SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

**(As Per Revised Syllabus 2014-15, Third Year BBI Students of
Mumbai University, Fifth Semester)**

Winner of "Best Commerce Author – 2013-14" by Maharashtra Commerce Association

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Preface

It is a matter of great pleasure to present this new and revised edition of the book on SAPM to the students and teachers of Bachelor of Commerce – Banking and Insurance course started by University of Mumbai. This book is written on lines of syllabus instituted by the university. The book presents the subject matter in a simple and convincing language.

I would also thank all of them who have been a part of this and helped me knowingly or unknowingly. I also extend my heartfelt thanks to my family and well-wishers would have been a distant reality.

Dr. Nishikant Jha
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Syllabus

UNIT – 1   **(15 Lecture)**

1. An Overview

— What is Investment? — Investment versus Speculation — Objectives of investment — Meaning of Portfolio — Meaning of Portfolio management — Portfolio Management Process — Approaches to Investment Decision making.

2. Investment Alternatives

— Non-Marketable Financial Assets — Money Market Instruments — Bonds or Fixed Income Securities — Equity Shares — Mutual Fund Schemes — Life Insurance — Real Estate — Precious Objects.

3. Securities Market

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UNIT – 2   **(15 Lecture)**

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— Macroeconomic Analysis — Industry Analysis — Company Analysis: The Study of Financials Numbers — Company Analysis: Going Beyond — Estimation of Intrinsic Value — Some Tools for Judging Undervaluation/Overvaluation.

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— What is Technical Analysis? — Charting Techniques — Technical Indicators — Testing Technical Trading Rules — Evaluation of Technical Analysi

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12. Capital Asset Pricing Model

— Basic Assumptions — Capital Market Line — Security Market Line — Inputs Required for Applying CAPM — Empirical Evidence on Capital Asset Pricing Model

13. Efficient Market Hypothesis

— Random Walk and Search for Theory — What is an Efficient Market? — Empirical Evidence on Weak Form — Empirical Evidence on Semi-strong — Efficient Market Hypothesis

Paper Pattern

Question Paper Pattern

Q.1 Objective / MCQs / True False with Reasons   15

Q.2 (a) (b)   or   Q.2 (a) (b)   8/7

Q.3 (a) (b)   or   Q.2 (a) (b)   8/7

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1 CHAPTER

SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT – AN OVERVIEW

Chapter Contents:

1.1 WHAT IS SECURITY

A security means a document that gives its owner a specific claim of ownership of a particular finance asset. Financial market provide facilities for buying and selling of financial claims and services. Thus, securities are financial instruments which are bought and sold in the financial market for investment. The important financial instruments are shares, debentures, bonds, etc. Other financial instruments are also known as securities such as Treasury Bill, Mutual Fund Units, Fixed Deposits, Insurance Policies, Post Office Savings like National Savings Certificates, Kisan Vikas Patras, Public Provident Funds, etc. Some of these securities are transferable while some of them are not transferable.

1.2 INVESTMENT OBJECTIVES

Investment is a widespread practice and many have made their fortunes the process. The starting point in this process is to determine the characteristics of the various investment and then matching them with the individuals need and preferences. All personal investing is designed in order to achieve certain objectives. These objectives may be tangible such as buying a car, house, etc., and intangible objectives such as social status, security, etc. Similarly, these objectives may be classified as financial or personal objectives. Financial objectives are safety, profitability and liquidity. Personal or individual objectives may be related to personal characteristics of individual such as family commitments, status, etc.

The objectives can be classified on the basis of the investors approach as follows:

(a) **Short-term high priority objectives:** Some investors have high priority towards achieving certain objectives in short time. For example, a young couple will give high priority to buy a house.

(b) **Long-term high priority objectives:** Some investors look forward and invest on the basis of objectives of long-term needs. They want to achieve financial independence in long period. For example, investing for post-retirement period or education of child, etc.

(c) **Low priority objectives:** These objectives have low priority in investing. These objectives are not painful. After investing in high priorities assets, investors can invest in these low priority assets. For example, provision for tour, domestic appliance, etc.

(d) **Money making objectives:** Investors put their surplus money in this kind of investment. Their objective is to maximize wealth. Usually, the investors invest in shares of companies which provides capital appreciation apart from regular income from dividend.

1.3 INVESTMENT AND SPECULATION

"Speculation, is an activity, quite contrary to its literal meaning, in which a person assumes high risks, often without regard for the safety of his invested principal, to achieve large capital gains." The time span in which the gain is sought to be made is usually very short.

Investment involves putting money into an assets which is not necessarily in order to enjoy a series of returns. The investor sacrifice some money today in anticipation of a financial return in future. He indulges in a bit of speculation. There is an element of speculation involved in all investment decisions. However, it does not mean that all investment are speculative by nature. Genuine investments are carefully thought out decisions. On the other hand, speculative investments are not carefully thought-out decisions. They are based on tips and rumours.

An investment can be distinguished from speculation in three ways–risk, capital gain and time period. Risk has definite financial meaning it is a possibility of incurring a loss in a financial transaction. Investment involves limited risk while speculation is considered as an investment of funds with high risk. Speculation involves buying a security at a low price and selling at a high price to make a capital

gain. Investment involves longer-term allocation of funds, whereas speculation involves holding a security for a short-term and trading quickly for earning higher gain.

Speculation involves a higher level of risk and a more uncertain expectation of return. Investments are not risk-free but the risk can be calculated. The expected return is consistent with the risk of investment.

1.4 ELEMENTS OF INVESTMENT

(a) **Return:** Investors buy or sell financial instruments in order to earn return on them. The return on investment is the reward to the investors. The return includes both current income and capital gains or losses, which arises by the increase or decrease of the security price.

(b) **Risk:** Risk is the chance of loss due to variability of returns on an investment. In case of every investment, there is chance of loss. It may be loss of interest, dividend or principal amount of investment. However, risk and return are inseparable. Return is a precise statistical term and it is measurable. But the risk is not precise statistical term.

(c) **Time:** Time is an important factor in investment. It offers several different courses of action. Time period depends on the attitude of the investors who follows a 'buy and hold' policy. As time moves on analysts believe that conditions may change and investors may revaluate expected return and risk for each investment.

1.5 MEANING OF PORTFOLIO

Portfolio means combined holding of many kinds of financial security that is shares, debentures, government bonds, units and other financial assets. The term investment portfolio refers to the various assets of an investor which are to be considered as a unit. It is not merely a collection of a unrelated assets but a carefully blended asset combination within a unified framework. It is necessary for investors to take all decisions as regards their wealth position in a portfolio context. Making a portfolio putting one's egg in different baskets with varying elements of a risk and return. Thus, a portfolio is a combination of various instrument of investment. It is also combination of securities with different risk return characteristics. A portfolio is built up out of the wealth or income of the investors over a period of time with a view to manage the risk return preferences. The analysis of the risk return characteristics of individual securities in the portfolio is made from time-to-time and changes that may take place in combination with other securities are adjusted accordingly. The object of portfolio is to reduce risk by diversification and maximize gains.

1.6 PORTFOLIO MANAGEMENT

Portfolio management means selection of securities and constant shifting of the portfolios in the light of varying attractiveness of the constituents of the portfolio. It is a choice of selecting and revising spectrum of securities to it in which the characteristics of an investor. Marko Wiz analyzed the implications of the fact that the investors, although seeking high expected returns, generally wish

to avoid risk. It is the basis of all scientific portfolio management. Although the expected return on a portfolio is directly related to the expected return on component securities, it is not possible to deduce a portfolio riskiness simply by knowing the riskiness of individual securities. The riskiness of portfolio depends upon the attributes of individual securities as well as the interrelationship among securities.

A professional, who manages other people's or institution's investment portfolio with the object of profitability, growth and risk minimization is known as portfolio manager. He is expected to manage the investors assets prudently and choose particular investment avenues appropriate for particular times aiming at maximization of profit. Portfolio management includes portfolio planning, selection and construction, review and evaluation of securities. The skill in portfolio management lies in achieving a sound balance between the objectives of safety, liquidity and profitability.

Timing is an important aspect of portfolio revision. Ideally, investors should sell at market tops and buy at market bottoms. They should be guarded against buying at high prices and selling at low prices.

1.7 PORTFOLIO MANAGEMENT PROCESS

Portfolio management is a dynamic process which involves the following basic steps:

(a) Identification of the objectives, constraints and preferences of investors for formulation of investment policy.

(b) Develop and implement strategies in tune with investment policy formulated. It will help the selection of asset classes and securities in each class depending upon their risk return attributes.

(c) Review and monitoring of the performance of the portfolio by continuous overview of the market conditions and performance of the companies.

(d) Evaluation of the portfolio for the result to compare with targets and make some adjustments for the future.

1.8 OBJECTIVES OF PORTFOLIO MANAGEMENT

The basic objective of portfolio management is to maximize yield and minimize risk. The other objectives are as follows:

(a) **Stability of income:** An investor considers stability of income from his investment. He also considers the stability of purchasing power of income.

(b) **Capital growth:** Capital appreciation has become an important investment principle. Investors seek growth stocks which provide a very large capital appreciation by way of right, bonus and appreciation in the market price of shares.

(c) **Liquidity:** An investment is a liquid asset. It can be converted into cash with the help of a stock exchange. Investment should be liquid as well as marketable. The portfolio should contain a planned proportion of high grade and readily saleable investment.

    (d) Safety: Safety means protection for investment against loss under reasonably variations. In order to provide safety, a careful review of economic and industry trends is necessary. In other words, errors in portfolio are unavoidable and it requires extensive diversification.

    (e) Tax incentives: Investors try to minimize their tax liabilities from the investment. The portfolio manager has to keep a list of such investment avenues along with the return risk, profile, tax implications, yield and other return.

1.9 EXERCISES

Answer the following questions

1. What is an investment? What are the objectives of investment? **(April 06)**

2. What is an investment? How it is different from speculation? **(April 09)**

3. What is portfolio? What are the objectives of construction of portfolio? **(April 07)**

4. What is an investment decision? What are the approaches to investment decision-making? **(Nov 05)**

5. What is the difference between investor and speculator?

6. What is a security? What are the important securities traded in the stock market? **(April 08)**

Objective Type Questions

State whether the following statements are True (T) or False (F).

1. Investments are concerned with risk and return.

2. Investments involve long-term commitments.

3. Speculation brings about stable return for long-term period of time.

4. Speculation is considered with review and analysis and investments with capital gain.

5. Investments are based on portfolio construction, valuation, identification and analysis.

6. The variable investments consist of cash, bonds and savings certificates.

7. The investment objective is high risk and high return.

8. Arbitrage is a long-term investment.

9. The commodity investment is through saving bank.

10. Indirect securities consist of mutual fund and life insurance securities.

Ans: 1. (T), 2. (T), 3. (F), 4. (F), 5. (T), 6. (F), 7. (F), 8. (F), 9. (F), 10. (T).

Multiple Choice Questions

Choose the right answer

1. Which of the following is not a financial investment?
   (i) Purchase of shares   (ii) Purchase of bonds
   (iii) Purchase of car   (iv) Purchase of debentures

2. Which of the following is a tax saving investment?
   (i) Fixed deposit   (ii) Shares
   (iii) NSC   (iv) PPF

3. The fundamental analysis approach has been associated with _____ .
   (i) Uncertainties   (ii) Certainties
   (iii) Ratios   (iv) Balance sheet

4. The object of portfolio is to reduce _____ by diversification.
   (i) Return   (ii) Risk
   (iii) Uncertainty   (iv) Percentage

Ans: 1. (iii), 2. (iv), 3. (i), 4. (ii)

❐   ❐   ❐

2 CHAPTER

INVESTMENT ALTERNATIVES

Chapter Contents:

2.1 INTRODUCTION

Characteristics of Investments

It is worthwhile considering the characteristics of some forms of investment popular amongst individuals. The most popular is probably the bank or building society deposit. On the upside these are free of capital risk, offer an income yield, and are usually liquid. On the downside they lack substantial growth potential, are subject to a high level of income risk and have inflation risk.

Rental, or buy-to-let, property has become popular in recent years. Such investment has growth potential and provides an income yield. On the downside it is illiquid and subject to both income and capital risk. The income risk relates to the possibility that rents fall, or that a property fails to attract tenants and remains unoccupied for long periods. The capital risk exists because property prices can fall.

An investor invests in the avenues after studying the merits and demerits of the investments. The types of investments are as:

1. Shares and debentures.
2. Government funds
3. Money market instruments
4. Public deposits
5. Bank deposits
6. Post office savings
7. HDFC schemes/Housing bank schemes
8. Mutual Fund Schemes
9. Life Insurance Schemes
10. Public provident fund
11. Gold-silver
12. Real estates

2.2 NON-MARKETABLE FINANCIAL ASSETS

The financial instruments which are not transferable or saleable are known as non-marketable financial assets. The investors can invest in these instruments but they cannot transfer or sell the instruments.

A good portion of the financial assets of individual is held in the form of non-marketable financial assets like bank deposits, post office deposits, company deposits, and provident fund deposits. A distinguishing feature of these assets is that they represent personal transactions between the investor and the issuer. For example, when you open a savings bank account at a bank you deal with the bank personally. In contrast when you buy equity shares in the stock market you do not know who the seller is and you do not care. The important non-marketable financial assets held by investors are briefly described below.

1. Post office saving schemes
2. Public provident fund
3. Deposit with banks
4. Life insurance policy

1. Post Office Saving Scheme

The main financial services offered by the Department of Posts are the Post Office Savings Bank. It is the largest and oldest banking service institution in the country. The Department of Posts

operates the Post Office Savings Scheme function on behalf of the Ministry of Finance, Government of India. Under this scheme, more than 20.50 crores savings account are operated. These accounts are operated through more than 1,54,000 post offices across the country.

The Post offices provide a number of savings schemes like the Savings Account Schemes, Recurring Deposit Schemes, Time Deposit Schemes, Public Provident Fund Schemes, Monthly Income Schemes, National Savings Certificates, Kisan Vikas Patras, and Senior Citizens, and Savings Scheme.

A. Post Office Monthly Income Scheme:

The post office monthly income scheme (MIS) provides for monthly payment of interest income to investors. It is meant for investors who want to invest a sum amount initially and earn interest on a monthly basis for their livelihood. The MIS is not suitable for an increase in your investment. It is meant to provide a source of regular income on a long-term basis. The scheme is, therefore, more beneficial for retired persons.

Features:

- Only one deposit is available in an account.
- Only individuals can open the account; either single or joint (two or three).
- Interest rounded off to nearest rupee, i.e., 50 paise and above will be rounded off to next rupee.
- The minimum investment in a Post Office MIS is ₹ 1,000 for both single and joint accounts.
- The maximum investment for a single account is ₹ 3 lakh and ₹ 6 lakh for a joint account.
- The duration of MIS is six years.

Returns:

The post office MIS gives a return of 8% plus a bonus of 10 per cent on maturity. However, this 10 per cent bonus is not available in case of premature withdrawals. The minimum investment in a Post Office MIS is ₹ 1,000 for both single and joint accounts.

Deposit ₹	Monthly Interest	Amount returned on maturity
5,000	33	5,500
10,000	66	11,000
50,000	333	55,000
1,00,000	667	1,10,000
2,00,000	1,333	2,20,000
3,00,000	2,000	3,30,000
6,00,000	4,000	6,60,000

Advantages:

- Premature closure of the account is permitted any time after the expiry of a period of one year of opening the account.

- Deduction of an amount equal to 5 per cent of the deposit is to be made when the account is prematurely closed. Investors can withdraw money before three years, but a discount of 5%.

- Closing of account after three years will not have any deductions. Monthly interest can be automatically credited to savings account provided both the accounts standing at the same post office.

- The interest income accruing from a post office MIS is exempt from tax under Section 80L of the Income Tax Act, 1961.

- Moreover, no TDS is deductible on the interest income. The balance is exempt from Wealth Tax.

B. Post Office Time Deposits (POTDs):

Similar to fixed deposits if commercial banks, POTDs have features:

1. Deposits can be made in multiples of ₹ 50 without any limit.

2. The interest rates on POTDs are in general slightly higher than those on bank deposits.

3. The interest is calculated half-yearly and paid annually.

4. No withdrawal is permitted for up to six months.

5. After six months, withdrawals are permitted. However, on withdrawals made between six months and one year, no interest is payable. On withdrawal after one year, but before the term of deposit, interest is paid for the period the deposit has been held, subject to a penal deduction of 2 per cent.

6. A POTD account can be pledged.

7. Deposits in 10 years to 15 years post office cumulative Time Deposit Account can be deducted before computing the taxable income under Secion 80C.

C. Monthly Income Scheme of the Post Office (MISPO):

A popular scheme of the post office, the MISPO is meant to provide regular monthly income for the depositors. The salient features of the scheme are as follows:

1. The term of the scheme is 6 years.

2. The minimum amount of investment is ₹ 1,000. The maximum investment can be ₹ 3,00,000 in a single account or ₹ 600,000 in a joint account.

3. The interest rate is 8.0 per cent payable monthly. A bonus of 10 per cent is payable on maturity.

4. There is no tax deduction at source.

5. There is a facility of premature withdrawal after one year, with 5 per cent deduction before 3 years.

D. Kisan Vikas Patra (KVP):

Scheme of the post office, the Kisan Vikas Patra has the following features:

1. The minimum amount of investment is ₹ 1,000. There is no maximum limit.
2. The investment doubles in 8 years and 7 months. Hence, the compound interest rate works out to 8.4 per cent.
3. There is no tax deduction at source.
4. KVPs can be pledged as a collateral security for raising loans.
5. There is a withdrawal facility after 2½ years.

E. National Savings Certificate:

Issued at post offices, the National Saving Certificate offers the following features:

1. It comes in denomination of ₹ 100, ₹ 500, ₹ 1,000, ₹ 5,000 and ₹ 10,000
2. It has a term of 6 years. Over this period ₹ 100 becomes ₹ 160.1. Hence, the compound rate of return works out to 8.16 per cent
3. Investment in NSC can be deducted before computing the taxable income under Section 80C.
4. There is no tax deduction at source.
5. It can be pledged as collateral for raising loans.

F. Investment in Government Securities:

It is possible through post offices. Here, the terms and conditions are fixed by the government. Thus, post office provides various schemes for safe investment of interest rates are reduced considerably in recent years. Personal attention are not given by the staff due to use of old methods. The postal rules and procedures are lengthy.

G. Time Deposits:

Period 1 to 5 years. No maximum limit of deposit in an account. The interest rate on time deposits have a effect on the investment decision of the investor.

H. Recurring Deposits:

Period 5 years. Rate of interest is 7.5 per cent. The interest is compounded on a quarterly basis. Maturity value is notified and paid accordingly.

2. Public Provident Fund

PPF is a 30-year-old statutory scheme of the Central Government started with the objective of providing old age income security to the unorganized sector workers and self-employed persons. Presently, there are nearly 30 lakh PPF accountholders in India across banks and post offices.

Eligibility:

Any individual (salaried or non-salaried) can open a PPF account. He may also subscribe on behalf of a minor, HUF, AOP and BOI. Even NRIs can open PPF account.

A person can have only one PPF account. Also, two adults cannot open a joint PPF account. The aggregate annual contribution by an individual on account of himself, his minor child and HUF/AOP/BOI (of which individual is member) cannot exceed ₹ 70,000 otherwise the excess amount will be returned without any interest.

Subscription:

The annual contribution to PPF account ranges from a minimum of ₹ 500 to a maximum of ₹ 70,000 payable in multiple of ₹ 5 either in lump sum or in convenient instalments, not exceeding 12 in a year.

Where to Open a PPF Account?

A PPF account can be opened at any branch of State Bank of India or its subsidiaries or in few nationalized banks or in post offices. On opening of account, a pass book will be issued wherein all amounts of deposits, withdrawals, loans and repayment together with interest due shall be entered. The account can also be transferred to any bank or post office in India.

Interest Rate:

Deposits in the account earn interest at the rate notified by the Central Govt. from time-to-time (presently 8% p.a. compounded annually). Interest is calculated on the lowest balance between the fifth day and last day of the calendar month and is credited to the account on 31st March every year. So to derive the maximum, the deposits should be made between 1st and 5th day of the month, as it also enables you to earn interest on your Savings Bank A/c for the previous month.

Tenure:

Although, PPF is 15-year scheme but the effective period works out to 16 years, i.e., the year of opening the account and adding 15 years to it. The contribution made in the 16th financial year will not earn any interest but one can take advantage of the tax rebate.

Withdrawal:

The investor is permitted to make one withdrawal every year beginning from the seventh financial year of an amount not exceeding 50% of the balance at the end of the fourth year or the financial year immediately preceding the withdrawal, whichever is less. This facility of making partial withdrawals provide liquidity and the withdrawn amount can be used for any purpose.

Loan:

The depositor can take a loan in the third financial year of opening the account for up to 25% of the balance at the end of second preceding financial year. Further, no loan can be taken after 6th financial year. Continuing with the previous example, the first loan can be taken during FY 2002-03 for 25% of the balance at the end of FY 2000-01.

The loan is to be repaid in 36 months following the month in which the loan is taken, either in lump sum or in instalments. The fresh loan will be given only after previous loan is repaid in full with interest at 1% p.a. over the interest paid on PPF. Moreover, if the loan is not repaid within stipulated time, the interest would be charged @ 6% p.a. instead of 1% p.a. In the event of death of subscriber, his legal heirs/nominee shall repay the interest on the loan.

Maturity:

On maturity, the account can be closed by making an application for withdrawal of entire balance together with interest after adjustments, if any. However, the account can also be extended for any period in a block of five years at each time, with or without fresh contribution.

If the account is continued without fresh contribution, the entire sum can be withdrawn either in lump sum or in instalments not exceeding one in a year. If continued with fresh subscriptions, withdrawal is permitted for up to 60% of the balance at the beginning of each extended period in one or more instalments, but not more than once a year.

Tax Treatment:

The contributions made to the PPF account are eligible for deduction u/s 80C of Income Tax Act. The interest earned and the entire amount received on maturity or premature withdrawal is completely tax-free. Moreover, the balance held in PPF account is fully exempt from wealth tax, without any limit.

Benefits:

- The investment in PPF offers highest security as it is a government-backed scheme. The return of 8% p.a. offered by the scheme actually works out to be higher due to tax benefits and the compounding factor (interest on interest earned).
- The balance amount in PPF account is not subject to attachment under any order or decree of court in respect of any debt or liability.
- Reasonably attractive interest rate.
- Tax exemption on investment made in PPF.
- Withdrawal facility available at certain intervals which also avoids frequent withdrawals.

Disadvantages:

1. Low liquidity as one can withdraw only once in a year.
2. The PPF account is for a period of 15 years which is very long.

Conclusion:

PPF is debt product that is an all-time favourite and it adds stability to one's portfolio along with risk-free stable returns.

3. Bank Deposits

Commercial and cooperative banks accept deposits from public in the form of current account which bears no interest, savings accounts which bear interest varying from 4.5% to 5.5% per annum, and fixed deposits of varying maturities.

What's the difference between savings and investment? The simple definition is savings have very little risk with low limited returns, on the other hand, investments provide the opportunity for higher returns by managing risk.

By savings in the banks, you may earn interest and you feel good and secured as you watch your money grows overtime. But hang on, if you factor in inflation you realise that you actually have a negative growth.

Alternatively, investment may provide income and capital gains with proper management of the risk involved in any form of investment. Investment comes in all sort of categories of investment assets such as Money market, Equity, Bonds, Derivatives, Unit Trust, etc.

There are two types of returns that can be derived from investments, that is income and capital gains. While income is derived from your investment in the form of rental or dividends, you get capital gains from selling the investment asset for a profit.

Bank Savings

Bank Fixed Deposits [Term Deposit]

In a Fixed Deposit Saving Scheme a certain amount of money is deposited in the bank for a specified period at a fixed rate of interest.

To invest the hard earned money for a longer period and get a regular income, a Fixed Deposit Scheme is ideal. It is safe, liquid and fetches high returns.

Loan/Overdraft facility is available against bank fixed deposits. Now many banks don't charge premature withdrawals.

Recurring Deposits

Under a Recurring Bank Deposit Saving Scheme, an investor invests a specific amount in a bank on a monthly basis for a fixed rate of return. The deposit has a fixed tenure, at the end of which the investor gets principal amount as well as the interest earned during that period.

Recurring Deposit provides the element of compulsion to save at high rates of interest applicable to Term Deposits along with liquidity to access that savings any time.

Advantages

1. Investment is reasonably safe and secured.

2. Banks offer loan facility.

3. Procedures and formalities involved in bank investment are limited.

4. Reasonable return on the investment made and that too in a regular manner.

Disadvantages:

1. The rate of return in the case of bank investment is low as compared to other avenues of investment.

2. The return on investment is not adequate even to give protection against the present inflation rate in the economy.

3. Capital appreciation is not possible.

2.3 MONEY MARKET INSTRUMENTS

By convention, the term "money market" refers to the market for short-term requirement and deployment of funds. Money market instruments are those instruments, which have a maturity period of less than one year. The most active part of the money market is the market for overnight and term money between banks and institutions (called call money) and the market for repo transactions. The former is in the form of loans and the latter are sale and buyback agreements – both are obviously not traded. The main traded instruments are commercial papers (CPs), certificates of deposit (CDs) and Treasury Bills (T Bills). All of these are discounted instruments, i.e., they are issued at a discount to their maturity value and the difference between the issuing price and the maturity/face value is the implicit interest. These are also completely unsecured instruments. One of the important features of money market instruments is their high liquidity and tradability. A key reason for this is that these instruments are transferred by endorsement and delivery and there is no stamp duty or any other transfer fee levied when the instrument changes hands. Another important feature is that there is no tax deducted at source from the interest component. A brief description of these instruments is as follows:

Commercial Paper (CP)

These are issued by corporate entities in denominations of ₹ 2.5 mn and usually have a maturity of 90 days. CPs can also be issued for maturity periods of 180 and one year but the most active market is for 90 day CPs.

Two key regulations govern the issuance of CPs Firstly, CPs have to be compulsorily rated by a recognized credit rating agency and only those companies can issue CPs which have a short-term rating of at least P1. Secondly, funds raised through CPs do not represent fresh borrowings for the corporate issuer but merely substitute a part of the banking limits available to it. Hence, a company issues CPs almost always to save on interest costs, i.e., it will issue CPs only when the environment is such that CP issuance will be at rates lower than the rate at which it borrows money from its banking consortium.

Certificates of Deposit (CD)

These are issued by banks in denominations of ₹ 0.5 mn and have maturity ranging from 30 days to 3 years. Banks are allowed to issue CDs with a maturity of less than one year while financial institutions are allowed to issue CDs with a maturity of at least one year. Usually, this means 366 day CDs. The market is most active for the one year maturity bracket, while longer dated securities are not much in demand. One of the main reasons for an active market in CDs is that their issuance does not attract reserve requirements since they are obligations issued by a bank.

Treasury Bills (T Bills)

These are issued by the Reserve Bank of India on behalf of the Government of India and are thus actually a class of Government Securities. At present, T Bills are issued in maturity of 14 days, 91 days and 364 days. The RBI has announced its intention to start issuing 182 day T Bills shortly. The minimum denomination can be as low as ₹ 100, but in practice most of the bids are large bids from institutional investors who are allotted T Bills in dematerialized form. RBI holds auctions for 14 and 364 days T Bills on a fortnightly basis and for 91 days T Bills on a weekly basis. There is a notified value of bills available for the auction of 91 days T Bills which is announced 2 days prior to the auction. There is no specified amount for the auction of 14 and 364 days T Bills. The result is that at any given point of time, it is possible to buy T Bills to tailor one's investment requirements.

Potential investors have to put in competitive bids at the specified times. These bids are on a price/interest rate basis. The auction is conducted on a French auction basis, i.e., all bidders above the cut-off at the interest rate/price which they bid while the bidders at the clearing/cut-off price/rate get *pro rata* allotment at the cut-off price/rate. The cut-off is determined by the RBI depending on the amount being auctioned, the bidding pattern, etc. By and large, the cut-off is market determined although sometimes the RBI utilizes its discretion and decides on a cut-off level which results in a partially successful auction with the balance amount devolving on it. This is done by the RBI to check undue volatility in the interest rates.

Non-competitive bids are also allowed in auctions (only from specified entities like State Governments and their undertakings and statutory bodies) wherein the bidder is allotted T Bills at the cut-off price.

Apart from the above money market instruments, certain other short-term instruments are also in vogue with investors. These include short-term corporate debentures, Bills of exchange and promissory notes.

Like CPs, short-term debentures are issued by corporate entities. However, unlike CPs, they represent additional funding for the corporate, i.e., the funds borrowed by issuing short term debentures are over and above the funds available to the corporate from its consortium bankers. Normally, debenture issuance attracts stamp duty; but issuers get around this by issuing only a letter of allotment (LoA) with the promise of issuing a formal debenture letter. However, the debenture is never issued and the LoA itself is redeemed on maturity. These LoAs are freely tradable but transfers attract stamp duty.

Bills of exchange are promissory notes issued for commercial transactions involving exchange of goods and services. These bills form a part of a company's banking limits and are discounted by the banks. Banks in turn rediscount bills with each other.

Gilt-edged Securities

Gilts are bonds issued by certain national governments. The term is of British origin, and originally referred to the debt securities issued by the Bank of England, which had a gilt (or gilded) edge. Hence, they are called gilt-edged securities, or gilts for short. The term is also sometimes used in Ireland and some British Commonwealth countries, South Africa and India. When a reference is made to gilts, what is generally meant is British gilts unless otherwise specified. The description below applies to the UK gilt market. The data reveal that about two-thirds of all gilts are held by insurance companies and pension funds. During 2009, large quantities of gilts were created and purchased by the Bank of England under its policy of quantitative easing.

The term "Gilt Account" is also a term used by the Reserve Bank of India to refer to a constituent account maintained by a custodian bank for maintenance and servicing of dematerialized Government Securities owned by a retail customer.

Conventional Gilts

These are the simplest form of UK government bond and make up the largest share of UK government debt. A conventional gilt is a bond issued by the UK government which pays the holder a fixed cash payment (or coupon) every six months until maturity, at which point the holder receives their final coupon payment and the return of the principal.

Coupon Rate

Conventional gilts are denoted by their coupon rate and maturity year, e.g., 4¼% Treasury Gilt 2055. The coupon paid on the gilt typically reflects the market rate of interest at the time of issue of the gilt, and indicates the cash payment per £100 that the holder will receive each year in two semi-annual payments.

Gilt Names

Historically, gilt names referred to their purpose of issuance, or signified how a stock had been created, such as 10¼% Conversion Stock 1999. In more recent times, gilts have been generally named Treasury Stocks. From 2005-2006 onwards, all new issues of gilts are being called Treasury Gilts.

2.4 BONDS OR FIXED SECURITIES

What Does Bond Mean?

A debt investment in which an investor loans money to an entity (corporate or governmental) that borrows the funds for a defined period of time at a fixed interest rate. Bonds are used by companies, municipalities, states and US and foreign governments to finance a variety of projects and activities.

Bonds are commonly referred to as fixed-income securities and are one of the three main asset classes, along with stocks and cash equivalents.

Bond

The indebted entity (issuer) issues a bond that states the interest rate (coupon) that will be paid and when the loaned funds (bond principal) are to be returned (maturity date). Interest on bonds is usually paid every six months (semi-annually). The main categories of bonds are corporate bonds, municipal bonds, and US Treasury bonds, notes and bills, which are collectively referred to as simply "Treasuries".

Two features of a bond-credit quality and durations are the principal determinants of a bond's interest rate. Bond maturities range from a 90-day Treasury Bill to a 30-year government bond. Corporate and municipals are typically in the three to 10-year range.

Definition

A debt instrument issued for a period of more than one year with the purpose of raising capital by borrowing. The Federal government, states, cities, corporations, and many other types of institutions sell bonds. Generally, a bond is a promise to repay the principal along with interest (coupons) on a specified date (maturity). Some bonds do not pay interest, but all bonds require a repayment of

principal. When an investor buys a bond, he/she becomes a creditor of the issuer. However, the buyer does not gain any kind of ownership rights to the issuer, unlike in the case of equities. On the hand, a bond holder has a greater claim on an issuer's income than a shareholder in the case of financial distress (this is true for all creditors). Bonds are often divided into different categories based on tax status, credit quality, issuer type, maturity and secured/unsecured (and there are several other ways to classify bonds as well). The US Treasury bonds are generally considered the safest unsecured bonds, since the possibility of the Treasury defaulting on payments is almost zero. The yield from a bond is made up of three components: coupon interest, capital gains and interest on interest (if a bond pays no coupon interest, the only yield will be capital gains). A bond might be sold at above or below par (the amount paid out at maturity), but the market price will approach par value as the bond approaches maturity. A riskier bond has to provide a higher payout to compensate for that additional risk. Some bonds are tax-exempt, and these are typically issued by municipal, county or state governments, whose interest payments are not subject to federal income tax, and sometimes also state or local income tax.

Buying Bonds: Advantages and Disadvantages

Bonds don't enjoy the same allure as stocks, but high quality bonds should be an essential part of your financial plan. Bonds promise a steady income stream, typically at a fixed coupon rate (interest rate).

Advantages of Investing in Bonds

- Bonds are predictable. You know how much interest you can expect to receive, how often you'll receive it, and when your principal (the bond's face value) will be repaid (maturity date).
- Bonds are more steady than stocks (which can fluctuate wildly short-term). Nervous investors usually sleep better by buying bonds instead of equity investments.
- People on a fixed income and/or in retirement will receive a predictable amount of regular income from bonds.
- The interest rates paid by bonds typically exceed those paid by banks on savings accounts, especially short-term bonds.

Disadvantages of Bonds

- Companies and municipalities can and do go bankrupt, and if they do, your bonds will lose value and possibly even become worthless.
- Long-term bonds will have your money tied up in low yielding bonds should interest rates go up.
- Unlike stocks, bonds don't offer the possibility of high long-term returns. Younger investors and those with several years to go until retirement would be better served by limiting their bond purchases and opting for equity buys instead.

Government Securities Market (G-Sec Market): It consists of Central and State Government securities. It means that, loans are being taken by the Central and State Government. It is also the most dominant category in the India debt market.

Bond Market: It consists of Financial Institutions bonds, Corporate bonds and debentures and Public Sector Units bonds. These bonds are issued to meet financial requirements at a fixed cost and hence remove uncertainty in financial costs.

Advantages:

- The biggest advantage of investing in Indian debt market is its assured returns. The returns that the market offer is almost risk-free (though there is always certain amount of risks, however the trend says that return is almost assured). Safer are the government securities.

- On the other hand, there are certain amounts of risks in the corporate, FI and PSU debt instruments. However, investors can take help from the credit rating agencies which rate those debt instruments. The interest in the instruments may vary depending upon the ratings.

- Another advantage of investing in Indian debt market is its high liquidity. Banks offer easy loans to the investors against government securities.

Disadvantages:

- As there are several advantages of investing in Indian debt market, there are certain disadvantages as well.

- As the returns here are risk-free, those are not as high as the equities market at the same time. So, at one hand you are getting assured returns, but on the other hand, you are getting less return at the same time.

- Retail participation is also very less here, though increased recently. There are also some issues of liquidity and price discovery as the retail debt market is not yet quite well developed.

2.5 INVESTMENT IN EQUITY MARKET

What are the advantages and disadvantages in investing in the stock market?

This is a common question among investors. Stocks and bonds differ dramatically in their structures, payouts, returns and risks. In order to answer this question, we need to go through a brief description of both stocks and bonds.

