 Further Readings:

1. Fischer, D.E. and R J Jordan, 1995, **Security Analysis and Portfolio Management**, Prentice Hall of India, New Delhi.

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K S N R

LESSON 10

TECHNICAL ANALYSIS

10.0 Objectives:

The objectives of this lesson are to:

- explain the meaning of fundamental and technical analysis
- distinguish fundamental analysis from technical analysis.
- discuss the historical development of technical analysis.
- pinpoint the Dow theory and its basic tenets.
- explain and illustrate techniques of technical analysis
- highlight the market indicators

Structure:

10.1 Introduction

Prices of securities in the stock market fluctuate daily on account of continuous buying and selling. Stock Prices move in trends and cycles and are never stable. Any investor in the stock market is interested in buying securities at a low price and selling them at a high price, so as to get a good return on his investment. Two approaches are commonly used to analyze the movement of share prices in the market. One of these is the fundamental analysis wherein the analyst tries to determine the true worth or intrinsic value of a share based on the current and future

earning capacity of the company. He would buy the share when its market price is below its intrinsic value. The second approach to security analysis is called technical analysis.

The term Technical analysis is used to mean fairly wide range of techniques, all based on the study of past share price behaviour to predict the future trend. The technical analysts believe that the price of a stock depends on supply and demand in the market place and has little relationship to value. The rationale behind technical analysis is that share price behaviour repeats itself overtime and the analyst attempts to derive methods to predict this repetition. The technical analyst looks at the past share price data to see if any of the established patterns are applicable and, if so, extrapolations can be made to predict the future price movements. Although past share prices are the major data used by technical analysts, other statistics as volume of trading and stock market indices are also utilized to some extent. Thus, technical analysis is really a study of past or historical price and volume so as to predict the future stock price behaviour.

10.2 Basic Assumptions on Technical Analysis

Before we go in detailed on the actual methods themselves, let us review the basic and necessary assumptions regarding the technical analysis.

(i) The market and/ or an individual stock acts like a barometer rather than a thermometer. Events are usually discounted in advance with movements as the likely result of influenced buyers and sellers at work. We should never forget, as we explore the technical implications of market analysis that the price formations or patterns that evolve due to supply demand behaviour are, for the most part, the result of fundamentalists or speculators putting their money to work based upon their established convictions.

(ii) Before a stock experiences a mark-up phase, whether it be minor or major, a period of accumulation usually takes place. Conversely, before a stock enters into a major/ a minor down trend, a period of distribution usually will be the preliminary occurrence. Accumulation or distribution activity can occur within natural trading trends. Obviously, an uptrend in prices denotes a balance buying, while a down trend is indicative of extreme supply. The ability to analyze accumulation or distribution within net neutral

price patterns will be, therefore, a most essential pre-requisite. Such analysis is the technician's main challenge. He should anticipate, not react.

(iii) The third assumption is actively tied into the first two. It is an observation that deals with the scope and extends of market movements in relation to each other. As an example, in most cases, a small phase of stock price consolidation – which is really of backing and filling – will be followed by a relative short term movement, up or down, in the stock's price. On the other hand a larger consolidation phase can lead to a greater potential stock price move.

10.3 Basic Principles of Technical Analysis

The basic principles on which technical analysis is based may be summarized as follows:

a. The market value of a security is related to demand and supply factors operating in the market.

b. There are both rational and irrational factors which surround the supply and demand factors of a security.

c. Security prices behave in a manner that their movement is continuous in a particular direction for some length of time.

d. Trends in stock prices have been seen to change when there is a shift in the demand and supply factors.

e. The shifts in demand and supply can be detected through charts prepared specially to show market action.

f. Patterns which are projected by charts record price movements and these recorded patterns are used by analysts to make forecasts about the movement of prices in future.

10.4 Technical Analysis Vs. Fundamental Analysis

The major differences between technical analysis and fundamental analysis are as follows:

1. Fundamental analysis tries to estimate the intrinsic value of a security by evaluating the fundamental factors affecting the economy, industry and company. Technical analysis studies the price and volume movements in the market and by carefully examining the pattern of these movements, the future price of the stock is predicted.

2. Fundamental analyst tries to establish long term values, whereas technical analysis mainly seeks to predict short term price movements.
3. Fundamental analysis appeals primarily to long term investors, whereas technical analysis appeals mostly to short term traders or speculators.

10.5 Charting Techniques

Charts have the strength of condensing information into a pattern that is easy to understand and grasp rather than numbers or statements. As a complete pictorial record of all trading, chart patterns provide a framework to analyze the position of the market in terms of a single share or a consolidation of the market position. This information can help investors to understand the market and achieve their investment goal. Chart Pattern analysis can be used to make short term or long term forecasts. The data can be intra-day, daily, weekly or monthly and the patterns can be as short as one day or as long as many years. Charts can be plotted using arithmetic or logarithmic price scales. The most commonly used charts are :

- The Dow theory
- Bar Charts
- Line Charts
- Point and figure Charts
- Candlestick Chart
- the moving average line, and
- the relative line strength line

The basic concepts underlying Chart Analysis are:

i) **Persistence of trends :** Main belief of the Chartist is that stock prices tend to move in fairly persistent trends. Security price behaviour is characterized by inertia; the price movement continues along a certain path (up, down or side ways) until it meets an opposing force, a rising out of an altered supply-demand relationship.

ii) **Relationship between Volume and Trends:** Technical analyst believes that generally volume and trend go hand in hand. When a major upturn begins, the volume of trading increases as the price advances and decreases as the price declines. In a major downturn, the opposite happens: the volume of trading increases as the price declines and decreases as the price rallies.

iii) **Support and Resistance Levels :** Chartists assume that it is difficult for the price of a share to rise above a certain level called the resistance level. Example, if investors find that prices fall after their purchases, they continue to hang on to their shares in the hope of a recovery. And when the price rebounds to the level of their purchase price, they tend to sell and have a sign of relief as they break even. Such a behavioral tendency on the part of investors stimulates considerable supply when the price rebounds to the level at which substantial purchases were made by the investors. As a result, the share is not likely to rise above this level, the resistance level. The level at which a declining share may evoke a substantial increase in demand is called the support level. This typically represents the level from which the share rose previously with large trading volumes. As the price falls to this level, there is a lot of demand from several quarters; those `who missed the train' on the previous occasion and have regrets for their failure to partake in the earlier advance, short-sellers who, having sold short, at higher levels, want to book profits by squaring their position, and value oriented investors.

10.6 THE DOW THEORY:

Whatever is generally being accepted today as technical analysis has its roots in the Dow Theory. The theory is so called because it was formulated by Charles.H.Dow who was the editor of the Wall Street Journal in USA. There are many versions of this story, but essentially it consists of three types of market movements:

The major market trend, which can often last a year or more; a secondary immediate trend, which can move against the primary trend for one to several months; and minor movements lasting only for hours to a few days. The determination of the major market trend is the most important decision to the DOW believer. The three movements of the market have been compared to the

tides, the waves and ripples in the ocean. According to Dow Theory, the price movements in the market can be identified by means of a line chart. In this Chart, the closing prices of shares or the closing values of the market index may be plotted against the corresponding trading days. The chart would help in identifying the primary and secondary movements.

Fig. No.10.1**:** Shows a Line Chart of the closing values of the market index. The primary trend of the market is upwards but there are secondary reactions in the opposite direction. Among the three movements in the market, the primary movement is considered to be the most important.

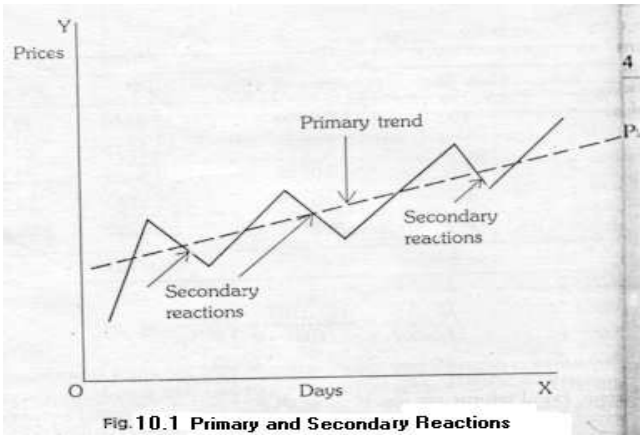

Fig. 10.1 Primary and Secondary Reactions

10.7 Bullish Trend

During a bull market, in the first phase the price rise follows certain patterns of share price charts. The most bullish patterns are the inverted head and shoulders, the saucer, double bottom, triple bottom, cup and handle breakdown and falling wedge.

i) Inverted Head and Shoulder

A neckline identifies the inverted head and shoulders. A break in the neckline indicates the reversed and bullish run can be identified. Inverse head and shoulders occur at market bottoms.

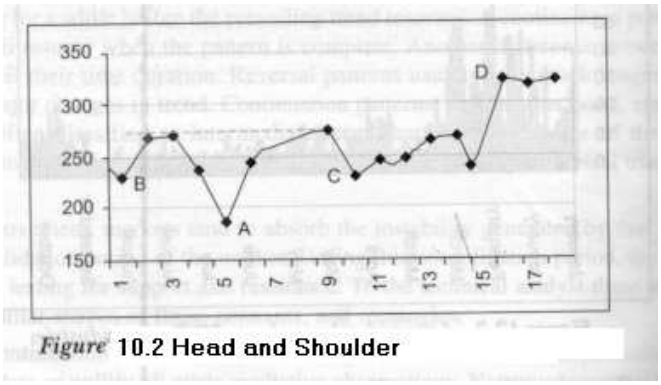

Figure **10.2 Head and Shoulder**

ii) Saucer

Rounding bottoms occur as expectations gradually shift from bearish to bullish. The share price of `ABC' Company is a typical illustration of saucer formations indicating shifts of bearish and bullish runs (Fig.10.3). The areas `A' and `C' indicate rounded bottom. The areas `B' and `D' that follow these rounded bottoms indicate the bullish rise in the price of ABC shares.

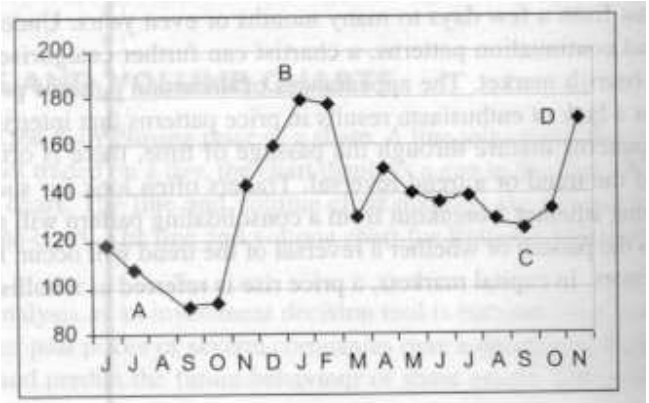

***Figure*10.3** *The saucer pattern*

iii) Double Bottom

A double bottom reflects a bullish development, signaling that the price is expected to rise. A double bottom occurrence can also follow a downtrend. At the end of the downtrend, double bottom could indicate a reversal in pattern. A double bottom indicates a broader base, which helps in the upswing movement of prices, like the saucer.

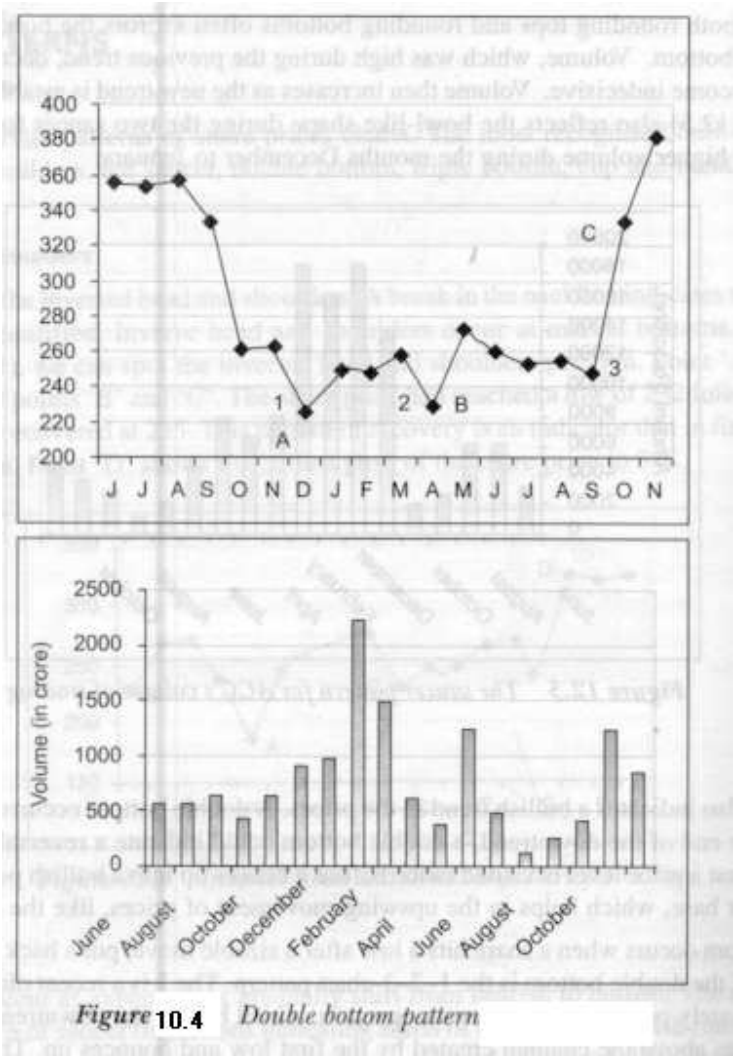

Figure **10.4** *Double bottom pattern*

iv) Triple Bottom

Similar to the double bottoms, triple bottoms also foresee a bullish trend in the market. Triple bottoms indicate a prolonged market situation. A triple bottom formation may evolve in the long range. The triple bottom does not show a recovery in prices over a period of time. If reiterates the slump in the prices and a break in the formation occurs when the volume increases above the average. The triple bottom differs from the inverted head and shoulders slightly since the neckline

that can be identified clearly in the inverted head and shoulders formation is not present in the triple bottom.

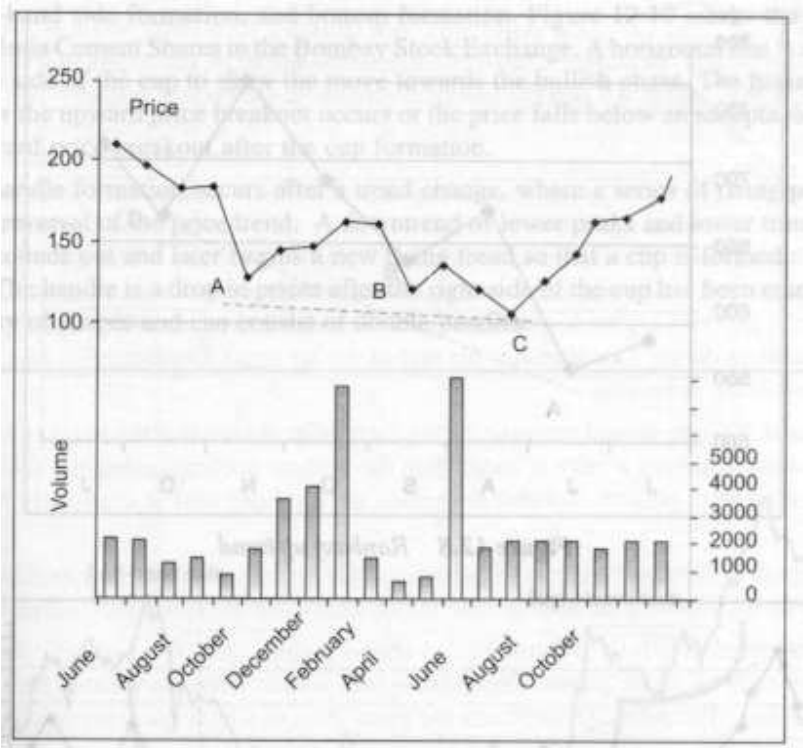

Figure **10.5** *Triple bottom pattern*

v) Cup and Handle Bottom

In a cup and handle, the breakout should be accompanied by strong volume, significantly higher than prior trading. A cup with handle formation will be identified through the following formations; left hand side formation; right-hand side formation, and bottom formation.

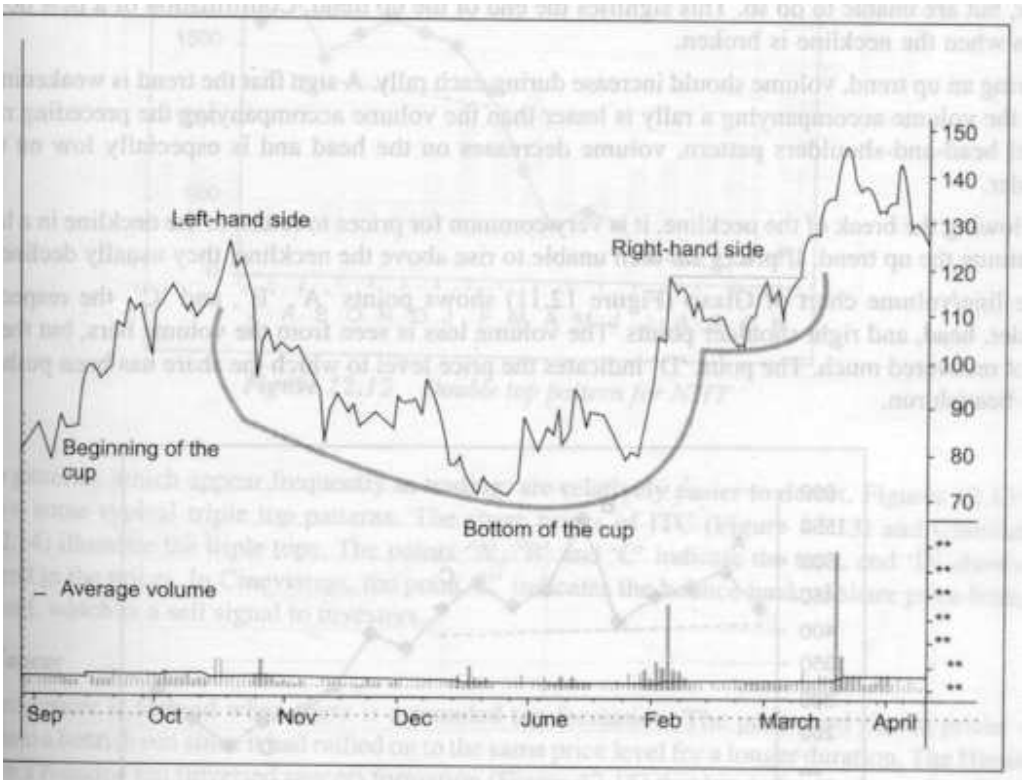

Figure **10.6** *Cup and handle pattern*

The cup and handle formation occurs after a trend, where a series of rising peaks and troughs is follows by a reversal of the price trend. A downtrend of lower peaks and lower troughs form the left side of the cup, rounds out and later begins a new rising trend so that a cup is formed. The cup is in the shape of a `u'. The handle is a drop in prices after the right side of the cup has been reached.

10.8 Bearish Trend

Among the most commonly encountered bearish indicators are the head and shoulders, the double top, the triple and round top, the downtrend and the inverted version of the bullish saucer.

i) Head and Shoulder

The head and shoulder price pattern is the most reliable and well known chart pattern. It gets its name from the resemblance of a head with two shoulders on either side. An uptrend is formed as prices higher highs and higher lows in this step movement. The trend is broken when this upward climb ends. The head formation, which is above the left and right tops, distinguishes this formation. The left shoulder and the head are the last two higher highs. The right shoulder is created as the bulls try to push the prices higher, but are unable to do so. During an uptrend, volume should increase during each rally. A sign that the trend is weakening occurs when the volume accompanying a rally is lesser than the volume accompanying the preceding rally.

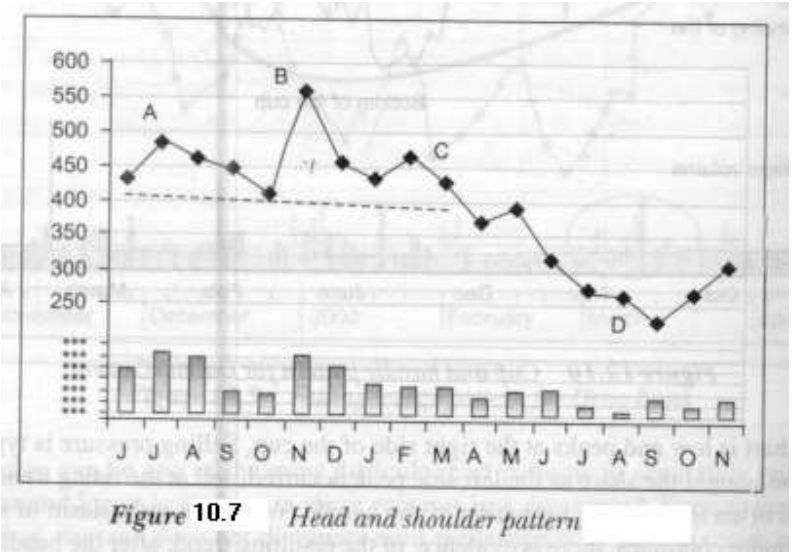

Figure **10.7** *Head and shoulder pattern*

ii) **Double Top**

Double Top occurs when a share hits a high or a low after a sizeable move, pulls back but fails to hit the old high. There is a price with a failure to break the immediately prior high. Then, there is a move down, which again breaks the uptrend. Finally, the share price falls below the line created by the second move and falls down. The following Line Chart shows a double top. This arises when the share price has risen sharply, followed by a limited profit taking which causes the share price to fall. Investors decide that the peak has been reached and they take their profits causing the price to fall again.

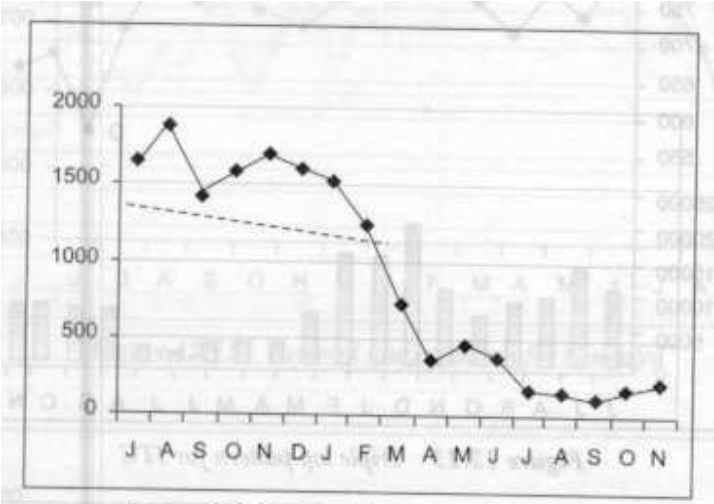

Figure **10.8** *Double top pattern*

iii) Triple Top

Triple Top patterns, which appear frequently in trading, are relatively easier to detect. The following figure shows some typical triple top patterns. The share price of a company illustrates the triple tops. The points A, B and C indicate the tops and `D' shows the bearish trend in the prices.

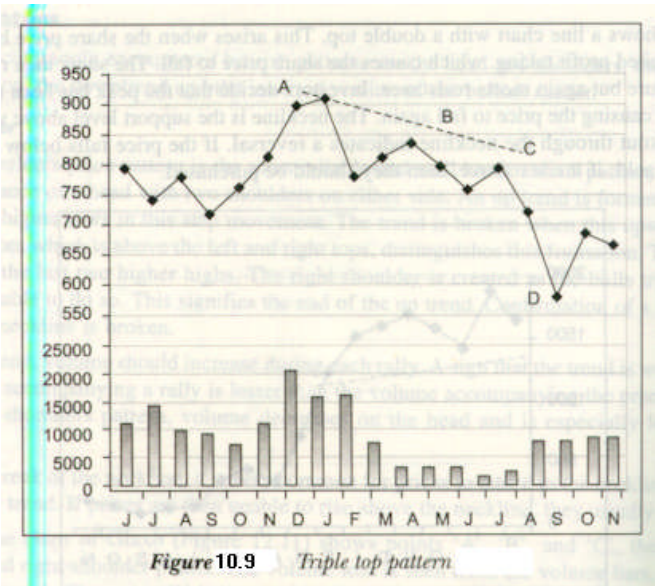

Figure 10.9 *Triple top pattern*

iv) Inverted Saucer

An inverted saucer is formed when there is a rounded top formation. The prolonged rise in prices will break out into a bearish run since it had rallied on to the same price level for a long duration.

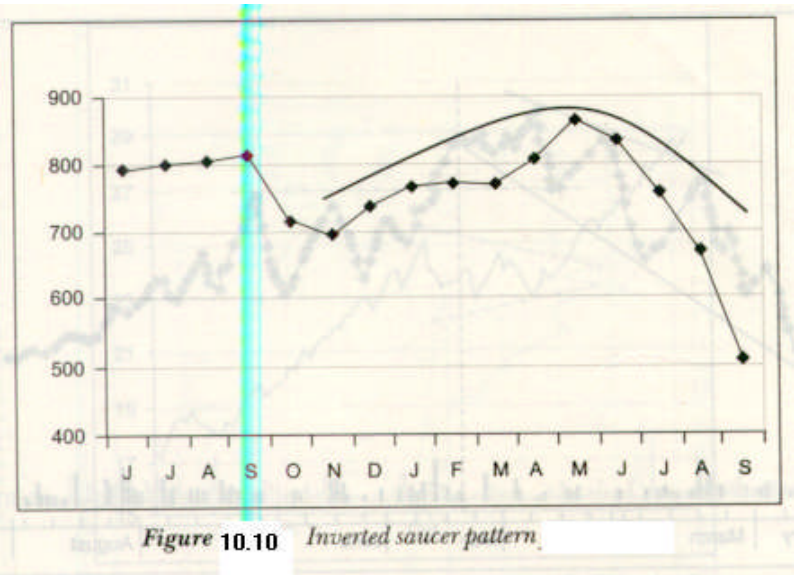

Figure 10.10 *Inverted saucer pattern*

v) Down Trend

A down-trend is just the opposite of an inverted saucer, a series of declining peaks and troughs; the support and resistance levels are also in descent. In a down trend, support levels are not sufficient to stop the decline permanently, but are only able to check it temporarily. A downtrend is a series of lower highs and lower lows.