A bond is a form of debt with which you are the lender instead of the borrower. Bonds are contractual loans made between investors and institutions that, in return for financing, will pay a premium for borrowing, known as a coupon. Additionally, the bond's face value is returned to the investor at maturity. The guarantee of payback and all coupon payments relies solely on the ability of the borrower to generate enough cash flow to repay bondholders.

Stocks are a form of ownership; they represent participation in a company's growth. Generally, investors are given no promises about returns of the initial investment. In fact, the profitability of the investment depends almost entirely upon rising stock price, which, at the most fundamental level, relates directly to the performance and growth (increasing profits) of the company.

So, this leads to the original question: which security is better? The answer is neither. Stocks and bonds both have their pros and cons depending on what you are looking for. For example, risk-averse investors looking for safety of capital and who prefer a known periodic payment structure (i.e., coupon payments) for a limited timeframe would be better off investing in bonds. On the other hand, investors who are willing to take on greater risks than bondholders and who would prefer the benefit of having partial ownership in a company and the unlimited potential of a rising stock price would be better off investing in stocks.

However, the disadvantage of stocks versus bonds is that stocks are not guaranteed to return anything to the investor while the coupon payments and principal of bonds are. Thus, the possibility for high returns is greater with stocks but so is the possibility of losing money.

For most investors, a combination of stocks and bonds is the best situation. By diversifying your investments and putting some money into both stocks and bonds you ensure some safety while leaving some opportunity for above-average returns in your stock investments.

Advantages:

1. You own your own business with literally do nothing.
2. Flexible holding position, which you can liquidate it anytime you want, no string attach.
3. Unlike other business, you need a team. But here, you can work yourself, and from home!

Disadvantages:

1. Very steep learning curve in the beginning.
2. It is not that easy to control your emotion.
3. You can end up broker if you do things wrong.

2.6 MUTUAL FUND

Mutual funds are money-managing institutions set up to professionally invest the money pooled in from the public. These schemes are managed by Asset Management Companies (AMCs), which are sponsored by different financial institutions or companies.

Mutual Fund is an ideal investment vehicle where a number of investors come together to pool their money with common investment goal. Each Mutual Fund with different type of schemes is managed by respective Asset Management Company (AMC). An investor can invest his money in one or more schemes of Mutual Fund according to his choice and becomes the unitholder of the scheme. The invested money in a particular scheme of a Mutual Fund is then invested by fund

manager in different types of suitable stock and securities, bonds and money market instruments. Each Mutual Fund is managed by qualified professional man, who use this money to create a portfolio which includes stock and shares, bonds, gilt, money market instruments or combination of all. Thus Mutual Fund will diversify your portfolio over a variety of investment vehicles. Mutual Fund offers an investor to invest even a small amount of money.

Mutual Funds schemes are managed by respective Asset Management Companies sponsored by financial institutions, banks, private companies or international firms. The biggest Indian AMC is UTI while Alliance, Franklin Templeton, etc., are international AMCs.

Mutual Funds offers several benefits to an investor such as potential return, liquidity, transparency, income growth, good post-tax return and reasonable safety. There are number of options available for an investor offered by a mutual fund.

Before investing in a Mutual Fund an investor must identify his needs and preferences. While selecting a Mutual Fund's schemes he should consider the effect of inflation rate, diversification of investment, the time period of investment and the risk factors. There are various type of risk factors as:

    (a) Market Risk

    (b) Credit Risk

    (c) Interest Rate Risk

    (d) Inflation Risk

    (e) Political Environment

CRISIL's composite performance ranking (CPR) measures the performance for each of the open-ended scheme of Mutual Fund. There are four parameters considered to measure the performance of a mutual fund such as Risk-adjusted returns of the scheme's NAV, Diversification of Portfolio, Liquidity and Asset Size.

Tax Benefits Available by Investing in Mutual Funds

From April 1, 2003 onwards, all dividends, declared by the debt-oriented mutual funds (mutual funds with less than 50% of assets in equities), are tax-free in the hands of the investor.

The mutual fund has to pay a dividend distribution tax of 12.5% (that includes surcharge on the dividends declared by the fund. Long-term debt funds, monthly income plans (MIPs), government securities funds (G-Sec/gilt funds), are some examples of debt-oriented funds.

Dividends that are declared by equity-oriented funds (mutual funds with more than 50% investment of assets in equities) are tax-free in the hands of investor. Also, no dividend distribution tax is applicable on these funds u/s 115R. Sector funds, balanced funds and diversified equity funds, are examples of equity-oriented funds.

The amount invested in tax-saving funds such as Equity linked savings schemes (ELSS) is eligible for deduction U/s 80C; but the aggregate amount deductible under this section cannot exceed ₹ 100,000.

What is a Mutual Fund?

Mutual fund is a pool of money from many investors who wish to save or make money. Investing in mutual funds can be a lot easier as compared to buying and selling individual stocks or bonds on your own. Here, the funds are kept in units of ₹ 10.

An investor can redeem his/her holdings partially or fully at any point of time and collect the proceeds on at + 2 basis.

The basic idea behind Mutual Fund is that investors lack time, the inclination and skills required to manage their own investments. Professional Mutual Fund managers are highly experienced personnels and act on behalf of the mutual fund company that manages the investments for the benefit of the investors in return of a management fees.

The organization that manages the investment is known as Asset Management Company (AMC).

In India, operations of AMC are supervised and regulated by the Securities and Exchange Board of India (SEBI).

Concept of Mutual Fund

↓

Many investors with common financial objectives pool
their money

↓

Investors, on a proportionate basis, get mutual fund units
for the sum contributed to the pool

↓

The money collected from investors is invested into shares,
debentures and other securities by the fund manager

↓

The fund manager realizes gains or losses, and collects
dividend or interest income

↓

Any capital gains or losses from such investments are
passed on to the investors in proportion of the number of
units held by them

Tax on Mutual Funds

Section 2(42A): A unit of mutual fund is treated as short-term capital asset if the same is held for less than 12 months. The units that are held for more than 12 months are treated as long-term capital asset.

Section 10(38): Short-term capital gains on all equity-oriented funds are chargeable to tax @ 10% (plus the education cess, applicable surcharge). However, such securities transaction tax shall be allowed as rebate under Section 88E of the Act, if the transaction indicates business income.

The long-term capital gains on debt-oriented funds are subject to a tax @ 20% of capital gain after allowing indexation benefit or at 10% flat without indexation benefit, whichever is lesser.

All short-term capital gains on debt-oriented funds are subject to a tax at the tax bracket applicable (i.e., marginal tax rate) to the investor.

Section 112: Capital gains not covered by exemption U/s 10(38), chargeable on transfer of long-term capital assets shall be subject to following tax rates:

- For Resident Individual and HUF – 20% plus surcharge, education cess.
- For Partnership firms as well as Indian companies – 20% plus surcharge.
- For Foreign companies – 20% (no surcharge).

Capital gains are computed after taking into consideration the cost of acquisition as adjusted by the Cost Inflation Index, notified by Central Government.

Unitholders can opt for being taxed at 10% (along with applicable surcharge, education cess) without the cost inflation index benefit or 20% (along with applicable surcharge) with cost inflation index benefit, whichever is beneficial.

U/s 115AB of the Income Tax Act, 1961, the long-term capital gains on units, purchased in foreign currency by an overseas financial, and held for a period greater than 12 months, will be charged at the rate of 10%. Such gains will be calculated without indexation of cost of acquisition. No surcharge is applicable for taxes U/s 115AB, for corporate bodies.

Mutual Fund Scheme by Structure

Open-ended Funds: An open-ended funds is one that is available for subscription all through the year. These do not have a fixed maturity. Investors can conveniently buy and sell units at Net Asset Value ("NAV") related prices. The key feature of open-ended schemes is liquidity.

Closed-ended Funds: A closed-ended funds has a stipulated maturity period which generally ranging from 3 to 15 years. The fund is open for subscription only during a specified period. Investors can invest in the scheme at the time of the initial public issue and thereafter they can buy or sell the units of the scheme on the stock exchanges where they are listed. In order to provide an exit route to the investors, some close-ended funds give an option of selling back the units to the Mutual Fund through periodic repurchase at NAV related prices. SEBI Regulations stipulate that at least one of the two exit routes is provided to the investor.

Interval Funds: Interval funds combine the features of open-ended and close-ended schemes. They are open for sale or redemption during predetermined intervals at NAV-related prices.

Mutual Fund Scheme by Investment Objective

Growth Funds: The aim of growth funds is to provide capital appreciation over the medium- to long-term. Such schemes normally invest a majority of their corpus in equities. It has been proved that returns from stocks, have outperformed most other kind of investments held over the long-term. Growth schemes are ideal for investors having a long-term outlook seeking growth over a period of time.

Income Funds: The aim of income funds is to provide regular and steady income to investors. Such schemes generally invest in fixed income securities such as bonds, corporate debentures and Government securities. Income funds are ideal for capital stability and regular income.

Balanced Funds: The aim of balanced funds is to provide both growth and regular income. Such schemes periodically distribute a part of their earning and invest both in equities and fixed income securities in the proportion indicated in their offer documents. In a rising stock market, the NAV of these schemes may not normally keep pace, or fall equally when the market falls. These are ideal for investors looking for a combination of income and moderate growth.

Money Market Funds: The aim of money market funds is to provide easy liquidity, preservation of capital and moderate income. These schemes generally invest in safer short-term instruments such as Treasury Bills, certificates of deposit, commercial paper and inter-bank call money. Returns on these schemes may fluctuate depending upon the interest rates prevailing in the market. These are ideal for corporate and individual investors as a means to park their surplus funds for short periods.

Other Schemes

Tax Saving Schemes: These schemes offer tax rebates to the investors under specific provisions of the Indian Income Tax laws as the Government offers tax incentives for investment in specified avenues. Investments made in Equity Linked Savings Schemes (ELSS) and Pension Schemes are allowed as deduction U/s 88 of the Income Tax Act, 1961. The Act also provides opportunities to investors to save capital gains U/s 54EA and 54EB by investing in Mutual Funds.

Special Schemes

Industry Specific Schemes: Industry specific schemes invest only in the industries specified in the offer document. The investment of these funds is limited to specific industries like Infotech, FMCG, Pharmaceuticals, etc.

Index Schemes: Index funds attempt to replicate the performance of a particular index such as the BSE Sensex or the NSE 50.

Sectoral Schemes: Sectoral funds are those which invest exclusively in a specified sector. This could be an industry or a group of industries or various segments such as 'A' Group shares or initial public offerings.

Benefits of Investment in Mutual Funds

Mutual funds offer several benefits to an investor that unmatched by the other investment options. The major benefits are good post-tax returns and reasonable safety, the other benefits in investing in mutual funds are:

Professional Management: Mutual funds provide the services of experienced and skilled professionals, backed by a dedicated investment research team that analyses the performance and prospects of companies and selects suitable investments to achieve the objectives of the scheme.

Diversification: The best mutual funds design their portfolios so individual investments will react differently to the same economic conditions. For example, economic conditions like a rise in interest rates may cause certain securities in a diversified portfolio to decrease in value. Other securities in the portfolio will respond to the same economic conditions by increasing in value. When a portfolio is balanced in this way, the value of the overall portfolio should gradually increase overtime, even if some securities lose value.

Convenient Administration: Investing in a mutual fund reduces paperwork and helps you avoid many problems such as bad deliveries, delayed payments and follow up with brokers and companies. Mutual funds save your time and make investing easy and convenient.

Potential Return: Mutual funds have the potential to provide a higher return to an investor than any other option over a reasonable period of time.

Liquidity: In open-ended schemes, the investor gets the money back promptly at net asset value related prices from the mutual fund. In closed-end schemes, the units can be sold on a stock exchange at the prevailing market price or the investor can avail of the facility of direct repurchase at NAV-related prices by the Mutual Fund.

Low Costs: Mutual fund expenses are often no more than 1.5 per cent of your investment. Expenses for index funds are less than that, because index funds are not actively managed. Instead, they automatically buy stock in companies that are listed on a specific index.

Flexibility: Investment in mutual funds offers a lot of flexibility with features of schemes such as regular investment plan, regular withdrawal plans and dividend reinvestment plans enabling systematic investment or withdrawal of funds.

Affordability: Small investors with low investment fund are unable to high-grade or blue chip stocks. An investor through mutual funds can be benefited from a portfolio including of high priced stock.

Transparency: You get regular information on the value of your investment in addition to disclosure on the specific investments made by your scheme, the proportion invested in each class of assets and the fund manager's investment strategy and outlook.

Well Regulated: All mutual funds are registered with SEBI and they function within the provisions of strict regulations designed to protect the interests of investors. The operations of mutual funds are regularly monitored by SEBI.

2.7 LIFE INSURANCE

Life insurance is a contract between the policyholder and the insurer, where the insurer promises to pay a designated beneficiary a sum of money (the "benefits") upon the death of the insured person. Depending on the contract, other events such as terminal illness or critical illness may also trigger payment. In return, the policyholder agrees to pay a stipulated amount (the "premium") at regular intervals or in lump sum. In some countries, death expenses such as funerals are included in the premium; however, in the United States the predominant form simply specifies a lump sum to be paid on the insured's demise.

The value for the policy owner is the 'peace of mind' in knowing that the death of the insured person will not result in financial hardship.

Life policies are legal contracts and the terms of the contract describe the limitations of the insured events. Specific exclusions are often written into the contract to limit the liability of the insurer; common examples are claims relating to suicide, fraud, war, riot and civil commotion.

Life-based contracts tend to fall into two major categories:

- Protection policies – designed to provide a benefit in the event of specified event, typically a lump sum payment. A common form of this design is term insurance.
- Investment policies – where the main objective is to facilitate the growth of capital by regular or single premiums.

Life insurance has the highest penetration levels amongst investment options with 44 per cent, followed by Bank Fixed Deposits which has 35 per cent votes. Gold (33%) and Property (23%) are the other favourites among Indians. The current financial turmoil makes it a tough case for equity markets.

Future Intention to Invest

Again, life insurance topped the list of future investment instruments with 30 per cent respondents agreeing to consider it as a future investment option, followed by Bank Fixed Deposits (11%), Gold and Property (both 7%), and Life Insurance Child Plans (6%).

"In the wake of the global financial meltdown, most investors are looking at options which help them safeguard their capital. Life insurance is seen to be one such avenue" said Kalyan Karmakar, Associate Director, Consumer Research, The Nielsen Company.

The Insurance Category

The three key triggers for buying life insurance are family protection in case of untimely death, Retirement Corpus and Securing Child's Future. Interestingly insurance for child emerged as a key trigger compared to the previous leg of the survey in 2004. Tax exemption as a trigger to purchase insurance has dropped significantly compared to 2004.

"We see a reduction in the number of people who bought insurance for tax saving with more people buying insurance for insurance sake!", said Kalyan Karmakar.

Marketing Channels

"We have seen a sea of change in the insurance marketing landscape in recent years. Increase in the number of players, significant spikes in media spends, growing focus on instruments like Unit Linked Insurance Plans (ULIPs) and expanding channels such as Bancassurance have led to high noise levels and clutter in the market. Yet, the role of the agent or insurance advisor remains paramount while closing sales", continued Karmakar.

For 98 per cent respondents, agents are the main source of information on insurance policies. Friends/peer group emerge as a significant source of information (58%) in comparison to 2004. Media also plays an important role in spreading awareness about various insurance policies, which includes Television Advertisements (55%), Newspapers (35%), and Outdoor Hoardings (33%).

By investing in life insurance, almost anyone can transfer the financial risks of dying early, guaranteeing a payout for family members who might otherwise be left in economic turmoil. Today's life insurance policies, however, often come with features borrowed from the investment world, blending traditional insurance with attributes of a mutual fund account.

Vehicles for Investing in Life Insurance

Those who haven't purchased a policy may be familiar only with "term" life insurance, which covers the owner for a set period of time, say, until their child graduates from college. If the owner lives past that date, the plan expires and is worthless.

But some life insurance policies are "cash value", which means the fees, or premium, initially are greater at the start of the policy than they would be in a term policy. The excess premium is then invested in a "separate account", either by the insurer or in an account controlled by the policy holder, building up cash value. Any investment gains can be used in a few ways: to increase the death benefit, to borrow against for any use or to keep the policy in effect if you stop paying monthly premiums. Policies that offer this investment feature come with significantly more complex terms, and are offered by salespeople who may earn a significant commission of your initial premium.

In variable life insurance policies, the cash value and benefits may actually decrease or go away completely depending upon the performance of your investments. The National Association of Insurance Commissioners website offers a downloadable consumer guide to life insurance policies

that urges prospective buyers of variable life policies to obtain a prospectus from the company and to read it carefully.

Tax Benefits of Investing in Life Insurance

Tax benefits are chief among the advantages of a variable universal life insurance policy. Each year's earnings on the investment portion of the policy are not taxed, and the taxable gains on policies that are later cashed out can be reduced by the amount of insurance protection the plan provided. And if the policyholder dies, the gains are not usually taxed.

Similar tax benefits are also offered through pure investment accounts, such as 401k plans, some financial advisers recommend that these choices be funded to the maximum amount before an investment-oriented insurance policy is considered.

In addition, insurance policies may offer a wide variety of investment options, including stocks, bonds, balanced mutual funds, international mutual funds and money market accounts. Investments may also be tied to a major stock market index, like the Standard & Poor's 500. These are often similar to what might be found in a retirement investment account.

Flexibility of Investing in Life Insurance

The death benefit on a variable universal plan may be increased with a lump sum payment, or borrowed against in the event of a pressing financial need like a medical emergency. The ability to skip payments is also considered an advantage. In addition, the investment account may be shifted to more conservative or aggressive options.

Fees and Complexity of Life Insurance

Critics of variable universal life insurance plans say that the tax benefits are outweighed by a variety of fees that eat away at returns. These fees may be misunderstood by the policyholder, disclosed in long prospectus documents but glossed over in sales pitches. These policies may charge a fee, often 4% to 6%, on each deposit; annual contract fees; administrative charges on the account, and expenses on the investment options themselves. Many of these plans come with "surrender" charges of $10,000 or more in the event the policy is cashed out before a certain number of years. While other investment accounts come with a variety of fees, critics of life insurance policies say the true cost of the plans are difficult for many buyers to comprehend.

Tips for Investing in Life Insurance

If you decide that a variable universal life insurance policy offers appropriate benefits, you might consider purchasing a plan directly from the insurer and skipping the salesperson. These include Ameritas, USAA life and TIAA-CREF. Though you won't be enriching a salesperson, there are still sales costs that should be explained by the company's agent. Here are some other tips:

- Consider funding your other tax-advantaged retirement accounts before opening a variable universal life insurance policy. Term life insurance, however, continues to provide a unique benefit.

- Holding a cash value insurance plan until death or retirement increases the likelihood that the plan will be an appropriate investment.

- Dodge big fees, commissions, and surrender charges by investigating "low-load" insurers.

- Read the prospectus, which explains the benefits and risks in relatively plain language, without the spin of a sales pitch.

2.8 INVESTMENT IN REAL ESTATE

The real estate sector in India is of great importance. According to the report of the Technical Group on Estimation of Housing Shortage, an estimated shortage of 26.53 million houses during the Eleventh Five Year Plan (2007-12) provides a big investment opportunity.

According to a report 'Emerging trends in Real Estate in Asia-Pacific 2011', released by PricewaterhouseCoopers (PwC) and Urban Land Institute (ULI), India is the most viable investment destination in real estate. The report, which provides an outlook on Asia-Pacific real estate investment and development trends, points out that India, in particular Mumbai and Delhi, are good real estate investment options for 2011. Residential properties maintain their growth momentum and hence are viewed as more promising than other sectors. ULI is a global non-profit education and research institute.

Further, real estate companies are coming up with various residential and commercial projects to fulfil the demand for residential and office properties in Tier-II and Tier-III cities. For instance, Ansal Properties has several residential projects in cities such as Jodhpur, Ajmer, Jaipur, Panipat, Kundli and Agra. Omaxe has also planned around 40 residential and integrated township projects in Tier-II and Tier-III cities, majority of them being in Uttar Pradesh, Punjab, Madhya Pradesh, Rajasthan and Haryana. The growth in real estate in Tier-II and Tier-III cities is mainly due to increase in demand for organized realty and availability of land at affordable prices in these cities.

Real estate is a legal term (in some jurisdictions, such as the United Kingdom, Canada, Australia, USA, Dubai, Trinidad and Tobago and The Bahamas) that encompasses land along with improvements to the land, such as buildings, fences, wells and other site improvements that are fixed in location— immovable. Real estate law is the body of regulations and legal codes which pertain to such matters under a particular jurisdiction and include things such as commercial and residential real property transactions. Real estate is often considered synonymous with real property (sometimes called realty), in contrast with personal property (sometimes called chattel or personality under chattel law or personal property law).

However, in some situations the term "real estate" refers to the land and fixtures together, as distinguished from "real property", referring to ownership of land and appurtenances, including anything of a permanent nature such as structures, trees, minerals, and the interest, benefits, and inherent

rights thereof. Real property is typically considered to be immovable property. The terms real estate and real property are used primarily in common law, while civil law jurisdictions refer instead to immovable property.

2.9 INVESTMENT IN PRECIOUS METALS

A precious metal is a rare, naturally occurring metallic chemical element of high economic value. Chemically, the precious metals are less reactive than most elements, have high lustre, are softer or more ductile, and have higher melting points than other metals. Historically, precious metals were important as currency, but are now regarded mainly as investment and industrial commodities. Gold, silver, platinum, and palladium each have an ISO 4217 currency code.

The best-known precious metals are the coinage metals gold and silver. While both have industrial uses, they are better known for their uses in art, jewellery and coinage. Other precious metals include the platinum group metals: ruthenium, rhodium, palladium, osmium, iridium, and platinum, of which platinum is the most widely traded. Radioactive polonium, radium, actinium and protactinium, are not considered precious due to the health risk they pose.

Why Invest in Precious Metals?

In the past, people have invested in gold or silver as a method for storing value when a currency was losing its value. But today, our currency is no longer backed by gold *per se*. It is backed by the gross domestic production of the nation. Now there are many other reasons people have for investing in these precious metals. For the last several years, the consumption of gold, silver, platinum and palladium has far exceeded its production. This is coupled by the fact that the market price of these precious metals has been kept relatively down by the selling of gold reserves by central banks. In addition to this, rich foreign investors from developing countries have been increasingly looking for an investment to store away their personal wealth. They are moving out of their governments, which are often in the hands of corrupt politicians. It would take a global recession to slow the demand for gold and other such precious metals. Precious metals have long been looked to as the repositories of absolute value – not the relative value of paper currency.

When most people think of investing in gold and precious metals, they think of bullion (bars and wafers). Although many people do invest in bullion, there are investments in many different forms. Precious metal investments can be made in jewellery, coins, bullion, futures, options, mining stocks, or mutual funds. In this sense, they have tremendous liquidity and can be bought and sold without problems. Platinum and palladium, however, are less liquid than gold and silver. Each of the above types of precious metal investments is easy to get into and to get out of.

For these and similar other reasons, many investor's allot a portion of their portfolios to precious metal assets. Like other investments, the gold/silver market prices go through tremendous cycles. Prices moved from about $140 an ounce in early 1977 to over $887 an ounce in early 1980. When confidence in other assets causes their values to plummet, precious metals often do well. But as a result, investing in gold has been especially speculative, as you can see.

CASE STUDIES

1. As a portfolio management consultant, you are approached by a investor with investible funds of ₹ 25 lakhs. He wants to know from you that what are the investment avenues available to him which will give a stable return with minimum risks.

Ans: A rational investor considers two factors before making investment decision- Returns and Risk. He expects to get high returns while the associated risk should be low. There are various alternatives available for investment in market. Following are the few alternatives which provide stabilized returns with minimum risk.

1. Bonds and Debentures

Bonds are fixed income securities. Investors get interest on regular basis from companies. Interest may be paid quarterly, half-yearly or yearly. The risk involved is also limited particularly when money is deposited with a reputed company. The interest offered is higher than the interest rate offered by banks. This method is simple and cheaper than obtaining loans from commercial banks. Gilt-edget securities, i.e., Government securities and securities issued by financial institutions such as IDBI, ICICI, etc. are fully secured as they have government banking. The maturity period varies from 10-20 years. These securities are highly liquid asset as it can sold easily. Even tax benefits are available for such securities.

2. Fixed Deposits

The investor can invest in fixed deposits of banks particularly in nationalized banks as the risk involved is zero while the returns are reasonable. The returns generated from fixed deposits are around 9-10% p.a. It provides liquidity because the fixed deposits can be withdrawn before maturity in case of emergency or loan can be raised against F.D. There is a provision of tax saving under Sec. 80C of Income Tax Act, 1961. The bank deducts tax on interest if the interest amount is ₹ 10,000 or more in a year.

3. Public Provident Fund

PPF is a one attractive tax sheltered investment scheme for middle class and salaried people and businessmen. The investor can deposit certain amount periodically in the post office or SBI. The returns generated are 9.5% p.a. Withdrawals facility is available but it is limited to once in a year. It is normally for a period of 15 years but can be extended for more years. It is not transferable, but nomination facility is available. Thus, it is safe and reasonable investment avenue having limited liquidity.

4. Life Insurance Policy

Life insurance policy gives protection to family members through financial support in case of death of policy holders. At the same time, it is also acts as method of compulsory savings over a long

period out of regular income. It provides financially independent life after retirement. LIC issues different life policies such as Whole Life insurance policy, endowment policy, money back policy, etc. It gives tax benefit even if the policy is on the name of investor's wife, son, or daughter. LIC now gives bonus to policy holders on yearly basis. Thus apart from giving financial independence, policy allows investor to earn stabilize returns with no risk involved in investment.

5. Preference Shares

Preference shares are different from equity shares. Investment in equity shares is risky. Investor gets dividend only if company earns profits. This is not in case of preference shares. A preference shareholder is entitled to dividend every year. If company cannot pay in particular year, then it is added to next year's dividend. If company cannot pay next year also, it keeps on adding till company can pay it. Preference shareholder gets priority over ordinary shares. Equity shareholder gets dividend only after preference shareholder. If the company winds up and sells all its assets, the money that comes is given to shareholder. Even here preference shareholder first gets the money. Thus, investor earns secured returns periodically and risk is also less.

6. Mutual Fund

Mutual Fund Company mobilizes the saving of variance small investors and invests them in stock market securities. The returns generated are distributed amongst the investor. These companies have expertise knowledge of investment. The funds are invested in safe, secured and profitable manner in companies belonging to different industries. Even tax benefit is available for the amount invested. Here, the risk of loss is diversified among different investors. So individually an investor has to face minimum risk while the returns are high. Investor can expect 15% returns on mutual funds.

The best way to manage portfolio is to diversify the entire amount of investment among different securities/stock. Even if a particular security fetches you loss, thee should be other securities that yield returns. Thus the overall portfolio risk of investor can be minimized. It is advisable to diversify ₹ 25 lacs.

In manner:

Sr. No	Investment	Amount	%
1	Bonds/Debentures	60,00,00	24
2	Fixed Deposits	20,00,00	8
3	Preference shares	60,00,00	24
4	LIC policy	53,00,00	21.2
5	PPF	70,000	2.8
6	Mutual fund	50,00,00	20
	Total	**25,00,000**	**100%**

2. You are a PMS (Portfolio Management Services) Consultant. A middle-aged investor approaches you to seek your advice on deploying his surplus funds of ₹ 20 lakhs in various shares, schemes, bonds and Govt. Securities. Present to him any five Investment schemes mentioning various merits and demerits of each scheme. You may assume that he is willing to take risk to the extent of 30% of his funds.

       Ans: The Portfolio of an Investor can be as follows:

<div align="center">

Portfolio of a Middle-aged Investor

Sr. No.	Investment	Amount	Percentage
1	Shares	6,00,000	30%
2	Bonds	3,30,000	16.5%
3	Fixed Deposits	5,00,000	25%
4	Public Provident Funds	70,000	3.5%
5	Mutual Funds	5,00,000	25%
	Total	**20,00,000**	**100**

</div>

    1. Share: Investment in share risky but it provides higher returns if investment is made carefully. As the investor is willing to take risk to the extent of 30%, an amount of ₹ 6,00,000 can be invested in shares. It is a liquid investment. The shares can be sold through the broker and money can be realized within 3 days. However, he should invest in blue chips like profit making and dividend paying companies. He can invest in four to five companies from different industries like IT, Pharma, Entertainment and Banking.

    2. Bond

    3. Fixed Deposits

    4. Public Provident Fund

    5. Mutual Fund

    For Explanation Please Refer Earlier Explanation

2.10 EXERCISES

Answer the following questions

1. What is mutual fund? What are the objectives of mutual fund?
2. What are the advantages of investment in life insurance market?
3. What are the limitations in investment in mutual fund?
4. What are bond? Explain different types of bonds.
5. Short note of equity options.
6. Mutual fund.

Objective Type Questions

State whether the following statements are True (T) or False (F).

1. A financial system is a network of financial markets, institutions, instruments and intermediaries.

2. Money market is for long-term investments.

3. The Central Bank of India is the Reserve Bank of India.

4. Mutual Funds are market intermediaries.

5. The ownership securities consist of Deep Discount Bonds.

6. Financial engineering is the creation of new securities by combining different options.

7. Security exchange commission acts as a controlling agency in a securities market.

8. A mutual fund has income, growth and sectoral schemes.

9. Debt securities are mostly ownership based.

10. The role of a financial system is to establish a link between savers and investors.

11. The new issue market and the stock market are independent of each other.

12. Book building means a fixed price of shares.

13. A merchant banker manages the share issue of a company.

14. An underwriter takes up the unsubscribed agreed portion of issue capital.

15. The Sensex has a base of 30 securities.

16. The NIFTYs base period is 1995.

17. Listing securities is compulsory for only government companies.

18. A depository is a deposit in a fixed deposit.

19. A Red Herring Prospectus does not have any details of number of shares offered or price of shares.

20. Free pricing of shares means issuing of shares at any denomination.

Ans: 1. (T), 2. (F), 3. (T), 4. (T), 5. (F), 6. (T), 7. (T), 8. (T), 9. (F), 10. (T).11. (F), 12. (F), 13. (T), 14. (T), 15. (T), 16. (T), 17. (F), 18. (F), 19. (T), 20. (T).

Multiple Choice Questions
Choose the right answer

1. The function of a financial system is to _____.
   (i) establish a link between savers and investors
   (ii) link commercial banks with the Central Bank of a country
   (iii) create regulators for influencing the intermediaries
   (iv) help traders and moneylenders in the capital market

2. Financial engineering is a new term _____.
   (i) to acquire a financial degree
   (ii) to become a market participant
   (iii) to be a credit rating agency
   (iv) to provide a combination of features in a security to suit an investor

3. The difference between a primary market and a secondary market is _____.
   (i) primary market is the stock market and secondary market is the market for second-hand sale of securities
   (ii) a primary market helps in long-term credit and secondary market offers short-term credit
   (iii) a primary market helps in issue of new securities those which are offered for the first time and the secondary market is for second-hand sale of securities listed on stock exchange
   (iv) a primary market is the unorganised sector and the secondary market is the organised sector for sale and purchase of securities

4. The New Issue Market and Stock Market _____.
   (i) are independent of each other   (ii) control each other
   (iii) compete with each other   (iv) complement each other

5. Book Building means _____.
   (i) fixed price of shares   (ii) variable price auction
   (iii) making a book for a publisher   (iv) a price index

6. A Merchant Banker is _____.
   (i) broker
   (ii) bank
   (iii) banker who manages the issue of a company
   (iv) a shareholder

7. An underwriter takes up _____.
   (i) the unsubscribed agreed portion of issued capital
   (ii) fixed portion of issued capital
   (iii) book building
   (iv) private placement

8. SENSEX has _____ shocks.

   (i) 25   (ii) 30

   (iii) 50   (iv) 100

9. The NIFTY's base period is _____.

   (i) 1992   (ii) 1995

   (iii) 1978   (iv) 1985

10. Listing of securities is _____.

    (i) mandatory

    (ii) recognises the merit of the stock

    (iii) is necessary for large joint-stock companies

    (iv) is compulsory for mid-capped companies

Ans: 1. (i), 2. (iv), 3. (iii), 4. (iv), 5. (ii), 6. (iii), 7. (a), 8. (ii), 9. (ii), 10. (ii).

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3

CHAPTER

SECURITIES MARKET

Chapter Contents:

3.1 INTRODUCTION OF SECURITIES MARKET

Securities market is an economic institute within which take place sale and purchase transactions of securities between subjects of economy on the base of demand and supply. Also we can say that securities market is a system of interconnection between all participants (professional and non-professional) that provides effective conditions:

- To buy and sell securities,
- To attract new capital by means of issuance new security (securitization of debt),
- To invest money for short- or long-term periods with the aim of deriving profit.

3.2 BASIC FUNCTIONS OF SECURITIES MARKET

- Commercial function (to derive profit from operation on this market)
- Price determination (demand and supply balancing, the continuous process of prices movements guarantees to state correct price for each security. (so, the market corrects mispriced securities)
- Informative function (market provides all participants with market information about participants and traded instruments)
- Regulation function (securities market creates the rules of trade, regulation, priorities determination)

3.3 SECONDARY MARKET OPERATIONS

(a) Trading

The act of buying and selling of securities on a stock exchange is known as Stock Exchange Trading. Jobbers and brokers are the two categories of dealers in the stock exchange. A jobber is a dealer in securities while a broker is an agent or seller of securities. Every year a member has to decide and declare in advance whether he proposes to act as a jobber or a broker. A jobber gives two quotations as a dealer in securities, lower quotation for buying and higher one for selling. The difference between the two quotations is his remuneration. This system enables specialization in the dealings and each jobber specializes in a certain group of securities. It also ensures smooth and prompt execution of transactions. The double quotation of a jobber assures fair trading in the market. A broker is merely an agent to buy or sell on behalf of his clients. He is a generalist. Broker has to negotiate terms and conditions of sale or purchase and safeguard his client's interest. He gets commission from his clients, which is fixed by the stock exchange.

(b) Types of Dealings

There are three types of dealings in the Indian Stock Market:

(1) **Spot Delivery Contract:** Spot delivery contract is a contract in which the payment and delivery of securities takes place on the spot, on the same day or on the next day. The sale is completed on the day of the contract. These are essentially cash dealings meant for the investors. All listed securities are allowed in the spot market.

(2) **Ready Delivery Contract:** Where the payment and delivery takes place within a fixed time period not exceeding 7 days from the date of the contract is called 'Ready Delivery Contract'. There is usually hand delivery full payment.

(3) **Forward Delivery Contract:** When payment and delivery of securities takes place on a future date through clearing house only, it is called Forward Delivery Contract. Such a contract has carry over facilities also. Speculators are the interested parties in these dealings.

(c) Speculative Dealings

Stock market dealings which are carried out as a part of speculative dealings are as follows:

(1) **Option Dealings:** The right to buy or sell a certain security within a certain time and at a certain price is called option dealing. An option to buy a security is called 'Call Option' and an option to sell a security is called 'Put Option'. When in an option, both the right to buy and sell is acquired by an investor it is called double option.

An investor acquires a call option where the price of a security is expected to rise in future and in such a case, he will buy the security at a lower price and sell it at higher price, thereby making a profit by way of the difference in price. On the other hand, when an investor acquires put option where the price of a security is expected to fall in future and as such, he will sell the security at a higher price and buy it a lower price, thereby making a profit by way of difference in price.