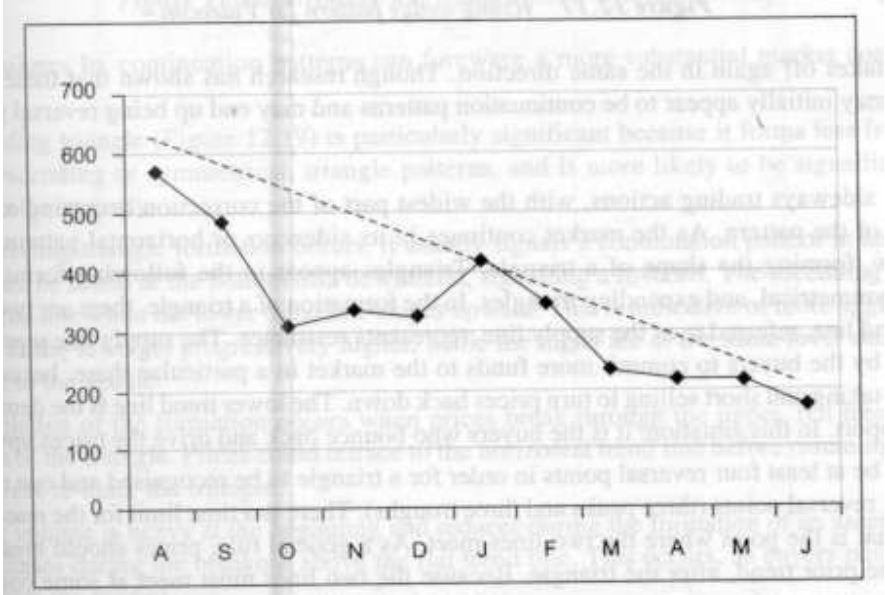

Figure **10.11** *Down trend pattern*

vi) Continuation Pattern

There are certain patterns, which tend to provide a breathing space to the earlier sharp rise or fall and after the completion of these patterns, the price tends to move along the original trend. These patterns are formed during side way movements of share prices and are called continuation patterns because they indicate a continuation of the trend prevailing before the formation of the pattern.

vii) Triangles

Triangles are the most popular among the continuation patterns. Triangles are formed when the price movements result in two or more consecutive descending tops and two or

more consecutive ascending bottoms. The triangle becomes apparent on the chart when the consecutive tops are joined by straight line and the consecutive bottoms are joined by another straight line. The two straight lines are the upper trend line and the lower trend line respectively.

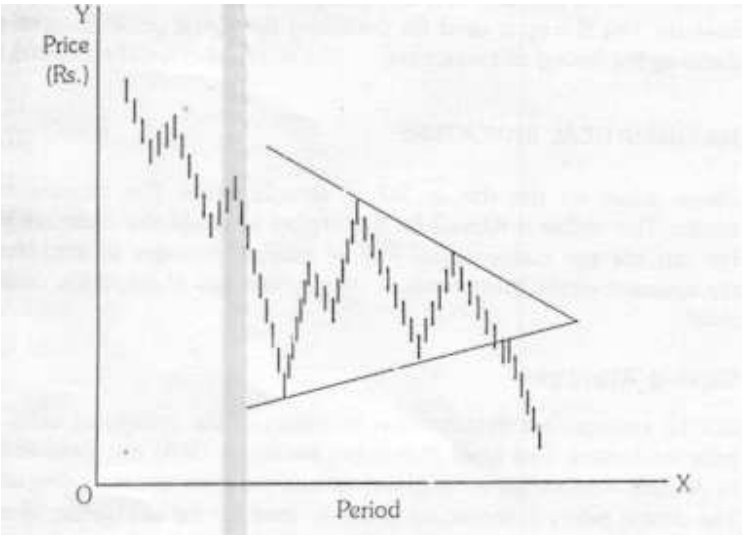

Fig. 10.12 Triangle formation.

The triangle formation may occur during a bull phase or a bear phase. In either case it would indicate a continuation of the trend. It is generally seen that the volume diminishes during the movement within the triangular pattern.

viii) Flags and Pennants

These are considered to be very reliable continuation patterns. They represent a brief pause in a fast moving market. They occur mid-way between a sharp rise in price or a steep fall in price. The Flags formation looks like a parallelogram with the two trend lines forming two parallel lines. The volume of trading is expected to fall during the formation of the flag and again pick up on breaking out from the pattern.

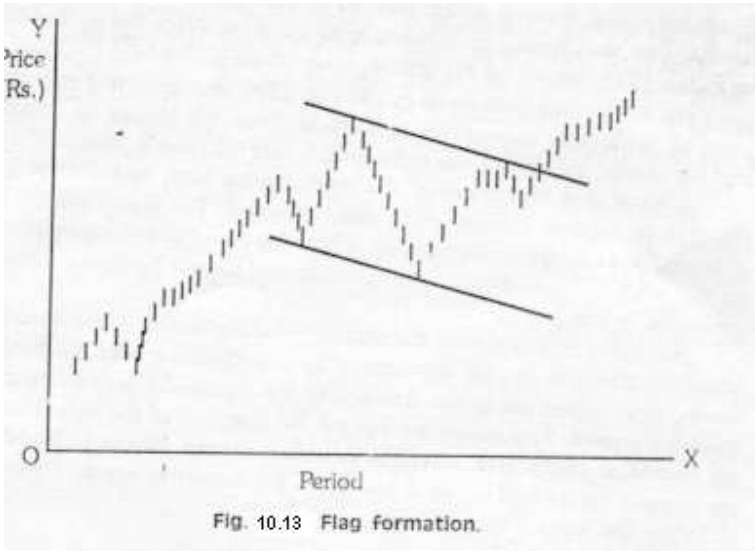

Fig. 10.13 Flag formation.

The pennant formation looks like a symmetrical triangle. The upper trend line formed by connecting the tops stoops downwards, whereas the lower trend line formed by connecting the bottoms rises upwards.

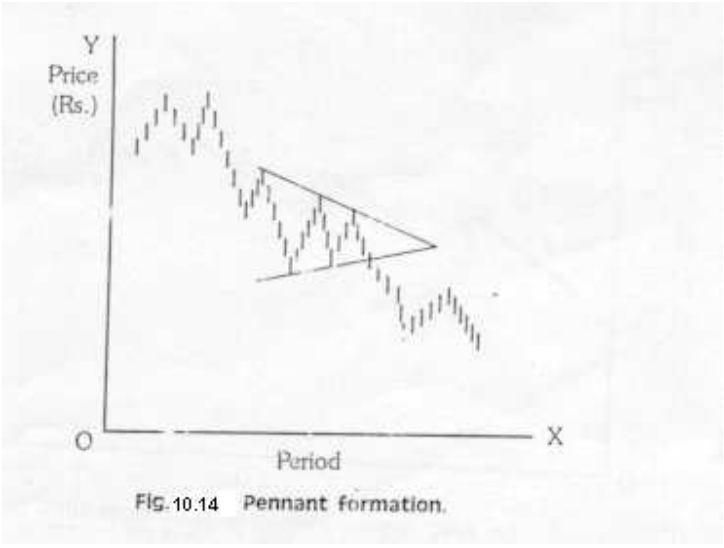

Fig. 10.14 Pennant formation.

The pennant is formed mid way between either a bullish trend or a bearish trend and signals the continuation of the same trend. The breakout from the pattern is marked by increased volume of trading.

10.9 Elliott Wave Theory:

There are many theories which seek to explain the behaviour of the stock market. One such theory, in technical analysis, is the Wave Theory formulated by Ralph Elliott, known as the Elliott Wave Theory. The theory was formulated in 1934 by Elliot after analyzing seventy five years of stock price movements and charts. From his studies he concluded that the market movement was quite orderly and followed a pattern of waves. A wave is a movement of the market price from one change in the direction to the next change in the same direction. The waves are the result of buying and selling impulses emerging from the demand and supply pressures on the market. Depending on the demand and supply pressures, waves are generated in the prices.

According to Elliott Wave Theory, the market moves in waves. A movement in a particular direction can be represented by five distinct waves. Of these five waves, three waves are in the direction of the movement and are termed as Impulse Waves. Two waves are against the direction of the movement and are termed as corrective waves or reaction waves. Waves 1, 3 and 5 are the impulse waves and waves 2 and 4 are corrective waves. The wave 1 is upwards and wave 2 corrects the wave 1. Similarly wave 3 and 5 are those with an upward impulse and wave

4 correct the wave 3

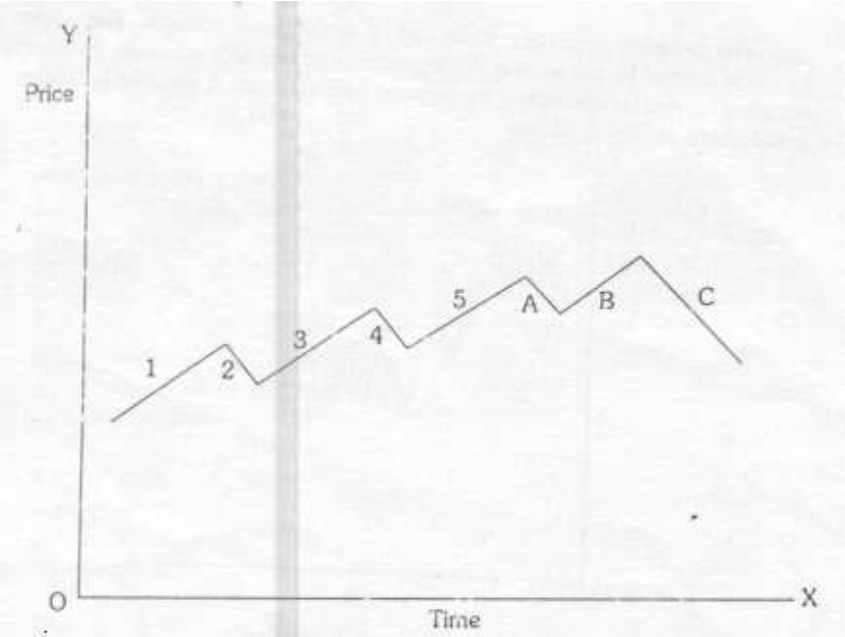

Fig.10.15 Representation of Elliot wave theory.

A general trading rule for applying the Elliott Wave principle will be to recognize the number of patterns/sub-patterns. Since all patterns or their sub-patterns are either 3 wave or 5 wave structures, it follows that a minimum of three waves will occur always, no matter what happens. Therefore, if the investors concentrate on the 3rd wave, either in an impulsive or corrective wave, there will be a strong probability of making a profit. The Elliott Wave principle expects the same patterns to evolve over and over again, enabling an investor to forecast the markets. The Elliott Wave principle provides an effective method for trading. The patterns are sometimes easy to recognize, especially the strong impulsive waves. These patterns indicate where the market is heading; in what way this will happen and under what circumstances the pattern will produce a stronger probability. This makes it possible to exactly determine the entry and exit points, which is an outstanding characteristic of the Elliott Wave principle.

10.10 Mathematical Indicators:

Share prices do not rise or fall in straight lines. The movements are erratic. This makes it difficult for the analyst to gauge the underlying trend. One can use the mathematical tool of moving averages to smoothen out the apparent erratic movements of share prices and highlight the underlying trend.

i) Moving Averages

Two types of moving averages (MA) are commonly used by analysts – the simple moving average and the exponential moving average. The closing prices of shares are generally used for the calculation of moving averages.

ii) Simple moving average

An average is the sum of prices of a share for a specific number of days divided by the number of days. In a simple moving average, a set of averages are calculated for a specific number of days, each average being calculated by including a new price and excluding an old price.

Example:

Calculation of Five-day Simple Moving Average

Days (1)	Closing Prices (2)	Total Price of 5 days (3)	Five Day Moving Average (4)
1.	33	--	--
2.	35	--	--
3.	37.5	--	--
4.	36.0	--	--
5.	39.0	180.5	36.1
6.	40.0	187.5	37.5
7.	40.5	193.0	38.6
8.	38.5	194.0	38.8
9.	41.0	198.0	39.6
10.	42.0	202.0	40.4
11.	44.0	206.0	41.2
12.	42.5	208.0	41.6
13.	42.0	211.50	42.3
14.	44.0	214.50	42.9
15.	45.0	217.5	43.5

The first total of 180.5 in column 3 is obtained by adding the prices of the first five days, that is, (33+35+37.5+36+39.0). The second total of 187.5 in column 3 is obtained by adding the price of the 6th day and deleting the price of the first day from the first total, that is, (180.5 +40 – 33). This process is continued.

iii) Exponential moving average

Exponential moving average (EMA) is calculated by using the following formula:

EMA = (Current closing price – previous EMA) x factor + previous EMA)

$$\text{Factor} = \frac{2}{n+1}, \text{ and}$$

Where,

n = number of days for which the average is to be calculated.

The calculation of exponential moving average is illustrated below:

Calculation of Five-day EMA

Days	Closing Price	EMA
1.	33.0	33.0
2.	35.0	33.66
3.	37.5	34.93
4.	36.0	35.28
5.	39.0	36.51
6.	40.0	37.66
7.	40.5	38.60
8.	38.5	38.57
9.	41.0	39.37
10.	42.0	40.24

Here factor = $\frac{2}{n+1} = \frac{2}{5+1} = \frac{2}{6} = \frac{1}{3} =$ .33.

The EMA for the first day is taken as the closing price of that day itself. The EMA for the second day is calculated as shown below:

EMA = (Closing price – Previous EMA) Factor + Previous EMA

= (35 – 33) 0.33 + 33 = 33.66

EMA for the third day = (37.5 – 33.66) 0.33 + 33.66 = 34.93

If we are calculating the five day exponential moving average, the correct five day EMA will be available from the sixth day onwards. A moving average represents the underlying trend in the share price movement. The period of the average indicates the type of trend being identified. For example, a five day or ten day average would indicate the short-term trend; a 50 day average would indicate the medium-term trend and a 200 day average would represent the long-term trend.

iv) Oscillators

Oscillators are mathematical indicators calculated with the help of the closing price data. They help to identify overbought and oversold conditions and also the possibility of trend reversals. These indicators are called oscillators because they move across a reference point.

v) Rate of change indicator

It is a popular oscillator which measures the rate of change of the current price as compared to the price a certain number of days or week back. To calculate a 7 day rate of change, each day's price is divided by the price which prevailed 7 days ago and then 1 is subtracted from this price ratio.

$$\text{ROC} = \frac{Current\ \text{Pr}ice}{\text{Pr}ice`n'\ period\ ago} - 1$$

Calculation of 7 day ROC

Day	Closing Price	Closing price 7 days ago	Price Ratio	ROC = Ratio-1
1.	68	--	--	--
2.	70	--	--	--
3.	72	--	--	--
4.	73	--	--	--
5.	70	--	--	--
6.	74	--	--	--
7.	76	--	--	--
8.	77	68	1.132	0.132
9.	75	70	1.071	0.071
10.	78	72	1.083	0.083
11.	80	73	1.096	0.096

12.	79	70	1.129	0.129
13.	78	74	1.054	0.054
14.	76	76	1.000	0.000
15.	75	77	0.974	- 0.026
16.	77	75	1.027	0.027
17.	78	78	1.000	0.000
18.	76	80	0.950	- 0.050

The ROC values may be positive, negative or zero. The ROC values are plotted on an XY graph where the X axis represents the time and the Y axis represents the values of the ROC. ROC Values oscillate across the zero line. When the ROC line is above the zero line, the price is rising and when it is below the zero line, the price is falling. Ideally, one should buy a share that is oversold and sell a share that is overbought.

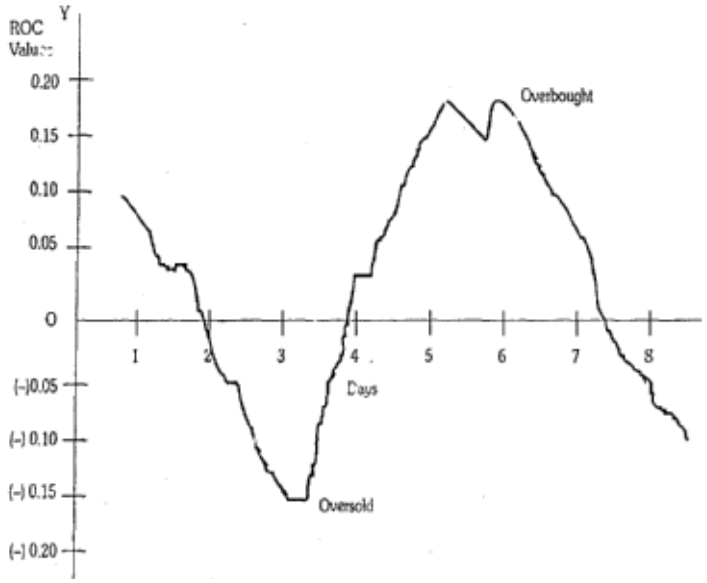

Fig. 10.16 RSI Chart

In the ROC Chart, the overbought zone is above the zero line and the oversold zone is below the zero line. Many analysts use the zero line for identifying buying and selling opportunities. Upside crossing indicates a buying opportunity, while a downside crossing indicates a selling opportunity.

vi) Relative Strength Index (RSI)

This is a powerful indictor that signals for buying and selling opportunities a head of the market. RSI for a share is calculated by using the following formula.

$$RSI = 100 - \frac{(100)}{(1+RS)}$$

Where,

$$RS = \frac{\text{Average gain per day}}{\text{Average loss per day}}$$

The most commonly used time period for the calculation of RSI is 14 days. For the calculation a 14 day RSI, the gain per day or loss per day is arrived at by comparing the closing price per day with that of the previous day for a period of 14 days. The gains are added up and divided by 14 to get the average gain per day. Similarly, the losses are added up and divided by 14 to get the average loss per day.

The calculation of RSI is illustrated below.

Calculation of 14 Day RSI

Day	Closing Price	Change over previous day	
		Gain	Loss
1.	150	-	-
2.	152	2	-
3.	150	-	2
4.	155	5	-
5.	157	2	-
6.	154	-	3
7.	156	2	-
8.	160	4	-
9.	160	-	-
10.	162	2	-
11.	159	-	3
12.	161	2	-
13.	165	4	-
14.	163	-	2
15.	165	2	-
	Total	25	10

14 Day Average = $\frac{25}{14} = 1.786$ $\frac{10}{14} = 0.714$

RS = $\frac{1.786}{0.714} = 2.50$

RSI = $100 - \left(\frac{100}{1+2.5}\right)$

= $100 - \frac{100}{3.5}$

= 100 – 28.53 = 71.42

This is the RSI for day 15. In this way the RSI value for the subsequent days can be calculated by taking the closing prices of 14 previous days.

vii) Moving average convergence and divergence (MACD)

MACD is an oscillator that measures the convergence between two exponential moving averages. A short term exponential moving average and a long-term exponential moving average are calculated with the help of the closing price data. A 12 day and 48 day exponential moving averages constitute a popular combination. The difference between the short term EMA and the long term EMA represents MACD. The MACD values for different days are derived by deducting the long term EMA for each day from the corresponding short term EMA for the day.

10.11 Weaknesses of Technical Analysis

Technical Analysis is subject to certain weaknesses such as analyst bias, open to interpretation and mistiming in the market.

i) Bias:

Just as with fundamental analysis, technical analysis is subjective and the investor's personal biases can be reflected in the analysis. If the investor is always optimistic on a share

performance, then a bullish bias will overshadow the analysis. On the other hand, if the investor is a pessimist, then the analysis will be weighted down by a bearish outlook.

ii) Open to interpretation

Technical analysis is open to interpretation. Even there are standards, many times two investors will look at the same chart and infer two different scenarios or see different patterns. Both will be able to come up with logical support and resistance levels as well as evidence to justify their position.

iii) Timing the market

By the time the trend is identified, in most instances, a substantial portion of the move has already taken place in the market. After such a large move, the reward to risk ratio is not great. Even after a new trend has been identified, another important level crops up immediately. Even though the principles of technical analysis are the same, each type of share may require specific tools for interpretation. Technical analysts consider the market to be 80 percent psychological and 20 percent logical. Fundamental analysts consider the market to be 20 percent psychological and 80 percent logical. Whether or not the market is psychological or logical, the price set by the market reflects the sum knowledge of all participants.

The critics of technical analysis believe that technical analysis is a useless exercise. In their argument –

- Empirical evidence in support of the random-walk hypothesis casts it shadow over the usefulness of technical analysis.
- Most analysts in technical analysis are not able to offer convincing explanations for the tools employed by them.
- By the time an uptrend or downtrend may have been signaled by technical analysis, it may already have taken place.
- The numerous claims that have been made for different chart patterns are simply untested assertions.
- All data used in technical analysis is past. Therefore, these indices cannot take into account unexpected events such as natural disasters and economic crisis.

10.12 Summary

In this lesson, we have discussed the technical analysis to predicting share price behaviour. This approach differs from fundamental approach is as much as it is based on the analysis of movements of price and volume of stocks, while fundamental analysis is focused on economy, industry and company variables affecting share price. The two approaches are, however, complementary to each other rather than substitutes. In this unit, we have also explained the origin and development of technical analysis. The originator of technical analysis, dated 1902, and its basic tenets have been discussed and classical charting techniques viz point and figure chart and bar chart and classical formations viz., triple top, congested area, head and shoulder, triangle, flag and pennant etc., have been explained. The techniques of modern technical analysis viz price bar charts, moving averages, exponential moving average, Rate of Change, Relative Strength Index and Moving Average, Convergence techniques have been explained and illustrated.

10.13 Key words:

Technical analysis: this analysis mainly studies the stock price movement of the security market.

10.14 Self assessment questions

1. What is technical analysis?
2. What are reversal patterns?
3. What is the purpose of technical analysis?
4. Explain how technical analysis is useful to investors?
5. Compare and contrast classical and modern technical analysis.

10.15 Further Readings

- Clifford, P., 1992 Technical Analysis, Vision Books, New Delhi
- Fischer, D.E., and R.J. Jordan, 1991, Security Analysis and Portfolio Management, 5th ed., PHI, New Delhi,
- Murphy J, 1986, Technical Analysis of the Future Market, PHI, New Delhi

B K S P

LESSON 11

EFFICIENT MARKET HYPOTHESIS

11.0 Objectives:

After reading this lesson, you should be able to:

- explain the concept of market efficiency
- distinguish various forms of market efficiency
- undertake various empirical tests of market efficiency
- Pinpoint implications of efficient market hypothesis for security analysis and Portfolio management.

Structure:

11.1 Introduction

Stock prices are determined by a number of factors such as fundamental factors, technical factors and psychological factors. The behaviour of stock prices is studied with the help of different methods such as fundamental analysis and technical analysis. Fundamental analysis seeks to

evaluate the intrinsic value of securities by studying the fundamental factors affecting the performance of the economy, industry and companies. Technical analysis believes that the past behaviour of stock prices gives an indication of the future behaviour. There is a third theory on stock price behaviour which questions the assumptions of technical analysis. The basic assumption in technical analysis is that stock price movement is quite orderly and not random. The new theory questions this assumption. From the results of several empirical studies on stock price movements, the advocates of the new theory assert that share price movements are random. The new theory came to be known as Random Work Theory because of its principal contention that share price movements represent a random walk rather than an orderly movement.

11.2 Random Walk Theory:

Stock Price behaviour is explained by the theory in the following manner. A change occurs in the price of a stock only because of certain changes in the economy, industry or company. Information about these changes alters stock prices immediately and the stock moves to a new level, either upwards or downwards, depending on the type of information. This rapid shift to a new equilibrium level whenever new information is received is recognition of the fact that all information which is known is fully reflected in the price of the stock. Further, change in the price of the stock will occur only as a result of some other new piece of information which was not available earlier. Thus, according to this theory, changes in stock prices show independent behaviour and are dependent on the new pieces of information that are received but within themselves are independent of each other. Each price change is independent of other price changes because each change is caused by a new piece of information. The basic premise in random walk theory is that the information on changes in the economy, industry and company performance is immediately and fully spread so that all investors have full knowledge of the information. There is an instant adjustment in stock prices either upwards or downwards. Thus, the current stock price fully reflects all available information on the stock. Therefore, the price of a security two days ago can in no way help in speculating the price two days later. The price of each day is independent. It may be unchanged, higher or lower from the previous price, but that depends on new prices of information being received each day. The random walk theory presupposes that the stock markets are so efficient and competitive that there is immediate price adjustment. This is the result of good communication system through which information can be spread almost anywhere in the country

instantaneously. Thus, the random walk theory is based on the hypothesis that the stock markets are efficient. Hence, this theory later came to be known as the efficient market hypothesis (EMH).

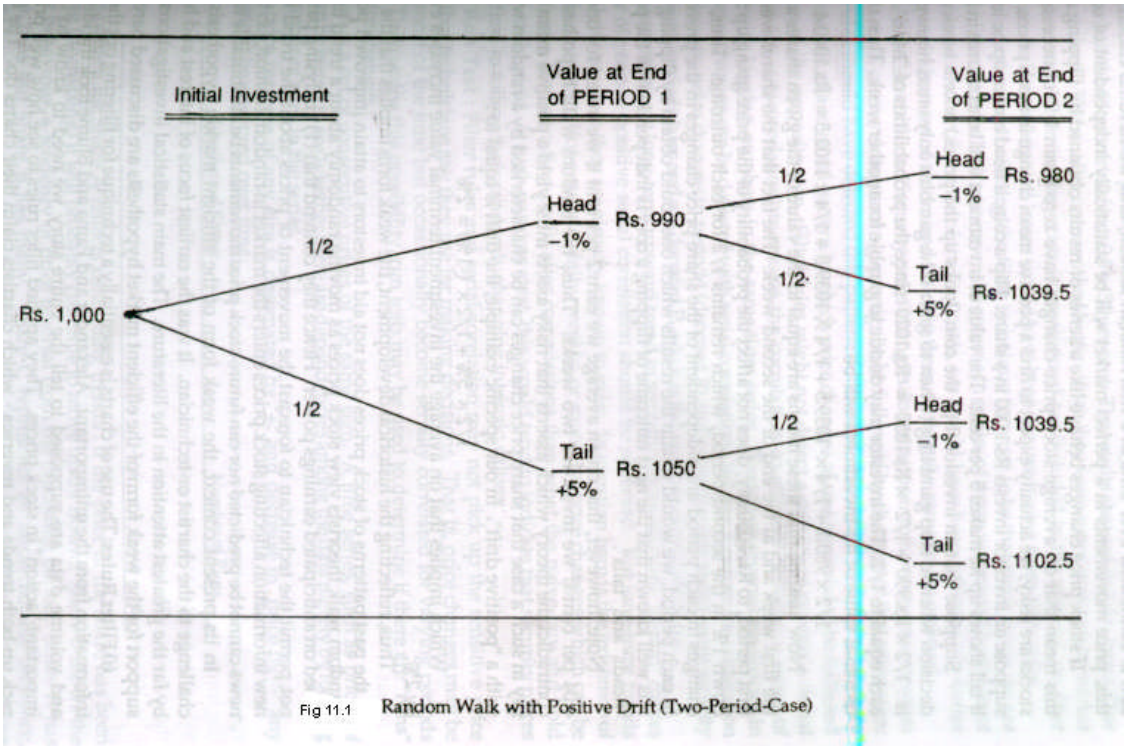

Fig 11.1 Random Walk with Positive Drift (Two-Period-Case)

11.3 The Efficient Market Hypothesis:

This hypothesis states that the capital market is efficient. An efficient capital market is a market that is efficient in processing information. In an efficient market, prices fully reflect all available information. In an efficient market, new information is evaluated as it arrives and prices instantaneously adjust to a new level. Thus, an efficient capital market is one in which security prices equal their intrinsic values at all times. In an efficient market, most securities are correctly priced. The concept of an efficient capital market has been one of the dominant themes in academic literature since the 1960s. According to Elton and Gruber, "When someone refers to efficient capital markets, they mean that security prices fully reflect all available information". According to Eugene Fama, in an efficient market, prices fully reflect all available information. The Efficient Markets Model is actually concerned with the speed with which information is incorporated into security prices. The technicians believe that past price sequence contains information about the future price movements because they believe that information is slowly incorporated in security prices. This gives the technician an opportunity to earn, excess returns by studying the patterns in price movements and trading accordingly. The efficient market theory holds the view that, in

efficient market new information is processed and evaluated as it arrives and price instantaneously adjust to new and correct levels. Consequently, an investor cannot earn excess returns by understanding fundamental analysis or technical analysis.