(2) **Hedging:** A mechanism through which loss on a transaction is minimized is called 'hedging'. It is possible for a bull speculator to hedge himself by buying a put option where he agrees to purchase the security from the market. It would help him offset any loss that he may suffer on the exercise of the call option. Similarly, a speculator intending to exercise right to sell can hedge himself against loss through a call option.

(3) **Margin Trading:** The term margin is used with reference to the deposit required to be maintained by the member-brokers with the clearing house of the stock exchange. This level of deposit varies with the value and volume of security, traded by the member. Such an arrangement of margin enables the broker for buying and selling of securities on behalf of the clients without any difficulty. Margin offers a measure of cushion to the broker in securities. The securities purchased by the broker will be used as a margin for securing maintains the minimum amount with the broker. It places a check on excessive speculation by requiring the client to maintain the margin by making a fresh deposit besides making the broker's investment safe. Margin trading has been carried out in Bombay, Delhi, Kolkata and Ahmedabad Stock Exchanges.

(d) Demat Trading

Buying and selling electronic shares is just like buying and selling physical shares. The only difference is trading in electronic shares in simpler and safer. The steps in the procedure are:

(1) **Placing Order:** When a shareholder desires to sell his electronic share, he places an order with his broker. After the sell transaction he instructs his participant by use of Delivery instruction (cheque like instrument) to debit his account with the number of shares sold by him.

(2) **Issue Receipt Intimation:** When a shareholder buys electronic shares, he must inform his broker about his depository account number so that the electronic shares bought by him

are credited into his account. He has to instruct his participant by way of Receipt Intimation to receive credit in his account.

(3) **Payment:** Payment for electronic shares either bought or sold is made directly through bank account connected to the demat account of the investor.

(4) **Transfer of share:** The shares bought by a shareholder are transferred in his name the very next day of payout. There is no fear of bad delivery. There is no formality of filling transfer deeds, affixing share transfer stamps and applying to the company for registering the shares in his name.

It is important to note that trading in demat share is possible only in those stock exchanges whose clearing houses are linked to the depository. The following stock exchanges are linked to the depository:

(1) Bombay Stock Exchange

(2) National Stock Exchange

(3) Calcutta Stock Exchange

(4) Ludhiana Stock Exchange

(5) Delhi Stock Exchange

(6) Over the Counter Exchange of India (OTCEI)

Setting up of depository is a major development in the Indian capital market. SEBI has granted registration to two depositories, namely, the **National Securities Depository Ltd. (NSDL)** and the **Central Depository Services (India) Ltd. (CDSL)** under the Depository Act, 1996.

(e) Rolling Settlement

Trading in demat shares used to take place on the basis of T+5 or T+3 rolling settlement on an optional basis. IT has been started since 1998. The system was introduced in those exchanges, which are connected to a depository. Rolling settlement system was first introduced at Bombay Stock Exchange and then by the National Stock Exchange.

(f) New Settlement System

SEBI has introduced T+2 rolling settlement in the Indian Equity Market from 1st April, 2003. The rolling settlement has widened the scope of settlement procedure. There has been wider use of electronic fund transfer facility. Electronic contract notes have been issued to the clients.

(g) Online Trading

Online trading in shares and securities has already been started in India. It has been made possible due to introduction of demat. ICICI Web Trade, HDFC Securities, Stock Holding Corporation of India and many other institutions have started the online trading system. The investors can carry-

out buying and selling of securities while sitting in the house or office. Internet connection is required for this purpose. The investors have to open an account with these institutions who provide online trading. There are three accounts into one place, Demat Account, Bank Account and Online Trading Account. A password is given to each investor which is secret. Investors can carry-out buying and selling securities at BSE and NSE during normal trading hours. The settlement is done automatically with the programme of the computer. Margin Trading, Options and Futures Trading are also possible in this method.

3.4 STOCK MARKET QUOTATIONS

The price at which a company's shares are offered initially in the primary market is called as Issue Price. However, when the shares begin to be traded in the stock market, the market price may be above or below the issue price. When an investor contracts the broker for any dealing, his computer screen may show the following pictures:

Buy Quantity	Buy Rate	Sell Quantity	Sell Rate
1000	51.00	400	51.50
200	51.00	600	52.00

The best buy order is at the rate of ₹ 51, while the best sell order is at the rate of ₹ 51.50. The investor can decide and then place the order to buy or sell the shares.

The closing prices of all traded scrips are calculated based on the weighted average price of all the trades in last 15 minutes for that particular scrip. If there are no trades during the last 15 minutes, then the last traded price would be taken as the official Closing Price. If there has been no trading in the scrip during the day, then the opening price will be traded as the cloasing price. The stock exchange bulletin also gives the price quotations such as previous close, the day's open, close, high and low which are published in the newspapers.

3.5 STOCK EXCHANGES IN INDIA — BOMBAY STOCK EXCHANGE

Introduction

The Stock Exchange, Mumbai, popularly known as "BSE" was established in 1875 as "The Native Share and Stock Brokers Association", as a voluntary non-profit making association. It has evolved over the years into its present status as the premier Stock Exchange in the country. It may be noted that the Stock Exchanges is the oldest one in Asia, even older than the Tokyo Stock Exchange, which was founded in 1878.

The Exchange, while providing an efficient and transparent market for trading in securities, upholds the interests of the investors and ensures redressal of their grievances, whether against the companies or its own member-brokers. It also strives to educate and enlighten the investors by making available necessary informative inputs and conducting investor education programmes.

A Governing Board comprising of 9 elected directors (one-third of them retire every year by rotation), two SEBI nominees, a Reserve Bank of India nominee, six public representatives and an Executive Director is the apex body, which decides the policies and regulates the affairs of the Exchange.

The Executive Director as the Chief Executive Officer is responsible for the day-to-day administration of the Exchange.

The average daily turnover of the Exchange during the year 2000-2001 (April-March), was ₹ 3984.19 crore and average number of daily trades was 5.69 lakh. However, the average daily turnover of the exchange during the year 2001- 2002 has declined to ₹ 1244.10 crore and number of average daily trades during the period to 5.17 lakh. The ban on all deferral products like BLESS and ALBM in the Indian capital markets by SEBI w.e.f. July 2, 2001, abolition of account period settlements, introduction of Compulsory Rolling Settlements in all scrips traded on the Exchanges w.e.f. December 31, 2001, etc., have adversely impacted the liquidity and consequently there is a considerable decline in the daily turnover at the exchange.

3.6 LOCATIONS

One of the objectives of NSE was to provide a nationwide trading facility and to enable investors' spread all over the country to have an equal access to NSE. NSE uses sophisticated telecommunication technology through which members can trade remotely from their offices located in any part of the country. NSE trading terminals are present in around 400 cities and towns all over India.

3.7 LISTING

The prime objective of admission to dealings on the Exchange is to provide liquidity and marketability to securities as also to provide a mechanism for effective management of trading.

Securities listed on the Exchange are required to fulfill the listing eligibility criteria. Various types of securities of a company are traded under a unique symbol and different series. This section provides a direct link to the web site of companies traded on the Exchange.

3.8 CONSTITUTION

The NSE has two segments for trading in securities: Wholesale Debt Market (WDM) and Capital Market (CM). Separate membership is required for each segment.

3.9 TRADING MEMBERS

They are recognized members of NSE. The persons eligible to become TMs are body corporates, subsidiaries of banks and financial institutions. They are selected on the basis of a comprehensive selection criterion.

3.10 TRADING MECHANISM

Rolling Settlement

In a rolling settlement, each trading day is considered as a trading period and trades executed during the day are settled based on the net obligations for the day.

In NSE, the trades in rolling settlement are settled on a T+5 basis, i.e., on the 5th working day. For arriving at the settlement day all intervening holidays, which include bank holidays, NSE holidays, Saturdays and Sundays are excluded. Typically trades taking place on Monday shall be settled on the next Monday, Tuesday's trades shall be settled on the next Tuesday and so on.

Trading System

NSE operates on the 'National Exchange for Automated Trading' (NEAT) system, a fully automated screen based trading system, which adopts the principle of an order driven market. NSE consciously opted in favour of an order driven system as opposed to a quote driven system. This has helped reduce jobbing spreads not only on NSE but in other exchanges as well, thus reducing transaction costs.

Till the advent of NSE, an investor wanting to transact in a security not traded on the nearest exchange had to route orders through a series of correspondent brokers to the appropriate exchange. This resulted in a great deal of uncertainty and high transaction costs. NSE has made it possible for an investor to access the same market and order book, irrespective of location, at the same price and at the same cost.

3.11 SECURITIES EXCHANGE BOARD OF INDIA

Introduction

In 1988 the Securities and Exchange Board of India (SEBI) was established by the Government of India through an executive resolution, and was subsequently upgraded as a fully autonomous body (a statutory Board) in the year 1992 with the passing of the Securities and Exchange Board of India Act, (SEBI Act) on 30th January, 1992. In place of Government Control, a statutory and autonomous regulatory board with defined responsibilities, to cover both development and regulation of the market, and independent powers have been set up. Paradoxically this is a positive outcome of the Securities Scam of 1990-91.

The basic objectives of the Board were identified as:

- to protect the interests of investors in securities;
- to promote the development of securities market;
- to regulate the securities market, and
- for matters connected therewith or incidental thereto.

Since its inception SEBI has been working targeting the securities and is attending to the fulfilment of its objectives with commendable zeal and dexterity. The improvements in the securities markets like capitalization requirements, margining, establishment of clearing corporations, etc., reduced the risk of credit and also reduced the market.

SEBI has introduced the comprehensive regulatory measures, prescribed registration norms, the eligibility criteria, the code of obligations and the code of conduct for different intermediaries like, bankers to issue, merchant bankers, brokers and sub-brokers, registrars, portfolio managers, credit rating agencies, underwriters and others. It has framed bye-laws, risk identification and risk management systems for clearing houses of stock exchanges, surveillance system, etc., which has made dealing in securities both safe and transparent to the end investor.

Another significant event is the approval of trading in stock indices (like S&P CNX Nifty and Sensex) in 2000. A market index is a convenient and effective product because of the following reasons:

- It acts as a barometer for market behaviour;
- It is used to benchmark portfolio performance;
- It is used in derivative instruments like index futures and index options;
- It can be used for passive fund management as in case of index funds.

Two broad approaches of SEBI is to integrate the securities market at the national level, and also to diversify the trading products, so that there is an increase in number of traders including banks, financial institutions, insurance companies, mutual funds, primary dealers, etc., to transact through the exchanges. In this context the introduction of derivatives trading through Indian Stock Exchanges permitted by SEBI in 2000 AD is a real landmark.

SEBI appointed the **L.C. Gupta Committee** in 1998 to recommend the regulatory framework for derivatives trading and suggest bye-laws for Regulation and Control of Trading and Settlement of Derivatives Contracts. The Board of SEBI in its meeting held on May 11, 1998 accepted the recommendations of the committee and approved the phased introduction of derivatives trading in India beginning with Stock Index Futures. The Board also approved the "Suggestive bye-laws" as recommended by the Dr. L.C. Gupta Committee for Regulation and Control of Trading and Settlement of Derivatives Contracts.

SEBI then appointed the **J.R. Verma Committee** to recommend Risk Containment Measures (RCM) in the Indian Stock Index Futures Market. The report was submitted in November 1998.

However, the Securities Contracts (Regulation) Act, 1956 (SCRA) required amendment to include "derivatives" in the definition of securities to enable SEBI to introduce trading in derivatives. The necessary amendment was then carried out by the Government in 1999. The Securities Laws (Amendment) Bill, 1999 was introduced. In December 1999 the new framework was approved.

Derivatives have been accorded the status of 'Securities'. The ban imposed on trading in derivatives in 1969 under a notification issued by the Central Government was revoked. Thereafter SEBI formulated the necessary regulations/bye-laws and intimated the Stock Exchanges in the year 2000. The derivative trading started in India at NSE in 2000 and BSE started trading in the year 2001.

3.12 GOVERNMENT SECURITIES MARKET

A market where the Government Securities are bought and sold is called Government Securities Market. The securities are bonds, treasury bills, special rupee securities in payment of India subscriptions to IMF, IBRD, ADB, IDA, etc. The special rupee securities are treated as a part of internal floating debt of the Government. These securities are issued by the Central Government, State Governments and Semi-Government Authorities, which include local government authorities like city corporations and municipalities, port trusts, state electricity boards, public sector corporations and other agencies like IDBI, IFCI, SFCs, SIDCs, NABARD and Housing Boards. These agencies are suppliers of Government Securities to banks, financial institutions and investors demand these securities in the market.

Government Securities offer a safe avenue of investment through guaranteed payment of interest and repayment of principal by the Government. They offer relatively a lower fixed rate of interest compared to interest on other securities. These securities are issued in the interest is paid half-yearly. RBI services loans as these are the liabilities of Government of India and the State Governments. These securities are also eligible as SLR investments. As the date of maturity is specified in the securities they are also called as 'dated Government Securities'.

RBI plays a special role in the purchase and sale of these securities as part of its monetary management exercise. There is no underwriting or guaranteeing required in sale of Government Securities. Dealing in securities take place through the mechanism provided by the RBI. The brokers and dealers are approved by the RBI. A striking feature of these securities is that they offer wide-ranging tax incentives to the investors. Therefore, these securities are more popular. Under the Income Tax Act, rebates are allowed for the investment in these securities. Each sale and purchase has to be negotiated separately; the gilt-edged market is an over-the-counter market. The Government Securities market has two segments namely primary market and secondary market. The issuers are Central and State Governments in the primary market. The secondary market comprises Banks, Financial Institutions, Insurance Companies, Provident Funds, Trusts, Individuals, Primary dealers and the RBI.

The securities of Central and State Government are issued in the form of Stock Certificate, Promissory Notes and Bearer bonds. These securities are mainly traded at Bombay Stock Exchange.

In terms of size, the primary market for Government Securities is much bigger than the Industrial Securities Market. A notification for the issue of securities is made a few days before the public subscription is open. The opening of the subscription depends on the response of the market and varies between two to three days. The issue is made in number of branches in a year. The offices of RBI and SBI receive the applications for the Securities. The Government reserves the right to retain oversubscription up to a pre-specified percentage which is generally 10%, of the notified amount. The mechanism of trading in Government Securities takes place through the Direct Sale, Securities General Ledger accounts and Bank Receipts method. The Government may issue securities through the following modes;

(1) Issue of securities through auction.

(2) Issue of securities with pre-announced coupon rates.

(3) Issue of securities through tap sale.

(4) Issue of securities through conversion.

The securities can be issued through auction either on price basis or yield basis. The coupon on such securities are announced before the date of floating and the securities are issued at par. No aggregated amount is indicated in the notification in respect of the securities sold on tap. The holders of Treasury Bills of certain specified maturities and holder of specified dated securities are provided an option to convert the respective Treasury Bills or dated securities at specified prices into new securities offered for sale.

3.13 CORPORATE DEBT MARKET

A market where fixed income securities of various types and features are issued and traded is called Debt Market. Fixed income securities are Government Securities, public sector bonds and private sector bonds. These securities are issued by Central and State Governments, municipal corporations, semi-government bodies and commercial bodies such as financial institutions, banks, public sector units, and public limited companies.

The profiles of financial instrument which are traded in the debt market include the following:

(a) **Government Securities,** such as Treasury Bills, zero coupon bonds, coupon bearing bonds, etc.

(b) **Public sector bonds,** such as bonds issued by public sector entities like government agencies, statutory bodies. The financial instruments issued by these bodies include Debentures, PSU Bonds, Government Guaranteed Bonds and Commercial Paper.

(c) **Private sector bonds** are issued by private sector entities such as companies, financial institutions, banks. The financial securities issued by these institutions include Debentures, Bonds, Commercial Paper, Floating Rate Bonds, Zero-coupon Bonds, Intercorporate Deposits, and Certificate of Deposits.

Investment in fixed income securities is profitable to the banks and other investors. They ensure steady and constant return by way of interest and repayment of principal of maturity of the instrument. These securities are issued by eligible entities of standing against the money borrowed by them from the investors. This guarantees safety of funds invested. Such debt is usually secured against the assets of the company. Most of the fixed income securities are issued by Government or Government agencies who offer risk-free return on the investment.

Debt market facilitates mobilization of resources at reasonable cost. It provides greater funding avenues to public and private sector projects, and thus reduces the pressure on institutional financing. There is enhanced resource mobilization by unlocking illiquid retail investments like gold and silver. It also helps financing the development activities of the Government. It facilitates the efficient liquidity management in tune with the overall short-term and long-term objectives of the economic planning. The price of an instrument is determined in the market by the operation of the forces of demand and supply yield and the market price of the bond are inversely related.

Debt market is divided into two parts, secondary market and primary market. New instruments are issued in the primary market by various participants. The market for bonds and securities are bought and sold is called secondary debt market. The securities are already issued by the companies and these securities are traded in this market. The secondary market is again divided into wholesale market and retail market. Wholesale debt market comprises of institutions and agencies such as banks, financial institutions, RBI, primary dealers, insurance companies, provident funds, mutual funds, corporate entities and foreign institutional investors. The two types of transactions are executed in a wholesale debt market, i.e., an outright sale or purchase and a repo trade. The retail debt market comprises individual investors, small trusts and other legal entities.

3.14 MONEY MARKET INSTRUMENTS

Treasury Bills

Treasury Bills are money market instruments to finance the short-term requirements of the Government of India. These are discounted securities and thus are issued at a discount to face value. The return to the investor is the difference between the maturity value and issue price.

Types of Treasury Bills

There are different types of Treasury Bills based on the maturity period and utility of the issuance like, adhoc Treasury Bills, 3 months, 6 months and 12 months Treasury Bills, etc. In India, at present, the Treasury Bills are issued for the following tenors 91-days, 182-days and 364-days.

3.15 EXERCISES

Answer the following questions

1. What is a securities market? What are its features?

2. What is primary market? How it is different from secondary market?

3. What is security market? How does it differ from primary market?

4. Distinguish between primary market and secondary market?

5. Explain the role of SEBI in regulating securities market.

6. What are the benefits of NSE to the investors?

7. What is a stock exchange? How does it help the investors?

8. Write short notes:

   (a) Stock market.

   (b) Treasury bills.

   (c) Mutual funds.

   (d) Rating of debt securities.

Objective Type Questions

State True or False with Reasons

1. The new issue market and the stiock market are the independabt of each other.

2. Nifty 's base period is 1995.

3. Listing of securities is compulsory for only government companies.

4. A depository is a deposit in fixed deposit.

5. A red herring prospectus does not have any details of no. of shares offered or price of shares.

 Ans: 1. (F), 2. (T), 3. (F), 4. (F), 5. (T).

Multiple Choice Questions
Choose the right answer

1. The new issue market and stock market …..

   (i) Are independent of each other   (ii) Control each other

   (iii) Compete with each other   (iv) Complement each other

2. Book building means…

   (i) Fixed price of shares   (ii) Variable price auction

   (iii) Making a book for publisher   (iv) Price index

3. A merchant banker is…
    (i)   Broker
    (ii) Bank
    (iii) Banker who maneges issue of company
    (iv) Shareholder

4. An underwriter takes up…
    (i)   Unsubnscribed agreed of portion of issued capital
    (ii) Fixed proportion of issued capital
    (iii) Book building
    (iv) Private placement

5. The sensex has …
    (i)   25 stocks   (ii) 30 stocks
    (iii) 50 stocks   (iv) 100 stocks

Ans: 1. (iv), 2. (ii), 3. (iii), 4. (i), 5. (ii)

❐   ❐   ❐

4

CHAPTER

TIME VALUE OF MONEY
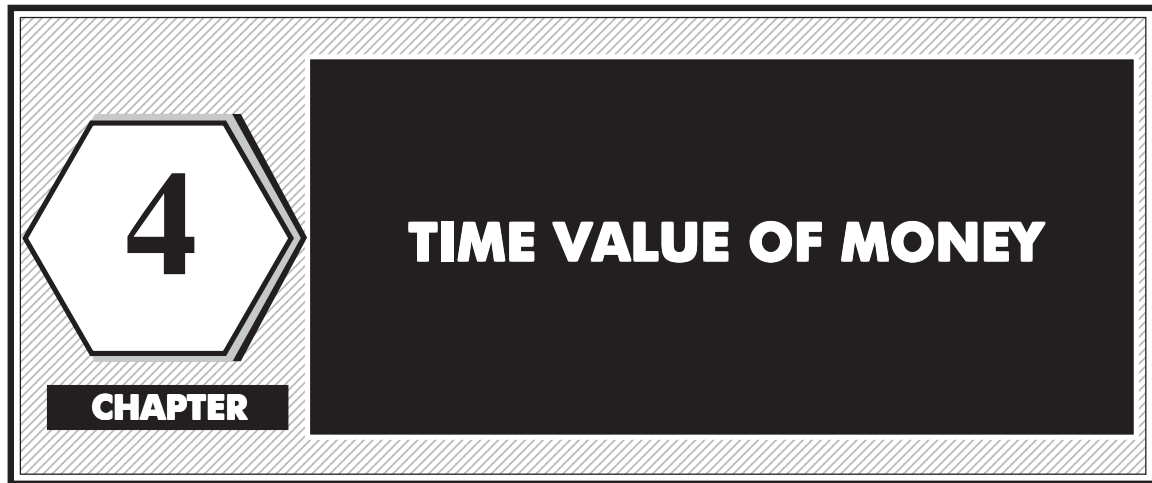
Chapter Contents:

4.1 INTRODUCTION

In the world of finance and investment, time does have a value. ₹ 100 today is more valuable than ₹ 100 a year later. This is because capital can be employed productively to generate positive returns. Again, individuals normally prefer current consumption to future consumption. Even in the case of inflation, ₹ 100 today represents greater real purchasing power as compared to ₹ 100 one year later. The longer the term of a loan, the greater the amount that must be paid due to interest. Bonds are worthless to an investor, if the maturity is longer. Therefore, this makes sense under the general framework of the time value of money.

Basic Concepts

(a) **Present Value:** A present value is the discounted value of one or more future cash flows.

(b) **Future Value:** A future value is the compounded value of a present value.

(c) **Discounting Factor:** The discounting factor is the present value of a rupee received of a rupee.

(d) **Compounding Factor:** The compounding factor is the future value of a rupee.

Discount and compounding factors are functions of two things:

(i) The interest rate used, and (ii) The time between the present value and the future value. The discount factor decreases as time increases. The discount factor also decreases as interest rate increases.

The Time Value of Money Relationship

The basic time values of money relationship are presented in the following equation:

(1) $PV = FV \times DF$

(2) $FV = PV \times CF$

where, PV = present value

FV = future value

DF = discounting factor $= \dfrac{1}{(1+R)^t}$

CF = compounding factor $= (1+R)^t$

R   = rate of interest

t   = time in years

4.2 FUTURE VALUE OF A SINGLE AMOUNT

The future value of an amount invested or borrowed at a given rate of interest can be calculated if the maturity period is given. Suppose a deposit of ₹ 5,000 gets 10% interest compounded annually for a period of 3 years, the future value will be:

$PV \times CF = 5{,}000 \times (1.10)^3 = 5{,}000 \times 1.331 = ₹\ 6{,}655.$

4.3 DOUBLING PERIOD

Sometimes, investors should know how long it will take to double his money at a given rate of interest. In this case, a rule of thumb called the rule of 72, can be used. This rule works pretty well for most of the interest rates. The rule of 72 says that it will take 72 years to double your money at 1%

interest. You can calculate the doubling period by dividing 72 by interest rate. You can also estimate the interest rate required to double your money in the given number of years by dividing number of years into 72.

For e.g., if the interest rate is 12%, it will take 6 years to double your money (72/12). On the other hand, if you want to double your money in 6 years, the interest rate should be 12% (72/6).

A more accurate method used for doubling your money is using the rule of 69. According to this rule, the doubling period of an investment is $= 0.35 + \dfrac{69}{\text{invterest rate}}$ thus, the doubling period of investment of different rates of interest can be determined as follows:

(1) Interest rate 12% $= 0.35 + \dfrac{69}{12} = 0.35 + 5.75 = 6.1$ years

(2) Interest rate 15% $= 0.35 + \dfrac{69}{15} = 0.35 + 4.60 = 4.95$ years

4.4 FUTURE VALUE OF ANNUITY

An annuity in the series of payment of a fixed amount for a specified number of periods. When payments are made at the end of each year, it is called ordinary annuity. On the other hand when the payments are made at the beginning of the year, it is called as annuity due. Normally it is assumed that the first annuity payment occurs at the end of the first year.

The future value of an annuity is determined on the basis of the following:

$$FV_A = A\left[\frac{(1+R)^t - 1}{R}\right]$$

where A = periodic cash payments

R = annual interest rate

t = time in years

The value of $\dfrac{(1+R)^t - 1}{R}$ can be determined by using the time value of money tables. The future value interest factors (FVIF) for various years are as shown in table:

Year	FVIF @ 8%	FVIF @ 10%	FVIF @ 12%	FVIF @ 14%
1	1.0000	1.0000	1.0000	1.0000
2	2.0800	2.1000	2.2100	2.1400
3	3.2464	3.3100	3.3744	3.4396

4	4.5061	4.6410	4.7793	4.9211
5	5.8666	6.1051	6.3528	6.6101
6	7.3359	7.7156	8.1152	8.5355
7	8.9228	9.4872	10.089	10.730
8	10.636	11.435	12.299	13.232
9	12.486	13.579	14.775	16.085
10	14.486	15.937	17.548	19.337

4.5 PRESENT VALUE

Many times, investors like to know the present value which grows to a given future value. Suppose, you want to save some money from your salary to buy a scooter after 5 years. You should know how much money should be put into bank now in order to get the future value after 5 years. The present value is simply the inverse of compounding between future value and present value is given in the following formula:

$$PV = FV \times DF = FV \times = \frac{1}{(1+R)^t}$$

4.6 PRESENT VALUE OF UNEVEN SERIES OF PAYMENT

The annuity includes the constant amount in which cash inflows are identical in every period. Many financial decision involve constant cash flows, however, some important decision are concerned with uneven series cash flows. For e.g., investment in shares is expected to pay an increasing series of dividends overtime. The capital budgeting projects also do not normally provide constant cash flows.

In order to deal with uneven payment streams, we have to multiply each payment by the appropriate PVIF and then sum these products to obtain the present value of an uneven series of payments.

4.7 PRESENT VALUE OF AN ANNUITY

Many times investors want to know the present value which must be invested today in order to provide an annuity for several future periods. For e.g., a grandfather wants to deposit enough money today to meet the tuition fees of his grandson for the next three years. The interest rate is 8% the present value of this annuity is the sum of the present values of all the future inflows of the annuities. The present value of an annuity can be expressed in the following formula:

$$PVA_t = A\left[\frac{(1+R)^t - 1}{R(1+R)^t}\right]$$

where, PVA_t = present value of an annuity with a duration of 't' periods

$\quad$ A $\quad$ = constant period flow

$\quad$ R $\quad$ = interest rate

The present value interest factor for an annuity (PVIF) can be determined by using the Time Value of Money Tables. The (PVIF) for various year are given below:

Year	FVIF @ 8%	FVIF @ 10%	FVIF @ 12%	FVIF @ 14%
1	0.9259	0.9091	0.8929	0.8772
2	1.7833	1.7355	1.6901	1.6467
3	2.5771	2.4869	2.4018	2.3216
4	3.3121	3.1700	3.0373	2.9140
5	3.9927	3.7908	3.6048	3.4331
6	4.6229	4.3553	4.1114	3.8887
7	5.2064	4.8684	4.5638	4.2883
8	5.7466	5.3346	4.9676	4.6389
9	6.2469	5.7590	5.3282	4.9464
10	6.7101	6.1446	5.6502	5.2161

For all positive interest rates, PVIF for the present value of an annuity is always less than the number of periods the annuity runs, whereas FVIF for the future value of an annuity is equal to or greater than the number of periods.

Illustration 1

The future value of an amount invested or borrowed at a given rate of interest can be calculated if the maturity period is given. Suppose a deposit of ₹ 10,000 gets 10 per cent interest compounded annually for a period of 3 years, the future value will be?

Solution:

Given

Present value = 10,000

Compounding factor = 105

Year = 3 years

To find Future Value

FV = PV × CF

$FV = 10,000 \times (1.10)^3$

$\quad = 10,000 \times 1.331$

$\quad = ₹\, 13,310$

Illustration 2

Satish deposits ₹ 1,00,000 with a bank which pays 8 per cent interest compounded annually, for a period of 2 years how much he will get at maturity?

Solution:

Given

Present Value = 1,00,000

Compounding Factor = 8%

To find FV

FV = PV × CF

$\qquad$ = 1,00,000 × $(1.08)^2$

$\qquad$ = 1,00,000 × 1.1664

$\qquad$ = ₹ 1,16,640

Illustration 3

Calculate the present value of annuity of ₹ 6,000 received annually for 4 years, when discounting factor is 10%

Solution:

Year	Cash flow	PVIF @ 10%	PV (₹)
1	6,000	0.909	5454
2	6,000	0.827	4962
3	6,000	0.751	4506
4	6,000	0.683	4098
		3.170	**19,020**

Alternate method

Present value factor = 3.170

i.e., 6,000 × 3.170 = ₹ 19,020

Illustration 4

Find out the present value of an annuity of ₹ 30,000 over three years at 10% discount.

Solution:

The present value of an annuity of rupee one one received annually for 3 years at 10% is 2.487. Hence, present value of an annuity of ₹ 30,000 can be evaluated as

$PV_A = A \times PVIF @ 10\%$

$\qquad = 30{,}000 \times 2.487$

$\qquad = ₹\,74{,}610$

Illustration 5

CSK deposits ₹ 10,000 with a bank at 12% interest compounded quarterly. How much amount he will get after a period of 6 years?

Solution:

$FV = PV \times CF$

$FV = PV \times (1 + r/4)^{n \times 6}$

$\qquad = PV \times (1 + 0.12/4)^{4 \times 6}$

$\qquad = 10{,}000 \times (1.03)^{24}$

$\qquad = 10{,}000 \times 2.0328$

$\qquad = ₹\,20{,}328$

Illustration 6

Four equal annual payments of ₹ 5,000 are made into a deposit account that pays 8 per cent interest per year. What is the future value of this annuity at the end of 4 years?

Solution:

The future value of annuity $= ₹\,5{,}000 \times FVIFA @ 8\%$

$\qquad = ₹\,5{,}000 \times 4.5061$

$\qquad = ₹\,22{,}530.50$

Illustration 7

City Union Bank advertises that it will pay a lump sum of ₹ 45,740 at the end of 8 years to investors who deposit annually ₹ 4,000 for 8 years. What is the interest rate the bank is paying?

Solution:

The interest rate may be calculated in two stages:

(a) Find the FVIFA for ₹ 45,740

$FV_A = A \,(FVIFA)$

$45{,}740 = 4{,}000 \,(FVIFA)$

FVIFA $= \dfrac{45,740}{4,000}$

FVIFA $= 11.435$

(b) Look at the FVIFA table and read the row corresponding to 8 years until you get the value 11.435. A value equal or close to it is reached and it is at 10%.

FVIFA 10%, 8 years $= 11.435$

Illustration 8

Find the present value of the following cash flow streams. The discount rate is 10 per cent.

Year	Cash Stream
1	₹ 1,000
2	₹ 4,000
3	₹ 4,000
4	₹ 4,000
5	₹ 3,000

Solution:

Year	Payment	PVIF	PV of Individual Payments
1	1,000	0.9091	909.10
2	4,000	0.8264	3305.60
3	4,000	0.7513	3005.20
4	4,000	0.6830	2732.00
5	3,000	0.6209	1862.70
			11,817.60

Illustration 9

Mr. Mehra has invested ₹ 50,000 on Xerox machine on 1st Jan., 2002. He estimates net cash income from Xerox machine in next 5 years as under:

Year	Estimated inflows
2002	12,000
2003	15,000
2004	18,000
2005	25,000
2006	30,000

At the end of 5th year machine will be sold at scrap value of ₹ 5,000 advice him whether his project is viable, considering interest rate of 10% p.a.

Solution:

Calculation of Present Value of Future Cash Flow

Year	Inflows ₹	PVIF @ 10 %	PV of Inflows
2002	12,000	0.9091	10,909
2003	15,000	0.8264	12,396
2004	18,000	0.7513	13,523
2005	25,000	0.6830	17,075
2006	30,000 }	0.6209	21,732
2006	5,000 }		
			75,635

Note: It is assumed that the net cash income is received at the end of the year considering 10% interest rate, the net present value of all future cash flows is ₹ 75,635 which is greater than the present net cash flow of ₹ 50,000. Thus, the project is viable.

Illustration 10

XYZ & Co. is considering investing in a project requiring a capital outlay of ₹ 2,00,000. Forecast for annual income after tax is as follows:

Year	1	2	3	4	5
Profit after tax (₹)	1,00,000	1,00,000	80,000	80,000	40,000

Depreciation is 20% on straight line basis

Evaluate the project on the basis of net present value taking 14% discounting factor and advise whether XYZ & Co. should invest in the project or not? The present value of rupee one at 14% discounting rate are 0.8772, 0.7695, 0.6750, 0.5921 and 0.5194.

Solution:

Depreciation = 20% of 20,000 = ₹ 40,000

Profit after tax is given.

The cash inflow after tax (CFAT) = profit after tax (PAT) + depreciation

Year	PAT	+Depreciation	CFAT	DF	P.V.
1	1,00,000	40,000	1,40,000	0.8772	1,22,808
2	1,00,000	40,000	1,40,000	0.7695	1,07,730
3	80,000	40,000	1,20,000	0.6750	81,000
4	80,000	40,000	1,20,000	0.5921	71,052
5	40,000	40,000	80,000	0.5194	41,552
Present value of cash inflow					4,24,142
Present value of cash outflow					2,00,000
Net present value					2,24,142

Net present value is positive; hence XYZ & Co. should invest in the project.

Illustration 11

Miss Sonali is considering an investment opportunity which will give her cash inflow of ₹ 1,000, ₹ 1,200, ₹ 1,100 and ₹ 400 respectively at the end of each of the next 5 years. The initial investment is ₹ 4,000. If the time, preference rate is 10%, state whether the investment is profitable or not. (Present value factor at 10% are 0.9091, 0.8264, 0.7513, 0.6830 and 0.6209)

Solution:

Calculation of Present Value

Year	Cash Flow (₹)	Discount Factor	PV (₹)
1	1,000	0.9091	909.10
2	1,500	0.8264	1,239.60
3	1,200	0.7513	901.56
4	1,100	0.6830	751.30
5	400	0.6209	248.39
		PV cash inflow	4,4049.92
		PV cash outflow	4,000.00
		NPV	49.92

As NPV is positive, the investment is profitable.

Illustration 12

What is the present value of a 4 years annuity of ₹ 5,000 at 12% interest.

Solution:

$$PVA_t = A[\frac{(1+R)^t - 1}{R(1+R)^t}$$

$$= 8,000 \times PVIF \ @ \ 12\%$$

$$= 8,000 \times 3.0373$$

$$= ₹ \ 24.299$$

Illustration 13

A 10 payment annuity of ₹ 6,000 will began 7 years. Hence, the first payment occurs at the end of 7th year. What is the present value of this annuity if the discount rate is 14 per cent?

Solution:

(a) Determine the value of this annuity a year before the first payment begins, i.e., 6 years from now

$$PVA_t = A[\frac{(1+R)^t - 1}{R(1+R)^t}]$$

$$= ₹\ 6,000\ (PVIFA\ @\ 14\%,\ 10) = ₹\ 6000 \times 5.2161 = ₹\ 31,296.60$$

(b) Compute the present value of the amount obtained

$$PV = FV\ x\frac{1}{(1+R)^t}$$

$$= ₹\ 31,296.60\ (PVIF\ @\ 14\%,6) = 31,296.60 \times 0.4556$$

$$= 14,258.73$$

Illustration 14

A is due to receive ₹ 10,000 at the end of 5 years. Since A is in need of money immediately, he wants to sell his interest to B. B wants a return of 10% per annum on his investment. How much should he pay A?

Solution:

B should pay the present value of ₹ 10,000 at the yield he wants, i.e.,

$$PV = FV \times CF$$

$$= 10,000 \times (1+0.10)^5$$

$$= 10,000 \times (PVIF\ @\ 10\%\ )$$

$$= 10,000 \times 0.6209$$

$$= ₹\ 6,209$$

Illustration 15

Krishnamurthy has inherited ₹ 1,000 a year for the next 20 years. First payment being made in one year's time. However, he is in need of money immediately and would like to sell his income to a buyer who would pay him the right price. Assume that the current market rate of interest is 9%.

(a) What should be the right price he should accept?

(b) How much of his income should he sell if he wants only ₹ 2,500 at present?

(c) If you were interested in buying the income but, if you had only ₹ 5,000 to invest what would you do?

Solution:

(a) Present value of annuity

$$PV_A = A \times PVIF_A @ 9\%, 20 \text{ years}$$
$$= ₹ 1,000 \times 9.1285$$
$$= ₹ 9,128.50$$

Mr. Krishnamurthy should accept ₹ 9,128.50

(b) The present value of rupee one per annum for the next 20 years at 9 per cent per annum is

₹ 9.1285. If he wants ₹ 2,500 then he should sell ₹ $\dfrac{2,500}{9.1285} = ₹ 273.87$

Therefore, Mr. Krishnamurthy should sell only ₹ 273.87 of his income, the balance of ₹ 726.13 being kept for himself

(c) You have ₹ 5,000 to offer to buy his income which is not sufficient to buy it fully. Hence,

you can buy part of his income, i.e., $\dfrac{5,000}{9.1285} = 547.74$

And balance of ₹ 452.26 will be kept for him

Illustration 16

An investment of ₹ 40,000 made on 1/04/06 provides inflows as follows:

Date	Alternative I	Alternative II
01/04/06	20,000	10,000
01/04/07	10,000	20,000
01/04/08	10,000	10,000
01/04/09	10,000	10,000

Which alternative you would prefer if the investor's expected return is 10%. Give reasons for your preference.

Solution:

Alternative I

Date	Amount	Discount Factor	PV
01/04/06	20,000	0.9091	18,182
01/04/07	10,000	0.8264	8,264
01/04/08	10,000	0.7513	7,513
01/04/09	10,000	0.6830	6830
			40,789

Alternative II

Date	Amount	Discount Factor	PV
01/04/06	10,000	0.9091	9,091
01/04/07	20,000	0.8264	16,528
01/04/08	10,000	0.7513	7,513
01/04/09	10,000	0.6830	6,830
			39,962

The net present value of all future cash flows is ₹ 40,789 in case of Alternative I and ₹ 39,962 in case of Alternative II. The NPV in case of Alternative I is higher at 10% discounting factor. Hence, Alternative I is preferred.

Illustration 17

The share of Ridhi Ltd, (₹ 10) was quoting at ₹ 102 on 1.04.2002 and the price rose to ₹ 132 on 1.04.2005. Dividends were received at 10% on 30th June each year. Cost of funds was 10% is it worthwhile investment, considering the time value of money (Present value of factor @ 10% were 0.909, 0.826, 0.751)

Solution:

Calculation of Present value of Cash inflow

Year	Inflow (₹)	Present Value Factor	Present Value
1	1	0.909	0.909
2	1	0.826	0.826
3	1 + 132 = 133	0.751	99.883
		Present value	101.618
		(–) Present Value of Cash flow	102.00
		NPV	–0.382

Considering the time value of money, the NPV is negative, hence, it is not a wise investment.

Illustration 18

Find out the present value of a debenture from the following:

Face value of Debenture   ₹ 1000

Annual Interest Rate   15%

Expected return   12%

Maturity Period   5 years

(Present value of rupee one at 12% are, 0.8929, 0.7972, 0.7118, 0.6355, 0.5674)

Solution:

$$PV_d = I\,(PVAF) + F\,(DF)$$

$$= I\,(PVAF\ 12\%,\ 5\ years) + 5\,(DF\ 12\%,\ 5\ years)$$

$$= 150\,(3.6048) + 1{,}000(0.5674)$$

$$= 540.72 + 567.40$$

$$= 1108.12$$

Illustration 19

Mr. Vishwanathan is planning to buy a machine which would generate cash flow as follows:

Year	0	1	2	3	4
Cash flow	(25,000)	6,000	8,000	15,000	8,000

If discount rate is 10% is it worth to invest in machine?

Year	1	2	3	4
Discount factor	0.909	0.826	0.751	0.683

Solution:

Calculation of NPV

Year	Cash Flow	Discount Factor	Present value
1	6,000	0.909	5,454
2	8,000	0.826	6,608
3	15,000	0.751	11,265
4	8,000	0.683	5,464
Present value of CF			28,791
(–) Present value of Outflow			25,000
NPV			3,791

As the NPV is positive, it is worth investing in the machine.

4.8 EXERCISES

Multiple Choice Questions
Indicate the right answer with your reasoning

1. When compounding is done more than annually, the effective rate of interest is _____.

   (i) Greater than the nominal rate of interest

   (ii) Lower than nominal rate of interest

   (iii) Equal to nominal rate of interest

2. Which provides money with its time value?

  (i) Investment   (ii) Interest rate

(iii) Market rates   (iv) Currency rates

3. When payments are made at the end of each year, it is known as _____ annuity.

  (i) Annuity due   (ii) Ordinary annuity

(iii) Perpetuity   (iv) Fixed annuity

Ans: 1. (i), 2. (ii), 3. (ii)

Sume for Practice

1. Ramesh deposited ₹ 4,000 for 3 years period at 12% interest which is credited at the end of every six months. What will be the total amount credited to Ramesh's account at the end of 3 years?

2. Ganesh plans to send his son for higher studies in America after 5 years. He expects the cost of the study to be ₹ 4,00,000. How much should he save annually to have a sum of ₹ 4,00,00 at the end of 5 years, if the interest rate is 9%?

3. ICICI Bank promises to give you ₹ 5,000 after 10 years in exchange of ₹ 2,000 today. What is the interest rate involved in this offer?

4. Arvind wants to invest @ 8% p.a. compound interest, a such amount as will amount to ₹ 50,000 at the end of three years. How much should he invest?

5. A company has advertised for deposits from the public. If you deposit ₹ 1,000 now, you receive ₹ 1,464 at the end of 4 years or ₹ 1,611 at the end of 5 years. What rates of interest is the company paying?

6. Four equal annual payments of ₹ 4,000 are made into a deposit accounts that pays 8 per cent per year. What would be the future value of this annuity at the end of 6 years?

7. You can save ₹ 20,000 a year for 5 years and ₹ 3,000 a year for 10 years thereafter. What will these savings cumulate to at the end of 15 years if the rate of interest is 10 per cent?

❐ ❐ ❐

5 ANALYSIS AND VALUATION OF DEBENTURES
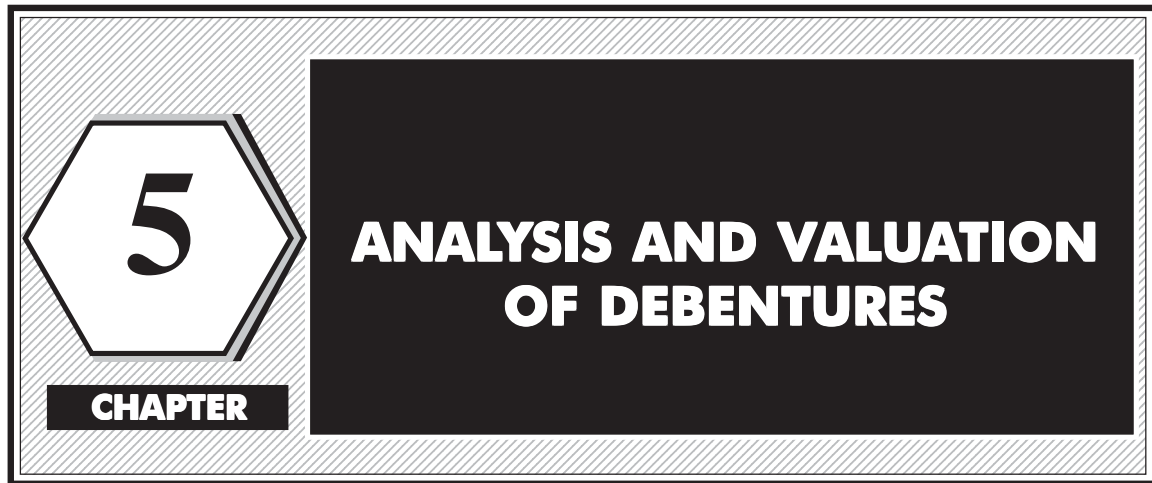
CHAPTER

Chapter Contents:

5.1 INTRODUCTION

Debt instrument include debentures and bonds. These are also included in the investment avenues. These are the instruments usually issued by the companies for borrowing from the market. These instruments are included to suit the investment needs of a risk averter who primarily invesed in steady returns with safety of the principal invested.

A debenture is an acknowledgement of a debt of the company. It contains promise to pay a stated rate of interest for a definite period and then repay the principal maturity. In India, debentures are secured against the assets of the company. There are different types of debentures.

5.2 DEBT INSTRUMENTS: DEBENTURES AND BONDS

Debentures

Debentures are issued for raising short, medium or long-term finance depending on the period for which they are issued. Debentures are creditorship securities, which provide funds on loan basic. However, they are given more security as regards repayment of capital and regular payments of interest.

Types of Debentures

1. Registered and Bearer.

2. Secured and Unsecured.

3. Cumulative and Non-cumulative.

4. Redeemable and Irredeemable.

5. Convertible and Non-convertible.

6. Participating and Non-participating.

Different types of debentures are issued on different terms and conditions in order to satisfy the needs of different categories of investors. The book value of debentures is usually ₹ 100. At present, debentures are popular. Such debentures are converted into equity shares on maturity as per the terms already notified.

Advantages of Debentures

1. Debentures are popular with the investors and their response is normally positive.

2. It provide capital without managerial control to the debentureholders.

3. It is an economical sources of finance.

4. It facilitate trading on equity by the company.

5. It avoid the possibility of overcapitalization.

6. It provide adequate safety to investors particularly to cautious investors.

Bonds

Along with debentures, companies for the collection of medium and long-term capital also issue bonds. It is creditorship security with fixed rate of interest decided at the time of issue of bonds. It is used for transactions in the securities market as they are easily transferred like shares and debentures. Loans can be taken on the security of such bonds. It is issued by financial institutions and even by the RBI. Security and attraction interest rate are the two advantages of bonds.

5.3 BOND VALUATION AND PRICING

Bond is an instrument of loan raised by the government or a company against a specified interest rate and a promised date of repayment. Debentures are bonds secured by mortgage against company assets as distinguished from fixed deposits, which are unsecured.

The following factors are involved in the valuation of bonds:

1. Face value

2. Redemption

3. Coupon Rate

4. Maturity Date
5. Call Option
6. Put Option
7. Bond Price

5.4 BOND YIELD (YIELD TO MATURITY) (YTM)

Yield to maturity is the same as Internal Rate of Return (IRR) of a bond and is the discount rate that is equal to the present value of a bond's cash flow to the bond's current market price. In the case of a bond, there is a cash outflow when the bond is purchased and there are cash inflows, when the periodic interest coupons are received. There is also a cash inflow when the redemptions are made on maturity. Calculating the IRR of these streams of cash flow gives the true returns on the bond, which is known as YTM. The YTM is calculated as follows:

$$YTM = \frac{(FV)-(PP)}{(Yrs.\,of\ maturity)+Coupon}$$

$$= \frac{(PP)+(FV)}{2}$$

$$= \frac{(Avg.\,annual\ price\ chage)+(Annual\ coupon)}{Avg.\,amt.\,of\ funds\ invested}$$

where, FV = Face value

PP = Purchase price

Illustration 1

You are considering an investment in one of the following bonds:

	Coupon Rate	Maturity	Price/₹ 100 Par value
Bond A	12%	10 yrs	₹ 70
Bond B	10%	6 yrs	₹ 60

1. What is YTM of each bond?
2. Which bond would you recommend for investment?

(April 2007)

Solution:

1. Calculation of YTM of Bond:

$$\text{YTM} = \frac{I + \dfrac{F - P}{n}}{\dfrac{F + P}{2}}$$

where, I = Annual Interest Payment

F = Par value of bond

P = Present value of bond

N = Yrs. of maturity

Bond A:

$$\text{YTM} = \frac{12 + \dfrac{(100 - 70)}{10}}{\dfrac{100 + 70}{2}}$$

$$= \frac{12 + 3}{85}$$

$$= \frac{15}{85} = 0.1765 = 17.65\%$$

Bond B:

$$\text{YTM} = \frac{10 + \dfrac{(100 - 60)}{6}}{\dfrac{100 + 60}{2}}$$

$$= \frac{10 + 6.67}{80}$$

$$= \frac{16.67}{80} = 0.208 = 20.80\%$$

2. The yield to maturity in case of Bond 'B' is higher than Bond 'A'. Therefore, Bond 'B' is recommended for investment.

Illustration 2

A bond of ₹ 1,000 has a coupon rate of 6% p.a. and maturity period of three years. The bond is currently selling at ₹ 900. What is the yield to maturity in the investment of this bond?

(Nov. 2007)

Solution:

$$YTM = \frac{(FV) - (PP)}{(Yrs.\ To\ maturity) + Coupon}$$

$$= \frac{(PP) + (FTV)}{2}$$

$$= \frac{1000 - 900}{3 + 60} = 93.33 = 0.068245$$

$$= \frac{900 + 1000}{2} = 950 = 9.8245\% \qquad \frac{(FV) - (PP)}{(Yrs.of\ maturity) + Coupon}$$

Illustration 3

A bond of ₹ 1,000 face value carrying an interest rate of 14 per cent is redeemable after six years at a premium of 5%. If the required rate of return is 15%, what is the present value of this bond?

(April 2008)

Solution:

Calculation of present value of bond:

PV = I (PVAF) + F (DF)

    = I (PVAF, 15%, 6 yrs) + F (DF 15%, 6 yrs)

    = 140 (3.78) + 1050 (0.43)

    = ₹ 529.20 + 451.50

    = ₹ 980.70

Illustration 4

Calculate yield to maturity (YTM) of bond- I:

Annual interest	12%
Face value	₹ 100
Price of bond	₹ 70
Maturity period	10 yrs

If bond II gives 20% YTM, which is better to invest?

Solution:

$$\frac{(100 - 70)}{10 + 12}$$

$$YTM = \frac{100 + 70}{2}$$

$$= \frac{3 + 12}{85} = 0.1764 = 17.64\%$$

If bond II gives 20% YTM, then bond II is better for investment.

Illustration 5

A bond of ₹ 1,000 has a coupon rate of 8% p.a. and maturity period of three years. The bond is currently selling at ₹ 910. What is the yield to maturity in the investment of this bond?

(April 2009)

Solution:

$$YTM = \frac{\dfrac{FV - PP}{n}}{\dfrac{FV + PP}{2}} \times 100$$

$$= \frac{1000 - 910}{80 + 3}$$

$$= \frac{1000 + 910}{2}$$

$$= \frac{80 + 30}{955}$$

$$= \frac{110}{995} = 0.11518 = 11.52\%$$

Illustration 6

A bond of ₹ 1,000 has a coupon rate of 6 per cent per annum and maturity period of three years. The bond is currently selling at ₹ 900. What is the yield to maturity in the investment of this bond?

Solution:

$$\text{YTM} = \frac{\text{FV} - \text{PP}}{\text{YTM} + \text{coupon}}$$

$$= \frac{\text{PP} - \text{FV}}{2}$$

$$= \frac{1000 - 900}{3 + 60}$$

$$= \frac{900 + 1000}{2}$$

$$= 0.098245$$

$$= 9.8245\%$$

Illustration 7

A bond of ₹ 1,000 face value carrying an interest rate of 15 per cent is redeemable after six years at a premium of 5%. If the required rate of return is 15%, what is the present value of the bond?

Solution:

Calculation of present value of the bond:

PV = I (PVAF) + F(DF)

PV = I (PVAF 15%, 5 years) + F (DF 15%, 5 years)

$$= 150(3.78) + 1,050(0.43)$$

$$= 567 + 451.50$$

$$= ₹ \ 1018.5$$

5.5 EXERCISES

Objective Type Questions

State with reasons whether the following statements are True or False.

1. Debentures and bonds are debt instruments.

2. Every investment has some risk.

3. Credit rating helps the investors to make good choice of investment in equity shares.

4. Yield curve considers only the relationship between the maturity and its yield.

5. Interest rate is determined by the RBI.

Ans: 1. (T), 2. (T), 3. (F), 4. (T), 5. (F).

Sums for Practice

1. A debenture of ₹ 10,000 face value carries an interest rate of 9% is redeemable after seven years at a premium of 5%. If the required rate of return is 12%, what should be the present value?

2. A GoI bond of ₹ 1,000 has a coupon rate of 8% per annum and maturity of 10 year, if the current market price is ₹ 1,015. Find YTM.

❏ ❏ ❏

6

CHAPTER
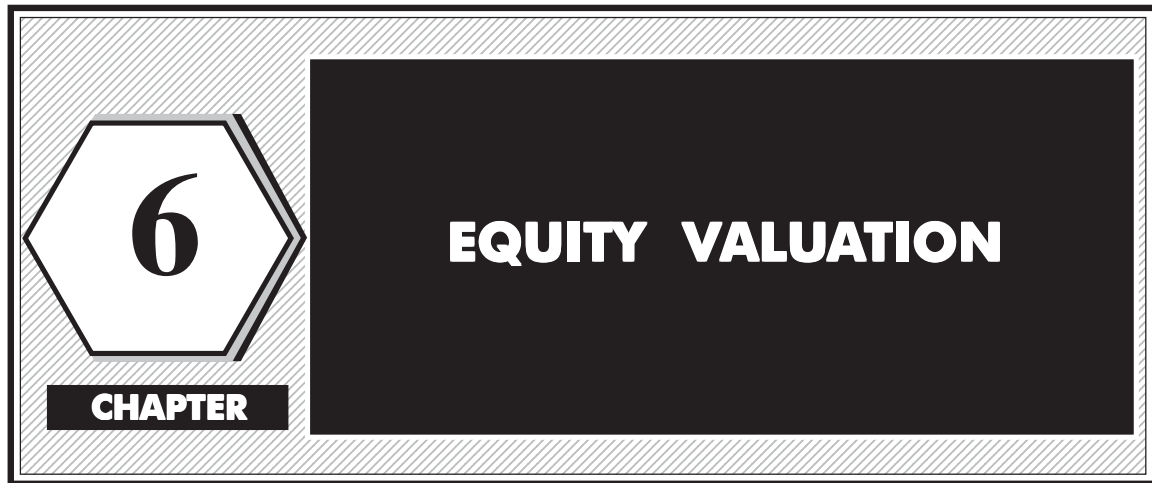
EQUITY VALUATION

Chapter Contents:

6.1 INTRODUCTION

Equity shares are traded by many investors in different ways. The forces that determines prices of equity shares are similar in all markets but they are slightly more obvious in markets using periodic calls. The security analyst must estimate the size of the amount which will be received by selling the securities, because the amount received may differ in size, timing and riskiness. The preferences of the investors should be used in the process of estimating the securities investment value.

6.2 NEED FOR VALUATION MODEL

In financial markets, stock valuation is the method of calculating theoretical values of companies and their stocks. The main use of these methods is to predict future market prices, or more generally potential market prices, and thus to profit from price movement – stocks that are judged *undervalued*

(with respect to their theoretical value) are bought, while stocks that are judged *overvalued* are sold, in the expectation that undervalued stocks will, on the whole, rise in value, while overvalued stocks will, on the whole, fall. In the view of fundamental analysis, stock valuation based on fundamentals aims to give an estimate of their intrinsic value of the stock, based on predictions of the future cash flows and profitability of the business. Fundamental analysis may be replaced or augmented by market criteria – what the market will pay for the stock, without any necessary notion of intrinsic value. These can be combined as "predictions of future cash flows/profits (fundamental)", together with "what will the market pay for these profits?". These can be seen as "supply and demand" sides – what underlies the supply (of stock), and what drives the (market) demand for stock? Valuations rely very heavily on the expected growth rate of a company. For starters, you can look at the historical growth rate of both sales and income to get a feeling for what type of future growth that you can expect. However, companies are constantly changing, as well as the economy, so don't rely on historical growth rates to predict the future, but instead use them as a guideline for what future growth could look like if similar circumstances are encountered by the company. To calculate your future growth rate, you'll need to do your own investment research. The easiest way to arrive at this forecast is to listen to the company's quarterly conference call, or if it has already happened, then read a press release or other company article that discusses the company's growth guidance. However, remember that although companyies are in the best position to forecast their own growth, they are not very accurate, and things change rapidly in the economy and in their industry. So, before you forecast a growth rate, try to take all of these factors into account.

And for any valuation technique, you really want to look at a range of forecast values. For example, if the company you are valuing has been growing earnings between 5% and 10% each year for the last 5 years but suddenly thinks it will grow 15-20% this year, you may want to be a little more conservative than the company and use a growth rate of 10-15%. Another example would be for a company that has been going through restructuring. They may have been growing earnings at 10-15% over the past several quarters/years because of cost cutting, but their sales growth could be only 0-5%. This would signal that their earnings growth will probably slow when the cost cutting has fully taken effect. Therefore, you would want to forecast earnings growth closer to the 0-5% rate than the 15-20%. The point I'm trying to make is that you really need to use a lot of gut feel to make a forecast.

6.3 BALANCE SHEET VALUATION MODELS

In finance, valuation is the process of estimating what something is worth. Items that are usually valued are a financial asset or liability. Valuations can be done on assets (for example, investments in marketable securities such as stocks, options, business enterprises, or intangible assets such as patents and trademarks) or on liabilities (e.g., bonds issued by a company). Valuations are needed for many reasons such as investment analysis, capital budgeting, merger and acquisition transactions, financial reporting, taxable events to determine the proper tax liability and in litigation.

6.4 EQUITY SHARE VALUATION MODELS

Valuation is the first step toward intelligent investing. When an investor attempts to determine the worth of her shares based on the fundamentals, it helps her make informed decisions about what stocks to buy or sell. Without fundamental value, one is set adrift in a sea of random short-term price movements and gut feelings.

For years, the financial establishment has promoted the specious notion that valuation should be reserved for experts. Supposedly, only sell-side brokerage analysts have the requisite experience and intestinal fortitude to go out into the churning, swirling market and predict future prices. Valuation, however, is no arcane science that can only be practised by MBAs and CFAs. With only basic math skills and some diligence, any fool can determine values with the best of them.

6.5 PRICE EARNINGS RATIO MODEL

$$\text{Expected Return} = \frac{(P1 - P) + D1}{P}$$

where, $P1 = (P1/E1) \times E1$

$\quad\quad P = $ Current price,

$\quad\quad E1 = $ Earning for the future year

(a) Zero Growth Model:

$$V = \frac{Eo}{K}$$

where, $Eo = $ Earning, $K = $ required rate of return.

(b) Constant Growth Model:

$$\text{Normal P/E Ratio with constant growth} = \frac{V}{Eo} = \frac{P\,(1 + ge)}{(K - ge)}$$

(c) Multiple Growth Model:

$$V = VT + VT$$

$$= \sum_{t=1}^{T} \frac{Dt}{(1 + K)^{\wedge}t} + \frac{DT + 1}{(k - g)\,(1 + k)^{\wedge}T}$$

Illustration 1

Samrudhi Ltd. paid ₹ 2.50 as dividend per share on its equity shares for the year ended 31ˢᵗ March, 2005. Dividends are expected to grow at 10 p.a. for an indefinite future. The current market price of the share is ₹ 20.

1. What is the expected rate of return?
2. If the required rate of return is 12%, what would be the value of the stock?
3. Is it investing in the shares?

(Nov. 2005)

Solution:

1. Expected Rate of Return $= \dfrac{Do\,(1-g)+g}{P} = \dfrac{2.50\,(1.10)+0.10}{20}$

$$= 0.1372 + 0.10 = 0.2375$$
$$= 23.75\%$$

2. Intrinsic Value $= \dfrac{Do\,(1+g)}{(k-g)} = \dfrac{2.50\,(1.10)}{(0.12-0.10)} = ₹\,137.50$

3. The intrinsic value of the share is ₹ 137.50, while its market price is ₹ 20. The share is underpriced. Hence, it is worth investing in it.

Illustration 2

Meghna Ltd. paid dividend of ₹ 1.80 per share. The forecast is the dividend will grow by 8 p.a. into the infinite future. If the required rate of return is 10% and the current market price of the company's stock is ₹ 60, find out the intrinsic value of the company's share. Is it investing in the company?

(Nov. 2006)

Solution:

$$V = Do\,\dfrac{(1+g)}{(k-g)} \text{ or } \dfrac{D1}{(k-g)}$$

$$= 1.80\,\dfrac{(1.08)}{(0.10-0.80)}$$

$$= \dfrac{1.80 \times 1.08}{0.02}$$

$$= \dfrac{1.944}{0.02} = ₹\,97.20$$

The intrinsic value of the share is ₹ 97.20. The current market price of the share is ₹ 60. The share is underpriced. Hence, it is worth investing in the company's share.

Illustration 3

MNO Ltd.'s share is quoted at ₹ 20 on BSE currently. The company pays rupee one per share as dividend. The investors expects growth rate of 5% per year. The required rate of return is 6%. Compute

1. Expected rate of return.
2. If the anticipated growth rate is 6% p.a., calculate the indicative market price.
3. Advise on the basic of indicative market price compute above whether it is profitable to invest in the shares of MNO Ltd., at its current price on BSE.

(April 2006)

Solution:

1. Expected Rate of Return $= \dfrac{Do\ (1-g)+g}{P} = \dfrac{1\ (1.05)+0.10}{20}$

$$= 0.0525 + 0.10 = 0.1525$$
$$= 15.25\%$$

2. Intrinsic Value $= \dfrac{Do\ (1+g)}{(k-g)} = \dfrac{1\ (1.06)}{(0.06-0.05)}$

$$= \dfrac{1.06}{0.01} = ₹\ 106\ .$$

3. The intrinsic value of the share is ₹ 106, which is higher than market price. Hence, the share should be purchased because it is underpriced.

Illustration 4

A Ltd. paid dividend of ₹ 3 p.a. in the last year. The dividend is expected to grow at a constant rate of 5% in the future. If the required rate of return is 10%, what would be the intrinsic value of that share?

Solution:

1. Intrinsic value of share

$$V = Do\ \dfrac{(1+g)}{(k-g)}\ or\ \dfrac{D1}{(k-g)}$$

$$= 3\ \dfrac{(1+0.05)}{(0.10-0.05)}$$

$$= \frac{3.15}{0.05} = ₹\ 63$$

The intrinsic value of the share is ₹ 63.

Illustration 5

A Ltd. has paid dividend @ 10% in the last year. The paid-up equity capital of the company is ₹ 6,00,000 and preference share capital of ₹ 1,00,000. Net operating profit is ₹ 4,00,000. The tax rate is 32%. The company expects a growth rate of 5%. Compute the value of equity share using:

1. Dividend Approach
2. Dividend Growth Approach
3. Earning Approach

(Nov. 2007)

Solution:

1. Value as per Dividend Approach:

$$V = \frac{D1}{k} = \frac{2}{10\%} = ₹\ 20$$

2. Value as per Dividend Growth Approach:

$$V = Do\ \frac{(1+g)}{(k-g)}$$

$$= \frac{2\ (1.05)}{(0.10-0.05)}$$

$$= \frac{2.10}{0.05} = ₹\ 42$$

3. Value as per Earning Approach:

	Operating Profit	₹ 4,00,000
—	Tax 32%	1,28,000
	Profit After Tax	2,72,000
—	Preference Dividend	10,000
	Net Profit	2,62,000
	EPS = 2,62,000	

Face value of a share is assumed as ₹ 10.

V = EPS (10)

V = 4.37 × 10

= ₹ 43.70

Illustration 6

Anand Ltd. paid dividend of ₹ 1.80 per share in the last year. The forecast is that dividend will grow by 5% per year. into indefinite future. If the required rate of return is 11%, what would be the intrinsic value of the share? If the market price of the share is ₹ 40, what is the expected rate of return on the stock? Should you make the investment in the stock?

(April 2008)

Solution:

1. $V = \dfrac{Do\,(1+g)}{(k-g)}$

    $= \dfrac{1.80\,(1.05)}{(0.11-0.05)}$

    $= \dfrac{1.89}{0.06} = ₹\ 31.50$

2. Expected Rate of Return $= \dfrac{Do\,(1+g)+g}{P} = \dfrac{1.80\,(1.05)+0.05}{40}$

    $= 0.04725 + 0.05$

    $= 0.09725$

    $= 9.725\%$

3. The expected rate of return is lower than the required rate of return. The intrinsic value of the share is ₹ 31.50, which is lower than its market price. Hence, the share is overpriced and investment in the stock is not recommended.

Illustration 7

RIL paid ₹ 3 as dividend per share on its equity shares for last year. It is expected that it will grow at 10% per year. for indefinite future.

1. What is the expected rate of return if current market price is ₹ 15?

2. If the required rate if return is 15%, then what would be the value of stock?

3. Is it investing in RIL worth?

(Oct. 2008)

Solution:

1. Expected Rate of Return $= \dfrac{\text{Do } (1+g) + g}{P} = \dfrac{3\ (1.10) + 0.10}{15}$

$$= 0.22 + 0.10$$
$$= 0.32$$
$$= 32\%$$

2. $V = \dfrac{\text{Do } (1+g)}{(k-g)}$

$$= \dfrac{3\ (1.10)}{(0.15 - 0.10)}$$

$$= \dfrac{3.30}{0.05} = ₹\ 66$$

3. Intrinsic value is ₹ 66. The current market price is ₹ 15. The RIL stock is underpriced. Hence, it is worth investing.

Illustration 8

Bharat Ltd. paid dividend of ₹ 2.50 p.a. in the last year. Dividend is expected to grow at 10% p.a. for indefinite future. What would be the value of stock if the required rate of return is 15%? Is it worth investing in the share at current market price of ₹ 60?

(April 2009)

Solution:

1. $V = \dfrac{\text{Do } (1+g)}{(k-g)}$

$$= \dfrac{2.50\ (1.10)}{(0.15 - 0.10)}$$

$$= \dfrac{2.75}{0.05} = ₹\ 55$$

2. Intrinsic value of the share is ₹ 55. The current market price of the share is ₹ 60. The share is overpriced. Hence, it is not worth investing in the company's share.

Illustration 9

BSES paid ₹ 2.50 as dividend per share on its equity shares for the last year. Dividends are expected to grow at 10 per cent per year for an indefinite future.

What is its expected rate of return if its current market price is ₹ 20?

If the required rate of return is 12%, what would be the value of stock?

Is it worth investing in the share?

Solution:

1. Expected rate of return = $\dfrac{\text{Do } (1+g)}{P} + g$

$$= \dfrac{2.50\ (1.10)}{20} + 0.10$$

$$= 0.1375 + 0.10$$

$$= 0.2375 \text{ or } 23.75\%$$

2. Intrinsic value = $\dfrac{\text{Do } (1+g)}{(k-g)}$

$$= \dfrac{2.50\ (1.10)}{0.12 - 0.10} = ₹ 137.50$$

3. The expected rate of return is greater than the required rate of return, the intrinsic value of the share is ₹ 137.50, which is higher than its market price of ₹ 20. Hence, the share should be purchased because it is underpriced.

Illustration 10

Prof. Ramesh wishes to invest in the shares of A Ltd., whose expected dividend in the first year is ₹ 4. In the past the company's dividend per share has grown at an average rate of about 5 per annum. Prof. Ramesh expects that the dividend will grow at the same rate in future. The required rate of return in the share is 25% per annum. The market price of the share is ₹ 16. Give your opinion to Prof. Ramesh whether he should buy the shares?

Solution:

The present dividend is ₹ 4. The Dividend over the next year will be 4x (1.05) = ₹ 4.20

$$V = \dfrac{\text{Do } (1+g)}{(k-g)}$$

$$= \dfrac{4 \times 1.05}{0.25 - 0.05} = 21$$

The intrinsic value of the share is 21. The current market price is ₹ 16. Hence, the share is underpriced. Prof. Ramesh is to buy the shares.

Illustration 11

The current EPS of Times Ltd. is ₹ 6. Its dividend payout is 40 per cent, and its growth rate of EPS is 10%. The normal P/E multiple is 15:1. What is the intrinsic value in 3 years using the same method?

Solution:

(a) P/E = EPS = Intrinsic value

Intrinsic value = $15 \times 6 = ₹ 90$

(b) EPS = $₹ 6 (1.10)^3$

   = ₹ 7.986

Value in 3 years = 15×7.986

   = ₹ 120

Illustration 12

B Ltd. paid a dividend at ₹ 10 per share. Earnings and dividends are expected to grow at a rate of 20 per cent. The required rate of return and the current market price are 25% and ₹ 240 respectively. Is the share fairly priced?

Solution:

The current price of share = $Po = \dfrac{D1}{k - g}$

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

$$= \frac{10 \, (1 + 0.20)}{0.25 - 0.20}$$

$$= \frac{120}{0.5} = 240$$

The share of B Ltd. is fairly priced because the current market price of the share is ₹ 240. If the market price is more than the intrinsic value. The share is overpriced, but if the market price is less than the intrinsic value, the share is underpriced.

Illustration 13

Sunrise Ltd. is currently paying dividend of ₹ 1.50 on its face value of ₹ 10. Earnings and dividends are expected to grow at 5% annual rate indefinitely. Investors require 9% rate of return on their investments. The company is considering several business strategies and wishes to determine the effect of these strategies on the market price of the share.

(a) Continuing the present strategy will result in the expected growth rate and required rate of return as above.

(b) Expanding sale will increase the expected dividend growth rate to 7% but will increase the risk of the company. As a result, the investor's required rate of return will increase by 12%.

(c) Integrating into retail stores will increase the dividend growth rate to 6 per cent and increase the required rate of return to 10 per cent.

You are required to find out the best strategy from the point of view of the market price.

Solution:

(a) Calculation of intrinsic value for condition 1:

$$V = \frac{D1}{k-g}$$

$$= \frac{1.5\,(1.05)}{(0.09 - 0.05}$$

$$= \frac{1.575}{0.04} = ₹\ 39.37$$

(b) Calculation of intrinsic value for condition 2:

$$V = \frac{Do\,(1+g)}{k-g}$$

$$= \frac{1.5\,(1.07)}{(0.12 - 0.07)}$$

$$= \frac{1.605}{0.05} = ₹\ 32.10$$

(c) Calculation of intrinsic value for condition 3:

$$V = \frac{Do\,(1+g)}{k-g}$$

$$= \frac{1.5\,(1.06)}{(0.10 - 0.06)}$$

$$= \frac{1.59}{0.04} = ₹ \ 39.75$$

For the point of view of market price per share, the strategy of integrating into retail stores is the best because the market price of share is highest, i.e., ₹ 39.75.