Efficiency in this context means the ability of the capital markets to function so that prices of securities react rapidly to new information. Such efficiency will produce prices that are appropriate in terms of current knowledge, and investors will be less likely to make unwise investments. A corollary is that investors will also be less likely to discover great bargains and thereby earn extraordinary high rates of return.

The requirements for a securities market to be efficient market are :

i) Prices must be efficient so that new inventions and better products will cause a firm's securities prices to rise and motivate investors to supply capital to the firm ;

ii) Information must be discussed freely and quickly across the nations so all investors can react to new information;

iii) Transactions costs such as sales commissions on securities are ignored;

iv) Taxes are assumed to have no noticeable effect on investment policy;

v) Every investor is allowed to borrow or lend at the same rate; and finally;

vi) Investors must be rational and able to recognize efficient assets and that they will want to invest money where it is needed most (i.e. in the assets with relatively high returns).

11. 4 Forms of Efficient Market Hypothesis:

The capital market is considered to be efficient in three different forms; the weak form, semi-strong form and the strong form. Thus the efficient market hypothesis has been subdivided into three forms, each dealing with a different type of information. The weak form deals with the information regarding the past sequence of security price movements, the semi-strong form deals with the publicly available information while the strong form deals with information, both public and private. The different forms of efficient market hypothesis have been tested through several empirical studies. The tests of the weak form hypothesis are essentially tests of whether all information contained in historical prices of securities fully reflected in current prices.

Semi-strong form tests of the efficient market hypothesis are tests of whether publicly available information is fully reflected in current stock prices. Finally, strong form tests of the efficient market hypothesis are tests of whether all information, both public and private (or inside) is fully reflected in security prices and whether any type of investor is able to earn excess returns.

11.4.1 Market Efficiency-Weak Form

The weak form of market efficiency theorists opined that the current price does not reflect fair value and is only a reflection of past prices. Further more; the future price cannot be determined using past prices. Technical analysts presume the existence of weak form of market in efficiency and believe that the true value of a security can be ascertained through financial models, using readily available information. The current price will not always reflect fair value and these models will help identify anomalies. Weak form efficiency prohibits abnormal profits to any investor using historical or current market prices. However, a weak form inefficient market will give investors an opportunity to make profits abnormally by studying historical or current price behaviour.

The weak form of the market hypothesis is thus a direct repudiation of technical analysis.

Five approaches have been used to test the weak form of the efficient market hypothesis. Several research tools are available to test the market efficiency in its weak form.

i) Simulation Tests

Simulation tests generate a random series of numbers as returns and compare them with the actual price changes in the market. The similarity between the two establishes the relevance of technical analysis as a stock market price predictor since random numbers can be generated to know the future movement of prices.

ii) Serial correlation test

Since the weak form from EMH postulates independence between successive price changes, such independence or randomness in stock price movements can be tested by calculating the correlation between price changes in one period and changes for the same stock in another period. Two price series data are formed with a lag of t-period and they are tested for dependence using the correlation coefficient. The correlation co-efficient can take on a value ranging from –1 to 1; a positive number indicates a direct relation, a negative value implies an inverse relationship and a value close to zero implies no relationship. Thus, if correlation co-efficient is close to zero, the price changes can be considered to be serially independent.

iii) Run Tests

The run tests are another test to examine the direction of movement of security prices and not the Quantum of movement in security prices. An examination of the continuous decline or increase in security prices is noted and these are compared with the expected increase or decline in prices. The stock prices, when they move at random, will not have any dominating runs, i.e. the number of positive runs will be equal to number of negative runs. An increase in price is represented by + signs. The decrease is represented by – sign. When there is not change in prices, it is represented by `0'. A consecutive sequence of the same sign is considered as a run. For example, the sequence + + + - - - has two runs. In other words, a change of sign indicates a new run. The sequence - - - + + 0 - - - + + + + has five runs; a run of three –'s followed by a run of two +'s, another run of one 0, a fourth run of three –'s and fifth run of

four +'s. In a run test, the actual number of runs observed in a series of stock price movements is compared with the number of runs in a randomly generated number series.

iv) Filter Tests

If stock price changes are random in nature, it would be extremely difficult to develop successful mechanical trading systems. Filter tests have been developed as direct tests of specific mechanical trading strategies to examine their validity and usefulness. It is often believed that, as long as no new information enters the market, the price fluctuates randomly within two barriers – one lower, and the other higher – around the fair price. When new information comes into the market, a new equilibrium price will be determined. If the news is favorable, then the price should move up to a new equilibrium above the old price. Investors will know that this is occurring when the price breaks through the old barrier. If investors purchase at this point, they will benefit from the price increase to the new equilibrium level. Likewise, if the news received is unfavorable, the price of the stock will decline to a lower equilibrium level. If investors sell the stock as it breaks the lower barrier, they will avoid much of the decline. Technicians set up trading strategies based on such patterns to earn excess returns. The strategy is called a filter rule. The filter rule is usually stated in the following way.

Purchase the stock when it rises by x% from the previous low and sell it when it declines by x% from the subsequent high. The filters may range from 1% to 50% or more. The alternative to this active trading strategy is the passive `buy and hold' strategy.

11.4.2 Market Efficiency – Semi-strong Form

The semi-strong form of the efficient market hypothesis says that current prices of stocks not only reflect all informational content of historical prices but also reflect all publicly available information about the company being studied. Examples of publicly available information are – corporate annual reports, company announcements, press releases, announcements of forthcoming dividends, stock splits etc. The semi-strong hypothesis maintains that as soon as the information becomes public the stock prices change and absorb full information. In other words, stock prices instantaneously adjust to the information that is received. The implication of semi-strong hypothesis is that the fundamental analyst cannot make superior gains by undertaking fundamental analysis because stock prices adjust to new pieces of information as soon as they are received. There is no time gap in which the fundamental analyst can trade for superior gains. Thus the semi-strong hypothesis repudiates fundamental analysis. Semi-strong form tests deal with whether or not security prices fully reflect all publicly available information. These tests attempt to establish whether share prices react precisely and quickly to new items of information. If prices do not react quickly and adequately, then an opportunity exists for investors or analysts to earn excess returns by using this information. The methodology used in semi-strong form tests has been introduced by Fama, Fisher, Jensen and Roll. Theirs was the first of the studies that were directly concerned with the testing of the semi-strong form EMH. Subsequent to their study, a number of refinements have been developed in the test procedure. The general methodology followed in these studies has been to take an economic event and measure its impact on the share price. The impact is measured by taking the difference between the actual return and expected return on a security. The expected return on a security is generally estimated by using the market model suggested by William Sharpe. The model used for estimating expected returns is the following:

$$R_i = a_i + b_i \ R_m + e_i$$

Where,

R_i is the return on security i,

R_m is the return on a market index

a_i and b_i are constants, and

e_i is random error.

This analysis is known as Residual analysis. The positive difference between the actual return and the expected return represents the excess return earned on a security. If the excess return is close to zero, it implies that the price reaction following the public announcement of information is immediate and the price adjusts to a new level almost immediately. Thus, the lack of excess returns would validate the semi-strong form EMH.

Major studies found that the market adjusted share prices instantaneously and accurately for the new information. Both Pettit and Watts have investigated the market's reaction to dividend announcements. They both found that all the price adjustment was over immediately after the announcement and thus the market had acted quickly in evaluating each information. Other items of information whose impact on share prices have been tested include announcements of purchase and sale of large blocks of shares of company takeovers, annual earnings estimates made by company officials. All these studies which made use of the Residual analysis approach showed the market to be relatively efficient. Ball and Brown tested the stock market's ability to absorb the information content of reported annual earnings per share information. They found the companies with good earnings report experienced price increase in stock while companies with bad earnings report experienced decline in stock prices. But surprisingly, about 85% of the international content of the earnings announcements was reflected in stock price movements prior to the release of the actual earnings figure. The market seems to adjust to new information rapidly with much of the impact taking place in anticipation of the announcement.

11.4.3 Market Efficiency – Strong Form

The strong form hypothesis represents the extreme case of market efficiency. The strong form of the efficient market hypothesis maintains that the current security prices reflect all information both publicly available information as well as private or inside information, whether public or inside, can be used to earn superior returns consistently. The directors of companies and other persons occupying senior management positions within companies have access to much information that is not available to the general public. This is known as inside information. Mutual funds and other professional analysts who have large research facilities may gather much private information regarding different stocks on their own. These are private information not available to the investing public at large. Strong form efficiency tests really involve two types of tests. The first type of tests attempt to find whether those who have access to inside information have been able to utilize profitably such inside information to earn excess returns. The second type of tests examine the performance of mutual funds and the recommendations of investment analysts to see if these

have succeeded in achieving superior returns with the use of private information generated by them.

Jaffe, Lorie and Nieaerhoffer studied the profitability of insider trading. They found that insiders earned returns in excess of expected returns. Although there have been only a few empirical studies on the profitability of using inside information, the results show, as expected, that excess returns can be made. These results indicate that markets are probably not efficient in the strong form. Firth studied the performance of Unit Trusts in the United Kingdom during the period 1965-75. He also found that unit trusts did not outperform the market index for their given levels of risk. A smaller body of research has been conducted into the profitability of investment recommendations by investment analyst. Such studies suggest that few analysts of firms of advisers can claim above average success with their forecasts.

The results of research on strong form EMH may be summarized as follows:

(a) Inside information can be used to earn above average returns.

(b) Mutual funds and investment analysts have not been able to earn superior return by using their private information.

In conclusion, it may be stated that the strong form hypothesis is invalid as regards inside information, but valid as regards private information other than inside information.

11.5 Efficient Market Hypothesis Vs Fundamental and Technical Analysis

There are three broad theories concerning stock price movements. These are the fundamental analysis, technical analysis and efficient market hypothesis.

Fundamental Analysis	Technical Analysis	Efficient Market Hypothesis
➢ The fundamental analysts believe that by analyzing key economic and financial variables they can estimate the intrinsic worth of a security and then determine what investment action to take.	➢ The technical analyst maintains that fundamental analysis is unnecessary.	➢ The weak form of the EMH directly contradicts technical analysis by maintaining that past prices and past price changes cannot be used to forecast future price changes because successive price changes are independent of each other.

➢ It seeks to identify under priced securities and over priced securities.	➢ The technician believes that history repeats itself. Hence he tries to predict future movements in share prices by studying the historical patterns in share price movements.	➢ The semi-strong form of the EMH contradicts fundamental analysis to some extent by claiming that the market is efficient in the dissemination and processing of information and hence publicly available information cannot be used consistently to earn superior investment returns.
➢ Their investment strategy consists in buying under priced securities and selling over priced securities, thereby earning superior returns.	➢	➢ The strong form of the EMH maintains that not only is publicly available information useless to the investor or analyst but all information is useless.

Even though the EMH repudiates both fundamental analysis and technical analysis, the market is efficient precisely because of the organized and systematic efforts of thousands of analysis undertaking fundamental and technical analysis are required to make the market efficient and thereby validate the hypothesis.

11.6 Market Efficiency and Anomalies:

In recent years, many researchers tested the impact of quarterly earnings announcements on stock prices. They said that favourable information published in quarterly are not instantaneously reflected in stock prices. The well known anomalies are listed in Table: 11.1.

Table 11.1 Stock Market Anomalies

Low Price –Earnings Ratio	Stock that are selling at price earnings ratios that are low relative to the market.
Low Price-Sales Ratio	Stocks that have price-to-sales ratios that are lower compared with other stocks in the same industry or with the overall market.
Low Price-to-Book Value Ratio	Stocks whose stock prices are less than their respective book values.

High Dividend Yield	Stocks that pay high dividends relative to their respective share prices.
Small Companies	Stocks of companies whose market capitalization is less than $100 million.
Neglected Stocks	Stocks followed by only a few analysts and/or stocks with low percentages of institutional ownership.
Stocks with High Relative Strength	Stocks whose prices have risen faster relative to the overall market.
January Effect	Stocks do better during January than during any other month of the year.
Day of the Week	Stocks do poorer during Monday than during other days of the week

Source: "Picking Stocks : Techniques that Stand the Test of time" – American Association of Individual Investors, 1994."

The above listed anomalies appear to move around four major themes:

- Markets tend to over react to news, both good and bad
- Value investing is contrarian in nature and is beneficial because markets over react.
- The market consistently ignores certain stocks, especially small stocks.
- All things being equal, there are times when it is more advantageous to buy stocks whereas there are other times when it is better to avoid stocks.

11.7 Summary

In this lesson, we have discussed various dimensions of the market hypothesis that the stock markets are efficient. We have highlighted the concept and forms of market efficiency viz weak form, semi-strong form, strong form and described various empirical tests of EMH. The unit closes by highlighting the market efficiency and anomalies and also highlights the implications of EMH for security analysis and portfolio management.

11.8 Key Words:

Efficient Market Hypothesis: The efficient market hypothesis states that the market is efficient. In an efficient market, prices fully reflect all available information and new information is evaluated as it arrives and prices instantaneously adjust to a new level.

Random Walk Theory: The changes in stock prices show independent behaviour and are dependent on the new pieces of information that are received but within themselves are independent of each other. The basic premise in random walk theory is that the information on changes in the economy, industry and company performance is immediately and fully spread so that all investors have full knowledge of the information.

Weak Form: The tests of the weak form hypothesis are essentially tests of whether all information contained in historical prices of securities fully reflected in current prices.

Semi-strong form: Semi strong form tests of the efficient market hypothesis are tests of whether publicly available information is fully reflected in current stock prices.

Strong form: Strong form tests of the efficient market hypothesis are tests of whether all information, both public and private is fully reflected in stock prices.

11.9 Self Assessment Questions

1. Define Market efficiency,

2. What is semi-strong form of efficiency?

3. What factors can act as signaling devices for stock price movements? Explain how these factors would affect market efficiency?

4. What are some of the anomalies in efficient market hypothesis?

5. What are the implications of EMH for security analysis and portfolio management?

11.10 Further Readings

S.Basu, “Investment Performance of Common Stocks in Relation to their Price earnings Ratio; A Test of the Efficient Market Hypothesis, “ Journal of Finance, June, 1997.

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LESSON 12

CAPITAL MARKET THEORY

12.0 Objectives

The objectives of this lesson are to:

- explain the concept of Capital Market Theory
- Pinpoint the basic tenets and assumptions of Capital Asset Pricing Model
- define the risk free asset, risk free lending, risk free borrowing and leveraged portfolio.
- discuss the implications of leveraged portfolio for efficient market.
- highlight the limitations of Capital Asset Pricing Model.

Structure:

12.1 Introduction:

The major implications of the Capital Market theory is that the expected return of an asset will be related to a measure of risk for that asset, known as beta. The exact manner in which expected return and beta are related is specified by Capital Asset Pricing Model. The Capital Asset Pricing Model was developed in Mid-1960s by three researchers William Sharpe, John Linter and

Jan Mossin independently, the model is often referred to as Sharpe-Linter-Mossin Capital Asset Pricing Model.

The Capital Asset Pricing Model (CAPM) builds upon the Markowitz Portfolio model and Capital market line. The Portfolio theory is description of how rational investors should build efficient portfolios and select the optimal portfolio. The capital asset pricing model derives the relationship between the expected return and risk of individual securities and portfolios in the capital markets if everyone behaved in the way the portfolio theory suggested.

12.2 Portfolio Theory :

Return and risk are two important characteristics of every investment. Investors base their investment decision on the expected return and risk of investments. Risk is measured by the variability in returns. Investors attempt to reduce the variability of returns through diversification of investment. This results in the creation of a portfolio. With a given set of securities, any number of portfolios may be created by altering the proportion of funds invested in each security. Among these portfolios some dominate others, or some are more efficient than the vast majority of portfolios because of lower risk or higher returns. Diversification helps to reduce risk, but even a well diversified portfolio does not become risk free. If we construct a portfolio including all the securities in the stock market, that would be the most diversified portfolio. Even such a portfolio would be subject to considerable variability. This variability is undiversifiable and is known as the market risk.

The actual risk of a security is the market risk which cannot be eliminated through diversification. This indicated by the sensitivity of a security to the movements of the market and is measured by the Beta coefficient of the security. A rational investor would expect the return on a security to be commensurate with its risk. The higher the risk of a security, the higher would be the return expected from it. And since the relevant risk of a security is its market risk or systematic risk, the return is expected to be correlated with this risk only. The capital asset pricing model gives the nature of the relationship between the expected return and the systematic risk of a security.

12.2.1 Assumptions :

The CAPM is based on certain assumptions regarding the behaviour of investors. The major assumptions are as follows:

a. Investors make their investment decisions on the basis of risk-return assessments measured in terms of expected returns and standard deviation of returns.

b. The purchase or sale of a security can be undertaken in infinitely divisible units.

c. The purchases and sales by a single investor cannot affect prices. This means that there is perfect competition where investors in total determine prices by their actions.

d. There are no transactions. Given the fact that transaction costs are small, they are probably of minor importance in investment decision-making, and hence they are ignored.

e. There are personal income taxes. Alternatively, the tax rates on dividend income and capital gains are the same, thereby making the investor indifferent to the form in which the return on the investment is received.

f. The investor can lend or borrow any amount of funds desired at a rate of interest equal to the rate for risk less securities.

g. The investor can sell short any amount of any shares.

h. Investors share homogeneity of expectations. This implies that investors have identical expectations with regard to the decision period and decision inputs.

i. Information is freely and instantly available to all investors.

j. All investors have the same one period horizon.

It is true that many of the above assumptions are untenable. However, they do not materially alter the real world. Moreover, the model describes the risk return relationship and the pricing of assets fairly well.

12.3 EFFICIENT FRONTIER WITH RISKLESS LENDING AND BORROWING

The portfolio theory deals with portfolios of risky assets. According to the theory, an investor faces an efficient frontier containing the set of efficient portfolios of risky assets. Now it is assumed that there exists a risk less asset available for investment. A risk less asset is one whose return is certain such as a government security. Since the return is certain, the variability of return or risk is zero. The investor can invest a portion of his funds in the riskless asset which would be equivalent to lending at the risk free asset's rate of return, namely, R_f. He would then be investing in a combination of risk free asset and risky assets.

Similarly, it may be assumed that an investor may borrow at the same risk free rate for the purpose of investing in a portfolio of risky assets. He would then be using his own funds as well as some borrowed funds for investment. The efficient frontier arising from a feasible set of portfolios of risky assets is concave in shape. When an investor is assumed to use riskless lending and borrowing in his investment activity the shape of the efficient frontier transforms into a straight line. Let us see how this happens.

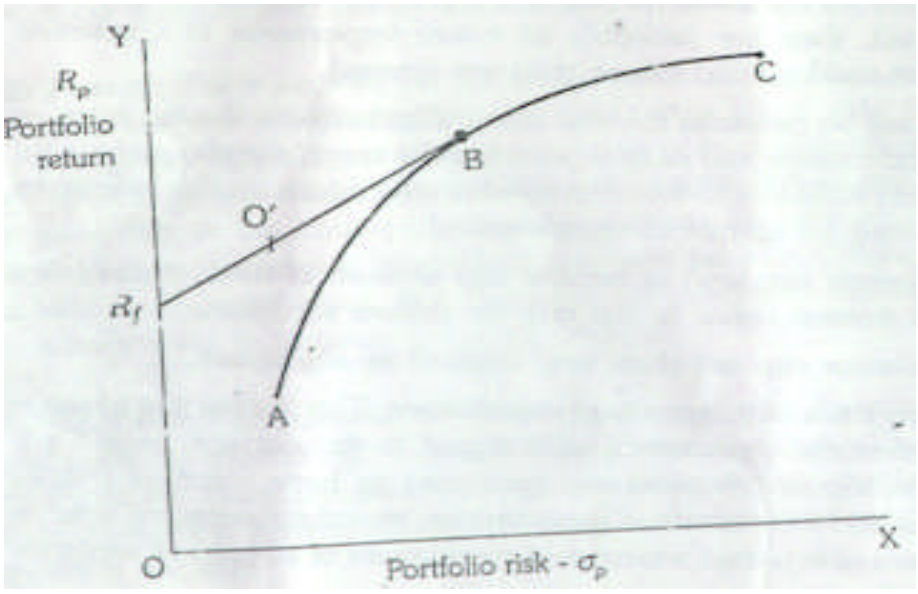


Fig12.1 Efficient Frontier with introduction of Lending

Consider Fig. 12.1. The concave curve ABC represents an efficient frontier or risky portfolios. B is the optimal portfolio in the efficient frontier with Rp = 15 per cent and σ_p = 8 per cent. A risk free asset with rate of return R_f = 7 per cent is available for investment. The risk or standard deviation of this asset would be zero because it is a riskless asset. Hence it would be plotted on the Y axis. The investor may lend a part of his money at the riskless rate, i.e. invest in the risk free asset and invest the remaining portion of his funds in a risky portfolio.

Portfolio risk - σ_p

If an investor places 40 per cent of his funds in the riskfree asset and the remaining 60 per cent in portfolio B, the return and risk of this combined portfolio O' may be calculated using the following formulae:

Return $$R_c = \omega R_m + (1-\omega) R_f$$

Where,

R_c = expected return on the combined portfolio
ω = proportion of funds invested in risky portfolio
$(1 - \omega)$ = proportion of funds invested in riskless asset
R_m = expected return of risky portfolio
R_f = rate of return on riskless asset

Risk $$\sigma_c = \omega\sigma_m + (1 - \omega)\, \sigma_f$$

Where,

σ = standard deviation of the combined portfolio
ω = proportion of funds invested in risky portfolio

σ_m = standard deviation of risky portfolio.
σ_f = standard deviation of riskless asset

the second term on the right hand side of the equation, $(1 - \omega)\ \sigma_f$ would be zero as σ_f = zero. Hence the formula may be reduced as

$$\sigma_c = \omega\sigma_m$$

The return and risk of the combined portfolio in our illustration is worked out below:

R_c = (0.60) (15) + (0.40) (7)
= 11.8 per cent
σ_c = (0.60) (8) = 4.8 per cent

Both return and risk are lower than those of the risky portfolio *B*. If we change the proportion of investment in the risky portfolio to 75 per cent, the return and risk of the combined portfolio may be calculated as shown below:

R_c = (0.75) (15) + (0.25) (7)
= 13 per cent
σ_c = (0.75) (8) = 6 per cent

Here again, both return and risk are lower than those of the risky portfolio B.

Similarly, the return and risk of all possible combinations of the riskless asset and risky portfolio B may be worked out. All these points will be in the straight line from R_f to B in Fig. 12.1.

Now, let us consider borrowing funds by the investor for investing in the risky portfolio which is larger than his own funds.

If ω is the proportion of investor's funds invested in the risky portfolio, then we can envisage three situations. If ω = 1, the investor's funds are fully committed to the risky portfolio. If ω < 1, only a fraction of the funds is invested in the risky portfolio and the remainder is lend at the risk free rate. If ω > 1, it means the investor is borrowing at the risk free rate and investing an amount larger than his own funds in the risky portfolio.

The return and risk of such a levered portfolio can be calculated as follows:

$$R_{L} = \omega R_m - (\omega - 1)R_f$$

Where,

R_L = return on the levered portfolio
ω = the proportion of investor's funds invested in the risky portfolio
R_m = return on the risky portfolio
R_f = the riskfree borrowing rate which would be the same as the risk free lending rate, namely, the return on the riskless asset.

The first term of the equation represents the gross return earned by investing the borrowed funds as well as investor's own funds in the risky portfolio. The second term of the equation

represents the cost of borrowing funds which is deducted from the gross returns to obtain the net return on the levered portfolio.

The risk of the levered portfolio can be calculated as:

$$\Sigma_L = \omega\sigma_m$$

The return and risk of the investor in our illustration may be calculated assuming ω = 1.25

R_L = (1.25) (15) – (0.25) (7)
= 17 per cent
σ_L = (1.25) (8)
= 10 per cent

The return and risk of the levered portfolio are larger than those of the risky portfolio. The levered portfolio would give increased returns with increased risk. The return and risk of all levered portfolios would lie in a straight line to the right of the risky portfolio B. This is depicted in Fig. 12.2

Thus, the introduction of borrowing and lending gives us an efficient frontier that is a straight line throughout. This line sets out all the alternative combinations of the risky portfolio B with risk free borrowing and lending.

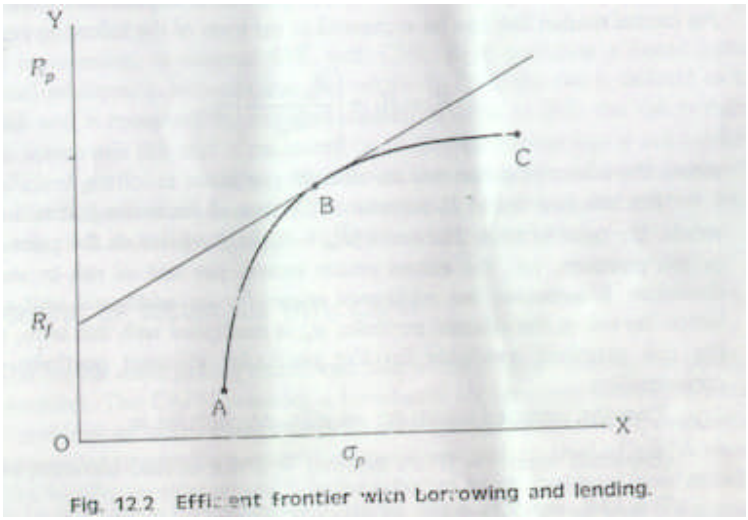


Fig. 12.2 Efficient frontier with borrowing and lending.

Fig. 12.2 Efficient frontier with borrowing and lending.

The line segment from R_f to B includes all the combinations of the risky portfolio and the riskfree asset. The line segment beyond point B represents all the levered portfolios (that is combinations of the risky portfolio with borrowing). Borrowing increased both the expected return and the risk, while lending (that is, combining the risky portfolio with risk free asset) reduces the expected return and risk. Thus the investor can use borrowing or lending to attain the desired risk level. Those investors with a high risk aversion will prefer to lend and thus hold a combination of

risky assets and the risk free asset. Others with less risk aversion will borrow and invest more in the risky portfolio.