Illustration 14

What will be the intrinsic value of equity shares of T Ltd. based on the following data:

Last Dividend	₹ 3 per share
Growth rate for 1-3 years	20% p.a
Growth rate for 4-6 years	10% p.a
Growth rate beyond 6 years	5% p.a
The required rate of return is 14%	

Solution:

Intrinsic value of equity shares

$$= \frac{3\,(1.20)}{1.14} + \frac{3\,(1.20)^2}{(1.14)^2} + \frac{3\,(1.20)^3}{(1.14)^3} + \frac{3\,(1.20)^3\,(1.10)}{(1.14)^4} + \frac{3(1.20)^3\,(1.10)^2}{(1.14)^5} + \frac{3\,(1.20)^3\,(1.10)^3}{(1.14)^6} +$$

$$= \frac{3\,(1.20)^3\,(1.10)^3\,(1.05)}{(0.14-0.05)} \times \frac{1}{(1.14)^6}$$

$$= \ 3.6 \ \text{PVIF } 14\%, 1 + 4.32 \ \text{PVIF} 14\%, 2 + 5.18 \ \text{PVIF } 14\%, 3 + 5.47 \ \text{PVIF } 14\%, 4 + 6.27$$

$$\text{PVIF } 14\%, 5 + 8.9 \ \text{PVIF } 14\%, 6 + 7.24 \ \frac{\text{PVIF}}{0.09} \ 14\%, 6$$

$$= \ (\,3.6 \times 0.877) + (4.32 \times 0.770) + (5.18 \times 0.675) + (5.70 \times 0.592) + (\,6.27 \times 0.519) + (6.90 \times 0.456) + [(7.24 \,/0.09) \times 0.456)]$$

$$= \ ₹ \ 56.44$$

6.6 EXERCISES

Objective Type Questions

Indicate the right answer with your reasoning

1. Which of the following is a key determinant of share value?
   - (i) Timing
   - (ii) Return
   - (iii) Beta
   - (iv) Growth rate
   - (v) Face value

2. Which defines the intrinsic value of a share as the present value of future dividend?

    (i)   CAPM   (ii) DDM

    (iii) PE model   (iv) PM

3. The intrinsic value of a share is based on _____ that the investor expects to receive them in future.

    (i)   Dividend   (ii) Capital gain

    (iii) Cash flow   (iv) Interest

4. Which model of share valuation assumes that the dividend per share remains at fixed amount for ever?

    (i)   Constant Growth model   (ii) Multiple Growth model

    (iii) PE model   (iv) Zero Growth model

Ans: 1. (i), 2. (iii), 3. (ii), 4. (iv).

Sums for Practice

1. ASP Ltd, is foreseeing a growth rate of 12% per annum in the next 2 years. The growth rate is likely to fall to 10% for the third year and fourth year. After that, the growth rate is expected to stabilize at 8% per annum. If the last dividend rate paid was ₹ 1.50 per share and the investor's required rate of return is 16%, find out the intrinsic value per share of ASP Ltd. as of date. You may use the following table:

Years	0	1	2	3	4	5
Discounting factor at 16 %	1	0.86	0.74	0.64	0.55	0.48

2. What will be the intrinsic value of equity shares of X Ltd. based on the following data:

    Last Dividend   ₹ 3 Per share

    Growth rate for 1-2 years   20% p.a.

    Growth rate for 3-6 years   10% p.a.

    Growth rate beyond 7 years   5% p.a.

    The required rate of return is 14%

3. The dividends per share of Rex Ltd. has been growing at an average annual compounded rate of 19%. Its dividend paid was ₹ 2 per share. Its growth rate will drop to 4 per cent from the beginning of the 4th year. What would be the intrinsic value of the company's share if required rate of return is 15%.

4. What would be the intrinsic value of the share on the basis of following data?

Last dividend (D_0)	₹ 4
Growth rate in dividend for next two years	10%
Growth rate in dividends thereafter	5%
Required rate of return	20%

5. Mehaboob intend to purchase KFC shares at ₹ 85 per share. He wants to hold it for one year and sell after getting a dividend of 8.5. If his required rate of return is 16%, how much should the stock price has to appreciate?

6. Reliance Petro is expected to pay ₹ 3 as dividend next year. The market price is projected at ₹ 60 after one year. If the required rate of return of the investor is 20 per cent, what should be the current price of the stock?

7. XYZ Ltd. paid its first cash dividend of ₹ 2.50 and dividends are expected to grow at a rate of 20% per annum for next 3 years. Thereafter, cash dividends will grow at a rate of 20% per annum. Shareholders expect to earn 15% return on their investments. Based on these assumptions, find out the value of shares of XYZ Ltd.

❏ ❏ ❏

7 RISK AND RETURN

CHAPTER

Chapter Contents:

7.1 MEANING OF RISK

Risk is a chance of loss. Investment risk exists where there is more than one possible future return associated with an investment. If more than one possible return exists and the investor has no idea of the probabilities associated with the occurrence of any of the possible future returns, the situation is of complete investment uncertainty. Investment certainty exists when there is an only one

possible return. The investor should be certain of the investment's return. Between the two extremes of investment certainty lies the area of investment risk. Under condition of risk, investors realize that there is a range of possible returns and can associate some probability to each possible return. This dispersion of possible returns represents risks. The greater the dispersion of possible returns on an investment, the greater the risk. **The risks that equity shares can carry are:**

1. Loss of dividend when no dividend is declared,

2. Low dividend, i.e., dividend lower than bank's fixed deposit rates of interest,

3. Stagnation or depreciation in the price of shares, and

4. Insolvency of the company.

7.2 TYPES OF RISK

The various types of risk in investment may be classified as follows:

(1) Default risk: It is the risk of insurer of investment going bankrupt. An investor who purchases share or debenture will have to face the possibility of default and bankruptcy of the company. In the case of fixed income securities such as debenture or fixed deposits of companies, the investor may take the care to see that the credit rating given to the company, so that the risk can be minimized.

(2) Business risk: Business risk means the risk of a particular business failing and thereby an investment is lost. It is identifiable as the variation in the firm earnings due to its business or product line. The principal determinants of a firm's business risk are the variability of sales and its operating leverage. Operating leverage represents the firm's ability to translate increased sales increased profit. Business risk can be divided into two broad categories, external and internal. External business risk to the result of operating conditions imposed upon the firm by circumstances beyond its control. Internal business risk is associated with the efficiency with which a firm conducts its operation.

(3) Financial risk: The financial risk is a function of the company's structure or financial leverage. Financial leverage is a per cent change in net earning for a giving result from the use of debt financing in the capital structure. If a company use of large amount of debt, then it has contracted to pay a relatively large fixed amount for its sources of capital. When the operating profits fall, the company will have to pay large interest payment and the net profit will even more. This is an example of financial leverage. The likelihood of a company defaulting on its debt-servicing obligation is known as financial risk.

(4) Purchasing power risk: The purchasing power risk of a security is the variation of real returns on the security caused by inflation. Inflation reduces the purchasing power of money over time. The impact of inflation is failed greater in case of fixed income investments. On the other hand, in case of fluctuating income like shares and dividends, there is a possibility of the dividend rate being higher than the inflation rate. Thus, unless the returns on your investments are higher than the inflation rates, your investments are not profitable. The return on your investment after adjusting for inflation is known as real rate of return.

(5) Interest rate risk: The earnings of the companies and the performance of their shares are sensitive to interest rates changes. Therefore, potential variability of investment return due to interest rate fluctuation is interest rate risk. The returns on other type of securities also depend upon interest rates. The degree of sensitivity to interest rate changes will naturally differ from company-to-company. Recently, companies have started issuing 'floating rate bonds'. The rate of interest on these bonds are linked to some floating rate such as 'prime rate' or the bank minimum lending rate. When the market interest rate rise, the bond rate rises and when it fall, the bond rate also falls.

(6) Market risk: The market risk means the variability in the rates of return caused by the market upswings or market downswings. It is caused by the investor reaction by tangible as well as intangible events in markets the returns on the securities tend to move together. That is, on a good day, the fact that some stocks in the market are rising seems to fuel enthusiasm, and other stocks tend to rise also. On the other hand, when some stock begin to fall, other will also tend to fall as a mood of pessimism pervades the market.

(7) Liquidity risk: Liquidity risk arises from the inability to convert an investment quickly into cash. It refers to the ease with which the stock may be sold. If a stock is highly liquid, it can be sold very quickly at a price which is more or less equal to its previous market price. When the investor wants to sell a stock he is concerned with its liquidity. On the other hand, when an investor wants to buy a stock, he is interested in its availability. A stock may be deemed to be easily available, if it can be purchased quickly at a price more or less equal to its previous price. A stock may be regarded as not easily available, if the purchaser has to wait for quite some to buy it at a price which is more or less equal to the previous price. Thus, the lower marketability of stock gives a degree of liquidity risk that makes the price of the stock a bit more uncertain.

(8) Systematic and unsystematic risk: The fluctuation in an investment's return attributable to the changes in broad economy social or political factors which influence the return on investment is a systematic risk. It is that portion of risk of a security which is caused by the influence of certain economic-wide factor like money supply, inflation, level of government spending and monsoon which have a bearing on the fortune of every company.

Unsystematic risk is the variation in return due to factors related to individual firm or security. It is that portion of total risk which arises from factors specific to a particular firm such as plant break down, labour strikes, sources of material, etc. All risky securities have some degree of unsystematic risk but combining securities into diversified portfolios reduces unsystematic risk from the portfolio.

7.3 MEASURING RISK

The risk associate with the stock refers to the variability of its rate of return. The investors should be able to quantify and measure the risk. The risk probability distribution of the possible returns on the investments represents an investment's total risk.

(1) Range: The simplest measure of the dispersion of a distribution is the range of returns. The range is equal to the highest value that the variable can be less to the lowest possible value.

Monthly holding returns for Gramophone Equipment Corporation

Months	Returns
January	0.026
February	-0.050
March	-0.109
April	0.053
May	-0.058
June	-0.076
July	-0.057
August	0.241
September	-0.063
October	0.125
November	0.161
December	-0.053

Expected value = 0.012

Range = 0.35

Variance = 0.011

Standard deviation = 0.106

Thus, the higher the range of returns, the riskier the security.

The advantage of the range as a measure of risk lies in its simplicity.

(2) Variance: Variance is the better measure of risk than the range. It takes into account the derivation of all possible returns from their mean or expected value. The statistical measure that accomplishes this purpose is the variance of returns. The formula used for variance is as follows:

$$\sigma^2 = \sum\nolimits_{i=1}^{n} \left[R_i - E(R) \right]^2 \times P$$

The above equation defines the variance as the weighted average of the squared deviation of the returns from their mean. The above table shows the variance computed for Gramophone Equipment Corporation using above equation. The greater the variance of a security, the higher the security's total risk level.

(3) Standard deviation: Computation of the variance of returns makes use of the squared deviation of returns from the mean and therefore the resulting variance is stated in squared terms. The standard deviation of a set of numbers is the average variability around the mean. The following formula can be used to calculate standard deviation.

$$\sqrt{\frac{1}{n-1}} \sum \left[(R_i - R_i) \right]^2$$

where, n = number of observation in the sample

R_i = rate of return

R_i = arithmetic average of the rates of return

7.4 RISK PREFERENCE OF INVESTORS

Investors make investment decision designed to maximise their expected utility. The expected utility of an investment means the total benefit that an investor expects to receive from the investment. We assume that investor seek to maximise expected utility. Investor could regard the risk-return trade-off in three distinct ways as follows:

(1) Investor could be risk seeking

(2) Investor could be risk indifferent

(3) Investor could be risk averse

(1) Risk seeking investors: This means that the investor are willing to make investment of increasing higher risk for the promise of increasingly smaller increments of return. These investors like to accept risk. Extreme risk seekers would be willing to purchase investments of higher risk for less return. Naturally, such extreme risk seekers would have distorted view of personal satisfaction.

(2) Risk indifferent investors: Risk indifferent investors would be willing to continue buying investment of higher risk by receiving the same increase in return. This is not a logical situation because at some point a reasonable person would likely to stop further investment. A risk-indifferent investor receives the same incremental utility for each increase in health.

(3) Risk averse investors: When investors require successfully greater increment of return to compensate them for each additional unit increase in risk, they are known as Risk averse investors. They receive smaller increments of utility of each additional increments of wealth. They will accept the additional risk, but if only if they are adequately compensated for doing so and adequately compensation for a risk averter means being paid more and more for accepting higher risk.

7.5 MEANING OF RETURN

The return means the profit earned on the capital invested in the business. It is expressed as a percentage. The return on an investment is the profit required to establish and maintain the investment. The investors invest their funds to make a profit which is known as return. The goal of the investment is to minimize the investor's utility and maximizing expected return.

7.6 MEASURES OF RETURN

Return can be measured as a rate of return on capital investment. To measure the rate of return an investor wants to know three items:

(1) The period of time that the measurement covers.

(2) The net profit of the investment over the time period, and

(3) The amount needed to establish and maintain the investment.

The final component of return is usually the purchase price of the security. It is a stock concept meaning that we measure its value of a particular point in time rather than over a time period.

7.7 HOLDING PERIOD RETURN

In the typical security investment, an investor purchase and pays for the security at the beginning of the holding period and then sells it at the end of the time period. In such a situation, the holding period return on the investment is:

$$R_t = \frac{P_t - P_t - 1 + Y_t}{\_P_t -_i}$$

where, R_t = the holding period return on the investment

P_t = the price of the security at time t_1 the end of the holding period

$P_t - 1$ = the price of the security at time (t-1), the beginning of the holding period

Y_t = the income from the investment during the holding period

The above equation shows that the holding period a return is equal to the profit on the security per rupee invested in the security.

For e.g., the holding period returns of the security purchased for ₹ 4,000 and sold for ₹ 5,000 after holding for two months is determined as follows:

$$R = \frac{5000 - 4000}{4000} = \frac{1000}{4000} = 0.25 \text{ or } 25\%$$

7.8 ANNUALIZED RETURN

When comparing the returns on two different investments, the holding periods for the investments must be equal length for the comparison to be meaningful. The most commonly used holding period for reporting and comparing returns is annual returns.

For e.g., a security purchased for ₹ 4,000 and sold for ₹ 5,000 after holding period for 2 months, its annualised return will be 150%, i.e., $\frac{5000 - 4000}{4000} \times 100 \times \frac{12}{2}$

7.9 EXPECTED RETURN

Under condition of risk, investors, realize that an investment can actually yield a number of different returns and they are able to associate or estimate each possible return with its respective probability of occurring. These probabilities may be determined using precise mathematical methods and past data or by using subjective, judgement assessment.

Probability distribution of returns represents the total risk of the investment. The larger and the more spread out the distribution the greater the risk of the investment. Investments with lower levels of risk correspond to narrower distribution of possible returns.

The concept of expected return becomes useful at any time when there is uncertainty about an return on an investment. Thus, an expected return means the average return that one expects to receive on an investment over the long-run. From mathematical point of view, an expected return is defined as the weighted average holding period various probabilities of their occurrences. The expected return is calculated by using the following return:

$$E(R) \sum_{t-1}^{n} R_i P_i$$

where, $E(R)$ = the expected return on an investment

n =   the number of possible terms

R_i =   the ith possible return

P_i =   the probability of the ith return R_i

Thus, the expected rate of return is equal to the sum of each possible returns its probability of occurrence.

7.10 INVESTORS' ATTITUDE TOWARDS RISK AND RETURN

Understanding and measuring return and risk is a fundamental to the investment process and increases an awareness of the investment problem. Most investors are risk averse. They must be aware of the risks in different investment. To have a higher return the investors should be able to accept the fact that he has to be faced with greater risk. The investor attempt to maximize their wealth at the minimum risk. When risk is established, it can be reduced to a minimum but it cannot be completely eliminated. Risk and return are related. The higher the risk a person is willing to accept the better the returns and he is able to achieve.

Illustration 1

Mr. A has invested equal amounts of security X and Y. The expected return during the boom and depression with equal probability of occurrence are as under:

Economic condition	Expected return of	
	Security X	**Security Y**
Boom	6	12
Depression	15	5

Calculate expected return and standards deviation of each security.

Solution:

(i) Calculation of Expected Rate of Return:

Economic condition	Expected Return		Probability	Expected returns	
	X	**Y**		**X**	**Y**
Boom	6	12	0.5	3.00	6.00
Depression	15	5	0.5	7.05	2.05
			Expected Return	10.50	8.50

(ii) Calculation of Standard Deviation of X:

State of Economy	K_i	$(K_i - K_i)$	$(K_i - K_i)^2$	P	$P(K_i - K_i)^2$
Boom	6	-4.50	20.25	0.5	10.125
Depression	15	4.50	20.25	0.5	10.125
					20.25

Standard deviation $= \sqrt{20.25} = 4.5$

(iii) Calculation of Standard Deviation of Y:

State of Economy	K_i	$(K_i - K_i)$	$(K_i - K_i)^2$	P	$P(K_i - K_i)^2$
Boom	12	305	12.25	0.50	6.125
Depression	5	-3.5	12.25	0.50	6.125
				12.25	

Standard Deviation $= \sqrt{12.25} = 3.5$

Illustration 2

The rate of return on Stocks X and Y under different states of the economy are given below:

	Boom	Normal	Recession
Probability of occurrences	0.35	0.50	0.15
Rate of return on stock X (%)	20	30	40
Rate of return on stock Y (%)	40	30	20

(i) Calculate the expected return and standard deviation of returns of both the stocks.

(ii) If you could invest in either stocks X and Y, but not in both, which stock would you prefer?

(iii) What would be your decision if the probability changes to 30:40:30?

Solution:

(i) **(a) Calculation of expected return:**

State of economy	Rate of return		Probability	Expected returns	
	X (%)	Y (%)		X	Y
Boom	20	140	0.35	07	14
Depression	30	30	0.50	15	15
Recession	40	20	0.15	06	03
			Expected Return	28	32

(b) Calculation of standard deviation of stock X:

State of economy	Return on X (%)	$(X - \bar{X})$	$(X - \bar{X})^2$	P	$P(X - \bar{X})^2$
Boom	20	-8	64	0.35	22.40
Normal	30	2	4	0.50	2.00
Recession	40	12	144	0.15	21.60
					46.00

Standard deviation $= \sqrt{46.00} = 6.78$

(c) Calculation of standard deviation of Y:

State of economy	Return on Y (%)	$(Y - \bar{Y})$	$(Y - \bar{Y})^2$	P	$P(Y - \bar{Y})^2$
Boom	40	8	64	0.35	22.40
Normal	30	-2	4	0.50	2.00
Recession	20	-12	144	0.15	21.60
					46.00

Standard deviation $= \sqrt{46.00} = 6.78$

(ii) Standard deviation measures the risk of a security. The standard deviation of both the stock is the same. Return on stock 'Y' is higher by 4% as compared to return on stock 'X' though the risk is same. Therefore, it is preferable to invest in stock 'Y'.

(iii) **(a) Calculation of expected return:**

State of economy	Rate of return		Probability	Expected returns	
	X (%)	Y (%)		X	Y
Boom	20	40	0.30	6	12
Depression	30	30	0.40	12	112
Recession	40	20	0.30	12	6
			Expected Return	30	30

(b) Calculation of Standard Deviation of X:

State of economy	Return on X (%)	$(X - X)$	$(X - X)^2$	P	$P(X-X)^2$
Boom	20	-10	100	0.30	30.00
Normal	30	0	0	0.40	0.00
Recession	40	10	100	0.30	30.00
					60.00

Standard deviation $= \sqrt{60.00} = 7.75$

(c) Calculation of Standard Deviation of Y:

State of economy	Return on X (%)	$(X - X)$	$(X - X)^2$	P	$P(X-X)^2$
Boom	40	-10	100	0.30	30.00
Normal	30	0	0	0.40	0.00
Recession	20	10	100	0.30	30.00
					60.00

Standard deviation $= \sqrt{60.00} = 7.75$

If the probability changes to 30:40:30 then both the stocks have same returns as well as risk. Hence, investment can be made in any stock.

Illustration 3

Dr. Shah purchased 400 shares of Sundar Ltd. @ ₹ 61 each on 15th October, 2004. He paid brokerage of ₹ 600. The company paid the following dividends:

June, 2005	₹ 800
June, 2006	₹ 1000
June, 2007	₹ 1200

He sold all his holdings for ₹ 34,500 (net) on 15th October, 2007

(1) What is the holding period return?

(2) What is annualized return?

(3) Is Mr. Shah a good investor?

Solution:

(1) Purchases 400 × 61   = ₹ 24,400

Brokerage   = ₹ 600

Total   = ₹ 25,000

(2) Dividend = 800 + 1,000 + 1,200 = ₹ 3,000

(3) Capital Gains = 34,500 – 25,000 = ₹ 9,500

(4) Total Returns = 3,000 + 9,500 = 12,500

(5) Holding period = 3 years

(6) $\dfrac{\text{Return}}{\text{Investment}} \times 100 = \dfrac{12,500}{25,000} \times 100 = 50\%$

(7) Annualized return = $\dfrac{50}{3} = 16.67$

(8) Mr. Shah is a good investor.

Illustration 4

Shankar has been considering an investment in stock X or Y. He has estimated the following probability distribution of return of stock X and Y.

Return on stock X	Return on stock Y	Probability
-10	05	10
0	10	25
10	15	40
20	20	20
30	25	05

Calculate the expected return and standard deviation of stock X and Y and state which stock is worth investing.

Solution:

(i) **Calculation of expected return**

X	Y	P	ER$_x$	ER$_{y\text{-}}$
-10	05	0.10	-1	0.50
0	10	0.25	0	0
10	15	0.40	4	6.00
20	20	0.20	4	8.00
30	25	0.05	1.50	1.25
			8.50	14.75

(ii) **Calculation of standard deviation of stock X**

X$_1$	(X$_1$ − X$_1$)	(X$_1$ − X$_1$)²	P	P(X$_1$ − X$_1$)²
-10	-18.50	342.25	0.10	34.225
0	-8.50	72.25	0.25	18.06
10	1.50	2.25	0.40	0.90
20	11.50	132.25	0.20	26.45
30	21.50	462.25	0.05	23.11
		1011.25		102.745

SD = $\sqrt{102.745}$ = 10.14

Y_1	(Y_1-Y_1)	$(Y_1-Y_1)^2$	P	$P(Y_1-Y_1)^2$
05	-9.25	85.56	0.10	8.55
10	-4.25	18.06	0.25	4.51
15	0.75	0.56	0.40	0.22
20	5.75	33.06	0.20	6.61
25	10.75	115.56	0.05	5.78
				25.67

$$SD= \sqrt{25.67} = 5.07$$

Illustration 5

The following is the information of stock A and stock B under the possible states of nature:

State of nature	Probability	Return 'A'	Return 'B'
1	0.10	5%	0%
2	0.30	10%	8%
3	0.50	15%	18%
4	0.10	20%	26%

(1) Calculate expected return on A and B.

(2) Calculate the standard deviation of stock A and B.

(3) If you want to invest in any one stock, which stock would you prefer?

Solution:

(1) Calculation of expected return

State of nature	Probability	$R_a\%$	$R_b\%$	$ER_a\%$	$ER_b\%$
1	0.10	5	0	0.50	0
2	0.30	10	8	3.0	2.40
3	0.50	15	18	7.50	9.00
4	0.10	20	26	2.00	2.06
				13.00	14.00

(2) (i) Calculation of standard deviation of stock A

State of Economy	K_i	$(K_i - K_i)$	$(K_i - K_i)^2$	P	$P(K_i - K_i)^2$
1	5	-8	64	0.10	6.40
2	10	-3	09	0.30	2.70
3	15	2	04	0.50	2.00
4	20	7	49	0.10	4.90
					16

$$16 \, \sigma_a = \sqrt{16} = 4\%$$

(ii) Calculation of standard deviation of stock B

State of Economy	K_i	$(K_i - \overline{K_i})$	$(K_i - \overline{K_i})^2$	P	$P(K_i - \overline{K_i})^2$
1	0	-14	196	0.10	19.6
2	8	-6	36	0.30	10.8
3	18	4	16	0.50	8.0
4	26	12	144	0.10	14.4
					52.8

$$\sigma_b = \sqrt{52.8} = 7.25\%$$

(3) Expected return on stock B is higher but the risk (S.D.) is also higher. Therefore, Risk averse investor can invest in stock A while the risk taker will invest in stock B.

Illustration 6

Following is the information about shares of ABC Ltd, and XYZ Ltd, under different economic condition. At present both shares are traded at ₹ 100.

Economic Condition	Probability	Expected price of Shares ABC Ltd,	Expected price of Shares XYZ Ltd,
High growth	0.3	140/-	150/-
Low growth	0.4	110/-	100/-
Stagnation	0.2	120/-	120/-
Recession	0.1	100/-	80/-

(i) Which company has more risk to invest?

(ii) Mr. Ram wants to invest ₹ 10,000

    (1) Only in ABC Ltd.

    (2) Only in XYZ Ltd.

    Which is better option justify?

(iii) Will your decision change if probabilities are 0.4, 0.4, 0.1, 0.1 respectively?

Solution:

(i) Calculation of rate of return:

$$\text{Rate of return} = \frac{\text{Expected Price} - \text{Present Price}}{\text{Present Price}} \times 100$$

ABC Ltd.	XYZ Ltd.
High growth $= \dfrac{140-100}{100} \times 100 = 40\%$	$= \dfrac{150-100}{100} \times 100 = 50\%$
Low growth $= \dfrac{110-100}{100} \times 100 = 10\%$	$= \dfrac{100-100}{100} \times 100 = 0\%$
Stagnation $= \dfrac{120-100}{100} \times 100 = 20\%$	$= \dfrac{120-100}{100} \times 100 = 20\%$
Recession $= \dfrac{100-100}{100} \times 100 = 0\%$	$= \dfrac{80-100}{100} \times 100 = 20\%$

(ii) Calculation of expected return:

Eco-condition	Rate of Return		Probability	Expected return	
	ABC %	XYZ %		ABC Ltd.,	XYZ Ltd.,
High growth	40	50	0.3	12	15
Low growth	10	0	0.4	4	0
Stagnation	20	20	0.2	4	4
Recession	0	-20	0.1	0	-2
				20	17

(iii) Calculation of S.D. of ABC Ltd.

Eco-condition	Return (K)	(K – Ki)	(K – Ki)²	P	P(K – K)²
High growth	40	20	400	0.3	120
Low growth	10	-10	100	0.4	40
Stagnation	20	0	0	0.2	0
Recession	0	-20	400	0.1	40
					200

SD $= \sqrt{200} = 14\%$

(iv) Calculation of SD of XYZ Ltd.

Eco-condition	Return (K)	(K – Ki)	(K – Ki)²	P	P(K – K)²
High growth	50	33	1089	0.3	326.7
Low growth	0	-17	289	0.4	115.6
Stagnation	20	3	9	0.2	1.8
Recession	-20	-37	1369	0.1	136.9
					581

SD $= \sqrt{581} = 24\%$

(v) SD when probability are changed ABC Ltd.

Eco-condition	Return (K)	(K-Ki)	(K – Ki)²	P	P(K – K)²
High growth	40	18	324	0.4	129.6
Low growth	10	-12	144	0.4	57.6
Stagnation	20	-2	04	0.1	0.4
Recession	0	-22	484	0.1	48.4
					236

$$SD = \sqrt{236} = 15.36$$

(vi) SD when probability are changed XYZ Ltd.

Eco-condition	Return (K)	(K-Ki)	(K – Ki)²	P	P(K – K)²
High growth	50	30	90	0.4	360
Low growth	0	-20	400	0.4	160
Stagnation	20	3	9	0.1	0
Recession	-20	-40	1600	0.1	160
					680

$$SD = \sqrt{680} = 26.08$$

If the probabilities are changed, then the decision will not change.

Illustration 7

The following is the information of stock X and stock Y under the possible states of nature:

States of nature	Probability	Return on X	Return on Y
Boom	0.10	5%	0%
Normal	0.30	10%	8%
Recession	0.50	15%	18%
Recovery	0.10	20%	26%

You are required to:

(i) Calculate the expected return on stock X and Y.

(ii) Calculate the standard deviation of both the stocks, and

(iii) If you want to invest in any one stock, which stock would you prefer?

Solution:

(i) Calculation of expected return on stock X and Y.

State of nature	Probability	Rate on return %		Expected return	
		X	Y	X	Y
Boom	0.10	5	0	0.50	0
Normal	0.30	10	8	3.00	2.40
Recession	0.50	15	18	7.50	9.00
Recovery	0.10	20	26	2.00	2.6
		Expected return		13.0	14.0

(ii) Calculation of standard deviation of stock 'X'.

State of nature	K_i	(K-Ki)	$(K_i - K_i)^2$	P	$P(K - Ki)^2$
Boom	5	-8	64	0.10	6.4
Normal	10	-3	09	0.30	2.7
Recession	15	2	04	0.50	2.0
Recovery	20	7	49	0.10	4.9
					16

Standard deviation $= \sqrt{16} = 04\%$

(iii) Calculation of standard deviation of stock 'Y'.

State of nature	K_i	(K-Ki)	$(K_i - K_i)^2$	P	$P(K - Ki)^2$
Boom	0	-14	196	0.10	19.6
Normal	8	-06	36	0.30	10.8
Recession	18	4	14	0.50	8.0
Recovery	26	12	144	0.10	14.40
					52.8

Standard deviation $= \sqrt{52.8} = 7.27\%$

Expected return on stock 'Y' is higher than 'X'. However, standard deviation is also higher. Hence, investment in stock 'X' is preferred because expected return is reasonable and risk (SD) is lower.

Illustration 8

Mr. Rajesh, a fund manager produced the following returns for the last five years. Rates of return on Sensex are also given on comparison:

	2003-04	2004-05	2005-06	2006-07	2007-08
Mr. Rajesh	6%	48%	-15%	7%	11%
Sensex	12%	40%	-6%	20%	3%

Calculate the average return and standard deviation of Mr. Rajesh's mutual fund. Did he do better or worse than sensex by these measures?

Solution:

Calculation of average return and standard deviation

Year	Rajesh			Sensex		
	R_i	$R_i - \overline{R_i}$	$(R_i - \overline{R_i})^2$	R_i	$R_i - \overline{R_i}$	$(R_i - \overline{R_i})^2$
2003-04	6	-5.4	29.16	12	-1.8	3.24
2004-05	48	36.6	1339.56	40	-26.3	686.44
2005-06	-15	-26.4	696.96	-06	-19.8	392.04
2006-07	07	-4.4	19.36	20	6.2	38.44
2007-08	11	-0.4	0.16	03	-10.8	116.64
			2085.20			1236.80

$$\text{Average return} = \frac{\sum R_i}{n}$$

$$\text{Average return of Rajesh} = \frac{57}{5} = 11.4\%$$

$$\text{Average return of Sensex} = \frac{69}{5} = 13.8\%$$

$$\text{Standard deviation of return} = \sqrt{\frac{\sum (R_i - \overline{R_i})}{n}}$$

$$\text{Standard deviation of Rajesh's return} = \sqrt{\frac{2085}{5}} = \sqrt{417} = 20.42\%$$

$$\text{Standard deviation of sensex return} = \sqrt{\frac{1236.80}{5}} = \sqrt{247.36} = 15.72\%$$

Average return on Rajesh's mutual fund is 11.4% and standard deviation is 20.42% while average return on sensex is 13.8% and standard deviation is 15.72%. Therefore, the performance of Rajesh's mutual fund is worse than sensex.

Illustration 9

Compute the expected return of an investment in the following security.

Economic condition	Probability (P)	Return on investment (%)
Boom	0.275	40
Stagnation	0.450	20
Depression	0.275	-10

Solution:

Economic condition	Probability (P)	Return on	Expected return investment (%)
Boom	0.275	40	11.00
Stagnation	0.450	20	09.00
Depression	0.275	-10	-02.75
			17.25

Illustration 10

Ashok purchased 100 shares of A Ltd., four years ago at ₹ 500 each. The rate of brokerage was 1%. The company paid the following dividends:

	Year 1	Year 2	Year 3	Year 4
Dividend per share (₹)	2	2	2.50	3
Dividend amount	200	200	250	300

The current price of the share is ₹ 600. What is the profit has be earned on his investment if he sells the shares now?

Solution:

Calculation of profit on sale of shares:		
(i) Calculation of investment	₹	
100 shares @ ₹ 500 each	50,000	
Add: Brokerage @ 1%		500
Total	₹ 50,000	
(ii) Total dividend received		
₹ 200 + 200 + 250 + 300	₹ 950	
(iii) Sales realised	₹	
100 shares @ ₹ 600 each	₹ 60,000	
Less: Brokerage @1%		600
Net proceeds	₹ 59,400	

(iv) Capital appreciation = ₹ 59,400 - ₹ 50,500

$$= ₹ 8,900$$

(v) Total profit earned = Dividend + Capital Appreciation

$$= ₹ 950 + ₹ 8,900$$

$$= ₹ 9,850$$

(vi) Holding period return $= \dfrac{\text{Profit}}{\text{investment}} \times 100$

$$= \frac{9,850}{50,500} \times 100 = 19.50\%$$

(vii) Annualised return $= \dfrac{19.50}{4} = 4.88\%$

Illustration 11

An investor would like to find the expected return on the share of Golden Ltd. The following data have been available:

State of economy	Probability	Rate of Return
Boom	0.30	30
Normal	0.50	18
Recession	0.20	10

Calculate the expected return from the share.

Solution:

Calculation of expected return from the share

State of economy	P	R_i	$\overline{R}_i$	$(R_i - \overline{R}_i)$	$(R_i - \overline{R}_i)^2$	$P(R_i - \overline{R}_i)^2$
Boom	0.30	30	9	10	100	30
Normal	0.50	18	9	-2	4	2
Recession	0.20	10	2	-10	100	20
				20		52

∴ The expected return of share is 20%

Illustration 12

Given below are the likely returns in case of shares of VCC Ltd. and LCC Ltd. in the various economic conditions. Both the shares ae presently quoted at 100 per share.

Economic Conditions	Probability	Returns of VCC Ltd.	Returns of LCC Ltd.
High Growth	0.3	100	150
Low Growth	0.4	110	130
Stagnation	0.2	120	90
Recession	0.1	140	60

Which of two companies are risky investments?

Solution:

Calculation of expected return and standard deviation for VCC Ltd.

Economic Conditions	P	R_i	$\overline{R}_i$	$(R_i - \overline{R}_i)$	$(R_i - \overline{R}_i)^2$	$P(R_i - \overline{R}_i)^2$
High Growth	0.3	100	30	− 12	144	43.2
Low Growth	0.4	110	44	− 2	4	1.6
Stagnation	0.2	120	24	8	64	12.8
Recession	0.1	140	14	28	784	78.4
			112			136

∴ Standard deviation

$$\sigma = \sqrt{136}$$

$$\sigma = 11.66\%$$

∴ Expected Return = 112%

∴ Standard Deviation = 11.66%

Calculation of expected return and standard deviation for LCC Ltd.

Economic Conditions	P	R_i	$\overline{R}_i$	$(R_i - \overline{R}_i)$	$(R_i - \overline{R}_i)^2$	$P(R_i - \overline{R}_i)^2$
High Growth	0.3	150	45	29	841	252.3
Low Growth	0.4	130	52	9	81	32.4
Stagnation	0.2	90	18	− 31	961	192.2
Recession	0.1	60	6	− 61	3721	372.1
			121			849

∴ Standard Deviation

$$\sigma = \sqrt{849}$$

$$\sigma = 29.14\%$$

∴ Expected Return = 121%

Standard Deviation = 29.14%

Standard deviation measures the risk of every security. Higher the standard deviation, higher is the risk. Here, VCC Ltd. and have 11.66% standard deviation and LCC Ltd. have 29.14% standard deviation.