12.4 THE CAPITAL MARKET LINE

All investors are assumed to have identical (homogeneous) expectations. Hence all of them will face the same efficient frontier depicted in Fig. 12.2. Every investor will seek to combine the same risky portfolio B with different levels of lending or borrowing according to his desired level of risk. Because all investors hold the same risky portfolio, then it will include all risky securities in the market. This portfolio of all risky securities is referred to as the market portfolio M. Each security will be held in the proportion which the market value of the security bears to the total market value of all risky securities in the market. All investors will hold combinations of only two assets, the market portfolio and a riskless security. All these combinations will lie along the straight line representing the efficient frontier. The line formed by the action of all investors mixing the market portfolio with the riskfree asset is known as the capital market line (CML). All efficient portfolios of all investors will lie along this capital market line.

The relationship between the return and risk of any efficient portfolio on the capital market line can be expressed in the form of the following equation.

$$\overline{R}_e = R_f + \left[\frac{\overline{R_m} - R_f}{\sigma_m}\right]\sigma_e$$

Where, the subscript ' **e**' denotes an efficient portfolio.

The risk free return R_f represents the reward for waiting. It is, in other words, the price of time. The term $\left[\{\overline{R}_m - R_f)/\sigma_m\right]$ represents the price of risk or risk premium, i.e., the excess return earned per unit of risk or standard deviation. It measures the additional return for an additional unit of risk. When the risk of the efficient portfolio, σ_e, is multiplied with this term, we get the risk premium available for the particular efficient portfolio under consideration.

Thus, the expected return on an efficient portfolio is:

(Expected return) = (Price of time) + (Price of risk) (Amount of risk)

The CML provides a risk return relationship and a measure of risk for efficient portfolios. The appropriate measure of risk for an efficient portfolio is the standard deviation of return of the portfolio. There is a linear relationship between the risk as measured by the standard deviation and the expected return for these efficient portfolios.

12.5 THE SECURITY MARKET LINE

The CML shows the risk-return relationship for all efficient portfolios. They would all lie along the capital market line. All portfolios other than the efficient ones will lie below the capital market line. The CML does not describe the risk-return relationship of inefficient portfolios or of individual

securities. The capital asset pricing model specifies the relationship between expected return and risk for all securities and all portfolios, whether efficient or inefficient.

We have seen earlier that the total risk of a security as measured by standard deviation is composed of two components; systematic risk and unsystematic risk or diversifiable risk. As investment is diversified and more and more securities are added to a portfolio, the unsystematic risk is reduced. For a very well diversified portfolio, unsystematic risk tends to become zero and the only relevant risk is systematic risk measured by Beta β. Hence it is argued that the correct measure of a security's risk is Beta.

It follows that the expected return of a security or of a portfolio should be related to the risk of that security or portfolio as measured by β. Beta is a measure of the security's sensitivity to changes in market return. If the Beta value is greater than one which indicates higher sensitivity to market changes, whereas, Beta value is less than 1 it indicates lower sensitivity to market changes. A β value of 1 indicates that the security moves at the same rate and in the same direction as the market. Thus the β of the market may be taken as 1.

The relationship between expected return and β of a security can be determined graphically. Let us consider an XY graph where expected returns are plotted on the Y axis and Beta coefficients are plotted on the X axis. A riskfree asset has an expected return equivalent to R_f and beta coefficient of zero. The market portfolio M has a beta coefficient of 1 and expected return equivalent to $\overline{R}_m$. A straight line joining these two points is known as the **security market line (SML).** This is illustrated in Fig. 12.3.

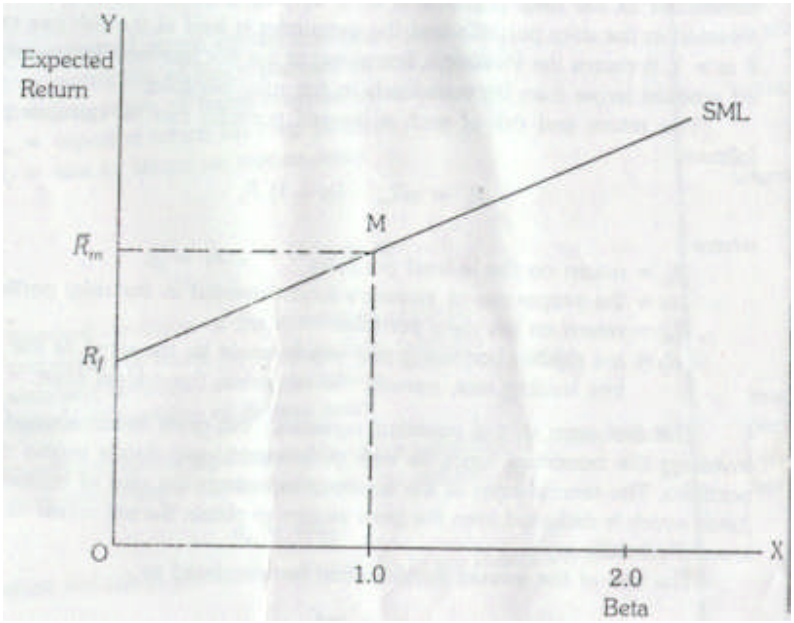


Fig. 12.3 Security market line.

The Security Market Line provides the relationship between the expected return and Beta of a security or portfolio. This relationship can be expressed in the form of the following equation:

$$\overline{R}_i = R_f + \beta_i(\overline{R}_m - R_f)$$

A part of the return on any security or portfolio is a reward for bearing risk and the rest is the reward for waiting, representing the time value of money. The risk free rate, R_f (which is earned by a security which has no risk) is the reward for waiting. The reward for bearing risk is the risk premium. The risk premium of a security is directly proportional to the risk as measured by β. The risk premium of a security is calculated as the product of Beta and the risk premium of the market which is the excess of expected market return over the risk free return, i.e., $[\overline{R}_m - R_f]$. Thus, the expected return on a security is risk free return + (beta x risk premium of market).

12.6 Capital Asset Pricing Model

The relationship between risk and return established by the security market line is known as the **capital asset pricing model.** It is basically a simple linear relationship. The higher the value of beta, higher would be the risk of the security and therefore larger would be the return expected by the investors. In other words, all securities are expected to yield returns commensurate with their risk as measured by β. This relationship is valid not only for individual securities, but is also valid for portfolios whether efficient or inefficient.

The expected return on any security or portfolio can be determined from the CAPM formula if we know the Beta of that security or portfolio. To illustrate the application of the CAPM, let us consider a simple example. There are two securities P and Q having values of beta as 0.7 and 1.6 respectively. The risk free rate is assumed to be 6 per cent and the market return is expected to be 15 per cent, thus providing a market risk premium of 9 per cent (i.e. $\overline{R}_m - R_f$).

The expected return on security *P* may be worked out as shown below:

$$\overline{R}_i = R_f + \beta_i(\overline{R}_m - R_f)$$

= 6 + 0.7 (15 – 6)
= 6 + 6.3 = 12.3 per cent

The expected return on security Q is

$$\overline{R}_i = 6 + 1.6(15 - 6)$$

= 6 + 14.4
= 20.4 per cent

Security P with a β of 0 has an expected return of 12.3 per cent whereas security Q with a higher beta of 1.6 has a higher expected return of 20.4 per cent.

CAPM represents one of the most important discoveries in the field of finance. It describes the expected return for all assets and portfolios of assets in the economy. The difference in the expected returns of any two assets can be related to the difference in their betas. The model postulates that systematic risk is the only important ingredient in determining expected return. As investors can eliminate all unsystematic risk through diversification, they can be expected to be

rewarded only for bearing systematic risk. Thus the relevant risk of an asset is its systematic risk and not the total risk.

12.6.1 SML AND CML

It is necessary to contrast SML with CML. Both postulate a linear (straight line) relationship between risk and return. In CML the risk is defined as total risk and is measured by standard deviation, while in SML the risk is defined as systematic risk and is measured by β. Capital market line is valid only for efficient portfolios while security market line is valid for all portfolios and all individual securities as well. CML is the basis of the capital market theory while SML is the basis of the capital asset pricing model.

12.6.2 PRICING OF SECURITIES WITH CAPM

The capital asset pricing model can also be used for evaluating the pricing of securities. The CAPM provides a framework for assessing whether a security is under priced, overpriced or correctly priced. According to CAPM, each security is expected to provide a return commensurate with its level of risk. A security may be offering more returns than the expected return, making it more attractive. On the contrary, another security may be offering less return than the expected return, making it less attractive.

The expected return on a security can be calculated using the CAPM formula. Let us designate it as the theoretical return. The real rate of return estimated to be realized from investing in a security can be calculated by the following formula.

$$R_i = \frac{(P_1 - P_O) + D_1}{P_O}$$

Where,

P_O = current market price

P_1 = estimated market price after one year

D_1 = anticipated dividend for the year

This may be designated on the estimated return

The CAPM framework for evaluation of pricing of securities can be illustrated with

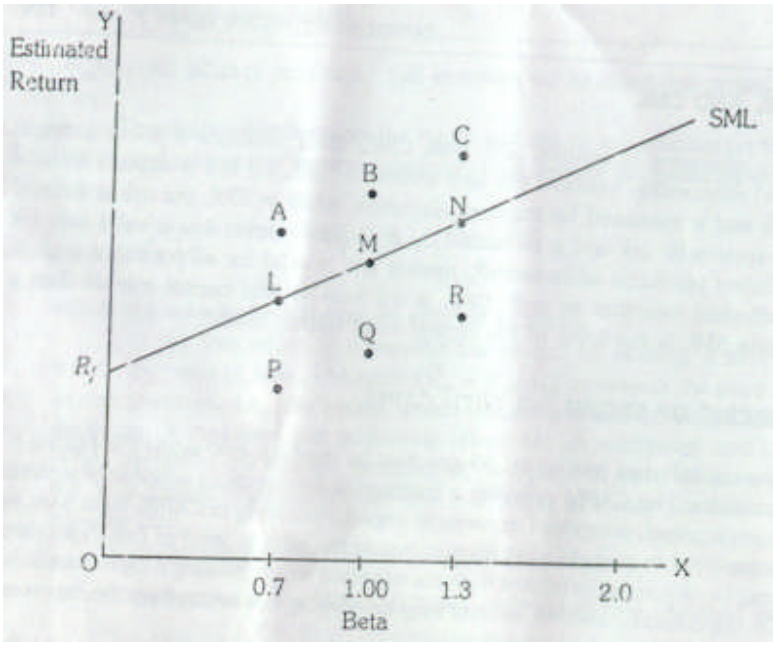


Fig. 12.4 CAPM and Security Valuation

Figure 12.4 shows the security market line. Beta values are plotted on the *X* axis while estimated returns are plotted on the *Y* axis. Nine securities are plotted on the graph according to their Beta values and estimated return values.

Securities *A, L* and *P* are in the same risk class having an identical beta value of 0.7. The security market line shows the expected return for each level of risk. Security *L* plots on the SML indicating that the estimated return and expected return on security *L* is identical. Security *A* plots above the SML, which indicates that its estimated return is higher than its theoretical return; it is offering higher return that what is commensurate with its risk. Hence it is attractive and is presumed to be under priced. Stock *P* which plots below the SML has an estimated return which is lower than its theoretical or expected return. This makes it undesirable. The security may be considered to be overpriced.

Securities *B, M* and *Q* constitute a set of securities in the same risk class. Security *B* may be assumed to be under priced because it offers more return than expected, while security *Q* may be assumed to be overpriced as it offers lower return than that expected on the basis of its risk. Security *M* can be considered to be correctly priced as it provides a return commensurate with its risk.

Securities C, N and R constitute another set of securities belonging to the same risk class, each having a Beta value of 1.3. It can be seen that security C is underpriced, security R is overpriced and security N is correctly priced.

Thus, in the context of the security market line, securities that plot above the line presumably are underpriced because they offer a higher return than that expected from securities with the same risk. On the other hand; a security is presumably overpriced if it plots below the SML because it is estimated to provide a lower return than that expected from securities in the same risk class. Securities which plot on SML are assumed to be appropriately priced in the context of CAPM. These securities are offering returns in line with their riskiness.

Securities plotting off the security market line would be evidence of mispricing in the market place. CAPM can be used to identify under priced and overpriced securities. If the expected return on a security calculated according to CAPM is lower than the actual or estimated return offered by that security, the security will be considered to be underpriced. On the contrary, a security will be considered to be overpriced when the expected return on the security according to CAPM formulation is higher than the actual return offered by the security.

Example: Let us consider an example. The estimated rates of return and Beta coefficients of some securities are as given below:

Security	Estimated returns (per cent)	Beta
A	30	1.6
B	24	1.4
C	18	1.2
D	15	0.9
E	15	1.1
F	12	0.7

The risk free rate of return is 10 per cent; while the market return is expected to be 18 per cent.

We can use CAPM to determine which of these securities are correctly priced. For this we have to calculate the expected return on each security using the CAPM equation.

$$\overline{R}_i = R_{f+} \beta_i (\overline{R}_m - R_f)$$

Given that R_f = 10 and $\overline{R}_m$ = 18 this equation becomes

$$\overline{R}_i = 10 + \beta_i (18 - 10)$$

The expected return on security *A* can be calculated by substituting the Beta value of security A in the equation. Thus

$\overline{R}_i$ = 10 + 1.6 (18 – 10)

= 10 + 12.8

= 22.8 per cent

Similarly, the expected return on each security can be calculated by substituting the Beta value of each security in the equation.

The expected return according to CAPM formula and the estimated return of each security are tabulated below:

Security	Expected return (CAPM)	Estimated return
A	22.8	30
B	21.2	24
C	19.6	18
D	17.2	15
E	18.8	15
F	15.6	12

Securities A and B provide more return than the expected return and hence may be assumed to be underpriced. Securities C, D, E and F may be assumed to be overpriced as each of them provides lower return compared to the expected return.

In this chapter we have seen two equations representing risk return relationships. The first of these was the Capital Market Line which describes the risk return relationship for efficient portfolios. The second was the Security Market Line describing the risk return relationship for all portfolios as well as individual securities. This formula is also known as the **capital asset pricing model (CAPM)**. It postulates that every security is expected to earn a return commensurate with its risk as measured by beta. CAPM establishes a linear relationship between the expected return and systematic risk of all assets. This relation can be used to evaluate the pricing of assets.

12.7 Summary

In this unit, we have discussed the basic levels and assumptions of Capital Asset Pricing Model (CAPM). The concept of risk free asset, risk free lending, risk free borrowing, leveraged portfolio, market portfolio, Capital Market Line (CML), Security Market Line (CSML) and beta have been explained and illustrated at length. This unit also pinpoints the limitations of CAPM and introduces arbitrage pricing theory (APT).

12.8 Key Words

Beta: it measures the sensitivity of a stock's returns to changes in returns on the market portfolio
Capital asset pricing model: it describes the relationship between risk and expected return of a security; here expected return includes the risk free rate plus a premium based on the systematic risk of the security.
Characteristic Line: it describes the relationship between an individual security's returns and returns on the market portfolio.
Portfolio: a combination of two or more securities or assets.
Security market line: it describes the linear relationship between expected rates of return for individual securities and systematic risk as measured by beta.

12.9 Self Assessment Questions

1. Define risk free asset and list out three risk free assets.
2. Compare and contrast Capital Market Line and Security Market Line.
3. What are the basic assumptions underlying Capital asset Pricing Model?
4. In the context of CAPM with unlimited borrowing and lending at the risk free rate of interest, explain the meaning of the capital market price.

12.10 Further Readings

Fisher, Donald E and Ronald J. Jordon, 1987, Security Analysis and Portfolio Management.

Nancy, Efficient Chaotic. What is the New Finance? Harvard Business Review, March-April, 1993.

Lee, Chang F., Joseph E. Finnerty & Donald H.Wort, Security Analysis and Investment Management, Foresman and Company, 1980.

B K S

LESSON – 13

PORTFOLIO ANALYSIS

13.0 Objectives:

After studying this lesson, you will be in position to understand the

- Concepts of return and risk in the portfolio context.
- Various situations when risk can be minimised through diversification.

Structure:

13.1 Introduction:

The process of investment consists of two major tasks. (i) Security analysis and (ii) Portfolio Management. Security analysis consists of examining the risk -return characteristics of individual securities. Security analysis helps in the calculation of intrinsic value of a security and identification of overpriced and under priced securities. Portfolio management consists of examining the risk-return characteristics in the portfolio context. It helps in the selection of the best possible portfolio from a set of feasible portfolios.

13.2 Security Return: $\left(\bar{r}_A\right)$

Expected rate of return from an individual security 'A' is the weighted average of possible outcomes of rates of return, where the weights are the probabilities. If a security is expected to provide the possible rates of return with the probability of occurrence, as shown Table 13.1 expected rate of return $\left(\bar{r}_A\right)$ can be calculated as follows.

Table 13.1

State of the Economy	Probability of Occurrence	Possible Rate of Return (Percent)
Deep recession	0.05	-3.0
Mild recession	0.20	6.0
Average Economy	0.50	11.0
Mild Boom	0.20	14.0
Strong Boom	0.05	19.0

Expected rate of return from security 'A' = $\bar{r}_A = \sum_{i=1}^{n} r_i p_i$

$\bar{r}_A = r_1 p_1 + r_2 p_2 + + r_3 p_3 + - - - - - - - - + r_n p_n$

$\bar{r}_A$ = (-3.0)(0.05) + (6.0)(0.20) + (11.0)(0.50) + (14.0)(0.20) + (19.0)(0.05) = 10.3%

13.3 Security Risk: (σ_A)

Risk involved in individual securities can be measured by variance or standard deviation. Risk is present when the estimated distribution has more than one possible outcome. In the case security 'A', where there are five possible rates of return, risk is present.

Variance is a measure of the dispersion of possible outcomes around its expected value (Mean). The larger the variance, the greater the dispersion.

Variance = $\sigma^2 = \left(r_1 - \bar{r}_A\right)^2 p_1 + \left(r_2 - \bar{r}_A\right)^2 p_2 + - - - - - - - - - \left(r_n - \bar{r}_A\right)^2 p_n$

$= \sum_{i=1}^{n} \left(r_i - \bar{r}_A\right)^2 p_i$

Variance is the sum of the squared deviations multiplied by the probability of occurrence.

σ^2 = (-3.0 - 10.3)^2 0.05 + (6.0 - 10.3)^2 0.20 + (11 – 10.3)^2 0.50 + (14 – 10.3)^2 0.20

+ (19 – 10.3)^2 0.05.

= 8.8445 + 3.698 + 0.245 + 2.738 + 3.7845

= 19.31%

Standard deviation (σ) is an alternative measure of dispersion about the mean. The standard deviation is found by taking the square root of the variance.

Standard deviation = $\sigma = \sqrt{\sigma^2} = \sqrt{\sum_{i=1}^{n}\left(r_i - \bar{r}_A\right)p_i}$

$= \sqrt{19.31}$ = 4.39%

13.4 Portfolio Investment:

Individually securities possess risk. The future return expected from a security varies and the variability of returns is risk. Rarely we find investors putting all their wealth in one single security. Investors are risk averse. They try to maximise their return given their risk taking ability or alternatively, investors will try to minimise the risk given their required rate of return. Investors follow a financial dictum "NOT TO PUT ALL THE EGGS IN ONE BASKET". It is believed that if money is invested in several securities simultaneously, the loss in one will be compensated by the gain in others. As a result investors put their money in more than one security or a combination of securities, which is known as portfolio investment. The group of securities held together as an investment is known as "Portfolio". The objective of portfolio investment is to spread and minimise risk.

The following steps are involved in portfolio management

- Portfolio Analysis
- Portfolio Selection
- Portfolio Revision
- Portfolio Evaluation

In this lesson the first step is covered

13.5 Portfolio Analysis:

Investor identifies the securities in which he would like to invest. He estimates the risk-return characteristics of these securities. He develops number of portfolios from the given set of securities. For each alternative portfolio investor determines the expected return and risk. The process of determining the portfolio return and portfolio risk is known as portfolio analysis.

(i) Portfolio Return: ($\bar{r}_P$)

Expected return of a portfolio ($\bar{r}_P$) is the weighted average of the expected returns of the individual securities held in a portfolio. The weights are the proportions of money invested in each security out of the total investment. For example, imagine that there are three securities in a portfolio with the following expected rates of return.

$\bar{r}_A = 15\%$ $\bar{r}_B = 20\%$ $\bar{r}_c = 8\%$

Table 13.2 Alternative Portolios

Proportion of Investment	1	2	3	4	5
W_A	0.33	0.25	0.10	0.50	0.20
W_B	0.34	0.50	0.20	0.25	0.50
W_C	0.33	0.25	0.70	0.25	0.30

You are provided with five alternative portfolios in table 13.2 where W_A indicates the proportion of investment in security A, W_B indicates the proportion of investment security B and so on. For example, if we consider portfolio '3', investment in security 'A' is 10%, 'B' is 20% and 'C' is 70%, the expected portfolio return will be.

$$\bar{r}_{P_3} = W_A \bar{r}_A + W_B \bar{r}_B + W_c \bar{r}_c$$

= 0.10(15%) + 0.20(20%) + 0.70(8%) = 15 + 4 + 5.6 = 11.10%

Return on portfolio '1' is

$$\bar{r}_{P_1} = 0.33(15\%) + 0.34(20\%) + 0.33(8\%) = 4.95 + 6.8 + 2.64 = 14.39\%$$

Therefore, "portfolio return"

$$\bar{r}_P = \sum_{k=1}^{n} w_k \bar{r}_k$$

Where

$\bar{r}_P$ = Rate of return on the portfolio

$\bar{r}_k$ = Rate of return on securities (k=1. . . . , n)

w_k = Weight of security in the portfolio

n = Number of securities in the portfolio

(ii) Portfolio Risk: (σ_P)

Portfolio risk is measured by the standard deviation of the portfolio return (σ_P). The standard deviation of an individual security measures the riskiness of an individual security $(\sigma_A, \sigma_B \ldots . \sigma_n)$. For measuring portfolio risk, the riskiness of each security with in the context of the portfolio has to be considered.

(a) Covariance (CoV_{AB})

Two key concepts in portfolio analysis are (1) covariance and (2) correlation coefficients. Covariance is a measure which reflects both the variance of a security's returns and the tendency of those returns to move up or down. For example, the covariance between securities A and B tells us whether the returns on the two securities tend to rise or fall together. Covariance is a measure of the general movement relationship between the two security returns.

$$COV_{AB} = \sum_{i=1}^{n} (r_{A_i} - \bar{r}_A)(r_{B_1} - \bar{r}_B) P_i$$

Where

r_{A_1} = Return on security A (i =1, ... n)

$\bar{r}_A$ = Expected rate of return on security A (mean)

r_{B_1} = Return on security B (i = 1, ... n)

$\bar{r}_B$ = Expected rate of return on security B (mean)

p_i = Probability of the i [th] possible outcome (i = 1, ... n)

Consider the information pertaining to securities A and B. shown in Table 13.3

Table 13.3 Calculation of covariance

Possible outcome	Return on A (%)	Return on B (%)	Probability (p_i)	r_{A_1}, p_i	r_{B_1}, p_i
1	14	2	0.1	1.4	0.2
2	12	6	0.2	2.4	1.2
3	10	9	0.4	4.0	3.6
4	8	15	0.2	1.6	3.0
5	6	20	0.1	0.6	2.0
				$\bar{r}_A$ **10.0**	$\bar{r}_B$ **10.0**

$(r_{A_1} - \bar{r}_A)$	$(r_{B_1} - \bar{r}_B)$	$(r_{A_2} - \bar{r}_A)(r_{B_i} - \bar{r}_B)$	$(r_{Ai} - \bar{r}_A)(r_{Bi} - \bar{r}_B) p_i$
4	-8	-32	-3.2
2	-4	-8	-1.6
0	-1	-0	0
-2	5	-10	-2.0
-4	10	-40	-4.0
			COV_{AB} **-10.8**

$\bar{r}_A = r_{A_1}\ p_1 + r_{A_2}\ p_2 + r_{A3}\ p_3 + r_{A4}\ p_4 + r_{A5}\ p_5 = 10.0\%$

$\bar{r}_B = r_{B_1}\ p_1 + r_{B_2}\ p_2 + r_{B3}\ p_3 + r_{B4}\ p_4 + r_{B5}\ p_5 = 10.0\%$

$(r_{Ai} - \bar{r}_A)(r_{Bi} - \bar{r}_B)\ p_i$ = (14-10)(2-10)0.1 + (12-10)(6-10)0.2 + (10 – 10)(9-10)0.4 + (8-10)(15-10)0.2 + (6-10)(20-10)0.1

= -10.8

COV_{AB} = -10.8

The covariance between A and B is –10.8

If A and B tend to move together product of $(r_{Ai} - \bar{r}_A)(r_{Bi} - \bar{r}_B)$ will be positive. If both move counter to one another the product of the deviations would be negative. If both fluctuate randomly the product may be positive or nagetive and sum of the products may near "Zero".

(b) Correlation Coefficient (r_{AB})

Covariance is an absolute measure of interactive risk between two securities. Dividing the covariance (COV_{AB}) between the two securities by the product of the standard deviations (σ_A, σ_B) of each security gives a standardised measure. This measure, which is called as "Coefficient of correlation (μ_{AB}), is another measure to indicate the similarity or dissimilarity in the behaviour of the securities.

$$r_{AB} = \frac{COV_{AB}}{\sigma_A \sigma_B}$$

Where r_{AB} = Coefficient of correlation between A and B

COV_{AB} = Covariance between A and B

σ_A = Standard deviation of A

σ_B = Standard deviation of B

For the above illustration, we calculate standard deviations (σ_A, σ_B).

Variance of A (σ^2_A) = $(r_{A_1} - \bar{r}_A)^2 p_1 + (r_{A_2} - \bar{r}_A)^2 p_2 \ldots . + (r_{A_n} - \bar{r}_A)^2 p_n$

= $(4)^2 0.1 + (2)^2 0.2 + (0)^2 0.4 + (-2)^2 0.2 + (-4)^2 0.1$

= 1.6 + 0.8 + 0 + 0.8 + 1.6

= 4.8

Standard deviation (σ_A) = $\sqrt{\sigma^2_A}$ = $\sqrt{4.8}$ = 2.19%

Variance of B (σ^2_B) = $(0.8)^2 0.1 + (0.4)^2 0.2 + (0.1)^2 0.4 + (5)^2 0.2 + (10)^2 0.1$

= 6.40 + 3.2 + 0.4 + 5 + 10

= 25

Standard deviation (σ_B) = $\sqrt{\sigma^2{}_B}$ = 5%

$$r_{AB} = \frac{COV_{AB}}{\sigma_A \sigma_B}$$

$$= \frac{-10.8}{(2.19(5)} = \frac{-10.8}{10.95} = -0.99$$

The sign of the correlation coefficient is the same as the sign of the covariance. A positive sign means that the returns of securities move together, a negative sign indicates that they move in opposite direction and if it is close to zero, they move independently of one another.

From the previous equation covariance may be expressed as the product of correlation between the securities and the standard deviation of each of the securities.

$$COV_{AB} = r_{AB}\ \sigma_A\ \sigma_B$$

The correlation coefficient range from –1 to 1. If it is –1, it indicates perfect negative correlation. A value of +1 represents a perfect positive correlation. A value close to zero indicates that the returns are independent.

(c) Portfolio Variance and Standard Deviation:

According to Harry M. Markowitz (1952), the standard deviation is a measure of the dispersion of possible returns that could be earned on the portfolio. The variance (risk) of a portfolio ($\sigma^2{}_P$) is not simply a weighted average of the variances of the individual securities in the portfolio. The risk of a portfolio is sensitive to

(i) The proportions of funds devoted to each security [$W_A, W_B, ...W_n$]

(ii) The standard deviation of each security [$\sigma_A, \sigma_B, \ldots . \sigma_n$]

(iii) The covariance between the securities [COV_{AB}, COV_{Bc} . . . .]

The variance of portfolio with only two securities in it may be calculated with the following formula.

$$\sigma^2{}_P = W^2{}_A \sigma^2{}_A + W^2{}_B \sigma^2{}_B + 2W_A W_B r_{AB} \sigma_A \sigma_B$$

Where,

$\sigma^2{}_P$ = Portfolio variance

W_A = Proportion of funds invested in security ‘A’

W_B = Proportion of funds invested in security ‘B’

$\sigma^2{}_A$ = Variance of security A

$\sigma^2{}_B$ = Variance of security B

r_{AB} = Coefficient of correlation between returns of securities A and B

σ_A = Standard deviation of security A

σ_B = Standard deviation of security B

Portfolio standard deviation is the square root of portfolio variance.

$$\sigma_P = \sqrt{\sigma^2{}_P}$$

Example: A and B securities have the following risk return characteristics. The correlation coefficient between A and B is – 0.6.

$$\bar{r}_A = 5\% \qquad \bar{r}_B = 15\% \qquad \sigma_A = 20\% \qquad \sigma_B = 40\%$$

A Portfolio is developed with 25% of funds invested in security A and 75% in security B. Calculate portfolio return and portfolio risk.

(a) Portfolio Return $= (\bar{r}_P) = W_A \bar{r}_A + W_B \bar{r}_B$

= 0.25(5%) + 0.75(15%)

= 1.25 + 11.25

= 12.5%

(b) The Variance of the portfolio = $(\sigma^2{}_P) = W^2{}_A\sigma^2{}_A + W^2{}_B\sigma^2{}_B + 2W_AW_Br_{AB}\sigma_A\sigma_B$

$=(0.25)^2(20)^2+(0.75)^2(40)^2+2(0.25)(0.75)(-0.6)(20)(40)$

= 25 + 900 – 180

= 745

(c) The standard deviation of the portfolio $= (\sigma_P) = \sqrt{\sigma^2{}_P}$

$= \sqrt{745}$

= 27.29%

13.6. Reduction of Portfolio Risk Through Diversification:

Various situations are analyzed here to see whether risk can be minimized

(**a) When can risk be eliminated:**

Risk can be totally eliminated only if the third term ($2W_AW_Br_{AB}\sigma_A\sigma_B$) is equal to the sum of the first two terms ($W^2{}_A\sigma^2{}_A + W^2{}_B\sigma^2{}_B$). This occurs, if

(i) Correlation coefficient is –1.0 [r_{AB} = -1.0]

(ii) The proportion of the portfolio in security A (W_A) is set equal to $\sigma_B / (\sigma_A + \sigma_B)$

i.e., $W_A = \dfrac{\sigma_B}{(\sigma_A + \sigma_B)}$

Let us illustrate with an example. The return on securities A and B and standard deviations of A and B are as follows.

$$\bar{r}_A = 9\% \qquad \bar{r}_B = 9\% \qquad \sigma_A = 2\% \quad \sigma_B = 4\%$$

r_{AB} = -1.0

If the weight of security 'A' is set equal to $[\sigma_B / \sigma_A + \sigma_B]$, w_A would be equal to

$$W_A = \frac{\sigma_B}{(\sigma_A + \sigma_B)} = \frac{4}{(2+4)} = \frac{4}{6} = \frac{2}{3} = 0.67$$

then W_B = 1 - $\frac{2}{3}$ = $\frac{1}{3}$ = 0.33

Standard Deviation of the portfolio = $(\sigma_P) = \sqrt{W^2{}_A\sigma^2{}_A + W^2{}_B\sigma^2{}_B + 2W_AW_Br_{AB}\sigma_A\sigma_B}$

$$= \sqrt{(0.67)^2(2)^2 + (0.33)^2(4)^2 + 2(0.67)(0.33)(-1)(2)(4)}$$

$$= \sqrt{1.795 + 1.742 - 3.537}$$

$$= 0$$

Therefore, portfolio risk (σ_P) can be brought down to zero by skillfully balancing the proportions of the portfolio to each security.

Some combinations of two securities (A and B) will provide a smaller σ_P than either security taken alone, so long as the correlation coefficient is less than the ratio of the smaller standard deviation to the larger standard deviation.

$$r_{AB} \langle \frac{\sigma_A}{\sigma_B}$$

(b) Security Returns Perfectly Positively Correlated:

When the security returns are perfectly positively correlated with a correlation coefficient of +1.0 the following formula can be applied.

Variance of the portfolio

$$(\sigma^2{}_P) = W^2{}_A\sigma^2{}_A + W^2{}_B\sigma^2{}_B + 2W_AW_Br_{AB}\sigma_A\sigma_B$$

When r_{AB} = + 1, the equation can be rewritten as

$$\sigma^2{}_P = W^2{}_A\sigma^2{}_A + W^2{}_B\sigma^2{}_B + 2W_AW_B\sigma_A\sigma_B$$

The expression is similar to that of $(a+b)^2 = a^2+2ab+b^2$
therefore

$$\sigma^2{}_p = (W_A\sigma_A + W_B\sigma_B)^2$$

Standard deviation of the portfolio

$$\left[\sqrt{\sigma^2{}_p}\right] = \sqrt{(W_A\sigma_A + W_B\sigma_B)^2} = (W_A\sigma_A + W_B\sigma_B)^2$$

When security returns are perfectly positively correlated the portfolio risk (σ_P) is the weighted average of the standard deviations of the individual securities. It is not possible to reduce risk through diversification.

(c) Security Returns Perfectly Negatively Correlated:

If the correlation coefficient between two securities is –1.0, the returns move in exactly opposite direction.

Variance of the portfolio

$$\left[\sigma^2{}_P\right] = W^2{}_A\sigma^2{}_A + W^2{}_B\sigma^2{}_B + 2W_AW_Br_{AB}\sigma_A\sigma_B$$

When r_{AB} = -1.0

Then $\sigma^2{}_P = W^2{}_A\sigma^2{}_A + W^2{}_B\sigma^2{}_B - 2W_AW_B\sigma_A\sigma_B$

This expression is similar to $(a-b)^2 = a^2-2ab+b^2$

$$\sigma^2 p = (\mathrm{W_A}\sigma_A + \mathrm{W_B}\sigma_B)^2$$

Standard deviation of the portfolio

$$\sigma_P = \sqrt{\sigma^2 p} = \sqrt{(\mathrm{W_A}\sigma_A + \mathrm{W_B}\sigma_B)^2} = \mathrm{W_A}\sigma_A - \mathrm{W_B}\sigma_B$$

Portfolio risk can be minimized or totally eliminated if the returns of two securities are perfectly negatively correlated.

(d) Security Return Uncorrelated:

If the correlation coefficient is zero [r_{AB} = 0] then the returns of the two securities are uncorrelated.

Variance of the portfolio

$$(\sigma^2{}_P) = W^2{}_A\sigma^2{}_A + W^2{}_B\sigma^2{}_B + 2W_AW_Br_{AB}\sigma_A\sigma_B$$

If r_{AB} = 0, then

$\sigma^2{}_P = W^2{}_A\sigma^2{}_A + W^2{}_B\sigma^2{}_B$

Portfolio standard deviation

$\sigma_P = \sqrt{\sigma^2{}_p} = \sqrt{W^2{}_A\sigma^2{}_A + W^2{}_B\sigma^2{}_B}$

(e) Minimum Risk:

We have discussed situations where r_{AB} = +1.0, r_{AB} = -1.0 and r_{AB} = 0. In other cases, the proportion of securities A and B would result in minimum risk. That portfolio can be arrived at by simplifying the equation for portfolio variance.

$$\sigma^2{}_P = W^2{}_A\sigma^2{}_A + W^2{}_B\sigma^2{}_B + 2W_AW_Br_{AB}\sigma_A\sigma_B$$

The proportions (σ_p) and W_B that would result in minimum risk can be calculated by using the following formula.

$$W_A = \frac{\sigma^2{}_B - \sigma_A\sigma_Br_{AB}}{\sigma^2{}_A + \sigma^2{}_B - 2\sigma_A\sigma_Br_{AB}}$$

$$\frac{\text{Variance of B-COV}_{\text{AB}}}{\text{Var of A+Var of B-2COV}_{\text{AB}}}$$

$$= \frac{\sigma^2{}_B\text{-COV}_{\text{AB}}}{\sigma^2{}_A + \sigma^2{}_B - 2\text{COV}_{\text{AB}}}$$

$$W_B = (1 - W_A)$$

Let us try to understand situations b,c,d and e with the help of examples.
(σ_p)

Suppose security A has an expected rate of return of $\left(\bar{r}_p\right)$ 5% and standard deviation of return σ_A 4%, while security B has expected return of $\left(\bar{r}_B\right)$ 8% and the standard deviation of $\left(\sigma_B\right)$ 10%. Let us work with three different assumed degrees of correlation r_{AB} = +1.0, r_{AB} = 0 and r_{AB} = -1.0 and develop the portfolios expected return $\left(\bar{r}_p\right)$ and standard deviation of returns, $\left(\sigma_p\right)$

To calculate $\bar{r}_P$ the following equation is used

$$\bar{r}_P = W_A\,\bar{r}_A + W_B\,\bar{r}_B$$

To calculate σ_P the following equations are used under three situations

(a) When r_{AB} = +1.0

$$\sigma_P = W_A\sigma_A + W_B\sigma_B$$

(b) When r_{AB} = 0

$$\sigma_P = \sqrt{W^2{}_A\sigma^2{}_A + W^2{}_B\sigma^2{}_B}$$

(c) When r_{AB} = -1.0

$$\sigma_P = W_A\sigma_A - W_B\sigma_B$$

Table 13.4 Portfolio Return and portfolio risk under different degrees of correlation.

Proportion of portfolio		r_{AB} = +1.0		r_{AB} = 0		r_{AB} = -1.0	
Security A	Security B	$\bar{r}_P$	σ_P	$\bar{r}_P$	σ_P	$\bar{r}_P$	σ_P
(W_A)	(W_B)	(%)	(%)	(%)	(%)	(%)	(%)
1.00	0.00	5.00	4.00	5.00	4.00	5.00	5.0
0.75	0.25	5.75	5.50	5.75	3.90	5.75	0.5
0.50	0.50	6.50	7.00	6.50	5.40	6.50	3.0
0.25	0.75	7.25	8.50	7.25	7.60	7.25	6.5
0.00	1.00	8.00	10.0	8.00	10.0	8.00	10.0

In Fig 13.1 points A and B represent pure holdings (100 percent) of securities A and B. The line segment identified as r_{AB} = +1.0 is a straight line. This line shows the inability of a portfolio of perfectly positively correlated securities to serve as a means to reduce risk.

The segment labeled r_{AB} = 0 is a hyperbola. Between points D,E and F, at point 'D' the risk is the lowest.

The segment labeled r_{AB} = -1.0 shows that with perfect negative correlation, portfolio risk can be reduced to zero at point 'C'.

Risk-return calculations of securities and those of the portfolio, which minimizes the portfolio risk are presented with the help of an Exercise 13.1.

Exercise:13.1

You are evaluating an investment in two companies whose post ten years of returns are as follows.

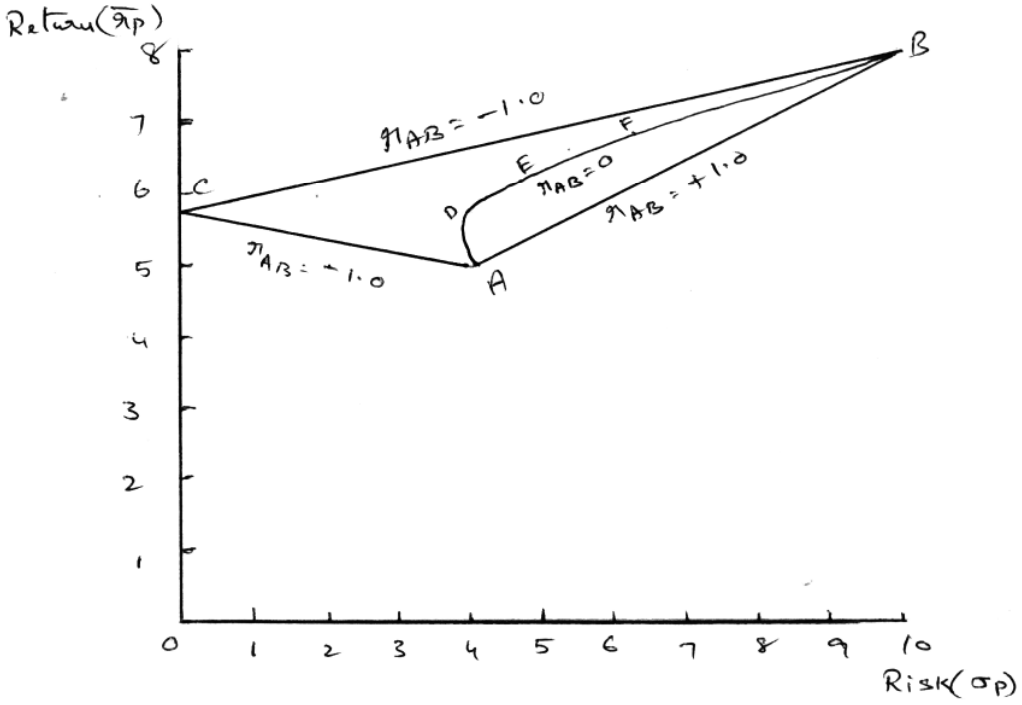
Companies	Percent Return during year									
	1	2	3	4	5	6	7	8	9	10
A	37	24	-7	6	18	32	-5	21	18	6
B	32	29	-12	1	15	30	0	18	27	10

What percentage of investment in each would have regulated in the lowest risk?

Solution:

Year	Return on Security A $(r_{A\,i})$	Return on Security B $(r_{B\,i})$	$r_{Ai} - \bar{r}_A$	$r_{Bi} - \bar{r}_B$	$(r_{Ai} - \bar{r}_A)^2$	$(r_{Bi} - \bar{r}_B)^2$	$(r_{Ai} - \bar{r}_A)(r_{Bi} - \bar{r}_B)$
1	37	32	+22	+17	484	289	374
2	24	29	+9	+14	81	196	126
3	-7	-12	-22	-27	484	729	594
4	6	1	-9	-14	81	196	126
5	18	15	+3	0	9	0	0
6	32	30	+17	+15	289	225	255
7	-5	0	-20	-15	400	225	300
8	21	18	+6	+3	36	9	18
9	18	27	+3	+12	9	144	36
10	6	10	-9	-5	81	25	45
TOTAL	**150**	**150**	**-60**	**-61**	**1954**	**2038**	**1874**

Fig:13.1 Portfobos of Two – Securities with Different Correlation



I Expected rate of return $\left(\bar{r}\right)$

$$\bar{r}_A = \left(\frac{\sum r_{Ai}}{N}\right) = \left(\frac{150}{10}\right) = 15.0\%$$

$$\bar{r}_B = \left(\frac{\sum r_{Bi}}{N}\right) = \left(\frac{150}{10}\right) = 15.0\%$$

I. Variance $\left(\sigma^2\right)$

$$\sigma^2{}_A = \left(\frac{\sum_{i-1}^{n}\left(r_{Ai} - \bar{r}_A\right)^2}{N}\right) = \left(\frac{1954}{10}\right) = 19.54$$

$$\sigma^2{}_B = \left(\frac{\sum_{i-1}^{n}\left(r_{Bi} - \bar{r}_B\right)^2}{N}\right) = \left(\frac{2038}{10}\right) = 203.8$$

II. Standard deviation (σ)

σ_A = $\sqrt{195.4}$ = 13.98%

σ_B = $\sqrt{203.8}$ = 14.28%

II. Covariance (COV_{AB})

$$COV_{AB} = \frac{\sum_{i=1}^{n}\left(r_{A_i} - \bar{r}_A\right)\left(r_{B_i} - \bar{r}_B\right)}{N} = \frac{1874}{10} = 187.4$$

III. Correlation (r_{AB})

$$r_{AB} = \frac{COV_{AB}}{\sigma_A \sigma_B} = \frac{187.4}{(13.98)(14.28)} = \frac{187.4}{199.63} = 0.94$$

IV. Proportion of investment in security 'A' that results in the lowest risk

$$W_A = \frac{\sigma^2{}_B - COV_{AB}}{\sigma^2{}_B + \sigma^2{}_A - 2COV_{AB}} = \frac{203.8 - 187.4}{195.4 + 203.8 - 2(187.4)} = \frac{16.4}{399.2 - 374.8} = 0.64$$

W_B = 1 - W_A = 1 - 0.67 = 0.33

If 67% of the money is invested in A and 33% in B, the portfolio risk would be minimum.

$$\sigma_P = \sqrt{(0.67)^2(13.98)^2(0.33)^2(14.28)^2 + 2(0.67)(0.33)(0.94)(13.98)(14.28)}$$

$$= \sqrt{87.73 + 22.21 + 82.98}$$

$$= \sqrt{192.92}$$

= 13.9%

13.7 Portfolios:

If more number of security are added to a portfolio, the risk of the portfolio (σ_p) decreases and becomes smaller and smaller. Security returns are never perfectly correlated we will never find securities which are neither perfectly negatively correlated or perfectly positively correlated. We will also not come across a situation where securities are uncorrelated with zero correlation coefficient. They will either negatively or positively correlate. Benefits of diversification are limited. Portfolio risk (σ_p) decreases as the number of securities in the portfolio increases.

The total risk of an individual security comprises of two components. The variance caused by market forces is called market risk or systematic risk. The variance caused by company specific factors is called unsystematic risk. Unsystematic risk is diversifiable where as systematic risk is not diversifiable. As the number of securities increases in a portfolio the unsystematic risk devises. Fig 13.2 presents the two components of risk. Risk redaction stops once the unsystematic risk is eliminated.

When the portfolio has more than two securities, the expected return of a portfolio is the weighted average of the returns of individual securities in the portfolio, the weights being the proportions of investment in each securities

$$\bar{r}_P = W_1\bar{r}_1 + W_2\bar{r}_2 + \text{-------} + W_N\bar{r}_N$$

$$= \sum_{K=1}^{n} W_K\bar{r}_K$$

Where,

$\bar{r}_P$ = the expected return of portfolio

W_K = the proportion of funds invested in each securities [K= 1,2,3, - - - N]

$\bar{r}_K$ = the expected return of each security [K= 1,2,3, - - - N]

N = No. of securities in a portfolio

If there are three securities (A,B & C) in portfolio risk (σ_p) can be calculated by using the following formula.

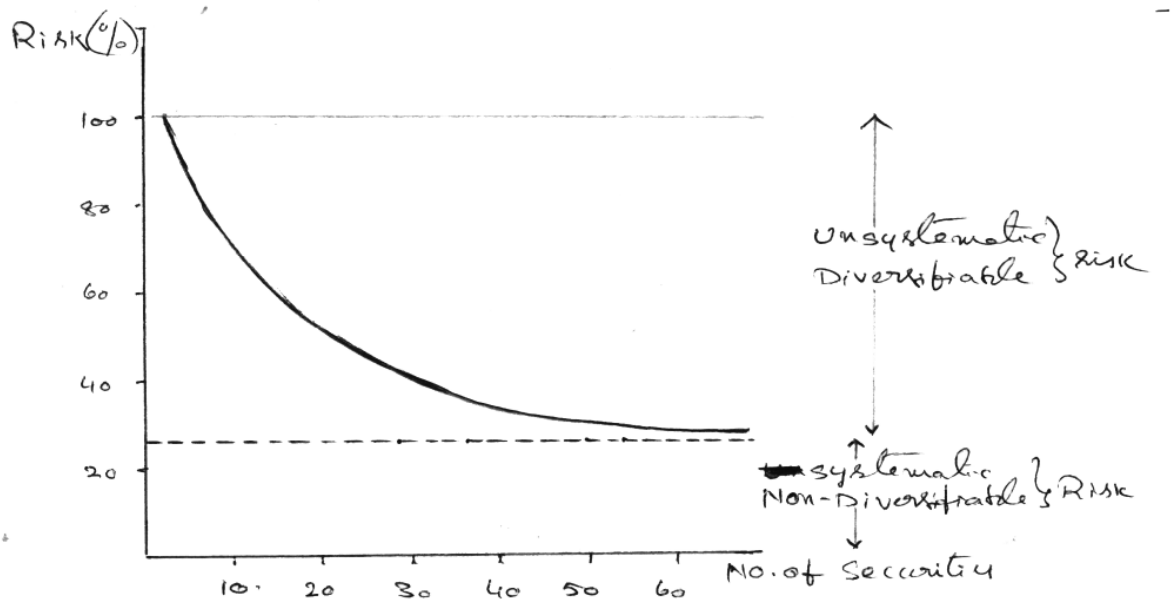


Fig: 13.2 Systematic & Unsystematic Risk

$$\sigma_p = \sqrt{W_A^2\sigma_A^2 + W_B^2\sigma_B^2 + W_C^2\sigma_C^2 + W_D^2\sigma_D^2 + 2W_AW_BCOV_{AB} + 2W_BW_CCOV_{BC} + 2W_CW_DCOV_{CD} + 2W_AW_CCOV_{AC} + 2W_AW_DCOV_{AD} + 2W_BW_DCOV_{BD}}$$

Let us consider a portfolio with three securities having the following characteristics

Exercise 13.2

	Stock A	Stock B	Stock C
Expected return (r_i)	10	12	8
Standard Deviation (σ_i)	10	15	5

Correlation Coefficient

r_{AB} = 0.3 r_{BC} = 0.4 r_{AC} = 0.5

What are portfolio risk and return if the amounts invested are 20% in stock A, 40% in stock B and 40% in stock C.

Solution:

Portfolio return = $\bar{r}_p = \bar{r}_A W_A + \bar{r}_B W_B + \bar{r}_C W_C$

= (10)(0.2) + (12)(0.4) + (8)(0.4) = 10%

Portfolio risk (variance) = σ_p^2

$= W_A^2\sigma_A^2 + W_B^2\sigma_B^2 + W_C^2\sigma_C^2 + 2W_AW_Br_{AB}\sigma_A\sigma_B + 2W_BW_Cr_{BC}\sigma_B\sigma_C + 2W_AW_Cr_{AC}\sigma_A\sigma_C$

$= (0.2)^2(10)^2+(0.4)^2(15)^2+(0.4)^2(5)^2 + 2(0.2)(0.4)(0.3)(10)(15)$

$+ 2(0.4)(0.4)(0.4)(15)(5) + 2(0.2)(0.4)(0.5)(10)(5)$

= 64.8

Portfolio risk (standard deviation) = σ_p

$= \sqrt{\sigma_p^2}$ $= \sqrt{64.8}$ = 8.0%

Exercise 13.3: From the following data calculate portfolio return and portfolio risk

Security	Expected return	Standard deviation	Proportion of funds invested
ACC	8.89	19.55	0.10
TCS	5.12	7.99	0.40
HLL	3.42	6.18	0.50

Variance – covariance matrix

Security	ACC	TCS	HLL
ACC	382.09	68.73	39.87
TCS	68.73	63.82	68.87
HLL	39.87	68.87	38.25

Solution:

Portfolio Return $= \bar{r}_p$

$= (8.89)(0.10)+(5.12)(0.40)+(3.42)(0.50)$

$= 4.65\%$

Portfolio Return $= \sigma_p^2$

$= (0.1)^2 382.09+(0.4)^2 63.82+(0.5)^2 38.25$

$+ 2(0.1)(0.4)68.73$

$+2(0.4)(0.5)68.87$

$+22(0.1)(0.5)39.87$

$\sigma_p^2 = 60.628$

$\sigma_p = 7.79\%$

13.8 Summary:

A portfolio is a group of financial security. With given number of securities many portfolios can be constructed by changing proportion of funds invested in each security. Each portfolio will have different return and risk. Risk of a portfolio is not a weighted average of the risk of individual securities. But portfolio return is a weighted average of return from individual securities.

Determination of portfolio return and risk for different portfolios is the first step in portfolio management. Which is called portfolio analysis. Risk is classified into systematic risk and unsystematic risk. Unsystematic risk can eliminated by increasing the number of securities in the portfolio.

13.9 Key words:

Portfolio Analysis : Determination of expected return and risk of a different portfolio

Covariance: A statistical measure that indicates the interactive risk of a security relative to others in a portfolio of securities.

Correlation Coefficient: A statistical measure that dictates the similarity and dissimilarity in the behaviour of the securities

Systematic risk: Market related risk

Unsystematic risk: Unique risk of that particular security

13.10 Self Assessment Questions:

1. What is expected return on a portfolio of risky assets?

2. What is the risk of a portfolio?

3. Under what conditions the portfolio risk can be minimized?

4. Stock R and S display the following returns over the past two years?

Year	Return on	
	Stock R (%)	Stock S (%)
1	10	12
2	16	18

What is the expected return and the risk on a portfolio made up of 40% of R and 60% of S?

5. The returns of two securities, (a) Ranbaxy , and (b) Polaris Soft are given below

Possible Rates of return on		Probability
Ranbaxy	Polaris	
5%	0%	0.1
10%	8%	0.3
15%	18%	0.5
20%	26%	0.1

What is the coefficient of correlation between the two securities.

6. The following information is available pertaining to two stocks A and B

	Stock A	Stock B
Expected return	14%	20%
Standard deviation	8%	11%
Coefficient of Correlation		

What is the expected return and risk of a portfolio in which A and B are equally weighed?

13.11 Further Readings:

Prasanna chandra, *Investment Analysis & Portfolio Management*, Tata McGraw Hill publishing Co Ltd., New Delhi,

Donald E. Fischer, Ronald J. Jordan, *Security Analysis and Portfolio Management*, Prentice Hall of India Pvt Ltd., New Delhi,

V K Bhalla, *Investment Management*", S. Chand & Co Ltd., New Delhi,

Punithavathy Pandian, *Security Analysis and Portfolio Management*, Vikas Publishing House pvt Ltd., New Delhi.

Kevin S. *Portfolio Management* , Prentice Hall of India Pvt ltd., New Delhi.

C A K

LESSON –14

PORTFOLIO SELECTION

14.0 Objectives:

After studying this lesson, you will be able to understand the:

- Markowitz model of portfolio selection
- Sharpe's single index model of portfolio selection.

Structure:

14.1 Introduction:

Investors seek to maximize expected return and minimize uncertainty. In the process of achieving the objective investors develop alternative portfolios with different return and risk characteristics. The portfolio that satisfies the objective of the investor is called the optimum portfolio. The process of finding the optimum portfolio is known as portfolio selection. Two important models were developed, which help in the selection of optimum portfolio. Markowitz model and Sharpe's model are the two models.