Hence, the investment in LCC Ltd. is risky as compared to VCC Ltd. though it gives more returns.

Illustration 13

The rate of return on stocks X and Y under different states of the economy are given below:

States of Economy	Probability	Returns on Stock X (%)	Returns on Stock Y (%)
Boom	0.35	20	40
Normal	0.50	30	30
Recession	0.15	40	20

(i) Calculate expected return and SD of return on both the stocks.

(ii) If you could invest in either stock X or stock Y, but not in both, which stock would you prefer?

(iii) What would be your decision if the probability changes to 0.30, 0.40 and 0.30?

Solution:

Calculation of expected return and SD of Stock X

State of economy	Probability (P)	R_i	$\overline{R}_i$	$(R_i - \overline{R}_i)$	$(R_i - \overline{R}_i)^2$	$P(R_i - \overline{R}_i)^2$
Boom	0.35	20	7	− 8	64	22.4
Normal	0.50	30	15	2	4	2
Recession	0.15	40	6	12	144	21.6
			28			46

Standard deviation $(\sigma) = \sqrt{46}$

$$\sigma = 6.78\%$$

∴ Expected Return = 28%

Standard Deviation = 6.78%

Calculation of expected return and SD of stock Y

State of Economy	P	R_i	$\overline{R}_i$	$(R_i - \overline{R}_i)$	$(R_i - \overline{R}_i)^2$	$P(R_i - \overline{R}_i)^2$
Boom	0.35	40	14	8	64	22.4
Normal	0.50	30	15	− 2	4	2
Recession	0.15	20	3	− 12	144	21.6
			32			46

Standard deviation $(\sigma) = \sqrt{46}$

$$\therefore \sigma = 6.78\%$$

∴ Expected Return = 32%

Standard Deviation = 6.78%

I would prefer the stock Y as it gives more returns than stock X and the standard deviation is also same, i.e., 6.78%.

Calculation of expected return and SD of stock X with new probability

State of economy	P	R_i	$\overline{R}_i$	$(R_i - \overline{R}_i)$	$(R_i - \overline{R}_i)^2$	$P(R_i - \overline{R}_i)^2$
Boom	0.30	20	6	-10	100	30
Normal	0.40	30	12	0	0	0
Recession	0.30	40	12	10	100	30
			30			60

Standard Deviation $(\sigma) = \sqrt{60}$

$$\sigma = 7.75\%$$

$\therefore$ Expected Return = 30%

Standard Deviation = 7.75%

Calculation of expected return and SD of stock Y with new probability

State of economy	P	R_i	$\overline{R}_i$	$(R_i - \overline{R}_i)$	$(R_i - \overline{R}_i)^2$	$P(R_i - \overline{R}_i)^2$
Boom	0.30	40	12	10	100	30
Normal	0.40	30	12	0	0	0
Recession	0.30	20	6	-10	100	30
			30			60

Standard Deviation $(\sigma) = \sqrt{60}$

$$\sigma = 7.75\%$$

$\therefore$ Expected Return = 30%

Standard Deviation = 7.75%

The decision will not change with the changes in probabilities because with earlier probabilities stock Y gives higher returns.

14.

Particulars	Boom	Normal	Recession
Probability	0.3	0.4	0.3
ROR of Stock A(%)	20	30	50
ROR of Stock B (%)	50	30	20

Calculate:

1. Expected Rate of Return
2. Standard Deviation
3. Which stock to be preferred?

Solution:

Calculation of expected return and SD of stock A

State of Economy	P	R_i	$\overline{R}_i$	$(R_i - \overline{R}_i)$	$(R_i - \overline{R}_i)^2$	$P(R_i - \overline{R}_i)^2$
Boom	0.3	20	6	-13	169	50.7
Normal	0.4	30	12	-3	9	3.6
Recession	0.3	50	15	17	289	86.7
			33			141

Standard Deviation $(\sigma) = \sqrt{141}$

$$\sigma = 11.87\%$$

$\therefore$ Expected Return = 33%

Standard Deviation = 11.87%

Calculation of expected return and standard deviation of stock B.

Situations	P	R_i	$\overline{R}_i$	$(R_i - \overline{R}_i)$	$(R_i - \overline{R}_i)^2$	$P(R_i - \overline{R}_i)^2$
Boom	0.3	50	15	17	289	86.7
Normal	0.4	30	12	-3	9	3.6
Recession	0.3	20	6	-13	169	50.7
			33			141

Standard Deviation $(\sigma) = \sqrt{141}$

$$\sigma = 11.87\%$$

$\therefore$ Expected Return = 33%

Standard Deviation = 11.87%

Both stocks gives the same returns. So, investment in any stock is preferable.

Illustration 15

Particulars	Boom	Normal	Recession
Probability	0.4	0.3	0.3
ROR of Stock P(%)	40	30	20
ROR of Stock Q (%)	30	25	15

Calculate:

1. Expected Rate of Return
2. Standard Deviation
3. Which stock to be preferred?

Calculation of expected return and standard deviation of stock P

Situations	P	R_i	$\overline{R}_i$	$(R_i - \overline{R}_i)$	$(R_i - \overline{R}_i)^2$	$P(R_i - \overline{R}_i)^2$
Boom	0.4	40	16	9	81	32.4
Normal	0.3	30	9	− 1	1	0.3
Recession	0.3	20	6	− 11	121	36.3
			31			69

Standard Deviation $(\sigma) = \sqrt{69}$

$= 8.31\%$

$\therefore$ Expected Return $= 31\%$

Standard Deviation $= 8.31\%$

Calculation of expected return and standard deviation of stock Q

Situations	P	R_i	$\overline{R}_i$	$(R_i - \overline{R}_i)$	$(R_i - \overline{R}_i)^2$	$P(R_i - \overline{R}_i)^2$
Boom	0.4	30	1.2	6	36	14.4
Normal	0.3	25	7.5	1	1	0.3
Recession	0.3	15	4.5	− 9	81	24.3
			24			39

Standard Deviation $(\sigma) = \sqrt{39}$

$= 6.24\%$

$\therefore$ Expected Return $= 24\%$

Standard Deviation $= 6.24\%$

Stock Q is preferable because it is less risky as compared to stock P.

Illustration 16

Ms. Radha purchased 4,000 shares at ₹ 25 each on 15.10.04. She earned dividend as below:

8,000, 9,000, 12,000 and 14,000. She sold all her holdings at ₹ 1,35,000.

What are her holding period returns?

What is annualised return?

Is Ms. Radha is a good investor?

Solution:

1. Investment of Ms. Radha = ₹ 25 × 4,000

   = ₹ 1,00,000

2. Dividend = 8,000 + 9,000 + 12,000 + 14,000

   = ₹ 43,000

3. Sales Price = ₹ 1,35,000

   Total Return = Dividend + Capital Gain

   $= 43,000 + (1,35,000 - 1,00,000)$

   $= 43,000 + 35,000$

   = ₹ 78,000

4. Rate of Return $= \dfrac{\text{Total Return}}{\text{Investment}} \times 100$

   $= \dfrac{78,000}{1,00,000} \times 100$

   $= 78\%$

5. Annualised Returns $= \dfrac{78}{4}$

   $= 19.5\%$

   ∴ Holding Period Return is 78%

   Annualised Return is 19.5%

   Ms. Radha is good investor.

EXERCISES

Objective Type Questions

State whether the following statements are True (T) or False (F).

1. The distance between intersection and horizontal axis is called beta risk.
2. The most important part of the regression equation is beta risk.
3. The relationship between stocks, returns and market indexs structures is called beta.
4. Correlation and covariance techniques are complementary methods for calculation of risk.
5. Rho describes the dispersion of the observations around the regression line.
6. The statistical tool to measure a companys risk is standard deviation.

7. Systematic risk is caused by the operating environment within an industry.

8. Purchasing power risk is a part of systematic risk.

9. Return is measured according to the internal risk.

10. Holding period yield is important to find out what the investor receives as income during the time he holds an asset.

Ans: 1. (F), 2. (T), 3. (T), 4. (T), 5. (T), 6. (T), 7. (F), 8. (T), 9. (F), 10. (T).

Sume for Practice

1. Prashant buys ₹ 30,000 of stock A Ltd, and sells short ₹ 10,000 of stock of B Ltd. using all the proceeds to buy more of stock Y Ltd. The corelation between the two securities is 0.45. The expected returns of stock A and B are 15% and 10% respectively with the standard deviation of 10% and 12%. What is the expected return and standard deviation of Vasant portfolio?

2. Mahesh has invested in two stocks, one is having a standard deviation of 20 per cent, the other is having a standard deviation of 30 per cent. The correlation between their rates of return is 0 and he has invested half of the money in each of the two stocks. Find out the standard deviation of his portfolio.

3. (a) What will be the expected rate of return on a portfolio composed of the followin securities?

Security	Expected return %	Proportion %
A	10	25
B	15	25
C	20	50

(b) What will be the expected return if the proportion of each security in the portfolio is 20, 30, and 50 respectively?

4. Ms. Monalisa's portfolio returns are given below:

Year	Returns of orange	Returns of airtel
1	10	12
2	16	18

Standard deviation of both the securities is 3.

Calculate:

(a) Expected rate of return on Monalisa's portfolio if it is made up of 40% of Orange shares and 60% of Airtel shares.

(b) Covariance of Airtel and Orange.

(c) Portfolio risk is made up of 40% of Orange and 60% of Airtel.

5. Ashok purchased 100 shares of "A" Ltd. four years ago at ₹ 500 each. The rate of brokerage was 1%. The company paid the following dividends:

	Year 1	Year 2	Year 3	Year 4
Dividend per share (₹)	2	2	2.50	3
Dividend amount	200	200	250	300

The current price of the share is ₹ 600. What is the profit has to be earned on his investment if he sells shares now, and also find the rate of return?

6. Mr. T.S.V. Mani has a portfolio of five securities. The expected return and amount of investment in each security is as follows:

Security	A	B	C	D	E
Expected return	14%	8%	15%	9%	12%
Amount invested (₹)	20,000	10,000	30,000	25,000	15,000

Compute the expected return on T.S.V. Mani's portfolio.

7. Calculate the expected rate of return from the return from the following information relating to B Ltd.

State of economy	Probability of occurrences	Expected rate of return
Boom	0.30	40%
Normal	0.50	30%
Recession	0.20	20%

❏ ❏ ❏

8 FINANCIAL STATEMENT ANALYSIS

CHAPTER

Chapter Contents:

8.1 INTRODUCTION

Analysis of financial statement is a study of the relationship among the various financial factors in a business as disclosed by a single set of statements and a study of the trend of these factors as shown in a series of statements. Financial statements are the indicators of the two significant factors namely sound financial position and profitability of the firm. Analysis and interpretation of financial statements refers to the treatment of the income statement and balance sheet so as to attend full diagnosis of the profitability and financial soundness of the given data for financial statement analysis. It is a method by which methodical classification is provided explaining the meaning and significance of the data so simplified. Thus, interpretation requires analysis while analysis is meaningless without interpretation. Thus, it makes it very essential that every security is evaluated in a portfolio content, therefore, financial analysis should consider the determination of future risk and return in holding

various combinations of individual securities. It also helps the investors and portfolio managers to take decisions regarding investment in portfolio. Newspaper, journals and magazines all help the investors to gain knowledge about the financial position of the company and provide useful information to the investors.

8.2 MEANING OF FINANCIAL STATEMENTS

Financial statements present an organized collection of financial information prepared in accordance with accepted accounting and reporting norms. Financial statements are essentially historical in nature since they relate to the past period. They are prepared in monetary terms as they are the end product of the accounting process being summary of accounting data in the form of balance sheet, income statement and cash flow statement.

Balance Sheet

Balance sheet is also known as a Statement of Financial Position. This provides the value of the firm's assets, liabilities and equity on a particular day. As per the Companies Act, 1956, a company' balance sheet can be in "Horizontal form" or in "Vertical Form". The Vertical form is most commonly used form of balance sheet in India. Schedule VI Part I of the Companies Act prescribe the form and detailed rules for preparing balance sheet of companies, vertical form is specified in Part I of Schedule VI. A company can select any form. It also indicates that notes and general instructions must be adhered while preparing the balance sheet.

Income Statement

It is also known as Statement of Earnings, Revenue statement, the statement of operations and more commonly Statement of profit and loss account. The income statement depicts the results of the business for a period. It provides information on the various revenue and expense items during that period.

Although the Companies Act does not prescribe any particular format for the income statement, it has specified that income statement must show specific information as required by Schedule VI such as turnover purchase, opening and closing stocks, depreciation, interest on company debentures and loans, charge for taxation amount reserved for repayments of loan/capital and expenditure incurred specifically for consumption of stores, power, rent, repairs, employee cost, etc.

8.3 ANALYSIS OF FINANCIAL STATEMENTS

1. Horizontal Analysis
2. Vertical Analysis

1. What Does Horizontal Analysis Mean?

A procedure in fundamental analysis in which an analyst compares ratios or line items in a company's financial statements over a certain period of time. The analyst will use his or her discretion when choosing a particular timeline; however, the decision is often based on the investing time horizon under consideration.

This analysis refers to the study of past consecutive balance sheets, income statements or statements of cash flow at a time. The analysis can be made between two periods or over a series of periods. The relevant accounting numbers of all years of the study are presented horizontally in a statement over a number of columns each representing a year. Those figures can also be graphically presented. The figures of each year are compared with those of the base year, i.e., the beginning year of the study. This analysis is also called 'Dynamic Analysis' as it covers several years for study. This analysis is very much effective for understanding the direction and trend of the organisation particularly when it is undertaken for several years. Comparative statements and trend analysis are two important tools that can be employed for horizontal analysis.

2. Vertical Analysis

Vertical analysis can be defined as the, "procedure of preparing and presenting common size statements. Common size statement is one that shows the items appearing on it in percentage form as well as in amount form".

What Does Vertical Analysis Mean?

A method of financial statement analysis in which each entry for each of the three major categories of accounts (assets, liabilities and equities) in a balance sheet is represented as a proportion of the total account. The main advantages of vertical analysis are that the balance sheets of businesses of all sizes can easily be compared. It also makes it easy to see relative annual changes within one business.

When the analysis is restricted to the financial statements of one particular period only, it is known as vertical analysis of financial statements. In this analysis each item of a particular financial statement is expressed as percentage of a base figure selected from the same statement. It is also known as 'Static Analysis' as it concentrates solely on one year's financial statement. Common-size statements and accounting ratios are two important tools used for vertical analysis. This analysis is very much useful for understanding the structural relationship of various items in a financial statement. Vertical analysis can also be done for studying the relationship within a set of financial statements at a point of time.

8.4 BALANCE SHEET RATIOS

1. **Current ratio:** Current ratio is also known as solvency ratio or working capital ratio. Standard current ratio is 2:1 current ratio indicates the short term financial position of the firm its expressed as pure ratio.

   It is calculated as:

   $$\text{Quick ratio} = \frac{\text{Quick assets}}{\text{Quick liabilities}}$$

   Quick assets consist of:

   1. Debtors
   2. Cash and bank balance
   3. Bills receivable

   Quick liabilities consists of:

   1. Creditor
   2. Bills payable
   3. Outstanding expenses

2. **Debt assets ratio:** This ratio indicates the percentage or the proportion of the total assets created by the company through short-term and long-term debt.

   It can be calculated as:

   $$\text{Debt assets ratio} = \frac{\text{Debt}}{\text{Assets}}$$

   where, Debt = all liabilities including the short-term or long-term,

   Assets = all assets, i.e., fixed and current.

3. **Debt equity ratio:** It shows the proportion of debt to assets. It is expressed pure ratio.

   It can be calculated as:

   $$\text{Debt equity ratio} = \frac{\text{Debt}}{\text{Equity}}$$

   where, Debt = all liabilities including long-term and short-term

   Equity = net worth + preference capital

4. **Stock to working capital ratio:** Stock to working capital ratio express the relationship between closing stock and working capital. This ratio expressed as pure ratio or percentage ratio.

It can be calculated as:

$$\text{Stock to working capital} = \frac{\text{Closing stock}}{\text{Working capital}} \times 100$$

5. **Proprietors' ratio:** This ratio indicates the proportion of proprietor's funds to the total assets of the firm.

   It can be calculated as:

$$\text{Proprietors' ratio} = \frac{\text{Proprietor's funds}}{\text{Total assets}}$$

6. **Capital gearing ratio:** This ratio includes the relation between fixed income bearing securities to funds on which no fixed returns are to be paid. It is expressed as pure ratio.

   It can be calculated as:

$$\text{Capital gearing ratio} = \frac{\text{Preference capital} + \text{Debentures} + \text{Term loans}}{\text{Equity share capital} + \text{Reserves and surplus}}$$

8.5 REVENUE STATEMENT RATIO

1. **Gross profit ratio:** Gross profit ratio indicates the efficiency of production and trading operations. It is expressed as percentage.

   It can be calculated as:

$$\text{Gross profit ratio} = \frac{\text{Gross profit}}{\text{Net sales}} \times 100$$

2. **Operating ratio:** It is the index of managerial operation to control operating expenses.

   It can be calculated as:

$$\text{Operating ratio} = \frac{\text{Cost of goods sold} + \text{operating expenses}}{\text{Net sales}} \times 100$$

3. **Expenses ratio:** The ratio of each item of expense or group of expenses to net sales is known as an "Expenses ratio". Expenses ratios analyze each individual item of expense or group of expenses and express them as a percentage in relation to net sales.

$$\text{Administrative expenses ratio} = \frac{\text{Administrative expenses}}{\text{Net sales}} \times 100$$

$$\text{Selling and Distribution expenses ratio} = \frac{\text{Selling and Distribution expenses}}{\text{Net sales}} \times 100$$

$$\text{Financial ratio} = \frac{\text{Financial expenses}}{\text{Net sales}} \times 100$$

$$\text{Material consumed ratio} = \frac{\text{Material consumed}}{\text{Net sales}} \times 100$$

$$\text{Non-operating expenses ratio} = \frac{\text{Non} - \text{operating expenses}}{\text{Net sales}} \times 100$$

4. **Net profit ratio:** Net profit ratio indicated the relationship between net profit and net sales. Net profit can be either operating net profit or net profit after tax or net profit before tax.

   It can be calculated as:

   1. $\text{Net profit before tax ratio} = \dfrac{\text{Net profit before tax}}{\text{Net sales}} \times 100$

   2. $\text{Net profit after tax ratio} = \dfrac{\text{Net profit after tax}}{\text{Net sales}} \times 100$

5. **Net operating ratio:** It is a relationship between net operating profit and net sales which is expressed as percentage. Net operating profit is equal to gross profit minus all operating expenses.

   It can be calculated as:

   $$\text{Net Operating Profit ratio} = \frac{\text{Net Operating Profit}}{\text{Net sales}} \times 100$$

6. **Stock turnover ratio:** Stock turnover ratio is also known as "Inventory ratio" or stock velocity ratio.This ratio measure the number of times stock turns of lows or rotates in an accounting period compared to the sales effected during the period.

   It can be calculated as:

   $$\text{Stock turnover ratio} = \frac{\text{Cost of goods sold}}{\text{Average stock}}$$

   Average stock is calculated by adding inventory in the beginning of the period to the inventory at the close of the period and the product is divided by two. When the opening stock figure is not available, closing stock can be considered as the average stock.

   $$\text{Average stock} = \frac{\text{Opening stock} + \text{closing stock}}{2}$$

8.6 COMBINED RATIOS

Combined ratios or inter-statement ratios shows relationship between two items or two groups or item of which one is form balance sheet and one of the revenue statements.

1. **Return on capital employed:** This ratio explains the relationship between total profits earned by the business and total investment made or total assets employed. This ratio, thus measures the overall efficiency of the business operations. This ratio is also known as "return on total resources" return on total assets. This is always expressed as a percentage.

   It can be calculated as:

   $$\text{Return on capital employed ratio} = \frac{\text{Net profit before tax and Interest}}{\text{Capital employed}} \times 100$$

   Capital employed = Owned funds + Borrowed funds

   OR

   Capital employed = Fixed assets + currents assets – Current liabilities

2. **Return on proprietors' Funds:** It is also known as "Return of Proprietors' equity" or return on shareholders' investment. The above ratio indicates the relationship between net profit earned and total proprietors' funds.

   It can be calculated as:

   $$\text{Return on proprietors' ratio} = \frac{\text{Net profit tax}}{\text{Pr oprietors' funds}} \times 100$$

   Proprietors Funds = Equity share capital + Preference share capital + Reserve and Surplus – Miscellaneous expenses.

3. **Return on Equity share capital:** This ratio indicates the rate of earning on the equity or ordinary share capital.

   It can be calculated as:

   $$\text{Return on Equity share capital ratio} = \frac{\text{Net profit tax} - \text{preference dividend}}{\text{Equity share capital}}$$

4. **Earnings per share:** Earning per share is calculated to find out the overall profitability of the organization. It is indicated by the following formula.

   $$\text{Earnings per share} = \frac{\text{Net profit tax} - \text{preference dividend}}{\text{Number of equity shares}}$$

5. **Dividend payout ratio:** The purpose of this ratio is to find out the proportion of earning used for payment of dividend and the proportion of earning retained. The ratio is a relationship

between earning per equity share and dividend per equity share, It is indicated by the following formula.

$$\text{Dividend payout ratio} = \frac{\text{Dividend per equity share}}{\text{Earnings per Equity share}}$$

6. **Debtors Turnover ratio (debtors velocity):** Debtors turnover ratio is also known as "Accounts receivable turnover ratio" or average collection period. It attempts to measure the collectability of debtors and other account receivable. It shows the rate at which the trade debtors are being collected.

$$\text{Debtor turnover ratio} = \frac{\text{Credit sales}}{\text{Average debtors} + \text{average bills receivable}} \times 360$$

Debtor collection period: Debt collection period indicates the extent to which the debts have been collected in time.

$$\text{Debt collection period} = \frac{\text{No. of days in a year}}{\text{Debtors Turnover}}$$

7. **Creditors Turnover period:** Creditor's turnover shows the speed with which payments are made to the supplier for purchases made from them. It is a relationship between net credit purchases and average creditors.

It can be calculated as:

$$\text{Creditor turnover ratio} = \frac{\text{Credit sales}}{\text{Average creditors} + \text{average bills payable}} \times 360$$

8. **Creditors payment period:** Creditors turnover ratio is further used to find out the average rate of payables by using the following formula:

$$\text{Creditor collection period} = \frac{\text{Number days in a year}}{\text{Creditors Turnover}}$$

Illustration 1

Balance Sheet

Capital and Liabilities	A Ltd.₹	B Ltd.₹	Assets	A Ltd.₹	B Ltd.₹
Share capital	88,000	88,000	Fixed Assets	1,21,000	96,800
Reserves	42,900	35,200	Current Assets	1,25,400	1,03,400
8% Debentures	22,000	22,000			
Current liabilities	93,500	55,000			
	2,46,400	**2,00,200**		**2,46,400**	**2,00,200**

Revenue Statement for the year

	₹	₹
Sales	3,30,000	2,64,000
Less: Cost of Sales	2,37,600	1,98,000
Gross Profit	92,400	66,000
Less: Operating profit Expenses	63,800	44,000
Operating Profit	28,600	22,000
Less: Income Tax	12,100	9,240
Net Profit after tax	16,500	12,760
Less: Dividend	8,800	6,600
Retained Earning	7,700	6,160

From the above data calculate following ratios and comment:

(a) Proprietary ratio

(b) Capital Gearing Ratio

(c) Gross Profit Ratio

(d) Operating Ratio, and

(e) Return on Proprietors' Equity

Solution:

(a) Proprietory Rati $= \dfrac{\text{Shareholders' Funds}}{\text{Total Assets}}$

A Ltd., $= \dfrac{88,000 + 4,29,000}{2,46,400} = 0.53$ or 53%

B Ltd., $= \dfrac{8,8000 + 35,200}{2,00,200} = 0.62$ or 62%

(b) Capital Gearing Ratio $= \dfrac{\text{Capital Carrying Fixed Rate of Dividend}}{\text{Capital not Carrying Fixed Rate of Dividend}}$

A Ltd., $= \dfrac{22,000}{88,000 + 42,900} = \dfrac{22,000}{1,30,900} = 0.168$

B Ltd., $= \dfrac{22,000}{88,000 + 35,200} = \dfrac{22,000}{1,23,200} = 0.178$

(c) Gross Profit Ratio $= \dfrac{\text{Gross Profit}}{\text{Sales}} \times 100$

A Ltd., $= \dfrac{92,400}{3,30,000} \times 100 = 28\%$

$$\text{B Ltd., } = \frac{66,000}{2,64,000} \times 100 = 25\%$$

(d) Operating Ratio $= \dfrac{\text{Cost of Goods Sold} + \text{Ooerating Expenses}}{\text{Sales}} \times 100$

$$\text{A Ltd., } = \frac{2,37,600 + 63,800}{3,30,000} \times 100$$

$$= \frac{3,01,400}{3,30,000} \times 100 = 91.21\%$$

$$\text{B Ltd., } = \frac{1,98,000 + 44,000}{2,64,000} \times 100$$

$$= \frac{2,42,000}{2,64,000} \times 100 = 91.64\%$$

(e) Return on Proprietors' Equity $= \dfrac{\text{Net Profit after tax}}{\text{Proprietors' Equity}} \times 100$

$$\text{A Ltd., } = \frac{16,500}{1,30,900} \times 100 = 12.61\%$$

$$\text{B Ltd., } = \frac{12,760}{1,23,200} \times 100 = 10.36\%$$

Illustration 2

From the following information, calculate Current Ratio, Liquid Ratio, Creditors' Turnover Ratio and Average Credit Sales of A Ltd. and B Ltd.

Particulars	A Ltd.₹	B Ltd.₹
Stock	8,00,000	1,00,000
Debtors	1,70,000	1,40,000
Cash	30,000	60,000
Trade Creditors	2,80,000	1,50,000
Bills Payable	20,000	10,000
Bank Overdraft	40,000	30,000
Creditors for Expenses	60,000	10,000
Total Purchases	9,30,000	6,60,000
Cash Purchases	30,000	20,000
Credit to Debtors	3 months	3 months

(T.Y. BBI, Sem. V; Nov. 2007, M.U.)

Solution:

(a) **Current Ratio:** $= \dfrac{\text{Current Assets}}{\text{Current Liabilities}}$

$= \dfrac{\text{Stock} + \text{Debtors} + \text{Cash}}{\text{Creditors} + \text{Bills Payable} + \text{Bank Overdraft} + \text{Creditors for Expenses}}$

A Ltd. $= \dfrac{8,00,00 + 70,000 + 30,000}{2,80,000 + 20,000 + 40,000 + 60,000}$

$= \dfrac{10,00,000}{4,00,000} = 2.5 : 1$

B Ltd. $= \dfrac{1,00,00 + 1,40,000 + 60,000}{1,50,00 + 10,000 + 30,000 + 10,000}$

$= \dfrac{3,00,000}{2,00,000} = 1.5 : 1$

(b) **Liquid Ratio** $= \dfrac{\text{Quick Assets}}{\text{Quick Liabilities}}$

$= \dfrac{\text{Current Assets} - \text{Stock}}{\text{Current Liabilities} - \text{Bank Overdraft}}$

A Ltd. $= \dfrac{10,00,000 - 8,00,000}{4,00,000 - 40,000}$

$= \dfrac{2,00,00}{3,60,000} = 0.56 : 1$

B Ltd. $= \dfrac{3,00,000 - 1,00,000}{2,00,000 - 30,000}$

$= \dfrac{2,00,000}{1,70,000} = 1.18 : 1$

(c) **Creditors Turnover Ratio** $= \dfrac{\text{Credit Purchases}}{\text{Average Creditors} + \text{Bills Payable}}$

$= \dfrac{\text{Total Purchases} - \text{Cash Purchases}}{\text{Creditors} + \text{Bills Payable}}$

$$\text{A Ltd.} = \frac{9,30,000 - 30,000}{2,80,000 - 20,000}$$

$$= \frac{9,00,000}{3,00,000} = 3 \text{ times}$$

$$\text{B Ltd.} = \frac{6,60,000 - 20,000}{1,50,000 - 10,000}$$

$$= \frac{6,40,000}{1,60,000} = 4 \text{ times}$$

(d) Average Credit Sales $= \dfrac{\text{Average Debtors}}{\text{Credit Period to Debtors}} \times 12$

$$\text{A Ltd.} = \frac{1,70,000}{3} \times 12 = ₹ \ 6,80,000$$

$$\text{B Ltd.} = \frac{1,40,000}{3} \times 12 = ₹ \ 5,60,000$$

Illustration 3

The consolidated Balance Sheet of Y Ltd. as on 31st March, 2004 is as follows:

Liabilities	₹	Assets	₹
Equity Share Capital	6,00,000	Fixed Assets	9,00,000
Reserves	2,00,000	Stock	3,00,000
6% Debentures	5,00,000	Marketable Investments	1,00,000
Current Liabilities	2,00,000	Debtors	1,50,000
Bank Overdraft	1,00,000	Cash and Bank Balance	1,00,000
Preliminary Expenses	50,000		
	16,00,000		**16,00,000**

(a) Current Ratio

(b) Liquid Ratio

(c) Proprietary Ratio

(d) Stock-working Capital Ratio

Solution:

(i) **Current Ratio:**

$$= \frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{6,50,000}{3,00,000} = 2.17$$

(ii) **Liquid Ratio:**

$$= \frac{\text{Liquid Current Assets}}{\text{Liquid Current Liabilities}} = \frac{\text{C.A.} - \text{Stock}}{\text{C.L.} - \text{B.O.D.}}$$

$$= \frac{6,50,000 - 3,00,000}{3,00,000 - 1,00,000} = \frac{3,50,000}{2,00,000} = 1.75$$

(iii) **Proprietory Ratio:**

$$= \frac{\text{Proprietors' Fund}}{\text{Total Assets}} = \frac{7,50,000}{9,00,000 + 6,50,000}$$

$$= \frac{7,50,000}{15,50,000} = 0.48 \text{ or } 48\%$$

(iv) **Stock Working Capital Ratio:**

$$= \frac{\text{Stock}}{\text{Working Capital}} = \frac{3,00,000}{3,50,000} = 0.857 = 86\%$$

Illustration 4

From the following information calculate Current Ratio, Liquid Ratio, Creditor's Turnover Ratio and Average Credit Sales of XYZ Ltd. and PQR Ltd.

Particulars	XYZ Ltd.₹	PQR Ltd.₹
Stock	8,00,000	1,00,000
Debtors	1,70,000	1,40,000
Cash	30,000	60,000
Trade Creditors	2,80,000	1,50,000
Bills Payable	20,000	10,000
Bank Overdraft	40,000	30,000
Creditors for Expenses	60,000	10,000
Total Purchases	9,30,000	6,60,000
Cash Purchases	30,000	20,000
Credit to Debtors	3 months	3 months

Solution:

(a) **Current Ratio:** $= \dfrac{\text{Current Assets}}{\text{Current Liabilities}}$

$= \dfrac{\text{Stock} + \text{Debtors} + \text{Cash}}{\text{Creditors} + \text{Bills Payable} + \text{Bank Overdraft} + \text{Creditors for Expenses}}$

XYZ Ltd. $= \dfrac{8,00,000 + 1,70,000 + 30,000}{2,80,000 + 20,000 + 40,000 + 60,000}$

$= \dfrac{10,00,000}{4,00,000} = 2.5 : 1$

PQR Ltd. $= \dfrac{1,00,000 + 1,40,000 + 60,000}{1,50,000 + 10,000 + 30,000 + 10,000}$

$= \dfrac{3,00,000}{2,00,000} = 1.5 : 1$

(b) **Liquid Ratio** $= \dfrac{\text{Quick Assets}}{\text{Quick Liabilitis}}$

$= \dfrac{\text{Current Assets} - \text{Stock}}{\text{Current Liabilities} - \text{Bank Overdraft}}$

XYZ Ltd. $= \dfrac{10,00,000 - 8,00,000}{4,00,000 - 40,000}$

$= \dfrac{2,00,000}{3,60,000} = 0.56 : 1$

PQR Ltd. $= \dfrac{3,00,000 - 1,00,000}{2,00,000 - 30,000}$

$= \dfrac{2,00,000}{1,70,000} = 1.18 : 1$

(c) **Creditors' Turnover Ratio** $= \dfrac{\text{Credit Purchases}}{\text{Average Creditors} + \text{Bills Payable}}$

$= \dfrac{\text{Total Purchases} - \text{Cash Purchases}}{\text{Creditors} + \text{Bills Payabel}}$

$$\text{XYZ Ltd.} = \frac{9,30,000 - 30,000}{2,82,000 - 20,000}$$

$$= \frac{9,30,000 - 30,000}{2,82,000 - 20,000} = 3 \text{ times}$$

$$\text{PQR Ltd.} = \frac{6,60,000 - 20,000}{1,50,000 - 10,000}$$

$$= \frac{6,40,000}{1,60,000} = 4 \text{ times}$$

(d) Average Credit Sales $= \dfrac{\text{Average Debtors}}{\text{Credit Period to Debtors}} \times 12$

$$\text{XYZ Ltd.} = \frac{1,70,000}{3} \times 12 = ₹\ 6,80,000$$

$$\text{PQR Ltd.} = \frac{1,40,000}{3} \times 12 = ₹\ 5,60,000$$

Illustration 5

The profit and loss account and balance sheet of Yadav Ltd. are given below:

Particulars	Amount ₹	Particulars	Amount ₹
To Cost of Goods sold	3,00,000	By Sales	5,00,000
To Interest on debentures	10,000	By Income from Investment	10,000
To Provision for taxation	1,00,000		
To Net profit	1,00,000		
	5,10,000		**5,10,000**

Balance sheet as on 31-03-2005

Liabilities	Amount ₹	Assets	Amount ₹
Share capital		Fixed Assets	4,50,000
10% Preference capital	1,00,000	Current Assets	1,50,000
Equity Capital	2,00,000	Investments	1,00,000
Reserves	1,00,000		
10% Debentures	1,00,000		
P & L A/c	1,00,000		
Provision for Tax	1,00,000		
Total	**7,00,000**		**7,00,000**

You are required to calculate

(a) RoI based on profit to total assets

(b) RoI based on profit and net worth

Solution:

(a) $\text{RoI} = \dfrac{\text{Profit}}{\text{Total Assets}} \times 100$

$= \dfrac{2,00,000}{6,00,000} \times 100 = 33\%$

(b) $\text{RoI} = \dfrac{\text{Profit}}{\text{Net worth}} \times 100$

$= \dfrac{2,00,000}{6,00,000} \times 100 = 33\%$

NOTES:

1. Profit = Net profit before interest and taxes
    = 5,00,000 – 3,00,000 = ₹ 2,00,000

    Income from investment is not considered as profit

2. Total assets = Fixed assets + Current Assets
    = ₹ 4,50,000 + ₹ 1,50,000
    = ₹ 6,00,000

3. Net worth = Capital + Reserve and surplus
    = 1,00,000 + 2,00,000 + 1,00,000 + 2,00,000
    = 6,00,000

Illustration 6

The following information about "Sumesh Ltd." is supplied to you for the year ended 31st March, 2010.

Share capital	
10% of Preference shares of ₹ 20 each	6,00,000
Equity Shares of ₹ 10.each	16,00,000
	22,00,000
Profit after Tax	5,40,000
Depreciation	1,20,000
Equity Dividend Share	20%

Market price of equity share ₹ 80

You are required to compute the following:

(i)   Dividend yield ratio

(ii) Earnings per share

(iii) Price earning ratio

The pricing earning ratio of market index is 15 times. Would you advise your client to invest in this share?