14.2 Markowitz Model:

Markowitz's work marks the beginning of modern portfolio theory. Markowitz approach is single period approach. According to this model standard deviation of a portfolio is a measure of the dispersion of possible return that could be earned on the portfolio.

14.2.1 Assumptions of Markowitz Model:

Key assumptions of the model are as follows:

(i) Investors decisions are based on two parameters (Expected return and standard deviation) only

(ii) Investors are risk averse, which means that when investor faces two alternative portfolios with same expected return but different standard deviations (risk), he prefers the one with the lower risk.

(iii) Investors seek to achieve the highest expected return at a given level of risk.

(iv) Investors have identical expectations about expected returns, variances, covariances for all risky assets.
(v) Investors have a common one-period investment horizon.

14.2.2 Portfolio Selection Process:

The procedure developed by Markowitz for selecting the optimum portfolio consists of the following steps:

(i) Develop feasible set of portfolios
(ii) Delineate the set of efficient portfolios
(iii) Specify the risk-return indifference curves of the investor
(iv) Select the optimum portfolio

(i) Feasible set of portfolios:

The feasib5le set simply represents the set of all portfolios that could be formed from a group of 'N' securities. With a given number of security an investor can create a very large number of portfolios combining these securities in different proportions. These constitute the feasible set of portfolios, which is known as "portfolio opportunity set".

Each portfolio is characterized by an expected return ($\bar{r}_P$) and a measure of risk (σ_P). Suppose an investor is considering three securities (A,B and C) for investment with the following expected return and risk.

$\bar{r}_A$ = 15%	σ_A = 10%	σ_A^2 = 100	COV_{AB} = 100
$\bar{r}_B$ = 20%	σ_B = 25%	σ_B^2 = 625	COV_{BC} = 52.5
$\bar{r}_C$ = 8%	σ_C = 3%	σ_C^2 = 9	COV_{AC} = 27

The coefficient of correlation between A and B = r_{AB} = 0.4
The coefficient of correlation between B and C = r_{AB} = 0.7
The coefficient of correlation between C and A = r_{AB} = 0.9

The investor can combine securities A,B and C in a number of ways by simply changing the proportions. Let us see some the options available.

Table: 14.1 Calculation of portfolio return and risk.

Portfolio	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Proportion of A (W_A)	0.80	0.70	0.60	0.50	0.40	0.30	0.20	0.15	0.15	0.10
Proportion of B (W_B)	0.10	0.20	0.20	0.30	0.10	0.30	0.50	0.60	0.15	0.30
Proportion of C (W_C)	0.10	0.10	0.20	0.20	0.50	0.40	0.30	0.25	0.70	0.60
Portfolio Return ($\bar{r}_P$)	14.8	15.3	14.6	15.1	12.0	13.7	15.4	16.25	10.85	12.3

Portfolio risk (σ_P)	9.6	10.4	9.8	15.9	10.9	10.2	14.0	16.23	6.5	9.4

The portfolio expected rate $\bar{r}_P$ and standard deviations are calculated using the following equations.

$$\bar{r}_P = W_A \bar{r}_A + W_B \bar{r}_B + W_C \bar{r}_C$$

$$\sigma_P = \sqrt{W_A^2\sigma_A^2 + W_B^2\sigma_B^2 + W_C^2\sigma_C^2 + 2W_A W_B r_{AB}\sigma_A\sigma_B + 2W_B W_C r_{BC}\sigma_B\sigma_C + +2W_A W_C r_{AC}\sigma_A\sigma_C}$$

Let us calculate the values for portfolio '3'

$$\bar{r}_{P_3} = 0.6(15\%) + 0.2(20\%) + 0.2(8\%) \quad = \quad 14.6\%$$

$$\sigma_{P_3} = \sqrt{(0.6)^2(100) + (0.2)^2(625) + (0.2)^2(9) + 2(0.6)(0.2)(0.4)(10)(25) + 2(0.2)(0.2)(0.7)(25)(3) + 2(0.6)(0.2)(0.9)(10)(3)}$$

= 9.8%

Similarly the portfolio return and risk can be calculated for all the portfolios possible. For the sake of example ten portfolios have been analyzed. Hundreds of such combinations can be formed and portfolio return and risk can be calculated. If the data are plotted graphically, we get a scattered diagram (Fig 14.1).

Fig :14.1

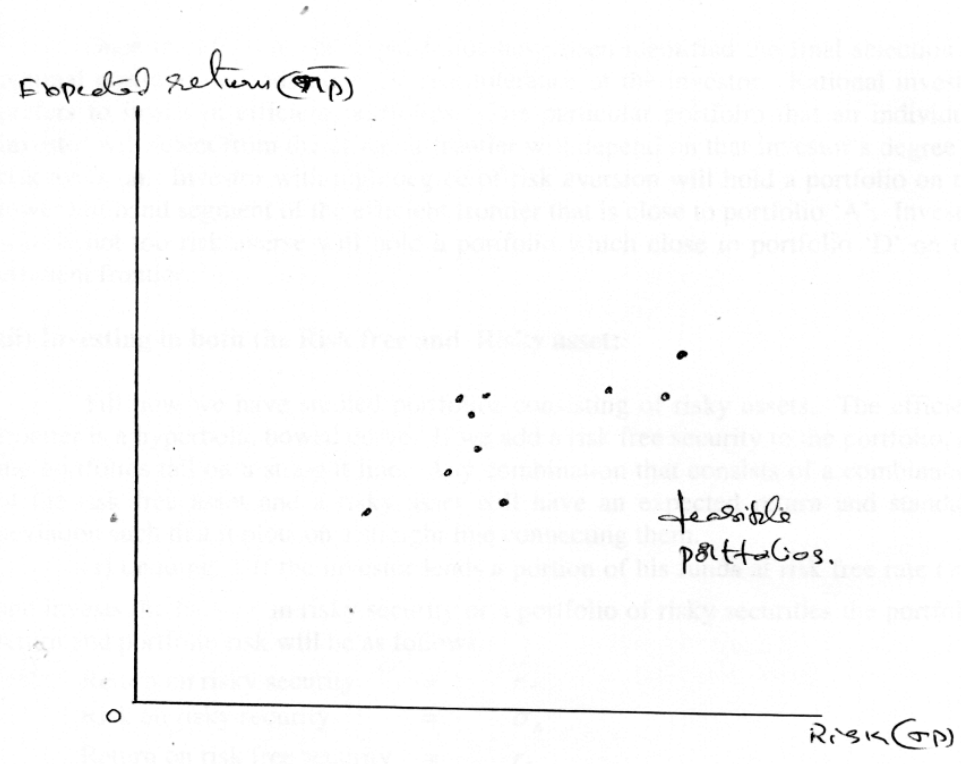


Fig 14.1 portfolio options

If just three securities offer so many options we can imagine the range of possibilities when an investor invest in number of securities. Fig 14.2 shows the portfolio options available. The collection of all possible options represent feasible set. Each portfolio in the feasible set is characterized by an expected return and a measure of risk. Among the feasible sets, some portfolios dominate the others. These portfolios are known as efficient portfolios and others are inefficient portfolios.

Fig :14.2

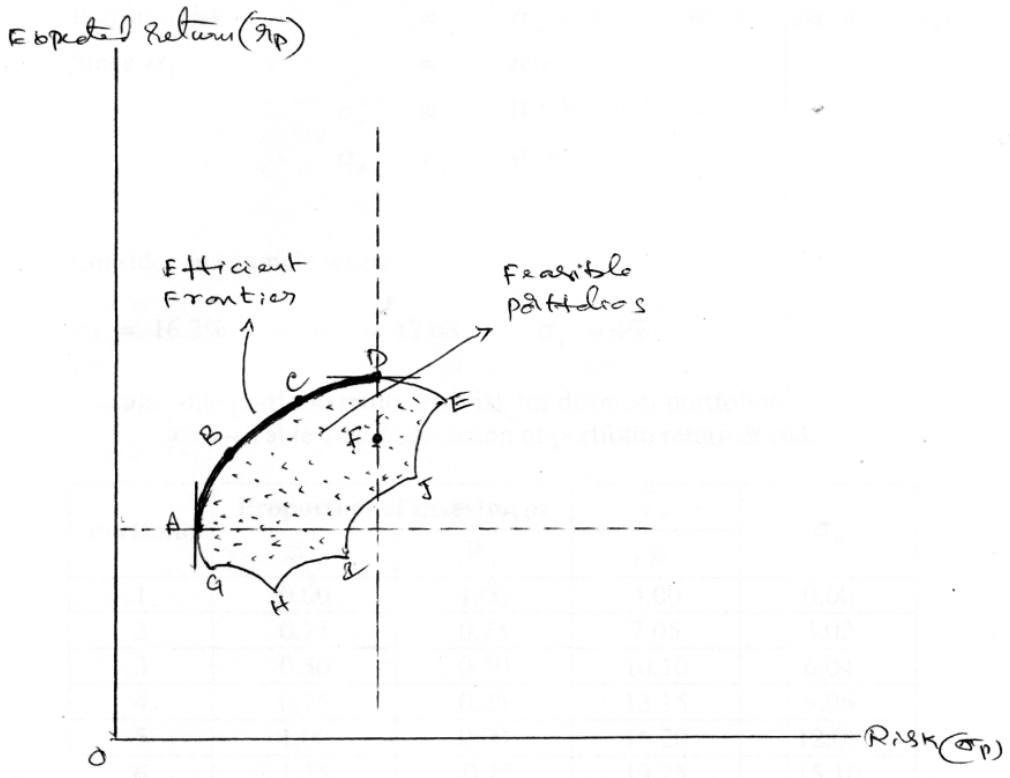


Fig 14.2 Efficient Frontier

(ii) Efficient set of portfolios:

An investor will choose optimal portfolio from the set of portfolios that

(a) offer maximum expected return from varying levels of risk and

(b) offer minimum risk for varying levels of expected return

A set of portfolios meeting these conditions is known as the efficient set or efficient frontier. The concept of efficient sets can be illustrated with the help of Fig 14.2. Expected return ($\bar{r}_P$) is shown on 'x' axis and risk (σ_P) is known as 'y axis. Portfolios A,B,C and D which are lying on the thick line are efficient. Consider portfolios D and F. Portfolio D provides a higher rate of return for the same risk. D is efficient and F is inefficient. Compare A and G, A provides a high rate at low risk. But G has low return with high risk. Therefore, between A and

G, A is preferred. Between D and F, F is preferred. Portfolios lying in the north-west boundary of the shaded area are more efficient than all the portfolios in the interior of the shaded area.

Portfolio 'A' in the diagram represents the global minimum variance portfolio because A has the lowest risk compared to all other portfolios. Portfolio 'D' provides the highest return compound to other portfolios. The set of portfolios lying between the global minimum variance portfolio and the maximum return portfolio represent efficient set of portfolios. The efficient frontier is a concave curve in the risk-return space that extends from the minimum variance portfolio to the maximum return portfolio.

Once the efficient set of portfolios have been identified the final selection of optimal portfolio depends upon the risk tolerance of the investor. Rational investor prefers to invest in efficient portfolios. The particular portfolio that an individual investor will select from the efficient frontier will depend on that investor's degree of risk aversion. Investor with high degree of risk aversion will hold a portfolio on the lower left hand segment of the efficient frontier that is close to portfolio 'A'. Investor who is not too risk averse will hold a portfolio which close to portfolio 'D' on the efficient frontier.

(iii) Investing in both the Risk free and Risky asset:

Till now we have studied portfolios consisting of risky assets. The efficient frontier is a hyperbola, bowed curve. If we add a risk free security to the portfolio, all the portfolios tall on a straight line. Any combination that consists of a combination of the risk free asset and a risky asset will have an expected return and standard deviation such that it plots on a straight line connecting them.

(a) Lending: If the investor lends a portion of his funds at risk free rate (r_f) and invests the balance in risky security or a portfolio of risky securities the portfolio return and portfolio risk will be as follows.

Return on risky security	=	$\bar{r}_A$
Risk on risky security	=	σ_A
Return on risk free security	=	r_f
Risk on risk free security of	=	- 0
Portfolio return	=	$\bar{r}_p = W_A \bar{r}_A + W_f r_f$
Portfolio risk	=	$\sigma_p^2 = W_A^2\sigma_A^2 + W_f^2\sigma_f^2 + 2W_A W_f r_{Af}\sigma_A\sigma_f$
Since σ_f	=	zero
σ_p^2	=	$W_A^2\sigma_A^2$
σ_p	=	$W_A W_f$

Consider an example where

$\bar{r}_A$ = 16.2% σ_A = 12.08 σ_f = 4%

Calculate the portfolio return and risk for different portfolios

Table 14.2 Calculation of portfolio return & risk

Portfolio	Proportion of investment		$\bar{r}_p$	σ_p
	W_A	W_f	(%)	
1	0.00	1.00	4.00	0.00
2	0.25	0.75	7.05	3.02
3	0.50	0.50	10.10	6.04
4	0.75	0.25	13.15	9.06
5	1.00	0.00	16.20	12.08
6	1.25	-0.25	19.25	15.10
7	1.25	-0.50	22.30	18.12
8	1.75	-0.75	25.35	21.14
9	2.00	-1.00	28.40	24.16

Borrowing:

Up to portfolio '5' the investor invested in both risk free security (Lending) and risky security or portfolio. Portfolio '6' is a case of borrowing, at risk free rate and investing the borrowed amount also in risky securities. Portfolio consists of a debt (loan) and asset (portfolio of risky securities). When the data present in table 14.2 are presented in a graph we obtain fig 14.3.

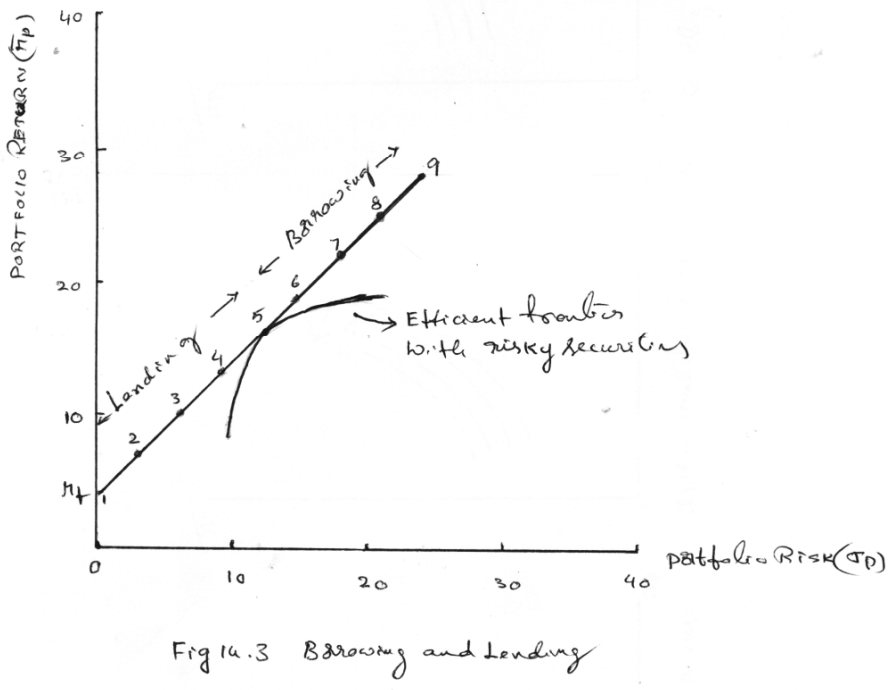


Fig 14.3 Borrowing and Lending

Fig 14.3.

From fig 14.3, we can understand that all the portfolios are lying on a straight line. Portfolio '1' is 100% investment in risk free asset. Therefore, it lies on the 'x' axis where σ_p is zero. Portfolio 5 is a portfolio with 100% investment risky securities. Portfolios 2,3 and 4 are

with investment in both borrows at risk free rate and investor all the borrowed money and own money in risky portfolio, we got portfolios with the expected return and standard deviation lying on the extension of the straight line beyond point '5'. Therefore, when a risk free security is added to the risky portfolio. All the portfolios tall on a straight line, indicating linear relationship.

(iv) Indifference curves (Risk-Return utility curves):

The indifference curves of investors will have the following features

- All the portfolios that lie on a given indifference curve are equally desirable to the investor.
- Indifference curves do not intersect.
- Investor will find any portfolio that is lying on an indifference curve that is "further north-west" to be more desirable than any portfolio lying on an indifference curve that is less north-west.
- Investor has an infinite number of indifference curves.

Fig 14.4 presents these curves in respect of three types of investors (a) Highly risk averse (b) moderately risk averse (c) slightly risk averse.

Investors like to get more return for additional risk assumed. Therefore, the indifference curves are positively sloped. The degree of the slope of indifference curve indicates the degree of risk aversion. In panel (a) of fig 14.4 the curves are steep and slope is high. This indicates that the investor expects large return for additional amount risk he takes. Panel (c) presents the case of an investor who is slightly risk averse. The indifference curves are relatively flat with low slope. For the additional risk the investor expects small amount of additional return. Panel (b) shows the case of moderately risk averter.

fig 14.4.

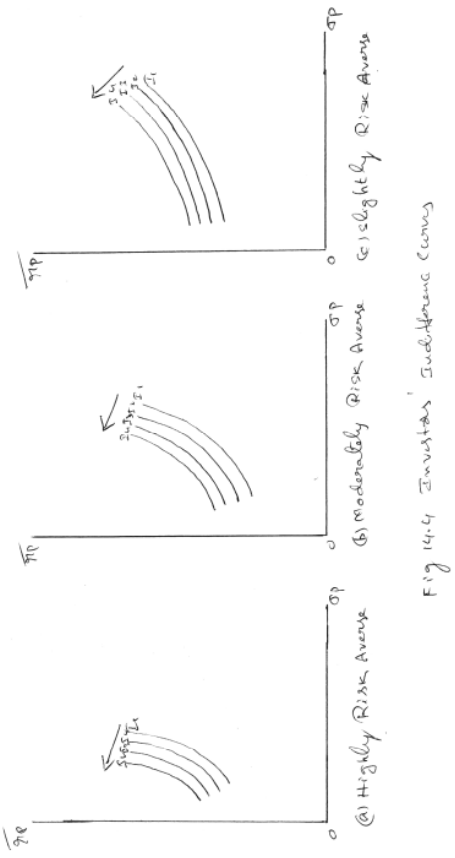


Fig 14.4 Investors' Indifference Curves

The investor's indifference map presented in Fig 14.4 reveals the following points.

- The investor is indifferent between various points on the same indifference curves. Between various portfolios on I_1 investor will be indifferent.
- Indifference cures moving up wards to the left represents a higher level of utility. Portfolio on I_4 provides higher level of utility when compound to portfolio on I_3.
- Investors prefer to be on the highest possible curve, as it maximizes his utility.

(v) Optimum Portfolio

Given the efficient frontier and the risk-return indifference curves, the optimum portfolio is found at the point of tangency between the efficient frontier and an indifference curve. This point of tangency represents the highest level of utility the investor can reach. This is shown in Fig 14.5.

Fig 14.5.

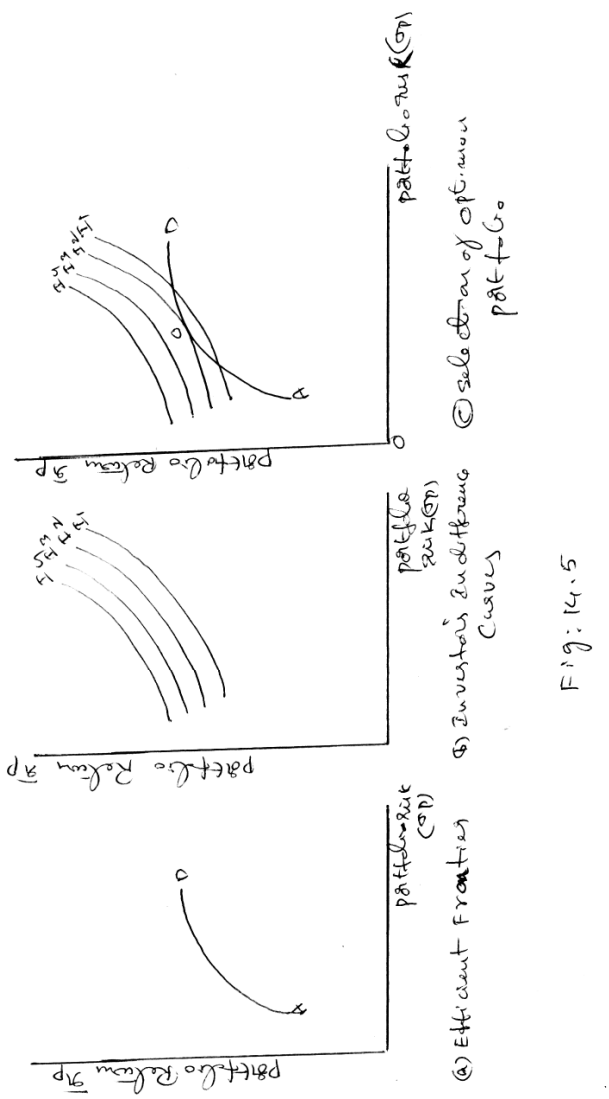


Fig: 14.5

Fig14.5 shows the selection of optimum portfolio. Panel (a) presents efficient frontier. Panel (b) presents the indifference curves of an investor. Panel (c) shows the tangency of efficient frontier and indifference curve (I_2) at point 'O'. This point represents optimal portfolio.

14.2.3 Limitations of Markowitz's approach:

This modal requires large number of input data for the calculations. If there are 'N' securities in the portfolio, N number or return estimates, N number of variance estimates and N(N-1)/2 covariance estimates are required. Total estimates are 2N+[N(N-1)/2. If there are 10 securities 65 estimates, if there are 100 securities 5150 estimates and for 200 securities 20,300 estimates are required. Number of estimates required increases with the increase in number of securities because covariances between each pair have to be estimated.

The computations required are numerous and complex in nature. Markowitz technique requires [N(N+3)]/2 bits of information. The identification of efficient portfolios requires the use of quadratic programming, which is a complex procedure.

14.3 Sharpe's Single Index Model:

William Sharpe developed a model that reduces data and computational requirements substantially. The model assumes that fluctuations in the value of a stock relative to that of another do not depend primarily upon the chrematistics of these two securities alone. The two securities reflect the influence of general business conditions. The basic notion underlying the model is that all stocks are affected by movements in the stock market. If we observe the market, we will find the prices of most stocks rising when the market moves up and vice versa. This co-movement of stocks with the market is studied with the help of simple linear regression technique.

Under this model bits of information requirement decreases to 3N+2 against [N(N+3)]/2 data requirement under Markowitz model. If the number of securities is 100, Sharpe's model requires 302 [3x100+2] bits of information while Markowitz technique requires 5150 [(100(100+3))]2 bits of information.

Sharpe suggested that covariances of each security with each other security can be abandoned and information on the relationship of each security to the market may be substituted. According Sharpe, the return on each security (r_i) is equal to some constant (α_i), plus same coefficient (β_i), times the return on the market index (r_m), plus a random component (e_i).

Where,

$r_i = \alpha_i + \beta_i r_m + e_i$

r_i = return on security 'i'

r_m = return on market index

α_i (alpha) = component of security return that is independent of market's performance.

β_i (beta) = measure of change in r_i given a change in r_m

e_i = residual return

The α_i (alpha) indicates the return on security 'i' when the market return (r_m) is zero. This part of the equation is not influenced by the market return. The β_i (beta) is a measure of sensitivity of security return (r_i) to the return on the market index (r_m). it reflects the tendency of a stock to move with the market. The e_i is that part of the return which is influenced by other factors other than return on market index (r_m). It is known as residual return or random return.

(i) Security Return:

Under the single index model, expected return on a security can be calculated using the following equation.

$$\bar{r}_i = \alpha_i + \beta i_i \bar{r}_m$$

The security return has two components

(i) α_i which is independent of the market

(ii) $\beta_i \bar{r}_m$ which is dependent on the market

The reside ℓ_i averages to zero with large number of observations.

(ii) Security risk

Risk of a security, σ_i^2, too has two components, market related component and security specific component. Risk caused by changes in market factor and risk caused by company specific factors are the two components. The first component is known as "systematic risk" and the second component is "unsystematic risk". Systematic risk affects all the securities. Unsystematic risk is unique and can be reduced through diversification.

Total risk = Systematic risk + Unsystematic risk

$$\sigma_i^2 = \beta_i^2 \sigma_m^2 + \sigma_{e_i}^2$$

Where σ_i^2 = Variance of security return

β_i = Beta coefficient of security 'i'

σ_m^2 = Variance of market return

$\sigma_{e_i}^2$ = Variance of residual return

(iii) Portfolio Return $\left(\bar{r}_P\right)$

Portfolio return is the weighted average of the expected returns of each security in the portfolio. It may be taken as portfolio alpha $\left(\alpha_P\right)$ plus portfolio beta times expected market return $\left(\bar{r}_m\right)$.

$$\bar{r}_P = \alpha_P + \beta_P \bar{r}_m$$

The portfolio alpha is the weighted average of the alphas of the individual securities

$$\alpha_P = \sum_{i=1}^{n} w_i \alpha_i$$

The portfolio beta is the weighted average of the beta coefficient of the individual securities.

$$\beta_P = \sum_{i=1}^{n} w_i \beta_i$$

Where w_i = Proportion of investment in security 'i'

α_i = alpha of security 'i'

β_i = the beta coefficient of security 'i'

Portfolio return is the weighted average of the expected return from individual securities ($\bar{r}_i = \alpha_i + \beta i_i \bar{r}_m$).

$$\therefore \ \bar{r}_P = \sum_{i=1}^{n} w_i(\alpha_i + \beta i_i \bar{r}_m) = \sum_{i=1}^{n} w_i \bar{r}_i$$

(iv) Portfolio Risk (σ_P)

Portfolio risk is calculated using the following equation.

Portfolio Variance = $\sigma_P^2 = \beta_P^2 \sigma_m^2 + \sum_{i-1}^{n} W_i^2 \sigma_{e_i}^2$

Portfolio Standard deviation = $\sigma_P = \sqrt{\beta_P^2 \sigma_m^2 + \sum_{i-1}^{n} W_i^2 \sigma_{e_i}^2}$

$\beta_P^2 \sigma_m^2$ represents systematic and market related risk and $\sum_{i-1}^{n} W_i^2 \sigma_{e_i}^2$ represents unsystematic and security specific risk. As more securities are included in the portfolio unsystematic risk becomes zero and portfolio risk becomes equal to $\beta_P^2 \sigma_m^2$.

$\sigma_P = \sqrt{\beta_P^2 \sigma_m^2}$

The sharpes single index model is explained with the help of the following example.

The historical return of security 'A' along with historical return of the market are given below.

Year	r_A	r_m
1	38.6%	23.8%
2	-24.7	-7.2
3	12.3	6.6
4	8.2	20.5
5	40.1	30.6

Year	Return on security r_{A_i} (%)	Return on Market r_{A_i} (%)	Deviation $(r_{A_i} - \bar{r}_A)$	$\left(r_{A_i} - \bar{r}_A\right)^2$	$\left(r_M - \bar{r}_{K_1}\right)$	$\left(r_{M_i} - \bar{r}_{M_2}\right)^2$	$(r_{A_i} - \bar{r}_A)\left(r_M - \bar{r}_{K_1}\right)$	$\left(r_{A_i}.r_{M_i}\right)$	$r_{M_i}^2$
1	38.6%	23.8	23.7	561.69	8.9	79.21	210.93	918.68	566.44
2	-24.7	-7.2	39.6	1568.16	22.1	488.41	875.16	177.84	51.84
3	12.3	6.6	-2.6	6.76	-8.3	68.89	21.58	81.18	43.56
4	8.2	20.5	-6.7	44.89	5.6	31.36	-37.52	168.1	420.25
5	40.1	30.6	25.2	635.04	15.7	246.49	395.64	1227.06	936.36
Total =	74.5	74.5	Total =	2816.54	Total =	914.36	1465.73	2572.86	2018.45
$\frac{}{}$ N	$\frac{}{}$ 5	$\frac{}{}$ 5	$\frac{}{}$ N	$\frac{}{}$ 5	$\frac{}{}$ N	$\frac{}{}$ 5	$\frac{}{}$ 5		
Avg:			σ_A^2	563.308	σ_M^2	182.872	COV_{AB}		
			σ_A	23.73	σ_M	13.52	293.146		

The following calculations are made

Expected return on security A = $\bar{r}_A$ = 14.9%

Expected return on security B = $\bar{r}_B$ = 14.9%

Variance of return on security A = σ_A^2 = 5633

Variance of return on security B = σ_B^2 = 182.8

Standard deviation of return of security A = σ_A = 23.73

Standard deviation of return of security B = σ_B = 13.52

Covariance between return of security A & B = COV_{AB} = 293.15

Covariance between return of security A & B = $r_{AB} = \frac{COV_{AB}}{\sigma_A \sigma_B}$ = 0.91

Coefficient of determination = r^2 = 0.83

$$\text{Beta} = \frac{N\left[\sum r_{M_i} r_{A_i}\right] - \sum r_{M_i} \sum r_{A_i}}{N \sum r_{M_i}^2 - \sum \left(r_{M_i}\right)^2}$$

$\sum r_{M_i} r_{A_i}$ = 2572.86

$\sum r_{M_i}$ = 74.5

$\sum r_{A_i}$ = 74.5

$\sum r_{M_i}^2$ = 2018.45

$\sum \left(r_{M_i}\right)^2$ = 5550.25

$$\beta = \frac{5[2572.86] - (74.5)(74.5)}{5[2018.45] - [5550.25]} = 1.6$$

Security 'β' can also be obtained using the following formula

$$\beta_A = \frac{COV_{AM}}{\sigma_M^2} = \frac{Covariance between the security and market}{Market variance}$$

$$= \frac{r_{AM}\sigma_A\sigma_M}{\sigma_M^2} = \frac{r_{AM}\sigma_A}{\sigma_M} = \frac{(0.91)23.73}{13.52} = 1.6$$

$$\text{Alpha} = \alpha_A = \frac{\sum r_{A_i} - \beta \sum r_{M_i}}{N} = \frac{74.5 - 1.6(74.5)}{5} = -8.9$$

The estimated equation = $\bar{r}_A = \alpha_A + \beta_A \bar{r}_M$

$= \bar{r}_A = -8.9+1.6\bar{r}_M$

Fig 14.6

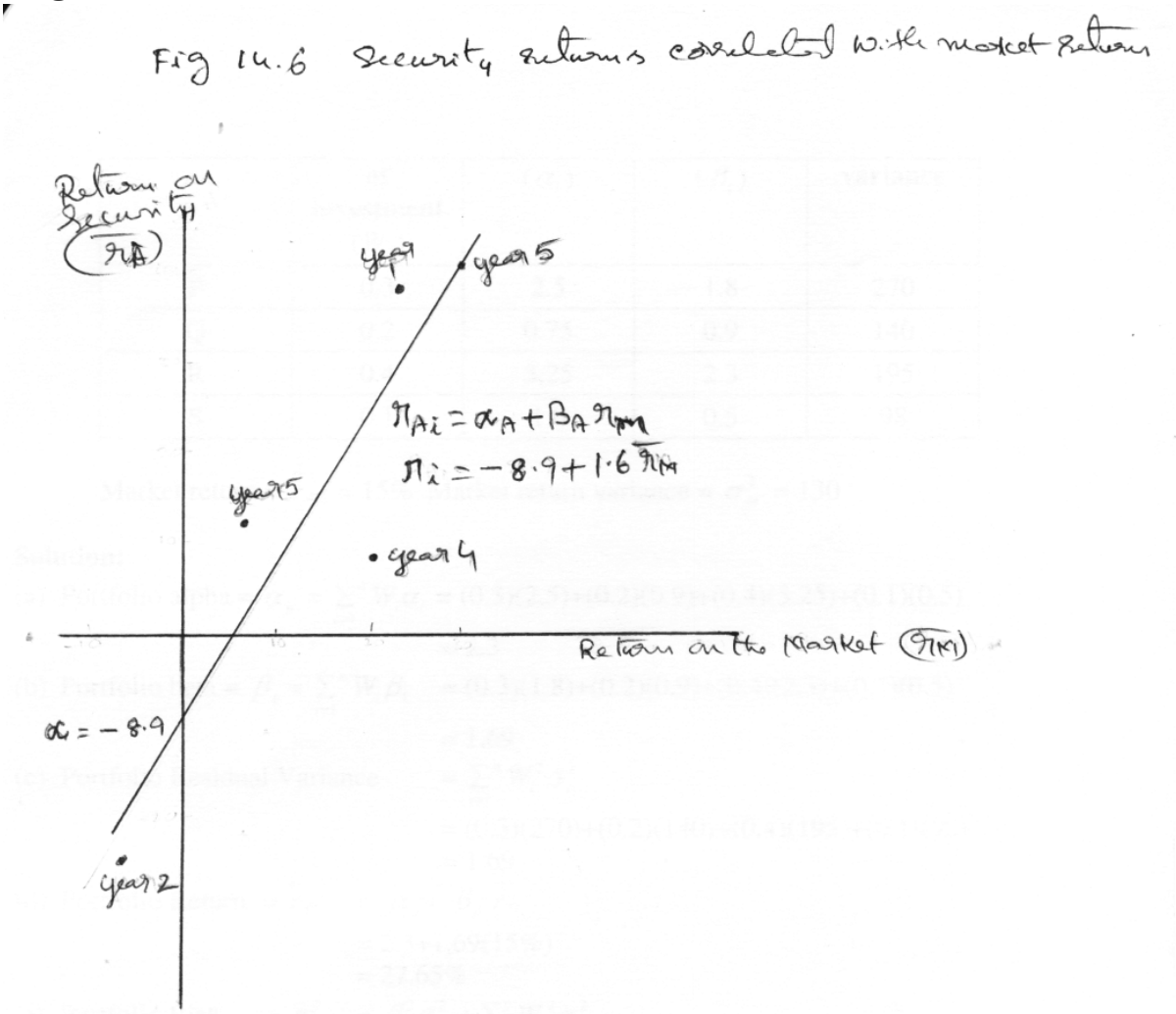


Fig 14.6 presents the relationship between return on the security and the return on the market. If we fit a line mathematically, we get the above equation.

The coefficient of determination (r^2) tells us the percentage of the variance of the security's return that is explained by the variation of return on the market index.

When r^2 = 0.83, it implies that 83% of variance of the security's return is explained by the market 17% is not explained.

Variance explained by the market = $r_A^2 . r^2$

= 563.3 (0.83) = 468

Variance not explained by the market = 563.3 (0.17) = 95

According to sharpes single index model the variance explained by the market is systematic risk and unexplained variance is unsystematic risk.

Systematic risk = $\beta^2 \sigma_M^2$ = $(1.6)^2$ (182.8) = 468

Unsystematic risk = e^2 = 563-468 = 95

(v) Selection of optimum portfolio

Under sharpes single index model construction of optional portfolio is simplified. The desirability of a stock to be included in the portfolio dependence upon excess return - to beta ratio.

Excess return – to beta ratio = $\frac{Excess \quad return \quad of \quad the \quad \text{sec}urity \, over \quad risk \quad free \quad rate}{\text{sec}urity \quad Beta}$

$= \frac{r_i - r_f}{\beta_i}$

Where,

r_i = expected return on stock i

r_f = return on a riskless asset

β_i = Security beta of stock i

Construction of optimal portfolio involves the following steps

1. Calculate the excess return to beta ratio for each security
2. Rank the security in the ascending order of the ratio
3. Establish a cut off ratio
4. Optimum portfolio consists of those securities whose excess return to rate ratio is greater than a particular cutoff point (c*)

Exercise 14.1 A portfolio consists of four securities A,B,C and D. Basic data is shown below. Calculate portfolio return and risk.

Security	Proportion of investment (W_i)	Alpha (α_i)	Beta (β_i)	Residual variance
P	0.3	2.5	1.8	270
Q	0.2	0.75	0.9	140
R	0.4	3.25	2.3	195
S	0.1	1.0	0.5	98

Market return = $\bar{r}_m$ = 15% Market return variance = σ_M^2 = 130

Solution:

(a) Portfolio alpha = $\alpha_p = \sum_{i=1}^{n} W_i\alpha_i$ = (0.3)(2.5)+(0.2)(0.9)+(0.4)(3.25)+(0.1)(0.5)

= 2.3

(b) Portfolio beta = $\beta_p = \sum_{i=1}^{n} W_i\beta_i$ = (0.3)(1.8)+(0.2)(0.9)+(0.4)(2.3)+(0.1)(0.5)

= 1.69

(c) Portfolio Residual Variance = $\sum_{i=1}^{n} W_i^2\sigma_{e_i}^2$

= (0.3)(270)+(0.2)(140)+(0.4)(195)+(0.1)(98)

= 1.69

(d) Portfolio Return = $\bar{r}_p$ = $\alpha_p + \beta_p \bar{r}_m$

= 2.3+1.69(15%)

= 27.65%

(e) Portfolio Risk = σ_p^2 = $\beta_p^2\sigma_m^2 + \sum_{i=1}^{n} W_i^2\sigma_{e_i}^2$

= $(1.69)^2$ (130) + 196.8

= 371.29+196.8

= 568.09

Exercise 14.2. An investor wants to build a portfolio with the following stocks. With the given details, find out his portfolio return and portfolio variance. The investment is spread equally over the four stocks ($W_A = W_B = W_C = W_D$ = 25)

Company	α	β	Residual variance
A	0.17	0.93	45.15
B	2.48	1.37	132.25
C	1.47	1.73	196.28
D	2.52	1.17	51.98

Market return = 11% Market return variance = 26

Solution:

Portfolio Return = $\bar{r}_p = \sum_{i=1}^{n} W_i\left(\alpha_i + \beta_i \bar{r}_m\right)$

$r_i = \alpha_A + \beta_A \bar{r}_m$

$\bar{r}_A$ = 0.17+(0.93)(11%) = 10.4%

$\bar{r}_B$ = 2.48+(1.37)(11%) = 17.6%

$\bar{r}_C$ = 1.47+(1.73)(11%) = 20.5%

$\bar{r}_D$ = 2.52+(1.17)(11%) = 15.4%

$\bar{r}_p$ = (0.25)(10.4%)+(0.25)(17.6%)+(0.25)(20.5%)+(0.25)(15.4%)

= 15.975%

Portfolio $\sigma_p^2 = \beta_p^2\sigma_M^2 + \sum_{i=1}^{n} W_i^2\sigma_{e_i}^2$

$\beta_p^2 = \left[W_A\beta_A + W_B\beta_B + W_C\beta_C + W_D\beta_D\right]^2$

= [(0.25)(0.93)+(0.25)(1.37)+(0.25)(1.73)+(0.25)(1.17)]^2

= $(1.3)^2$ = 1.69

$\beta_p^2\sigma_M^2$ = (1.69)(26) = 43.94

$\sum_{i=1}^{n} W_i^2\sigma_{e_i}^2$ =$(0.25)^2$(45.15)+$(0.25)^2$(132.25)+$(0.25)^2$(196.28)+$(0.25)^2$(51.98)

σ_p^2 = 43.94 + 26.6 = 70.54

σ_p = 8.4

14.4 Summary:

Two models of portfolio selection are available under modern portfolio theory. One is that of Markowitz and the other model was developed by sharpe. Markowitz used expected return and risk of each security and covariance estimates for each pair of securities for calculating the portfolio return and portfolio risk. Selection of optimal portfolio was based on risk tolerance of the investors. Sharpe model beloved that security returns are dependent on the market rate of return which each reflected by the beta coefficient. Risk according to Sharpe is systematic and unsystematic.

14.5 Key words

Feasible Set : All portfolios an investor can create with a given number of securities.

Efficient Set: A set of portfolios which offer maximum return for varying levels of risk or minimum risk for varying levels of return

Optimum portfolio: The point of tangency between the efficient frontier and indifference curve.

Security Beta: It is a measure of sensitivity of security return to the return on the market index.

14.6 Self Assessment Questions:

1. What are the assumptions made by Markowitz on portfolio selection behaviour?
2. Explain the nature of risk-return indifference curves.
3. Explain the Single Index Model of William Sharpe
4. What is an efficient frontier?
5. What is security beta?
6. Explain the Markowitz model of portfolio selection

7. A portfolio consists of four securities 1,2,3 and 4. The proportions of these securities are: W_1 = 0.4 W_2 = 0.3 W_3 = 0.2 W_4 = 0.1. The standard deviations of returns on these securities are σ_1 = 4% σ_2 = 8% σ_3 = 20% and σ_4 = 10%. The correlation coefficients among security returns are: r_{12} = 0.3, r_{23} = 0.5, r_{34} = 0.8, r_{13} = 0.4, r_{24} = 0.2, r_{14} = 0.6. What is the standard deviation of portfolio return?

8. Two securities and the BSE Index have the following annual returns during the past ten years.

Year	BSE Index	Securities	
		X	Y
1	4.5	5.3	7.3
2	5.2	6.25	8.2
3	1.1	-2.12	-10.2
4	10.3	12.75	15.4
5	-1.3	-3.4	-2.0
6	10.5	8.6	9.5
7	7.6	9.2	8.2
8	-7.4	-2.1	-1.0
9	9.3	8.3	-10.2
10	4.4	10.2	11.5

Calculate the alpha & beta for each security

9. Vamsi owns a portfolio composed of four securities with the following characteristics

Security	Beta	Proportion	Standard Deviation Random Error Deviation
A	1.05	0.3	12
B	0.90	0.3	10
C	1.20	0.25	15
D	1.00	0.15	11

If the standard deviation of the market index is 20%, what is total risk of his portfolio?

14.7 Further Readings:

1. Prasanna chandra, *Investment Analysis & Portfolio Management*, Tata McGraw Hill publishing co Ltd., New Delhi.

2. Donald E. Fischer, Ronald J. Jordan, *Security Analysis and Portfolio Management*, Prentice Hall of India Pvt Ltd., New Delhi.

3. V K Bhalla, *Investment Management*", S. Chand & Co Ltd., New Delhi.

4. Punithavathy Pandian, *Security Analysis and Portfolio Management*, Vikas Publishing House pvt Ltd., New Delhi.

5. Kevin S. *Portfolio Management* , Prentice Hall of India pvt ltd., New Delhi

C A K

LESSON –15

PORTFOLIO REVISION

15.0 Objectives:

After reading this lesson, you will be able to understand the:

*Meaning of portfolio revision.

*Need for portfolio revision.

*Strategies and formula plans for Portfolio Revision.

Structure:

15.1 Introduction:

Portfolio management consists of four major steps viz. portfolio analysis, portfolio selection, portfolio revision and portfolio evaluation. Major emphasis is laid on portfolio analysis and selection, which leads to the construction of the optimal portfolio. Portfolio revision is given the least importance. Once an optimum portfolio is constructed, it does not end there, as market variables do not remain constant. Markets are volatile and the economic environment is dynamic. What is considered as the best optimum portfolio for the time being may not remain the same for ever. The objective of portfolio revision is same as that of portfolio selection i.e., maximizing the return for a given level of risk or minimizing the risk for a given level of return. The process involved in portfolio revision is similar to the process involved in portfolio selection. The process commences at the stage where the investor identifies the securities for inclusion in the portfolio. Portfolio revision is indispensable.

15.2 Need for Portfolio Revision:

Need for revision arises whenever there is a change in the variables taken for the purpose of decision making. Investor should keep an eye on the major decision making

variables and initiate the process of revision. Need for portfolio revision may arise due to market related factors and investor related factors. Change in the government economic policy, competitive situation, company's specific expansion, diversification, reconstruction plans etc necessitate the portfolio revision. Investor related factors are listed below.

(i) Availability of additional wealth / funds
(ii) Change in the attitude towards risk.
(iii) Change in investment goals.
(iv) Need to liquidate a part of the portfolio to provide funds for some alternative uses.

The portfolio needs to be revised to accommodate changes in investor's position and changes in the financial markets. Portfolio is a combination of various securities. It is a mix of securities which indicates two aspects.

(i) Number of securities in the portfolio.
(ii) Proportion of total funds invested in each security.

Revision may involve either change in the list of securities or change in the proportion of total funds invested in each security. Some of the existing securities may be sold and new securities may be purchased. While continuing the same securities the proportion of investment may be altered. For example, consider the portfolio of securities presented in Table 15.1. The table provides the names of the securities in the portfolio and proportion of total funds invested in each security. It is the optimum portfolio of the investor.

Table 15.1 Portfolio of Securities

Sl. No.	**Name of the Security**	**Percentage of money invested**
1	Ashok Leyland	03
2	Aarti Drugs	06
3	Ajantha Pharma	05
4	Balapur Industries	09
5	Balaji Tele	11
6	Cipla	20
7	IDBI	06
8	ITC	14
9	Sirpur Paper	07
10	Polaris Soft	09
11	Escorts	10
		100

(a) Revision of proportions while retaining the same securities**:** After investing the funds in the optimal portfolio as shown in Table 15.1, the investor perceives more risk in respect of investment in Aarti Drugs, Ajanta pharma, IDBI, Sirpur paper and Escorts as the half year financial results published by these companies are not as expected. The financial results of other companies are found to be as expected. Then the investor revises the portfolio by

reducing the proportion of investment in those companies where results are not as expected and increases investment in other companies. Table 15.2 presents the revised portfolio.

Table 15.2 Revision of proportions

Sl. No.	Name of the Security	Revised percent of money invested
1	Ashok Leyland	05
2	Aarti Drugs	03
3	Ajantha Pharma	03
4	Balapur India	10
5	Balaji Tele	15
6	Cipla	24
7	IDBI	03
8	ITC	16
9	Sirpur Paper	03
10	Polaris Soft	14
11	Escorts	04
		100

In the revision presented in Table 15.3 the equity shares of Aarti Drugs, Ajanta Pharma, Balapur Industries, IDBI, Sirpur Paper have been liquidated and shares of Andhra Bank, Bombay dyeing, HLL, and Neyvelli Lignite have been added to the portfolio. Therefore, portfolio revision leads to sale and purchase of securities, Major aim of the revision is maximise the return or minimise the risk. This process is a continuous process.

Table 15.3 Revision of securities and proportions

Sl. No.	Name of the Security	Percentage of money invested
1	Andhra Bank	06
2	Balaji Tele	09
3	Bombay Dyeing	16
4	Cipla	17
5	Hindustan Lever	18
6	ITC	12
7	Neyvelli lignite	04
8	Polaris Soft	07
9	Escorts	08
10	Ashok Leyland	03
		100

15.3 Constraints in portfolio revision:

The process of portfolio revision is not free from limiting factors. Some of the limiting factors are discussed below.

(a) Transaction Cost:

Buying and selling of securities involve transaction cost like brokerage / commission. Frequent buying and selling may give rise to increased transaction costs. It may result in reduced margins. Therefore, the transaction cost acts as a major constraint to timely and frequent revision of portfolio.

(b) Taxes:

When a sale transaction takes place the capital gain resulting from such transaction is taxable as short term capital gain or long term capital gain. In the case of equity shares, preference shares, debentures, units of UTI and units of mutual funds the capital gain resulting from the sale would be treated as long term if such securities were held for more than 12 months before transfer. Frequent sale would result in short term capital gains which attracts higher rate of tax. Therefore, taxes act as another constraint on the freedom of the investor to revise the portfolio.

(c) Statutory Stipulation:

SEBI has formulated certain regulation with respect to mutual funds, which are known as "Securities, and Exchange Board of India (Mutual Funds) Regulation, 1996". Investment companies, asset management companies and mutual funds manage portfolios where investment runs into crores. There institutional investors which manage large portfolios are governed by the regulation of SEBI. These regulations put restriction on active portfolio revision.

(d) Portfolio Revision has no single formula:

How, when and whether portfolio revision should be taken up? It is the question that has no scientific answer. Methodology is not clearly established. The difficulty in carrying out revision is a constraint.

15.4 Portfolio Revision Strategies:

As there are numerous factors necessitating revision of portfolio, there are numerous strategies of portfolio revision. Two different strategies may be adopted for portfolio revision, namely

(a) active revision strategy, and
(b) passive revision strategy

The choice of the strategy would depend on the investor's objective, skill, resources and time.

(i) Active Revision Strategy:

Active strategy of portfolio revision involves a process similar to portfolio analysis and selection. It seeks "beating the market by anticipating" or reacting to the perceived events or information. Investors who undertake active revision strategy believe that security markets are not efficient, the securities are mispriced giving an opportunity for earning excess returns through trading in them. They believe that different investors have heterogeneous expectations

regarding return and risk of securities. The basic objective of active revision strategy is to beat the market.

Active portfolio revision strategy is based on fundamental factors covering economy, industry and companies. It is also based on technical factors like demand and supply. The frequency of trading is high under this strategy as a result the transaction costs are also high.

(ii) Passive Revision Strategy:

Under this strategy investor holds a well diversified portfolio for a long period. Investors attempt to construct portfolios that resemble the overall market. The investor invests in a particular stock in the index in exact proportion of the stock in that index. Therefore, the strategy involves only minor and less frequent changes to the portfolio over time. The investor under this strategy expects that the market is efficient and investors will have homogeneous expectations. There will be no reward for active trading and periodical revision of portfolios. Under this strategy adjustments to portfolio are carried out according to certain rules and procedures. These are called "formula plans" which help the investor to adjust his portfolio according to changes in the market.

15.5 Formula Plans:

The formula plans provide the basic rules and regulations for purchase and sale of securities. Actual problem of portfolio revision boils down to timing the buying and selling of securities. Investors should buy when prices are low and sell when prices are high but investors hesitate to buy when prices are low expecting a further fall in the prices. They hesitate to sell when the prices are high expecting the prices to rise further. Certain mechanical portfolio revision techniques have been developed. These techniques are known as "formula plans".

The following are the basic assumptions of revision plans:

(a) Stock prices move up and down in cycles
(b) Stock prices and bond prices move in the opposite direction.
(c) Investors cannot forecast the direction of next fluctuation in the stock prices.
(d) Investors select good stocks that move along with the market.
(e) Investors allocate certain percentage of fund to fixed income securities and common stock.

There are different formula plans for portfolio revision under passive portfolio revision strategy. Some of the important plans are as follows;

(i) Constant Rupee Value plan:

This plan is most popular and commonly used. Under this plan investor should divide his funds into two portfolios, one aggressive portfolio consisting of equity shares and the other, defensive portfolio consisting of bonds and debentures. The purpose of this plan is to keep the value of the aggressive portfolio constant. When share prices rise, value of aggressive portfolio increases. Investor has to sell some of the shares and bring down the total value of the portfolio to original investment. The sale proceeds will be invested in the defensive portfolio by buying bonds and ventures. When the share prices fall total value of aggressive portfolio decreases. To keep the total value at the original level, investors have to liquidate some of the bonds in the defensive portfolio and buy some shares from the market.

Under this plan, investors gain profits by transferring funds from aggressive portfolio to defensive portfolio, when the share prices increase and vice-versa when share prices decrease. Therefore, this plans helps investors buy shares when prices are low and sell shares when prices are high. To implement this plan, investor has to decide the action points (or) revision points. The revision point is a point when be should transfer the funds to keep the value of a portfolio constant. Revision point may be determined as 20% above (or) below original value of portfolio. This point should be chosen carefully.

Let us take an example to understand the mechanism involved in the plan. Table 15.4 presents an example of constant rupee value plan. An investor has Rs. 1,00,000 for his investment. He invests Rs. 50,000 in an aggressive portfolio purchasing 1,250 shares at Rs 40 per share and Rs 50,000 in a defensive portfolio consisting of bonds and debentures. The revision point is 20% above or below the value of investment of Rs 50,000.

Table 15.4 Example of Constant Rupee Value Plan

Share Price Rs.	**Number of shares in aggressive portfolio**	**Value of aggressive portfolio Rs.**	**Value of conservative Portfolio Rs.**	**Revision action**
40	1250	50,000	50,000	
45	1250	56,250	50,000	
50	1000	50,000	62,500	Sell 250 shares at Rs 50 per share
40	1250	50,000	52,500	Buy 250 shares at Rs 40 each

When the share price increases to Rs 45, the value of the aggressive portfolio increase to Rs 56,250. Revision point is 20% which means, Rs 60,000 or Rs 40,000. If the share price rises to Rs 50, the value of portfolio will be Rs 62,500. At this point, the investor sells Rs 2,500 worth shares (250 shares at Rs 50) and transfer the amount to the defensive portfolio by buying bonds.

Then the value of aggressive portfolio would be Rs 50,000 (1000 shares) and that of defensive portfolio would be Rs 62,500. When the price falls to Rs 40 per share the value of the aggressive portfolio decreases to Rs 40,000. This value is less than the original value. The investor revises the portfolio by buying 250 shares at Rs 40 each by liquidating bonds to that extent. Now, aggressive portfolio would have a value of Rs. 50,000 and defensive portfolio would have a value of Rs 52,500. When the constant rupee value plan is implemented, funds would be transferred from one portfolio to the other when ever the value of the aggressive portfolio rises above and falls below the predetermined levels.

(ii) Constant Ratio Plan:

It is a variation of a previous plan under which investor constructs an aggressive and a defensive portfolio, the ratio between these two portfolio would be predetermined, for example as 1:1 (or) 1:5:1 under this plan ratio is held constant by readjusting the two portfolios when the

share prices fluctuate. A revision point is predetermined such as "$\pm$ 0.10", which means that a portfolio would be adjusted if the ratio moves by "$\pm$ 0.10" points. Table 15.5 presents an example of constant ratio plan. If the investor starts with Rs 10,000 in aggressive portfolio and Rs 10,000 in defensive portfolio. The ratio is 1:1 and predetermined revision point is I 0.20.

When the value of aggressive portfolio rises to Rs 12,000 the ratio becomes 1.2 : 1 (Rs 12000 : Rs 10000). Shares worth Rs 1000 will be sold and Rs 1000 worth bonds would be purchased. Now the ratio becomes 1:1 (Rs 11000 : Rs11000). Similarly, if the value of aggressive portfolio falls to Rs 8,500 the ratio becomes 0.77 : 1 (Rs. 8,500-Rs, 11,000). At this point investor purchases shares worth Rs 1,250 and sells debentures to the same extent. Now, the ratio becomes 1:1 (Rs 9750 : 9750).