Solution:

1. Dividend yield ratio $= \dfrac{\text{Dividend per share}}{\text{Market price per share}} \times 100$

    $= \dfrac{2}{80} \times 100 = 2.5\%$

2. Earnings per share $= \dfrac{\text{Prfit aftertax} - \text{PreferenceDividend}}{\text{Number of Equity Shares}}$

    $= \dfrac{5,40,000 - 60,000}{1,60,000} = ₹\ 3.00$

3. Price earning ratio $= \dfrac{\text{Market price per share}}{\text{Earnings per share}}$

    $= \dfrac{80}{3} = 26.67 \text{ times}$

Judging Undervaluation and Overvaluation of Shares

Common sense is the heart of investing and business management. Yet the paradox of common sense is that it is so uncommon. or example, people often refer to a stock or the market level as either "overvalued" or "undervalued". That is an empty statement. A share of stock or the aggregate of all shares in a market index have an intrinsic value, which is the sum of all future cash flows the share or the index will generate in the future, discounted to present value.

Estimating that amount of cash flows and its present value are difficult, but that defines value, and it is the same without regard to what people hope or guess it is. The result of the hoping and guessing game — sometimes the product of analysis, often not — is the share price or market level. Thus, it is more accurate to refer to a stock or a market index as overpriced or under priced than as overvalued or undervalued".

In financial markets, stock valuation is the method of calculating theoretical values of companies and their stocks. The main use of these methods is to predict future market prices, or more generally

potential market prices, and thus to profit from price movement — stocks that are judged undervalued (with respect to their theoretical value) are bought, while stocks that are judged overvalued are sold, in the expectation that undervalued stocks will, on the whole, rise in value, while overvalued stocks will, on the whole, fall.

In the view of fundamental analysis, stock valuation based on fundamentals aims to give an estimate of their intrinsic value of the stock, based on predictions of the future cash flows and profitability of the business. Fundamental analysis may be replaced or augmented by market criteria — what the market will pay for the stock, without any necessary notion of intrinsic value. These can be combined as "predictions of future cash flows/profits (fundamental)", together with "what will the market pay for these profits?". These can be seen as "supply and demand" sides — what underlies the supply (of stock), and what drives the (market) demand for stock.

8.7 EXERCISES

Multiple Choice Questions

Choose the right answer

1. The Financial stability is ensured if the company is solvent in _____.

    (i) Short-run

    (ii) Long-run

    (iii) Short and long-run

2. In case of a limited company, the term financial statements include _____.

    (i) P & L A/c   (ii) Balance sheet

    (iii) P & L A/c and Balance sheet   (iv) P & L appropriation A/c

3. The term current assets include _____.

    (i) Investments   (ii) Payment in advance

    (iii) Inventory   (iv) Deferred revenue expenditure

4. Financial Statements disclose only _____.

    (i) Material facts

    (ii) Monetary facts

    (iii) Likely facts

  Ans: 1. (iii), 2. (iii), 3. (ii), 4. (ii)

Sums for Practice

1. The following is the balance sheet of Realistic Co. Ltd. as on 31ˢᵗ March, 2005. Comment on this financial stability:

Liabilities	₹	Assets	₹
Share capital	1000000	Land and building	500000
Reserves and surplus	125000	Plant and machinery	700000
Bank overdraft	2000000	Stock	100000
Creditors	50000	Debtors	50000
Bills payable	25000	Bills receivable	15000
		Cash & bank	35000
	14,00,000		**14,00,000**

2. The following are the details of N Ltd.

Sales	12,00,000
Cost of goods	8,00,000
Profit	4,00,000
Capital	10,00,000

Calculate:

(a) Return on sales

(b) Capital turnover

(c) Return on investment

3. Draft the balance sheet of X Ltd. as at 31ˢᵗ December, 2004 from the summary of balances and make a brief report of the benefit of shareholders:

Debtors	57050
Stock	37200
Loans	100100
Bank overdraft	14000
Cash in hand	1000
Creditors	29000
Share capital	150000
Building	97300
Investment	128900
Preliminary expenses	8200
P & L a/c	36550

❏ ❏ ❏

9 | FUNDAMENTAL ANALYSIS

CHAPTER

Chapter Contents:

9.1 INTRODUCTION

There has been a phenomenal growth in Indian capital market in the recent years. The number of investors has grown up to 25 million. The government has initiated changes in the economic and financial policies. The liberalised schemes were announced with a view to overcome the foreign exchange crises due to adverse balance of payment in 1991. The abolition of the controller of capital issue and establishment of securities and exchange board of India have significantly contributed to changing the whole complexion of the investment scene.

A lay investor does not understand the techniques in the primary market as well as secondary market. He is not aware of the potentialities of tax planning and right investment decisions to make

money in stock market. A financial manager is always a borrower of funds and generally the seller of equity interest has to bargain with the investor. This analysis involves the examination of the past performance, present condition and future prospectus.

9.2 INVESTMENT ANALYSIS

An investor has to analyze the securities available for investment. Investment analysis means to make a comparative study of the type of industry, kind of security, fixed or variable securities. This helps to form beliefs regarding future behaviour of prices and stocks, the expected return and risk associated with it. All investment decisions are to be made on a scientific analysis.

The securities listed on stock exchange are equities, preference shares, bonds and debentures. These securities are traded on the stock exchange. It gives the price for each security. Trading provides liquidity to these securities. Thus, investment is promoted and savings flow into investment. The market reflects the economic and financial development in the country. The market is influenced by the flow of information and money.

9.3 FUNDAMENTAL ANALYSIS

Fundamental analysis is a method of finding out the future price of a security which an investor wants to buy. The objective of fundamental analysis is to raise the intrinsic value of a security. This is an intrinsic value for each security and it can be determined by making an analysis of the fundamental factors relating to the company, industry and economy. An investor can buy undervalued securities and sell overvalued securities.

The intrinsic value of a security is that value such as assets, earnings, dividends and prospects of the company. It is also measured as the present value of all future cash inflows on the security. The prospective dividend or interest stream depends upon the economic and industrial environment in the country.

The fundamental analysis is an attempt to estimate the real worth of the security by considering the earnings potential of a company. The earning potential of a company depends on investment environmental factors such as growth of national economy. The company's survival also depends upon the economy as a whole. The growth of economy is also favourable for the stock market. The intrinsic value of a security is closely associated with the economic environment in the country.

9.4 MACROECONOMIC ANALYSIS

It is very important to assess the state of the economy of making investment. If a recession is likely or undergoing the stock market is affected at certain times. On the other hand the stock market is also affected at certain times. This status of an economic activity has a major impact on overall stock market. Therefore, it is very important for the investor to assess the state of the economy and its impact on the stock market.

Investment in debt as well as ownership securities is closely associated with the economic activity of the country. An investment in the equity shares of a company is likely to be more profitable if the economy is strong and growing. The growth of a company depends basically on its ability to satisfy human wants through production of goods or creation and supply of services. Therefore, it is important to assess the state of the national economy over the next year or in long-term.

9.5 INDUSTRY ANALYSIS

Industry analysis is the study of industries which are on the upswing or growing. The ideal investment is the investment in the growing industry. There are certain industries which are growing in India. The recent examples are of entertainment and computer software. Investment in these industries will definitely gain in future.

The investor should know the industry classification used in the economy. It is also necessary to know the characteristics, problems and practices in different industries. A careful analysis of growth of industries will help to select few industries for investments. The competitive position of industries is also affected due to high labour cost, change in social habits, government regulations and automation.

An investor should select few industries that are in expansion stage. Investments should not be made in the industries which are in the pioneering stage. Similarly, industries that are in the stagnation stage or declining in economic importance should be avoided. It is difficult to identify a good industry for investment

9.6 COMPANY ANALYSIS

The industry analysis helps to select few industries for investment in securities. There are many companies in an industry. There are thousands of listed companies from computer software industry. Therefore, an investor has to select few companies for investment.

An company analysis is a study of the variables which influence the future price of a company's shares. It is an assessment of company's competitive position, earning capacity and profitability. It is a method of finding out the intrinsic value of a company's share. This requires internal as well as external information of the company. Internal investment consists of data and events of the company. External information consists of demand, supply, pricing, etc.

The basic financial statements which are used as tools of company analysis are the income statement, the balance sheet and the statement of changes in financial position. The accuracy of financial statement can be identified from the report of auditors. The most frequently used tools for company analysis are as follows:

1. Trend analysis
2. Ratio analysis
3. Fund flow analysis
4. Common size statement analysis
5. Technical analysis

9.7 TREND ANALYSIS

It is a dynamic method of analysis showing the changes over a period of time. It makes easy to understand the changes in an item over a period of time and to draw conclusion regarding the changes in data. The trend should be studied at least over a period of 5 years. It indicates a direction in which a concern is going and on this basis forecast for future can be made.

9.8 RATIO ANALYSIS

Balance Sheet Ratios

1. **Current ratio:** Current ratio is also known as solvency ratio or working capital ratio. Standard current ratio is 2:1 current ratio indicates the short-term financial position of the firm. It is expressed as pure ratio.

   It is calculated as:

   $$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

   Current assets consists of all the current assets of the concern such as:

   1. Debtors
   2. Cash and bank balance
   3. Bills receivable
   4. Stock
   5. Prepaid expenses

   Current liabilities consist of the following:

   1. Creditors
   2. Bills payable
   3. Outstanding expenses
   4. Bank overdraft

2. **Quick ratio:** Quick ratio is also known as liquidity ratio or acid ratio. Standard quick ratio is 1:1 greater the ratio, stronger the financial position. It indicates the solvency and financial soundness of the business. It is expressed as pure ratio.

   It is calculated as:

   $$\text{Quick ratio} = \frac{\text{Quick assets}}{\text{Quick liabilities}}$$

Quick assets consist of:

1. Debtors
2. Cash and bank balance
3. Bills receivable

Quick liabilities consists of:

1. Creditor
2. Bills payable
3. Outstanding expenses

3. **Debt assets ratio:** This ratio indicates the percentage or the proportion of the total assets created by the company through short-term and long-term debt.

   It can be calculated as:

   $$\text{Debt assets ratio} = \frac{\text{Debt}}{\text{Equity}}$$

   where, Debt = all liabilities including the short-term or long-term,

   Assets = all assets, i.e., fixed and current.

4. **Debt equity ratio:** It shows the proportion of debt to assets. It is expressed pure ratio.

   It can be calculated as:

   $$\text{Debt equity ratio} = \frac{\text{Debt}}{\text{Equity}}$$

   where, Debt = all liabilities including long-term and short-term

   Equity = net worth + preference capital.

5. **Stock to working capital ratio:** Stock to working capital ratio express the relationship between closing stock and working capital. This ratio expressed as pure ratio or percentage ratio.

   It can be calculated as:

   $$\text{Stock to working capital} = \frac{\text{Closing stock}}{\text{Working capital}} \times 100$$

6. **Proprietors' ratio:** This ratio indicates the proportion of proprietors' funds to the total assets of the firm.

   It can be calculated as:

   $$\text{Proprietors' ratio} = \frac{\text{Proprietors' funds}}{\text{Total assets}}$$

7. **Capital gearing ratio:** This ratio includes the relation between fixed income bearing securities to funds on which no fixed returns are to be paid. It is expressed as pure ratio.

It can be calculated as:

$$\text{Capital gearing ratio} = \frac{\text{Preference capital} + \text{Debentures} + \text{Term loans}}{\text{Equity share capital} + \text{Reserves and surplus}}$$

9.9 EXERCISES

Sums for Practice

1.

Liabilities	₹	Assets	₹
Equity share capital	6,00,000	Fixed assets	9,00,000
Reserves	2,00,000	Stock	3,00,000
6% debentures	5,00,000	Marketable investment	1,00,000
Current liabilities	2,00,000	Debtors	1,50,000
Bank overdraft	1,00,000	Cash bank balance	1,00,000
		Preliminary expense	50,000
	16,00,000		**16,00,000**

Re-arrange the above balance sheet in vertical form and calculate the following ratios:

(a) Current ratio

(b) Liquid ratio

(c) Proprietary ratio

(d) Stock revaluation ratio

2. Given below are the information of Parekar Ltd. as on 31ˢᵗ March, 2004.

Debtors	30,000
Outstanding manufacturing expenses	17,000
Cash balance	23,000
Bills payable and creditors	38,000
Machinery (imported)	30,000
Income earned but not received	6,000
Bank overdraft	15,000
Bills receivable	7,000
Prepaid travelling expenses	4,000

Using above data calculate current ratio and liquid ratio and comment on it.

3. Following are the figures being given and extracted from the books of Voodoo Ltd.

Land and building	6,00,000
Plant and machinery	5,00,000
Equity capital	5,00,000
Preference capital	2,00,000
Stock	2,40,000
Debtors	2,00,000
Cash and bank	5,50,00
Miss. Current assets	500
P and L account	2,00,000
General reserves	1,00,000
Sundry creditors	80,000
Bills payable	60,000
Misc. current liabilities	60,000
Debentures	4,00,000

You are required to calculate:

(a) Rearrange above figures in vertical format

(b) Debt equity ratio

(c) Proprietary ratio

(d) Capital gearing ratio

4. The summarized final accounts of two companies are as follows:

Balance Sheet

Liabilities	X Ltd.	Y Ltd.	Assets	X Ltd.	Y Ltd.
Share capital	8,8000	88,000	Fixed assets	1,21,000	96,800
Reserves	42,900	35,200	Current assets	1,25,400	1,03,400
8% debentures	22,000	22,000	Less: current liabilities	93,500	65,000
	1,52,900	**1,45,200**		**1,52,900**	**1,45,200**

Revenue Statement

Income	X Ltd.,	Y Ltd.,
Sales	3,30,000	2,64,000
Less: Cost of sales	2,37,600	1,98,000
	92,400	66,000
Operating expenses	63,800	44,000
Net profit before tax	28,600	22000
Less: Tax	12,100	9,240
Profit after tax	16,500	12,780
Less: dividend	8,800	6,600
Retained earning	7,700	6,160

You are required to calculate the following ratios and comment:

(i) Proprietary ratio

(ii) Capital gearing ratio

(iii) Gross profit ratio

(iv) Operating ratio

(v) Return on total resources ratio

(vi) Return on proprietors equity ratio

(vii) Expenses ratio

(viii) Net profit ratio

5. The following information is taken from the records of two companies in the same industry:

	A Ltd. ₹ in lakh	B Ltd. ₹ in lakh
Cash	2	3
Debtors	3	7
Stock	12	10
Plant and machinery	18	23
Total assets	35	43
Sundry creditors	9	10
12% debentures	5	10
Equity capital	11	18
Reserves and surplus	10	5
Total liabilities	35	43
Sales	60	85
Cost of goods expenses	40	65
Other operating expenses	8	10
Interest expenses	0.60	1.20
Income tax	3.40	3.80
Dividend	1.00	2.00

Answer each of the following questions by making a comparison of one or more relevant ratios:

(a) Which company is using the shareholders' money more profitably?

(b) Which company is better able to meet its current debt?

(c) If you want to purchase the debentures of one company which company's debentures would you buy?

(d) Which company collects its receivable faster assuming all sales are on credit basis?

(e) Which company retains the larger proportion of income in the business?

6. Following information available relating to Quick Ltd. and Slow Ltd.

Particulars	Quick Ltd.	Slow Ltd.
Equity share capital (₹ 10 FV)	200	250
12% preference shares	80	100
Profit after tax	50	70
Proposed dividend	35	40
Market price per share	₹ 100	₹ 140

Calculate:

   (i) Earnings per share

  (ii) P/E ratio

 (iii) Dividend payout ratio

  (iv) Return on equity shares

As an analyst inform the investor which of the two companies are worth investing.

❑   ❑   ❑

10 TECHNICAL ANALYSIS

CHAPTER

Chapter Contents:

10.1 MEANING OF TECHNICAL ANALYSIS

Technical analysis is a study of market data in terms of factors affecting supply and demand schedules, such as prices, volume of trading, etc. It is a simple and quick method of forecasting behaviour of share prices. The financial data and past behaviour of share price of a company are presented on charts and graphs in order to find out the history of price movements. It helps to explain and forecast changes in share prices. Technical analysis provides a simplified picture of price behaviour of a share. The analysis believe that the price of the share depends upon the supply and demand in the stock market. They get the important information about price and volume of a share in the stock market. Investors, who use technical analysis, start checking the market action of the share if it is favourable. They also examine the fundamental factors about the company and make sure that the company is sound and profitable.

Technical analysis is based on certain assumptions. These are as follows:

(1) The price of security is related to demand and supply factors operating in the market.

(2) There are rational as well as irrational factors which affects the supply and demand factors of a security.

(3) The prices of securities behave in a manner that their movement is continuous in a particular direction for some length of time.

(4) Trends in the price of securities have been seen to change when there is a shift in the demand and supply factors.

(5) Whenever there are shifts in demand and supply, they can be detected through charts prepared specially to show the action of the market.

There are several ways the technicians think and act. At any given time, some investors gain and some of them loose. A vital factor in this analysis is volume. When the volume is increasing, it is favourable to the investors. They recognize that formations and patterns signify changes in real volume as a result of their expectations, hopes, fears and developments. They are not committed to buy and hold policy. They act more quickly to make commitments and to make profits and losses. Technical analysis, especially charts, is the most convenient method of comparison.

Technical analysis believe that their method is simple and gives an investor a bird's eye on the future of security prices by measuring the past movements. They predict the price behaviour through line charts, bar charts, and point and figure charts. There are large numbers of patterns which predict the upward and downward swing in the market. This is not an accurate method but it gives the general indication of the behaviour of prices in the stock market.

10.2 FUNDAMENTAL vs. TECHNICAL ANALYSIS

Technical analysis differs from fundamental analysis in many respects. A fundamental analyst looks forward, whereas the technical analyst looks backward. A fundamental analyst attempts to forecast company's earnings and dividends of its shareholders. These earnings are then discounted to obtain the intrinsic value of a security by determining an appropriate rate of interest. The technical analyst believes that all relevant factors are reflected in the market price and volume of trading. He studies the historical price and volume patterns that provides clues for his future purpose and sales and profit from timely entering and existing from the market.

A fundamental analyst thinks from that stock market behaviour is 90% logical and 10% psychological whereas, a technical analyst thinks that it is 10% logical and 90% psychological. Fundamental analysis provides a long-run view of security pricing, whereas the technical analysis usually provides a short-run view of security pricing.

10.3 CHARTING TECHNIQUES

Technicians basically rely on charts of prices of stocks and trading volume of the analysis of the market movement and individual stocks. The purpose of charting technique is to determine the probable strength of demand and supply of various levels of stock prices and to predict the probable direction in which the stock will move and where it probably stop. The clues are provided by the history of stock's price movements as recorded on the charts. The basic assumption of charting technique is that the history does repeat itself. On the charts, the price fluctuations tends with remarkable consistency to fall into number of patterns, each of signifies the relationship between buying and selling pressure. Some patterns indicates that demand is greater than supply and others suggest that supply is greater than demand. Others imply that they are likely to remain in balance of sometime. Technical analyst claims that stock prices fluctuate generally from characteristic patterns which have important predictive value. No one with experience doubt that prices moves in trends and trends to continue until something happens to change the supply-demand balance. Such changes can be detected in the markets itself. Certain patterns of formulation levels or areas appear in the charts which have a meaning that can be interpreted in terms of probable future rends of stock prices. Most of them attempts to correlate a relationship between market price action and the volume of trading in stocks. The idea is that it is sign of strength when a stock advances on a large volume of shares traded. On the other hand, when volume in the market or on the pessimism is mounting and the trend is towards reducing price. In essences, the chartists contend that a study of a stock's behaviour not only tells where a stock has been but also tells where it is going. The following are the different types of charts:

(1) Line charts

In this type, the closing prices of successive time-periods are connected by lines with no notice taken of the highs and lows of stock prices for each such period. For example, the following chart presents a line chart of 'A' Ltd.
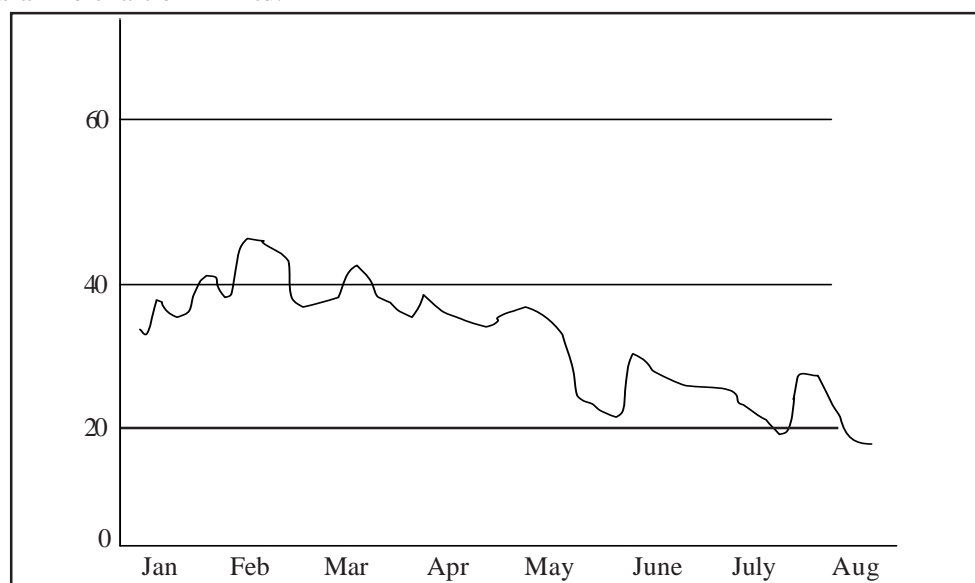
(2) Bar chart

In this type, the analyst draws on graphs or logarithmic paper a series of vertical line, each representing the price movement for a time period which may be a day, week, month or even a year. The vertical dimensions of lines represent the price of stock and the horizontal dimensions indicated the time involved by the chart as a whole. In a daily chart, each vertical line represents the range of each day's price activity and the chart as a whole may extend for a week or a month. The line on graph paper can be extended from the highest to the lowest of transactions for each day or weeks and make a cross-mark to indicate the closing price. Many investors are interested in charting use of bar charts because they have meanings familiar to a technical analyst and these charts are easy to draw. For example, the bar for a stock is shown below:
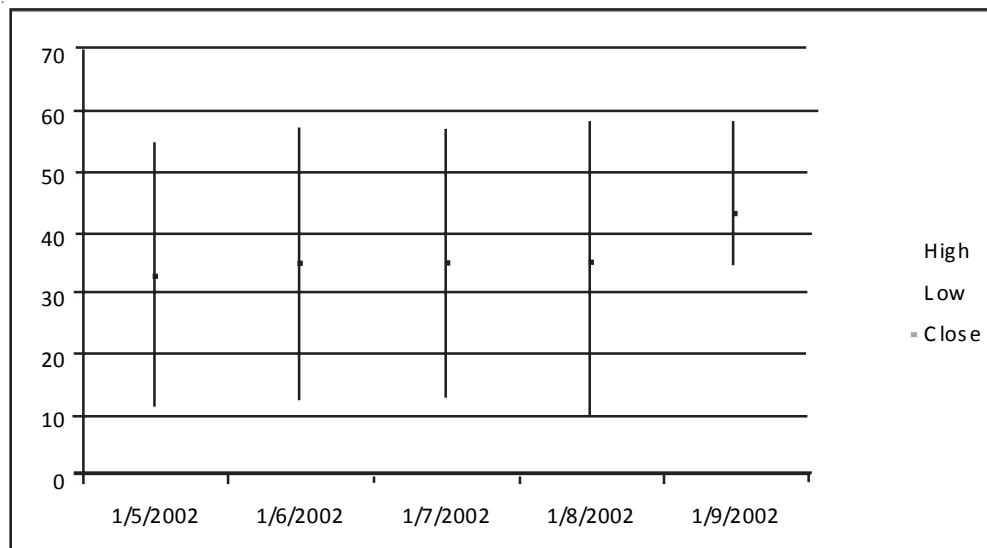
(3) Candlestick chart

The candlestick chart is a modified version of a bar chart. These charts shows the stock open, close, high and low for each time-period in a modified three-dimensional format. The vertical axis shows the stock prices, and the horizontal axis reflects the successive time-periods. The basic difference between a daily candle stick chart and a bar chart is the white and black candles augmenting the daily trading range lines. If the opening prices exceeds the closing price, the body of the candles is black and when the stock is up, the candle is clear. White candle represents the stock advances while the black candles represent the stock declines. The thick portion of the entry is called the real body with the vertical line representing the wick. Various clusters of candles are given a specific name, like dark cloud cover or the hanging man, etc., for example, the candlestick chart for stock of 'A' Ltd. is given below:
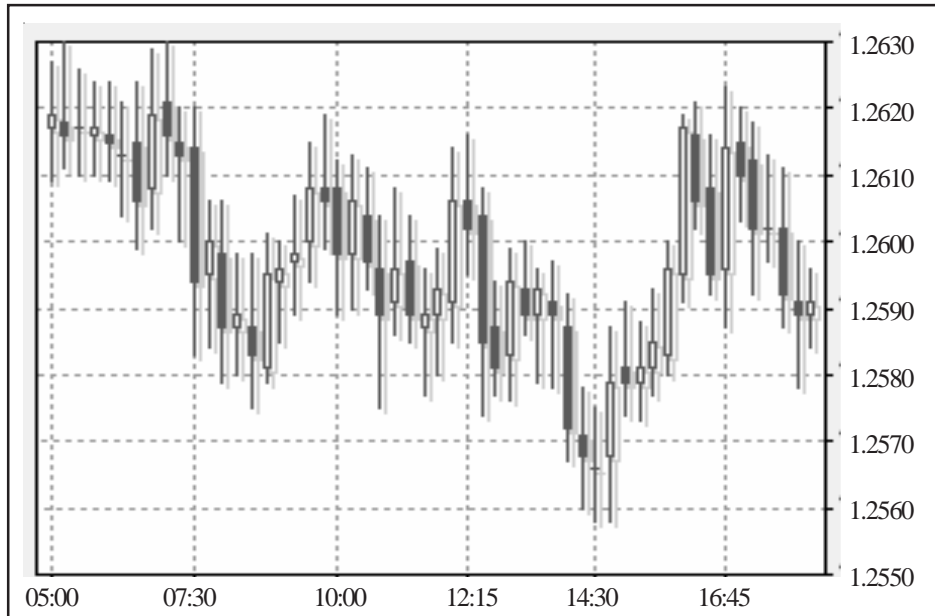
CHART PATTERNS

Analyst uses several techniques to examine various chart patterns. Charts are a means to an end. These charts help technical analyst to decide when to buy or sell stocks. The following are various chart patterns:

(1) Support and resistance levels: Identification of support and resistance levels is one of the most important aspects of charts analysis. A support level is a barrier or price decline while a resistance level is a barrier to price advancement. Though the barrier is an obstruction, it is by no means impassable. Stock prices may break support and resistance levels under abnormal circumstances. For example, the stock of 'A' Ltd. is currently trading at ₹ 35. in the recent past, it has been as low as ₹ 30 and as high as ₹ 45. when this stock trades at ₹ 30 or 50, it becomes an attractive investment because the stock has support level of ₹ 30 with a potential resistance level at ₹ 45. The investor may start buying this stock at ₹ 30 and the stock begins to advance in price. A stock breaking its support level is called technically weak and a stock breaking its resistance level is called technically strong.

(2) Head and shoulders configuration: Head and shoulders is the key reversal pattern. The basic reversal patterns help analysis identify the turning points so that they can decide when to buy and sell the stock. The configuration is an uptrend or downtrend in a stock. In this process, the

neckline is the familiar resistance or support level. Head and shoulders formation may be analysed against the background of volume trend. When the head and shoulder top is formed, resistance to further price increase dampens investors enthusiasm. The volume decreases on each of the rally phases within the top formation. The reverse type is followed when the head and shoulders bottom is formed.

The completion of head and shoulders is not considered final until the penetration of the neckline is apparent. There may be many reversal formations. The following figures show the head and shoulders, neckline and double and triple top.

Head and shoulder top

Double Top

Triple bottom
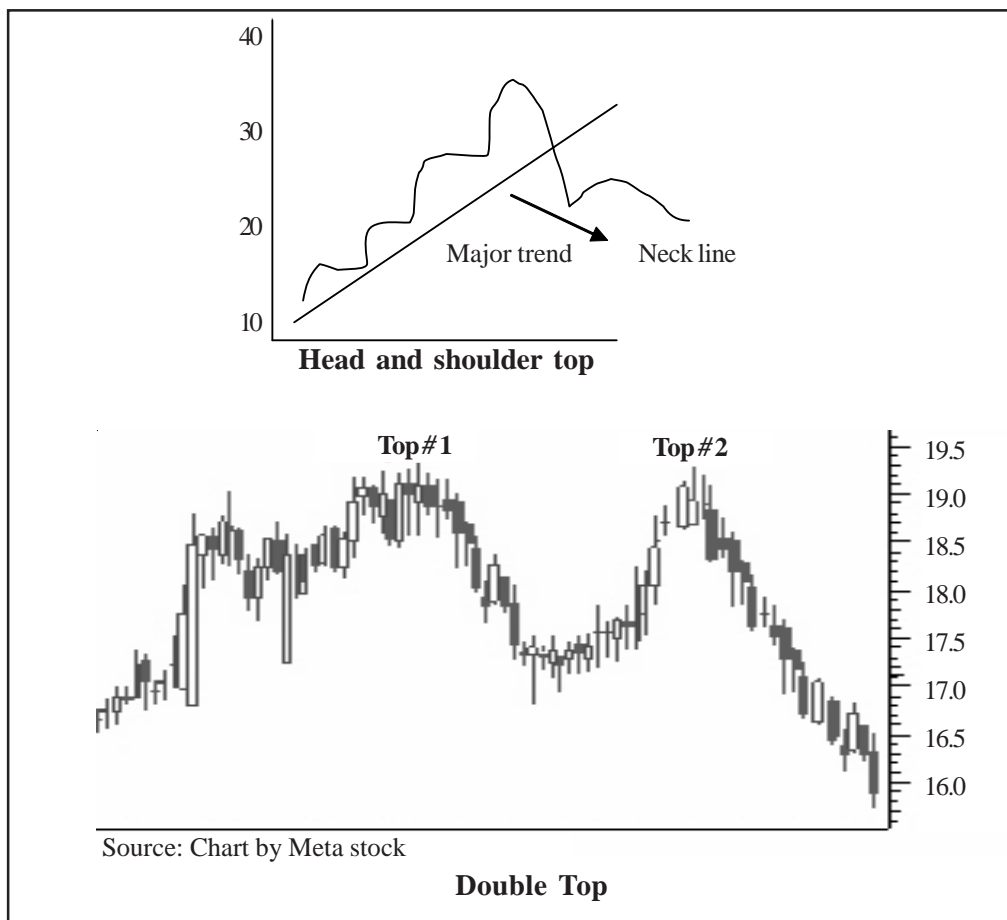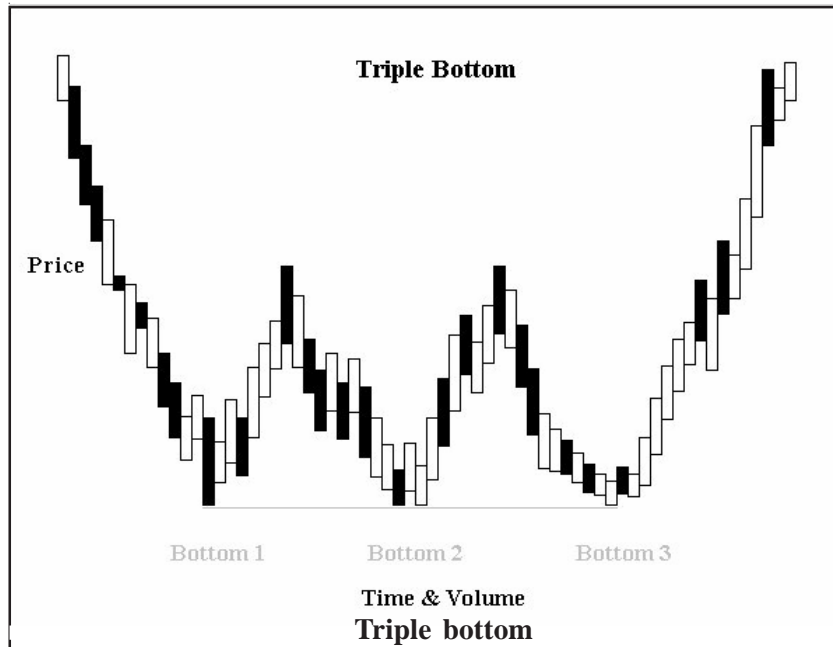
3. Trend Analysis: The technical analysts can establish a major trend in the prices of stocks. There may be a major uptrend or downtrend. There may be a reversal of major uptrend at a particular point. A major trend is preceded by notable advancement in stock's price. The analysts have to find out whether the stock has violated its trend. If a trend violation does not occur, it could be the forerunner or an early warning of a reversal in the major direction of the stock's price movement. A major uptrend is preceded by accumulation while distribution is generally followed by a down turn. The major uptrend and downtrend in the price of a stock are given in the figure below:
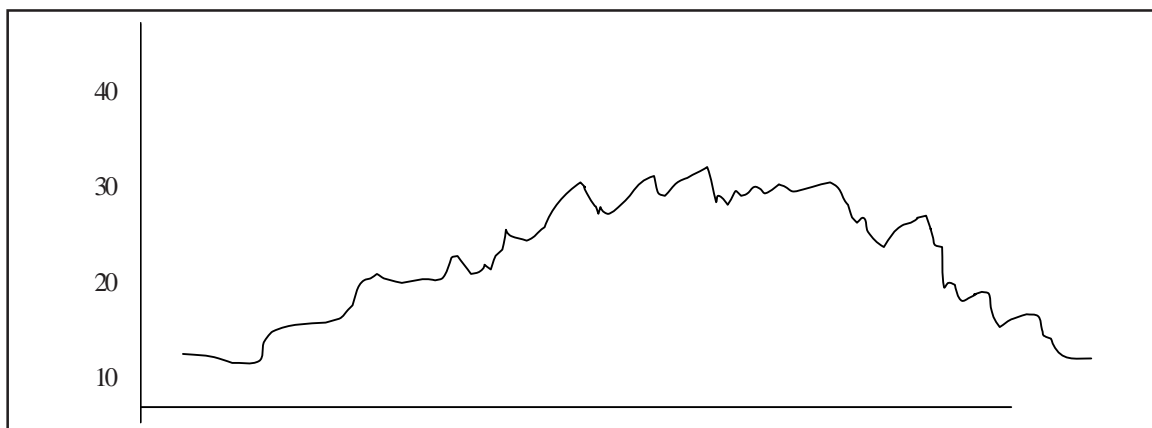
There is a reversal of major uptrend of point 'A'. This suggests that the stock has violated its trend. Similarly point 'B' is the significant distribution which signals a significant decline in the stock's price. Similarly, at point 'C' the stock penetrates its support level and therefore becomes technically weak.

Limitations of Charts

Technical analysts may prepare charts of major shares in the stock market. However, interpretation of charts is an important aspect. Therefore, there must be proper interpretation of charts on the basis of their patterns. The analysts also change their interpretation from time to time. Therefore, the investors are confused many a times. Investment decisions are almost and always made on the basis of the chart. Most of the investors do not have the idea of buying the stock on the basis of chart. This is a negative thinking because most of the investors know nothing about the company.