Table 15.5 Example of constant ratio plan.

Value of aggressive Portfolio Rs.	**Value of defensive Portfolio**	**Ratio**	**Revision action**
10,000	10,000	1:1	
12,000	10,000	1.2 :1	Sell shares worth Rs 1000 & buy debt worth Rs1000
11,000	11,000	1:1	
8,500	11,000	0.77:1	Buy shares worth Rs1250 & sell debt worth Rs 1000
9,750	9,750	1:1	

(iii) Variable Ratio Plan:

Under this plan, the proportions of stocks and bonds change at different levels of market price. The value of the aggressive portfolio changes by certain percentage, the ratio between aggressive portfolio and conservative portfolio will be allowed to change. Some variations of this plan provide for ratios to vary according to economic or market indices rather to value of the aggressive portfolio. An example of variable ratio plan has been presented in table 15.6.

Table 15.6 Example of Variable Ratio Plan:

Stock Price Rs.	**No. of shares in aggressive portfolio**	**Value of conservative portfolio Rs.**	**Value of aggressive portfolio Rs.**	**Value of aggressive as percent of Total**	**Revision action**
25	400	10,000	10,000	50%	
22	400	10,000	8,800	47%	
20	400	10,000	12,600	44.5%	
20	630	5,400	13,860	70%	Buy 230 shares at Rs20

22	630	5,400	13,860	72%	
25	630	5,400	15,760	74.5%	
25	423	10,580	10,580	50%	Sell 207 shares at Rs 25 each
26	423	10,580	11,000	53%	
28.8	423	10,580	12,180	54%	
25	423	10,580	10,580	50%	

The variable ratio plan states that if the value of the aggressive portfolio ratio rises by 20% or more from the present price of Rs 25, the appropriate ratio of the aggressive portfolio will be 3:7 instead of the initial ratio 1:1. If the value decreases by 20% or more, the appropriate percentage of aggressive portfolio will be 7:3. Table 15.6 presents Variable Ratio Plan.

15.6 Limitations:

Formula plans are not tailor made solutions for portfolio revision. They have the following shortcomings.

(a) Formula plans make no provision for what securities should be selected for investment.
(b) Formula plans are rigid and inflexible. Inflexibility makes it difficult to know when to adjust the plan to new conditions in the investment environment.
(c) For these formula plans there may not be many takers in the light of the faith in the market efficiency.

15.7 Summary:

In this lesson, we have seen how important it is to revise portfolios. Changing existing mix of securities in a portfolio is as important as portfolio selection. Portfolio revision strategic are two types (a) passive strategy and (b) active strategy. This classification is based upon the investor's belief in market efficiency. Major constraints that in portfolio revision are transaction cost, taxes, statutory stipulations and lack of an ideal formula. Formula plans have been illustrated with examples. Constant rupee value plan, constant ratio plan and variable ratio plan have been analyzed along with the limitations associated with these plans.

15.8 Key words:

Portfolio Revision: Portfolio Revision is changing the existing mix of securities in a portfolio.

Formula Plan: Formula plans are certain mechanical revision techniques or procedures developed to enable the investors to buy stocks when prices are low and sell when the prices are high.

15.9 Self Assessment Questions:

1. Define portfolio revision. Discuss the need for portfolio revision.
2. "Formula plans are hardly useful". Comment.

3. Critically examine the formula plans and discuss their limitations.
4. Explain the following

(i) Active portfolio revision

(ii) Passive portfolio revision

15.10 Further Readings:

1. Fischer, Donald E and Ronald J. Jordan, *Security Analysis and Portfolio Management*, prentice of India Pvt. Ltd., New Delhi.

2. Kevin S. *Portfolio Management*, Prentice Hall of India Pvt. Ltd., New Delhi.

3. Punithavathi Pandian, *Security Analysis and Portfolio Management*, Vikas Publishing House Pvt. Ltd., New Delhi.

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LESSON 16

PORTFOLIO EVALUATION

16.0 Objective:

After reading this lesson, you should be able to:

- Explain the concept and need of portfolio evaluation
- Know the measurement of portfolio performance
- Understand the different types of portfolio evaluations

Structure

16.1 INTRODUCTION

Portfolio analysis, selection and revision are undertaken with the objective of maximizing returns and minimizing risk. Portfolio evaluation is the stage where we examine to what extent the objective has been achieved. Portfolio manager evaluates his portfolio performance and identifies the sources of strength and weakness and provides a feedback to evolve better management strategy. Though, the evaluation of portfolio performance is considered to be last stage of investment process, it is a continuous process. Through portfolio evaluation, the investor tries to find out how well the portfolio performed. The portfolio of securities held by an investor is the result of his investment decisions. Portfolio evaluation is really a study of the impact of such decisions without which the portfolio management would be incomplete.

Every portfolio manager has to evaluate his performance in a portfolio relative to other portfolio manager. The investors are vitally interested in how well they have

faced both absolutely and relative to alternative investments they might have made. Portfolio builders accept a certain risk level and try to achieve the highest return compatible with that level and they can't know whether they are heading towards this objective unless they measure their portfolio's performance periodically. Thus, it is a process of comparing the return earned on a portfolio with the return earned on one or more other portfolios or a benchmark portfolio. While evaluating the performance of a portfolio, the return earned on the portfolio has to be evaluated in the context of the risk associated with that portfolio. One approach would be to group portfolio, which would be to group portfolios into equivalent risk classes and then compare returns of portfolios with in each risk category.

16.2 NEED FOR EVALUATION

Individuals on their own may carry out the investment decisions. The funds available with individual investors may not be large enough to create a well-diversified portfolio of securities. Moreover, the time, skill and other resources at the disposal of individual investors may not be sufficient to manage the portfolio professionally. In order to know whether individuals carry out the investment activity, investors themselves or through mutual funds and investment companies, different situations arise where evaluation of performance become imperative. The following are the various types of evaluation in different contexts, which are explained as under:

(i) Self Evaluation:
Where individual investors under take the investment activity on their own, they take the investment decisions. In such a situation, an investor would like to evaluate the performance of his portfolio in order to identify the mistakes committed by him. This self-evaluation will enable him to improve his skills and achieve better performance in future.

(ii) Evaluation of portfolio manager:
A mutual fund or investment company usually creates different portfolios with different objectives aimed at different sets of investors. Each such portfolio may be entrusted to different professional portfolio managers who are responsible for the investment decisions regarding the portfolio entrusted to each of them.

(iii) Evaluation of mutual funds:
There are many mutual funds as also investment funds with individual investors and other organizations by offering returns, minimum risk, high safety and prompt liquidity. For this, evaluation of the performance of mutual funds and their portfolios becomes necessary.

16.3 EVALUATION PERSPECTIVE

A Portfolio comprises several individuals' securities. In the building up of portfolios several transactions of purchase and sale of securities take place. Hence, the evaluation may be carried out from different perspectives or viewpoints, which are discussed as under:

(i) Transaction View:
An investor may attempt to evaluate every transaction of purchase and sale of security. Whenever a security is bought or sold the transaction is evaluated as regards to correctness and profitability.

(ii) Security View:

Each security included in the portfolio has been purchased at a particular price. At the end of holding the period, the market price of the security may be higher or lower than its cost price or purchase price. Thus, it may be possible to evaluate from the security point.

(iii) Portfolio View:

A portfolio is not a simple aggregation of a random group of securities. It is a combination of carefully selected securities, combined in a specific way so as to reduce the risk of investment to the minimum. Though evaluation may be attempted at the transaction level, or the security level, such evaluations would be incomplete inadequate and often misleading. Investment is an activity involving risk. But risk is best defined at the portfolio level and not at the security level or transaction level. Hence, the best perspective for evaluation is the portfolio view.

16.4 MEASURING PORTFOLIO PERFOMANCE

The first step in Portfolio evaluation is calculation of the rate of return earned over the holding period. Return may be defined to include changes in the value of the portfolio over the holding period. However, in case of mutual funds, during the holding period, cash inflows into the fund and cash withdrawals from the fund may occur. The unit value method may be used to calculate return in this case. In terms of return, the first requirement is obvious, but the necessity of considering risk in this context is not always immediately apparent. The risk is typically not dealt with prior to the 1960's when work in portfolio theory showed its significance.

In terms of modern theory, superior risk adjusted returns can be derived either through superior timing or superior stock selection. If a portfolio manager can do a superior job of predicting market turn, he can change his portfolio composition to anticipate the market, investing in a completely diversified portfolio of high beta stocks during a rising market, and in portfolio of low beta stocks during a declining market, thereby deriving above average risk-adjusted returns. The second factor to consider in evaluating portfolio manager is his ability to diversify complexity. The market only pays returns for assuming unsystematic risk, because this non-market risk can be eliminated in diversified market portfolio of risky assets.

Thus, the evaluation of the performance of a portfolio must take into account not only the rate of return achieved but also the level of risk the investor was subjected to. Initially investors evaluated portfolios almost entirely on the basis of the rate of return. They were clearly aware of the motion of risk and uncertainty, but did not know how to quantify the risk, so they could not consider explicitly.

(i) Dollar-Weighted Rate of Return:

The internal rate of return that equates the initial contribution and cash flows that occur during the period with the ending value of the fund is the dollar-weighted rate of return. Mathematically, this measure of return is the dollar-weighted average of sub-period returns with the dollar weights equal to the sum of the initial contribution and all the cash flows upto the sub-period return.

(ii) Time-Weighted Return:

The time-weighted rate or return is the weighted average of the internal rate of return and the sub-periods between the cash flows and it is weighted by the length of the sub-periods. Cash inflows and outflows can also be adjusted by using the unit value method. When cash inflows occur, the manager issues new units to the client, and when cash outflows occur, units are retrieved from the client. Hence, the number of units changes when cash flows occur, but the value per unit remains constant.

(iii) Risk Adjusted Returns:

We know that investment in shares is risky. Risk free rate of interest is the return that an investor can earn on a risk less security i.e. without bearing any risk. The return earned over and above the risk free rate is the risk premium that is the reward for bearing risk, we get the risk premium per unit of risk for different portfolios or mutual funds may be calculated and the funds may be ranked in descending order of the ratio. A higher ratio indicates better performance.

16.5 TECHNIQUES OF PORTFOLIO EVALUATION

In the last three decades various techniques have been developed in the theory of portfolio. These techniques take both the risk and return of a portfolio into consideration for evaluating the performance of the portfolio. Sharpe, Treynor, Jensen and others have developed models for portfolio performance measurement that consider both risk and return of portfolios to be ranked and compared to a new market standard.

16.5.1 Sharpe's Performance Index:

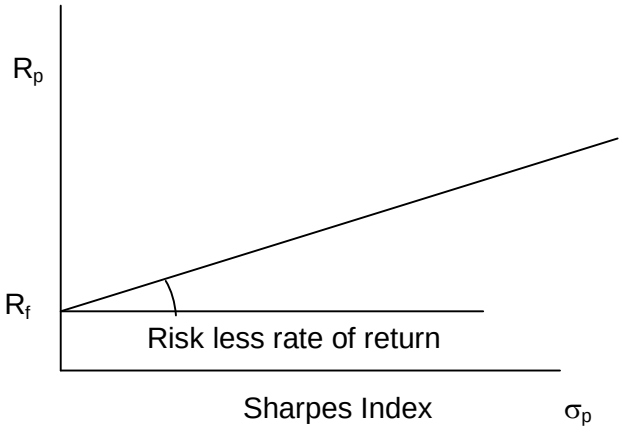
Sharpe's performance index gives a single value to be used for the performance ranking of various funds or portfolios. Sharpe index measures the risk premium of the portfolio relatives to the total amount of risk in the portfolio. This risk premium is the difference between the portfolios average rate of return and the risk less rate of return. The standard deviation of the portfolio indicates the risk. The index assigns the highest values to assets that have best risk-adjusted average rate of return.

$$\text{Sharpe Index} = \frac{\text{Portfolio average return-Risk free rate of interest}}{\text{Standard Deviation of the portfolio Return}}$$

$$St = \frac{Rp - Rf}{\sigma_p}$$

The following figure 16.1 gives a graphic representation of Sharpe's index. Larger the value of S_p, the better the performance of the portfolio, S_p measures the slope of the line.

Figure 16.1 Sharpe's Index



The difference between portfolios net return and the estimate of the risk free rate over the evaluation period is viewed as a risk premium or reward for investing in assets with more than zero risk. Then each portfolio's risk premium is divided by its standard deviation fo annual return (p), a measure of the portfolio's total risk or variability, estimated over the evaluation period. The resulting number (Sp) is the ratio of reward per unit of variability:

$$Sp = \frac{Rp - R_f}{\sigma_p} = \frac{\text{Reward}}{\text{Total risk}} = \frac{\text{Risk Premium}}{\text{Standard deviation}}$$

Where,

S_p= Sharpe;s Index, Rp = expected average return from the portfolio

R_f= risk free return, σ_p = total risk of the portfolio

Sp is Sharpe's index of desirability, known as the reward to variability ratio, and can be used for comparing portfolio's in different classes. The larger the standard deviation, better the fund has performed.

	ABC fund	XYZ fund
Average Return® %	18	16
Standard deviation , %	20	15

Risk free rate, T = 8.0 %

Using the Sharpe performance measure, the risk-return measurement for these two funds is:

$$SpA = \frac{0.18 - 0.08}{0.20} = 0.500$$

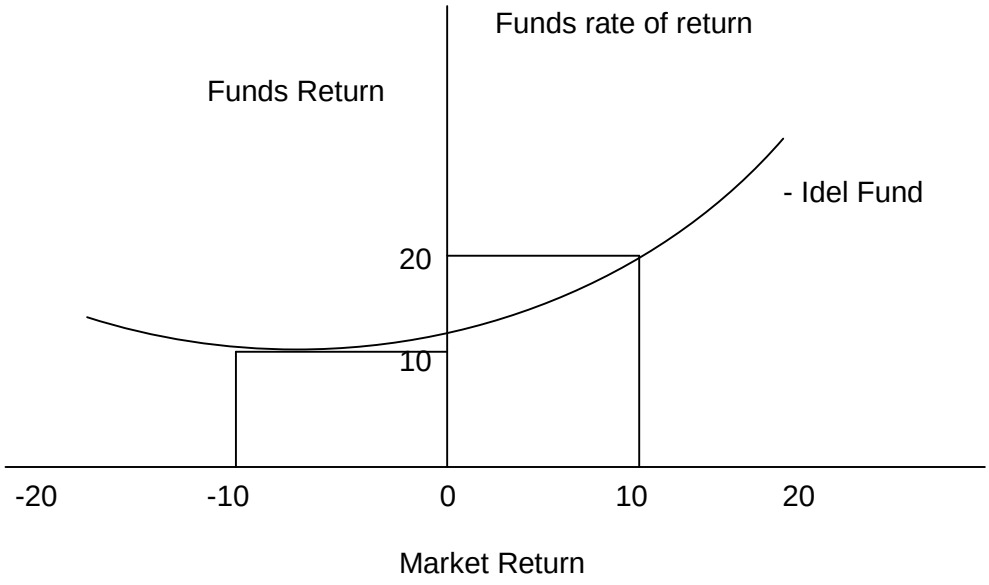
$$SpB = \frac{0.16 - 0.08}{0.15} = 0.533$$

Thus, B ranked as better fund because its index 0.533 > 0.500 even though the portfolio A had a higher return of 18.00 percent. The reason is that the fund 'A's managers took such a great risk to earn the higher returns and its risk adjusted return was not the most desirable. Thus, fund B had a better performance and would be the better alternative of the given set of two funds available to make a performance evaluation based on the Sharpe's index model of performance evaluation. Sharpe index can be used to rank the desirability of funds or portfolios, but not the individual assets. The individual asset contains its divisible risk.

16.5.2 Treynor's Performance:

An investor should know the concept of characteristic line. The relationship between a given market return and the fund's return is given by the characteristic line. The fund's performance is measured in relation to the market performance. The ideal fund's return rises at a faster rate than the general market performance when the market is moving upwards and its rate of return declines slowly than the market return in the decline. The ideal funds may place its fund in the treasury bills or short sell the stock during the decline and earn positive return. The relationship between the ideal fund's rate of return and the market's rate of return is given.

Figure 16.2 Fund's rate of return



When the market rate of return increases, the fund's rate of return increases more than proportional and vice-versa. The fund's rate of return is 20% when the market's rate of return is 10%, and when the market return is – 10%, the fund's return is 10% and hence, the relationship between the market return and fund's return is assumed to be linear and thus, the characteristic line shows the linear relationship. Each fund establishes plotting the fund's rate of return for a given period against the market's return for the same period can draw a performance relationship with the market the Characteristic line. The slope of the line reflects the volatility of the fund's return.

$$Rp = \alpha + \beta Rm + \ell p$$

A steep slope would indicate that the fund is very sensitive to the market performance. If the fund were not so sensitive then the slope would be a slope of less inclination. All the funds have the same slope indicating same level of risk. The investor would prefer a fund, because it offers superior return than funds C and B for the same level of risk exposure. With the help of the characteristic line Treynor measures the performance of the fund. The slope of the line is estimated by

Rp = Portfolio return
Rm = the market return or index return
ep = the error or the residual
α, β = Coefficient to be estimated

Beta coefficient is treated as a measure of undiversifiable systematic risk

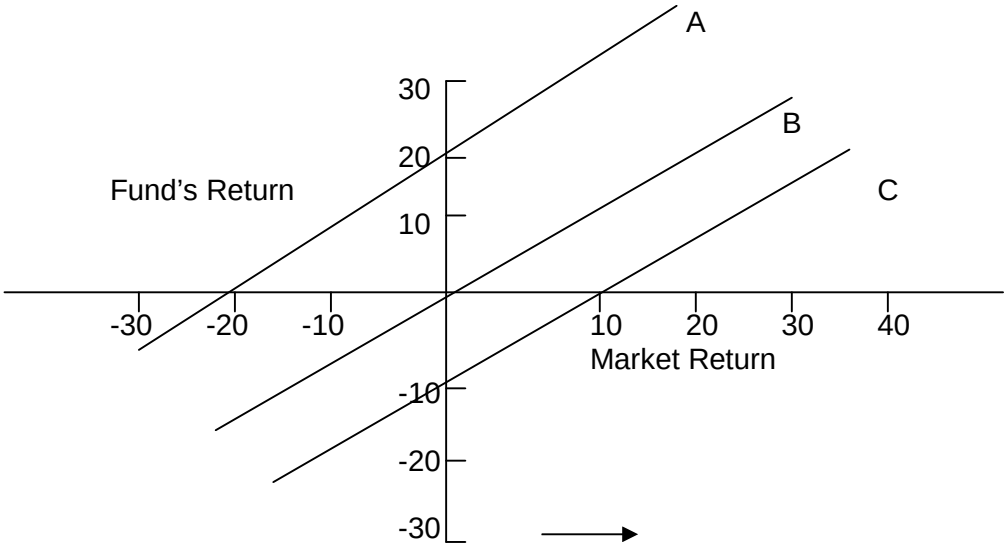
$$Tn = \frac{\text{Portfolio average return - risk less rate of interest}}{\text{Beta co-efficient of portfolio}}$$

$$Tn = \frac{Rp - Rf}{\beta p}$$

Treynor's risk premium of the portfolio is the difference between the average return and the risk less rate of return. The risk premium depends on the systematic risk assumed in a –portfolio. Let us analyze two hypothetical funds.

Fund	Average return	Beta	Risk premium	Rf	Tn
A	0.0879	0.499	0.0379	0.05	$\frac{0.0879 - 0.05}{0.499} = 0.076$
B	0.1347	1.2493	0.0847	0.05	$\frac{0.1347 - 0.05}{1.2493} = 0.0678$

Figure 16.3 Market return and Fund's Return



The fund 'A' is more desirable than B because it earned more risk premium per unit of systematic risk.

(i) Treynor Vs. Sharpe Index:

The only difference between Sharpe and Treynor is the denomination, the difference in risk measure. The Sharpe measure relates a portfolio's excess return to total risk (as measured by the portfolio's standard deviation), while the Treynor relates a portfolio's excess return to systematic risk (beta coefficient). The Sharpe measure uses the standard deviation of returns as the measure of risk, while the Treynor measure employs beta risk.

The Sharpe implicitly evaluates the portfolio manager on the basis of return performance, but also takes into account how well diversified the portfolio was during this period. If a portfolio were perfectly diversified (does not contain an unsystematic risk), the two measures would give identical rankings because the total variance of the portfolio would be a systematic variance. If a portfolio is purely diversified, it is possible for it to have a high ranking one the basis of Treynor measur4es but a much lower ranking on the basis of Sharpe measure. Sharpe felt the variability due to the unsystematic risk was probably transitory; he felt that Treynor measure might be a better measure for predicting future performance.

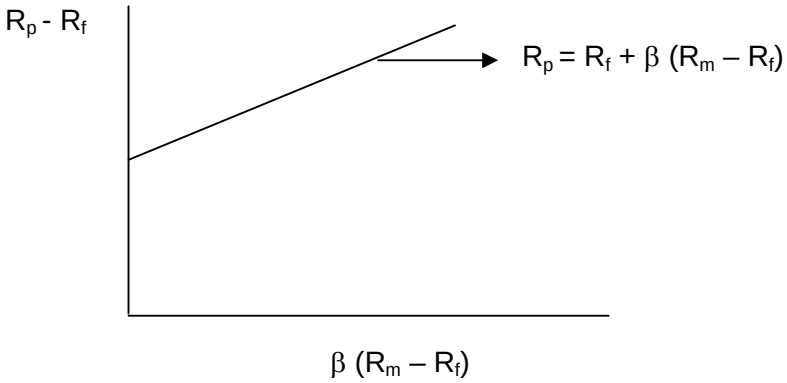
16.5.3 Jensen's Performance Index:

The absolute risk adjusted return a measure was developed by Michael Jensen and commonly knows as Jensen measures. It is mentioned as a measure of absolute performance because a definite standard is set and against that the performance is measured. The standard is based on the manager's predictive ability. Successful prediction of security price would enable the manager to earn higher returns than the ordinary investor expects to earn in a given level of risk. Jensen's measure of portfolio performance is based on the Capital Asset Pricing Model (CAPM). The basic model of Jensen is expressed as:

R_p = + b (Rm – Rf)
R_p = Average return of portfolio
R_f = risk less rate of interest
= the intercept
B = a measure of systematic risk
R_m = average market return

The return of the portfolio varies in the same proportion of B to the difference between the market return and risk less rate of interest. Beta is assumed to reflect the systematic risk. The fund's portfolio beta would be equal to one if it takes a portfolio of all markets securities. The B would be greater than one if the fund's portfolio consists of s4curities that one riskier than a portfolio of all market securities.

Figure 16.4 Jensen's measure of Fund's Beta and Return



Any professional would expected to earn average portfolio return of Rp = Rf + B(Rm – Rf). If his predictive ability is superior, he should earn more than other funds at each level of risk. If the fund manager has consistently performed better than average Rp, there would be some constant factor that would make the actual return higher than average Rp. The constant may be p that represents the forecasting ability of the manager.

$$R_p – R_f = p + B(R_m – R_p)$$

Thus, the Jensen's approach to evaluating portfolio performance involves two steps:

i) using equation, he calculates what the return of a given portfolio on the basis of Bpm, Rm and T
ii) he compares the actual realised return of the portfolio with the calculated or predicted return.

The greater the excess of realised return over the calculated return, the better the performance of the portfolio.

Example 16.3

There are 2 Funds xyz and abc. The xyz has a sample mean of success 0.13 and for Fund abc it is of 0.18, with the riskier fund abc having double the beta at 2.0 as fund xyz. The respective SD are 15% of abc and 19% of xyz. Mean return for Market Index is 0.12, while risk-free rate is 8%.

Solution:

For Fund xyz:

13% - [8% + (12% - 8%)1.0]

= 1%

Fund abc:

18% - [8% + (12% - 8%) 2.0]

= 2%

Fund abc has twice the Jensen Index as Fund xyz

16.6. ARBITRAGE PRICING THEORY

The Jensen index uses the linear relationship of the security market line as benchmark to measure performance. In the arbitrage pricing theory there is a similar linear relationship between the factor betas and the expected rates of return on securities and portfolios.

The relationship for any given portfolio, p is given by:-

E(rp) = E(rz) + 1 B1p + n Bn p

Expected portfolio return = risk free + sum of factor risk predmium rate

The Treynor and Jensen index uses the Security Market Line as a benchmark, both focus on management ability to generate excess returns and ignore the ability to generate excess returns on one more security.

16.7 SUMMARY

The concluding lesson of the book has examined the different classifications of evaluation perspective. There are grouped into transaction view, security view, and portfolio view. The Sharpe's, Treyner's and Jensen Models were shown and examples were drawn from their equations to show that the managed portfolios performed in the same manner, as an average intelligent investor would make his investments. It was considered whether these investments are better for an average investor or should he make his own investments. The managed portfolio to a large extent helps an average investor because he does not have to look into the quality of the securities. The superior knowledge of the special trustees and consultants make it favourable for an average investor to put his investments in an open-end investment company.

16.8 KEY WORDS

Accounting Beta: A relative measure of the sensitivity of a firm's accounting earnings to changes in the accounting earnings of the market portfolio.

Alpha: The difference between a security's expected return and its benchmark return.

Benchmark Portfolio: A portfolio against which the investment performance of an investor can be compared for the purpose of determining investment skill. A benchmark portfolio represents a relevant and feasible alternative to the investor's actual portfolio and, in particular, is similar in terms of risk exposure.

Beta: A relative measure of the sensitivity of an asset's return to changes in the return on the market portfolio. Mathematically, the beta coefficient of a security's covariance with the market portfolio divided by the variance of the market portfolio.

Common Stock: Legal representation of an equity position in a corporation.

Earnings per share: A corporation's accounting earnings divided by the number of its common shares outstanding.

Portfolio construction: A component of the investment process that involves identifying which assets to invest in and determining the proportion of funds to invest in each of the assets.

Portfolio Manager: An individual who uses the information provided by financial analysts to construct a portfolio of financial assets.

Risk-adjusted return: The return on an asset or portfolio, modified to explicitly account for the risk to which the asset or portfolio is exposed.

16.9 SELF-ASSESSMENT QUESTIONS

1. Discuss the need for evaluation of a portfolio.
2. How do you measure a portfolio performance?
3. Write notes on:
    a. Treyner's Ideal Fund.
    b. Sharper's Performance Measure.
    c. Jensen's Model.

16.10 FURTHER READINGS

1. G.P.Brinson, JJ Diermier and G.G.Schalrbaum "A Composite Portfolio Benchmark for Pension Plans" – Financial Analyst Journal, March/April 1986.
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3. Michael Murphy, "Why No One Can Tell Who's Winning", Financial Analyst Journal, May-June 1980.
4. Jack L Treynor, How to Rate the Measurement of Investment Funds, Harvard Business Review, January-February 1965.
5. William F Sharpe "Mutual Fund of Performance", Journal of Business, January 1966.

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