10.4 TECHNICAL INDICATORS

There are numerous technical indicators that collectively add up to organized confusion. But when one examines the technical indicators individually, it makes some sense. The following are some of the technical indicators:

(1) The short interest ratio theory: The short interest ratio is derived by dividing the reported short interest or the number of shares sold short by the average volume of about 30 days. When short sales increases relative to the total value, the indicators rise. A ratio above 150% is considered bullish, and a ratio below 100% is considered as bearish. The logic behibd this ratio is that investors sell stocks at high prices in anticipation of buying them back at lower prices. Thus, increasing short sales is viewed as a sign of general market weakness and short covering as a sign of strength. An existing large short interest is considered as a sign of strength whereas an established slight short interest is considered as sign of weakness.

(2) Confidence index: Confidence index is a ratio of a group of lower grade bonds to a group of high grade bonds. When this ratio is high investors' confidence is likewise high which is reflected by their purchase of relatively more of the lower grade securities. When they buy relatively more of the higher grade securities, it is relatively more of the higher grade securities, it is taken as an indication of low confidence which is reflected in a low ratio.

(3) Spreads: Large spreads between yields indicates low confidence and are bearish. The market requires large consumption of business, finanacial and inflation risks. Small spread indicates high confidence and are bullish. Thus, larger the spread lower the ratio and less the confidence. On the other hand, smaller the spread, there is greater ratio indicating greater confidence.

(4) Advance-Decline ratio: The index relating advances to declines is called the advance-decline ratio. When advances are more than decline, the ratio increases and *vice versa*. When advances are more than decline the bullish condition is created. Similarly, when declines are more than advances, a bearish condition is created. The advance decline ratio tries to capture the markets underlying strength by taking into account the number of advancing and declining issues.

(5) Market breadth index: The market breadth index is the result of the advance-decline ratio. It is computed by taking the net difference between the number of stocks rising and the number

of stocks falling added or subtracted to the previous one. The purpose of the index is to indicate whether a confirmation of some index has occurred. If both the stock index and the market breadth index increase, the market is bullish. The market is said to be bearish when the stock index increases but the market breadth index do not increase.

(6) The odd-lot ratio: The odd lots are the transactions of less than minimum shares in a lot. Normally the shares are traded in lots of 5, 50, 100, etc. however, the lot of demat shares is 1. All he shares are not in demat form. The odd lot transaction is measured by odd lot changes index. This index is sometimes referred to as a yardstick of uniformed sentiment or an index of contrary opinion because the odd lot theory assumes that small buyer or seller are not very bright specially at top and bottoms when they need to be brightest.

(7) Insider transaction: The technical analyst believes that the insider's transactions offer a clue to future earnings, dividend and stock prices performance. If the insiders start selling heavily, it is considered as bearish indicators and vice-versa. Thus, the insider's activities may be indicative of future stock prices. When insider's are buying heavily it is considered bullish trend and the investors may guess that there may be a good news about the company in the near future.

(8) Moving average: A moving average of underlying historical data about the stock prices. Each data point is the arithmetic average of a portion of the previous data. A ten-day moving average measures the average over the previous ten trading days. Regardless of the time period used, each day a new observation is included in the calculation and the oldest is dropped so that the constant number of prices are always being averaged. The changes in the slope of line of moving average are important. A stock whose twenty day moving average line has been trending up might become a candidate for sale if the line turns downwards.

10.5 TESTING TECHNICAL TRADING RULES

The technical analysts think that the only important information to work from is the picture given by the price and volume statistics. The technicians see the market, moving in definite trends which continue for significant periods. The past performance of a stock can be used to predict the future price. The direction of prices changes is as important as the relative size of the change. With the help of the following Technical Trading Rules, the technicians attempts to correctly catch changes in trend and take advantage of them:

(1) Dow Theory

Dow theory proposed by Charles Dow is one of the oldest technical method which has been widely used. The theory consists of three types of market movement: (a) the major market trend, (b) secondary intermediate trend and, (c) minor movements. The major market trends last a year or more, the intermediate trends lasts for few months and minor movements lasts only for hours to a few days. The determination of the major market trends is the most important decision to the dow believer. The Dow theory is built upon the assertion that measures of stock market tends to move

together. It asserts that stock prices demonstrate patterns over four to five years and these patterns are mirrored by indices of stock prices. The Dow theory implies two of the Dow Jones averages, the industrial average is rising, then the transportation average should also be rising. Such simultaneous price movements suggest the bull market. On the other hand, a decline in both the averages are moving in opposite directions, the market is uncertain as to direction of future prices.

If investors believe in Dow theory, they will try to liquidate when a sell signal becomes apparent which will drive down prices. Buy signals have the opposite effect. However, there are several problems of Dow theory. It is not a theory but the interpretation of known data. It does not explain why the two averages should be able to forecast future stock prices. There may considerable lag between actual turning points and those indicated by the forecast. Again Dow theory, can work only when a long wide upward or downward movement is registered in the market. The theory does not attempt to explain a consistent patterns of the stock price movements.

(2) Elliott Wave Principle

Elliott wave principle was established by R.M. Elliott in 1930. It states that major moves takes place in five successive steps resembling tidal waves. In a major bull market, the first move is upward, the second downward, the third upward the fourth downward and the fifth and final phase upward. The waves have a reverse flow in a bear market. The Elliott wave principle, claimed to be a valuable tool for market prediction is shown in the figure given on the next page.

Elliott wave principle offers investors a basis for developing important market strategies. However, it has two major limitations – first, it is difficult to identify the turning point of each stages and second, the investor frequently cannot distinguish between a major and a minor five stage movement.

(3) Chaos Theory

Chaos theory examines instances in which apparently random behavior is quite systematic or even deterministic. Investment analysts have sought a pattern in stock market behavior since the origin of the exchanges. Chaos theory eventually provides some potential answer about how security prices are determined. If the apparent randomness of security prices changes can be shown to be non random. Scientists also apply this theory to whether prediction, population growth estimates etc.

(4) Neutral Networks

A neutral network is a trading system in which a forecasting model is trained to find out desired output from past trading data. The neutral network eventually learns the patterns that produces the desired output by repeatedly cycling through the data. If the desired output remains elusive, more data is included until a pattern is found. Netrual networks man also include a feedback mechanism whereby experience is gain gained from past mistakes. A problem with the concept of neutral network is that the stock market is seldom deterministic. Situations constantly change and today's prices may

not necessarily prevail tomorrow. Research that tests a hypothesis using subsequent data is much more useful.

10.6 EVALUATION OF TECHNICAL ANALYSIS

Technical analysis has endeavoured to forecast the future of the stock market. The averages are useful and interesting in showing the course of the market and for measuring changes but not for forecasting the future. Technical analysis is not by itself, the road to riches. It is a tool which should be used with fundamental analysis and with commonsense. Despite assertions of some technicians, technical analysis is still an art. It requires talent, intuition and experience for its successful use. Investors can add a little luck and there may be difference between modest and good profit. The technical analysis has the following limitations:

(1) All data used in technical analysis is past data. Therefore, these indies cannot take into account unexpected events such as natural disasters and economic crisis. Charts, can only show activity by insiders well before privileged information becomes public knowledge.

(2) A chart may show a sudden, deep decline which by strict interpretation is a signal to sell. But this may be the result of one large trade of a lower than market price. The value of stock may bounce back quickly. If the technician fails to wait for confirmation, the investment decisions may go wrong.

(3) With actively traded stocks, the prices may be result of a battle of wits. Trading profits are realized at the expense of others who are trying to achieve gains on their own terms. In such cases, the technicians must be cleverer and luckier than their rivals.

10.7 EXERCISES

Answer the following questions

1. What technical analysis? What are its advantages and limitations?

2. What is charting technique?

3. How is technical analysis different from fundamental analysis?

4. What are charts? How are they interpreted in technical analysis?

5. Write short notes on:

   (a) Points and figure chart

   (b) Bar chart

   (c) Flags

   (d) Triangles

Multiple Choice Questions
Choose the right answer

1. In the bull market
    (i)   Stiock prices are increasing
    (ii) Each peak is higher than previous peak
    (iii) Prices are falling
    (iv) There is stability in stock prices

2. The mareket value of share is determined by
    (i)   Demand and supply of shares   (ii) Beta
    (iii) Historical past data   (iv) Unsystematic risk

3. Technical analysis is useful
    (i)   To make an estimate of growth in stock market
    (ii) To find out the market forces influencing stock market
    (iii) To indicate the direction of overall market
    (iv) To analyse the economic activity of government

4. Thesupport level exist
    (i)   When considerable demand is created demand is created at a particular
    (ii) When sebi fixes the price at a stock exchange
    (iii) When stock exchange broker fix a price
    (iv) When the price of stock is stable

Ans: 1. (ii), 2. (i), 3. (iii), 4. (i)

❐   ❐   ❐

11

CHAPTER

PORTFOLIO THEORY

Chapter Contents:

11.1 INTRODUCTION

Modern portfolio theory is the philosophical opposite of traditional stock picking. It is the creation of economists, who try to understand the market as a whole, rather than business analysts, who look for what makes each investment opportunity unique. Investments are described statistically, in terms of their expected long-term return rate and their expected short-term volatility. The volatility is equated with "risk", measuring how much worse than average an investment's bad years are likely to be. The goal is to identify your acceptable level of risk tolerance, and then to find a portfolio with the maximum expected return for that level of risk.

This covers the highlights of modern portfolio theory, describing how risk and its effects are measured, and how planning and asset allocation can help you do something about it.

Portfolio theory, or more properly, modern portfolio theory, is a set of ideas and mathematical calculations that strive to provide the best investment returns in relation to the amount of risk taken. Although the mathematics can be daunting, the basic ideas of modern portfolio theory can be used by all investors.

1. History

Portfolio theory was first discovered and developed by Harry Markowitz in the1950s. His work forms the foundation of Modern Finance. The resulting theory as modified and extended by many researchers is often called "modern portfolio theory".

In portfolio theory it is often assumed for the sake of simplicity that returns are normally distributed over the time period under analysis. With this assumption, portfolio efficiency is determined by simply compounded expected returns and the standard deviations of the simple compounded returns. The additional assumption of negative exponential utility leads to portfolio optimization problems that are linear in return and variance. In section 14, we present a rigorous review of this theory.

The assumption of normally distributed returns leads to problems when trying to extend the analysis to longer time periods or to multiple time periods, since long-term returns are far from normally distributed. Indeed, even over a single year, the lognormal distribution implied by the random walk model, while still not perfect, is a much better approximation to the distribution of observed historical returns for common financial assets like stocks and bonds. Lognormal returns are also consistent with the Central Limit Theorem and with limited liability, two theoretical issues which also cause problems if we assume normally distributed returns.

In the random walk model, portfolio efficiency is determined by instantaneous expected returns and the standard deviations of these returns. The additional assumption of its elastic utility leads to portfolio optimization problems that are linear in return and variance. In section 13, we develop the theory for the lognormal returns implied by the random walk model.

Considerations

Before portfolio theory, investors evaluated risk and reward only on individual securities or investments. Portfolio theory works to eliminate or minimize the risk of an individual security by diversifying the portfolio across asset classes. Portfolio theory works to maximize investment return by selecting the proportion of different assets in the portfolio. The overall return if the portfolio is then not dependent on the risk of individual investment held in the portfolio.

Expert Insight

Harry Markowitz puts it this way for his Nobel Prize biography: "Investors diversify because they are concerned with risk as well as return. Variance came to mind as a measure of risk. The fact that portfolio variance depended on security covariances added to the plausibility of the approach. Since there were two criteria, risk and return, it was natural to assume that investors selected from the set of Pareto optimal risk-return combinations."

Effects

The MIT course on portfolio theory divides investment risk into two classes. Systematic risk is the risk that all assets in a class move together. The stock market moves up and down as a group. Real estate prices rise and fall together, based on location. This is systematic risk. Non-systematic risk is specific to an individual asset. If a company goes bankrupt, its stock will be worthless, even if the broad market is rising. This is non-systematic risk. Portfolio theory states a properly formed portfolio eliminates non-systematic risk.

Potential

Although the mathematics of constructing a portfolio using expected variances and projected returns is complicated, individual investors can use the core of modern portfolio theory to protect and grow their assets. Instead of concentrating on individual stocks, properties or other investments, develop a broad picture of how the total of the different assets perform over time. What proportion of stocks, bonds, real estate, commodities and other securities will provide steady growth and minimize losses?

Traditional Portfolio Theory

Traditional portfolio theory says that, the market is inefficient and the fundamental analyst can take advantage of this situation. It is a very fundamental and subjective in nature. The normal method of estimating the return on an individual security is to find out the amount of dividends, price earning ratios, the common holding period and market value of shares. The traditional theory recognizes specific types of risk and non-risk factors, bearing upon the return such as interest rate risk, purchasing power risk and financial risk and non-risk variables such as taxation and liquidity. The traditional theory is based on the fact that risk can be measured on each deviation, greater variability the higher the standard deviation and *vice versa.*

The traditional theory believes that the investors prefer larger to smaller returns from securities, the ability to achieve higher depends upon the investors ability to make judgement and *vice versa*. The analysis can't be based on single analysis but a series of analysis on the company's portfolio the following steps need in a traditional portfolio:

1. **Background information:** The get the background check about the company's performance.
2. **Investment goals**: The investors has to have certain goals with respect to his investment.
3. **Investment policies:** The investor has to establish a suitable goal for building his portfolio mix.
4. **Security selection:** Above all steps help the investor to choose an appropriate security which would satisfy him and the security selection must be based on the P/E ratio and the earnings and dividend payout ratio and efficient management of the company.

Modern Portfolio Theory

Modern portfolio theory is the philosophical opposite of traditional stock picking. It is the creation of economists, who try to understand the market as a whole, rather than business analysts, who look for what makes each investment opportunity unique. Investments are described statistically, in terms of their expected long-term return rate and their expected short-term volatility. The volatility is equated with "risk", measuring how much worse than average an investment's bad years are likely to be. The goal is to identify your acceptable level of risk tolerance, and then to find a portfolio with the maximum expected return for that level of risk.

What Does Modern Portfolio Theory – MPT Mean?

A theory on how risk-averse investors can construct portfolios to optimize or maximize expected return based on a given level of market risk, emphasizing that risk is an inherent part of higher reward.

Also called "Portfolio Theory" or "Portfolio Management Theory"

Modern portfolio theory is the philosophical opposite of traditional stock picking. It is the creation of economists, who try to understand the market as a whole, rather than business analysts, who look for what makes each investment opportunity unique. Investments are described statistically, in terms of their expected long-term return rate and their expected short-term volatility. The volatility is equated with "risk", measuring how much worse than average an investment's bad years are likely to be. The goal is to identify your acceptable level of risk tolerance, and then to find a portfolio with the maximum expected return for that level of risk.

Portfolio theory deals with the value and risk of portfolios rather than individual securities. It is often called modern portfolio theory or Markowitz portfolio theory.

The key result in portfolio theory is that the volatility of a portfolio is less than the weighted average of the volatilities of the securities it contains.

Modern portfolio theory is not universally accepted, despite being the standard textbook description of portfolio risk and return. Markowitz himself thought normally distributed variance an inadequate measure of risk. Models have been developed that use asymmetric and fat tailed distributions (post-modern portfolio theory). There are also more radical objections, including an alternative behavioural portfolio theory.

Modern portfolio theory (MPT) is a theory of investment which attempts to maximize portfolio expected return for a given amount of portfolio risk, or equivalently minimize risk for a given level of expected return, by carefully choosing the proportions of various assets. Although MPT is widely used in practice in the financial industry and several of its creators won a Nobel memorial prize for the theory, in recent years the basic assumptions of MPT have been widely challenged by fields such as behavioural economics.

MPT is a mathematical formulation of the concept of diversification in investing, with the aim of selecting a collection of investment assets that has collectively lower risk than any individual asset. That this is possible can be seen intuitively because different types of assets often change in value in opposite ways. For example, as prices in the stock market tend to move independently from prices in the bond market, a collection of both types of assets can therefore have lower overall risk than either individually. But diversification lowers risk even if assets' returns are not negatively correlated—indeed, even if they are positively correlated.

More technically, MPT models an asset's return as a normally distributed function (or more generally as an elliptically distributed random variable), defines risk as the standard deviation of return, and models a portfolio as a weighted combination of assets so that the return of a portfolio is the weighted combination of the assets' returns. By combining different assets whose returns are not perfectly positively correlated, MPT seeks to reduce the total variance of the portfolio return. MPT also assumes that investors are rational and markets are efficient.

MPT was developed in the 1950s through the early 1970s and was considered an important advance in the mathematical modelling of finance. Since then, many theoretical and practical criticisms have been levelled against it. These include the fact that financial returns do not follow a Gaussian distribution or indeed any symmetric distribution, and that correlations between asset classes are not fixed but can vary depending on external events (especially in crises). Further, there is growing evidence that investors are not rational and markets are not efficient. Any theory or strategy that suggests it is possible to outperform the market without taking extra risk contradicts Markowitz portfolio theory, as does the evidence for the value effect or the existence of persistent arbitrage opportunities.

The objective of this topic is to show how you can apply modern portfolio theory in real life to create an optimized portfolio.

Definitions and Assumptions

Before we begin to explain portfolio theory and its application, let's begin by defining a number of key terms. A common nomenclature is essential to correctly interpreting this series.

- **Return:** For many assets, this may include both capital appreciation (the price of the stock rises) and dividends. For debt instruments, the return may include price appreciation (for example, when interest rates fall), the periodic interest payments, or the payment of the principal. Expected returns may be based on historical performance; however, it is important to think critically about whether past performance is likely to continue in the future. (For example, do you really expect to see a 50% rise in technology stocks year-over-year for the next 10 years?)

- **Risk:** This is perhaps the most contentious definition. In the context of this series, risk is the measure of variability in the expected return. We will use simple statistical tools to quantify risk. Risk is typically based on past volatility; however, as with returns, investors

should think critically about the assumptions underlying the estimates of risk. If anything, the recent credit crisis has shown that two assets that appeared to be unrelated (uncorrelated,) may actually move together quite quickly under certain economic conditions.

Assumptions

The framework of MPT makes many assumptions about investors and markets. Some are explicit in the equations, such as the use of normal distributions to model returns. Others are implicit, such as the neglect of taxes and transaction fees. None of these assumptions are entirely true, and each of them compromises MPT to some degree.

- **Asset returns are (jointly) normally distributed random variables.** In fact, it is frequently observed that returns in equity and other markets are not normally distributed. Large swings (3 to 6 standard deviations from the mean) occur in the market far more frequently than the normal distribution assumption would predict. While the model can also be justified by assuming any return distribution which is jointly elliptical, all the joint elliptical distributions are symmetrical, whereas asset returns empirically are not.

- **Correlations between assets are fixed and constant forever.** Correlations depend on systemic relationships between the underlying assets, and change when these relationships change. Examples include one country declaring war on another, or a general market crash. During times of financial crisis all assets tend to become positively correlated, because they all move (down) together. In other words, MPT breaks down precisely when investors are most in need of protection from risk.

- **All investors aim to maximize economic utility (in other words, to make as much money as possible, regardless of any other considerations).** This is a key assumption of the efficient market hypothesis, upon which MPT relies.

- **All investors are rational and risk-averse.** This is another assumption of the efficient market hypothesis, but we now know from behavioural economics that market participants are not rational. It does not allow for "herd behaviour" or investors who will accept lower returns for higher risk. Casino gamblers clearly pay for risk, and it is possible that some stock traders will pay for risk as well.

- **All investors have access to the same information at the same time.** This also comes from the efficient market hypothesis. In fact, real markets contain information asymmetry, insider trading, and those who are simply better informed than others.

- **Investors have an accurate conception of possible returns, i.e., the probability beliefs of investors match the true distribution of returns.** A different possibility is that investors' expectations are biased, causing market prices to be informationally inefficient. This possibility is studied in the field of behavioural finance, which uses psychological assumptions to provide alternatives to the CAPM such as the overconfidence-based asset pricing model of Kent Daniel, David Hirshleifer, and Avanidhar Subrahmanyam (2001).

- **There are no taxes or transaction costs.** Real financial products are subject both to taxes and transaction costs (such as broker fees), and taking these into account will alter the composition of the optimum portfolio. These assumptions can be relaxed with more complicated versions of the model.

- **All investors are price takers, i.e., their actions do not influence prices.** In reality, sufficiently large sales or purchases of individual assets can shift market prices for that asset and others (via cross-elasticity of demand.) An investor may not even be able to assemble the theoretically optimal portfolio if the market moves too much while they are buying the required securities.

- **Any investor can lend and borrow an unlimited amount at the risk-free rate of interest.** In reality, every investor has a credit limit.

- **All securities can be divided into parcels of any size.** In reality, fractional shares usually cannot be bought or sold, and some assets have minimum orders sizes.

More complex versions of MPT can take into account a more sophisticated model of the world (such as one with non-normal distributions and taxes) but all mathematical models of finance still rely on many unrealistic premises.

Markowitz's Two Security Analysis

Markowitz hypothesized that individuals would select portfolio of securities to maximize expected return and at the same time minimize the risk associated with the return. In other words investors will not accept risk if they are not compensated with huge profits. That means individuals would invest in portfolio with higher profits and higher risk and only when they are guaranteed about the returns. For a given individual expected return for a portfolio with the lowest risk. When all these criterias are met then only it will be known as efficient portfolio.

11.2 EVALUATION OF RISK AND RETURN

A portfolio is a combination of two or more securities. It is essential that every security should be considered while evaluating portfolio content. Portfolio analysis considers the determination of future risk and return in holding various combinations of individual securities. Expected return on a portfolio is a combination of many individual securities. However, portfolio variance can be less than a weighted average of security variances. Thus, investors can reduce portfolio risk by adding more securities with greater individual risk than any other security in more securities with greater individual risk than any other security in the portfolio. An investor can estimate expected return and expected risk of a portfolio, several estimates are needed. This requires the variance of each individual security and the covariance or correlation coefficient of each security.

Risk and Return for Single Securities

Risk and return will be very central terms in our analysis and it is essential that the reader clearly understands the meaning of each term and how assets with different payout structures can be compared. General utility theory suggests that the average investor is risk averse. Given the same expected return of two assets with different risks, he would prefer the one with less risk. (This assumption may not be perfectly true for all individuals in all situations, but for the investor community as a whole it is probably true). For an asset with uncertain cash flows and pay-offs, which are normally distributed, the mean of the distribution will be the expected return while the standard deviation forms some kind of "risk". Choosing the "less risky" asset therefore comes down to choosing the asset with the lowest standard deviation in its payout distribution. An investor could also approach the problem from the other direction, choosing among assets with the same risk and then choose the asset with the highest expected return.

11.3 SHARPE'S THEORY

It is now time to discuss how investors should go about choosing their investments in a world where the simple idea that more return and less risk is good does not help in deciding between assets. Most often, the choice is between two (or more) assets, where one asset has both higher risk and higher return than the other. In that case, one would think that it is the individual preferences of the investor that decide which asset to choose. In a way, that is true, but it does on the other hand imply ranking assets despite their having different returns and risks.

One way of ranking investments taking into account both risk and return is by using the **Sharpe ratio**. This ratio essentially divides the return by the risk, after first subtracting the risk-free rate of return from the return, since any asset with a lower return should never be chosen. The higher the ratio more favourable risk/return characteristics of the investment. The Sharpe ratio is computed as:

$$Si = \frac{\bar{R_t} - R_f}{\sigma_i}$$

where, *R-bar* is the mean rate of return of the asset and *R-f* is the risk-free rate of return. This measure can be taken to show return obtained per unit of risk. Apart from being very intuitive (dividing return above the risk-free rate by the risk of the asset), the Sharpe, ratio does have some theoretic merit.

Optimal portfolio
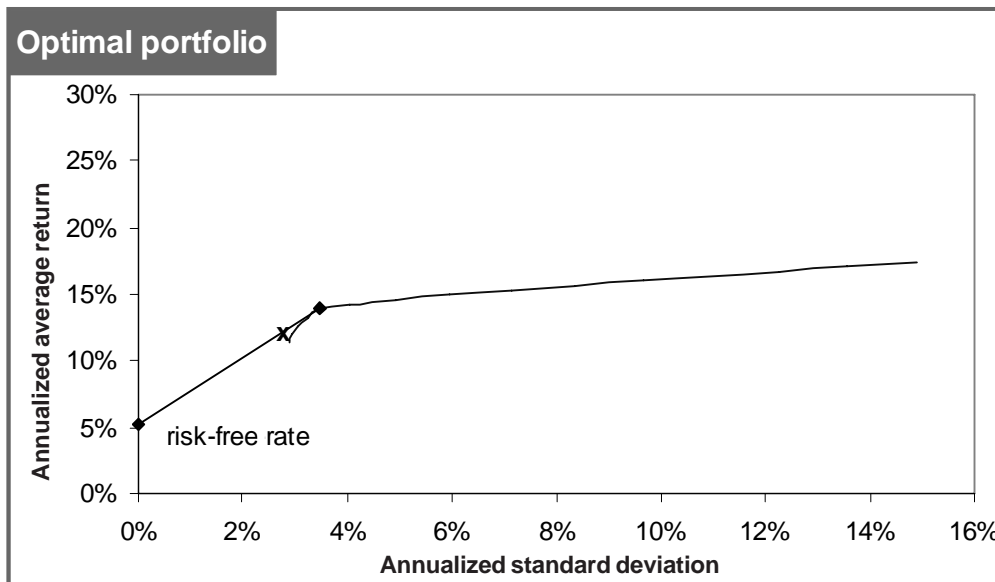
Portfolio Risk

Portfolio risk refers to the possibility that an investment portfolio will not earn the expected or desired rate of return. Investors attempt to reduce this risk through diversification or hedging (taking an offsetting position in a related security).

1. Sources of Risk

- Portfolio risk includes both systematic and unsystematic risk. Systematic risk is that impacts the overall market; for example, inflation, interest rate changes, or economic conditions. Unsystematic risk, such as product defects or management turnover, is unique to individual securities.

Measuring Risk

- Investors use standard deviation to measure the amount by which realized returns differ from expected, or average, returns. In general, the higher the standard deviation, the more volatile — or riskier — the investment is.

Managing Risk

- Systematic risk cannot be eliminated but can be managed by hedging with derivatives or short selling. Unsystematic risk can be eliminated through diversification.

Diversification

- Diversification entails investing in different asset classes, such as stocks, bonds, real estate, and cash, and selecting securities with different characteristics, such as company size, industry, country, or dividend policy.

Asset Allocation

- Determining how much to allocate to each asset class depends on the investor's goals, time horizon, and risk tolerance. According to Brinson, Hood, and Beebower, asset allocation explains 93.6 per cent of portfolio volatility, thus making it a critical factor in managing portfolio risk.

11.4 BETA

Beta described the relationship between the stock return and the market index returns. This can be positive and negative. It is the percentage change is the price of his stock regressed (or related) to the percentage changes in market index. if beta is 1, a one-percentage changes in market index will lead to one percentage change in price of the stock. If beta is 0, stock price is un related to the market index if the market goes up by a +1%, the stock price will fall by 1% beta measures the systematic market related risk, which cannot be eliminated by diversification. If the portfolio is efficient, beta measures the systematic risk effectively.

Evaluation Process

1. Risk is the variance of expected return of portfolio.
2. Two types of risk are assumed. They are:
   - systematic risk
   - unsystematic risk
3. Systematic risk is calculated by the investor by comparison of security return with market return.

$$\beta = \frac{\text{Co-variance of security and market}}{\text{Variance of market}}$$

   Higher value of beta indicates higher systematic risk and *vice versa*. When number of securities is hold by an investor, composite beta or portfolio can be calculated by the use of weights of security and individual beta.

4. Risk-free rate of return is identified on the basis of the market conditions.

The following two methods are used for calculation of return of security or portfolio.

Importance of Beta

The beta theory is useful for investors who look for returns in the short phases in a volatile market. When the market rises or falls the sudden beta scrips are useful measure to keep tabs on the volatility of a portfolio. An investors should think of getting into high beta stocks since they yield high returns also there is a chance of high risk attached to such stocks. The investor only if he is confident then must enter into such high yield returns, and on other hand he must plan for securities with short sell such that his portfolio is balanced with high risk and low risk securities and his portfolio would be more stable and he must look for lower beta values, less than one. Normally, beta values of individual securities fall in the range of 0.6 to 1.80 however the beta can be negative, but such cases are very rare. A negative beta indicates that the securities move in opposite direction of the magnitude and it indicates the beta value. The value of beta may change depending upon the period under consideration and comparative variable. If any of these is changed the beta value may also change and beta should never be in function of time as it decomposes the company risk and the change in market fancy for the scrip may indeed change the beta. Thus, only indicator of expected relative movement. It is incapable of predicting the market by itself. Therefore, investors, who use it for practical purpose, should be a good judge of how the market moves if the investor is unable to make a decision then he is accustomed to make mistake and it will harm the investor and using beta will cause more harm than good.

Beta and Risk

Some investors only hold diversified portfolios from which the diversifiable risk is eliminated. Therefore, the relevant measure of risk of an investment is its non-diversifiable risk or systematic risk. All securities do not have the same degree of non-diversifiable risk because the magnitude of influence of economy wide factors tend to vary from one company to another. Thus, different securities have differing sensitivities to variations in market returns.

The systematic or non-diversifiable risk of a security is generally measured by beta. This represents the extent to which the return on security fluctuates in response to changes in the market rate of return. If a share has consistently risen more than the market rate then it has beta more than one, if the market crashes, then the share will crash by greater than the market as a whole. Thus, beta is calculated by dividing the co-variances between particular security return and the market rate of return by the variance of return on the market index.

Beta and Portfolio Risk

The extent to which the return on a security fluctuates is called as beta. It happens as a response to the changes in the market rate of return. It measures systematic or non-diversifiable risk of a security. If a portfolio is diversified, the investor can focus on the beta of the individual securities as opposite to their standard deviation. The market index has a beta of the portfolio become riskier than the market as a whole, on the other hand a portfolio with a beta less than 1.0 is less risky than the market as a whole. Thus, a share whose beta is less than 1.0 will fall and rise to a lesser extent than the market.

11.5 PORTFOLIO DIVERSIFICATION

Portfolio diversification can be a valuable stock investing concept for every investor whose ultimate goal is to maximize profit and minimize risk. The principle of maximizing profits and minimizing risks is so simple, yet its practice is seemingly an impossible task. While the best investment advice abounds throughout investment circles, any wise and mature approach to investing is the same. Your best protection against risk is portfolio diversification; investing in multiple investment options instead of choosing to place all of your investments in only one area. You can, for example, use the stability of cash investments like CDs and money market funds to diversify your portfolio and offset the liability of stocks, futures, options and stock or bond mutual funds. Picking stocks of riskier small growth companies while also investing in the traditional blue chippers, which are the stocks of large, well-established companies allows for a structured stability that will translate to the bottom line of an investor's portfolio. In other words, when the return is down in one area, it's usually balanced by a positive performance in another. In the simplest terms, portfolio diversification is an excellent hedge against stock volatility and the ups and downs of investing.

As with any stock trading plan, it is imperative to evaluate assets and realign the investment mix from time-to-time. For example, as the value of a stock increases, it consumes a larger percentage of the total, thus affecting the total diversification of the portfolio. In an effort to maintain a healthy balance, it may be necessary to decrease the holding in that particular stock and increase in a different area, such as bond or cash holdings. Such decisions require not only experience but the benefit of a method such as candlestick chart analysis.

In all likelihood, a well-diversified portfolio will contain most, or all, of the following: stocks, bonds, mutual funds, cash equivalents like Treasury bills or money funds, as well as other types of investments. Being able to diversify over a broad range of investment options can help minimize many of the dramatic ups and downs in investing. It has been shown through research that, over extended periods of time, investors are actually able to reduce the level of stock volatility in their portfolios (by diversifying) without sacrificing much in the way of profit at the bottom line. Establishing a well diversified portfolio is crucial, and it is dependent on available assets, money management, risk tolerance, and long-term investing goals.

Simply stated, asset allocation is diversifying an investment portfolio among various categories, also known as asset classes. A typical allocation, for example, would put 60% of the available capital in stocks, 30% in bonds, and the other 10% in cash.

The single index model (SIM) is a simple asset pricing model commonly used in the finance industry to measure risk and return of a stock.

These equations show that the stock return is influenced by the market (beta), has a firm specific expected value (alpha) and firm-specific unexpected component (residual). Each stock's performance is in relation to the performance of a market index (such as the All Ordinaries). Security analysts often use the SIM for such functions as computing stock betas, evaluating stock selection skills, and conducting event studies.

Assumptions of the Single Index Model

- To simplify analysis, the single index model assumes that there is only one macroeconomic factor that causes the systematic risk affecting all stock returns and this factor can be represented by the rate of return on a market index, such as the S&P 500. According to this model, the return of any stock can be decomposed into the expected excess return of the individual stock due to firm-specific factors, commonly denoted by its alpha coefficient (α), the return due to macroeconomic events that affect the market, and the unexpected microeconomic events that affect only the firm.

- The term ßi (rm-rf) represents the movement of the market modified by the stock's beta, while ei represents the unsystematic risk of the security due to firm-specific factors. Macroeconomic events, such as changes in interest rates or the cost of labour, causes the systematic risk that affects the returns of all stocks, and the firm-specific events are the unexpected microeconomic events that affect the returns of specific firms, such as the death of key people or the lowering of the firm's credit rating, that would affect the firm, but would have a negligible effect on the economy. In a portfolio, the unsystematic risk due to firm-specific factors can be reduced to zero by diversification.

The Index Model is Based on the Following

- Most stocks have a positive covariance because they all respond similarly to macroeconomic factors.

- However, some firms are more sensitive to these factors than others, and this firm-specific variance is typically denoted by its beta (ß), which measures its variance compared to the market for one or more economic factors.

- Covariances among securities result from differing responses to macroeconomic factors. Hence, the covariance of each stock can be found by multiplying their betas and the market variance:

- Cov (Ri, Rk) = ßißks2. This last equation greatly reduces the computations required to determine covariance because otherwise the covariance of the securities within a portfolio must be calculated using historical returns, and the covariance of each possible pair of securities in the portfolio must be calculated independently. With this equation, only the betas of the individual securities and the market variance need to be estimated to calculate covariance. Hence, the index model greatly reduces the number of calculations that would otherwise have to be made to model a large portfolio of thousands of securities.

11.6 THE SINGLE INDEX MODEL

The single index model (SIM) is a simple asset pricing model commonly used in the finance industry to measure risk and return of a stock.

These equations show that the stock return is influenced by the market (beta), has a firm specific expected value (alpha) and firm-specific unexpected component (residual). Each stock's performance is in relation to the performance of a market index (such as the All Ordinaries). Security analysts often use the SIM for such functions as computing stock betas, evaluating stock selection skills, and conducting event studies.

Illustration 1

Following securities are held by an investor in his portfolio:

	Security A	Security B
Expected Return	15	20
Expected Variance	4	16

Covariance AB = +8

Solution:

Standard Deviation of A $= \sqrt{4} = 2$

Standard Deviation of B $= \sqrt{16} = 4$

Coefficient of Correlation $= +\dfrac{8}{6} = 1.34$

Illustration 2

From the following data, calculate Beta of a security.

Year	Return on Security %	Return on Market Portfolio
1	10	12
2	12	11
3	15	14
4	10	12
5	08	11

Solution:

Year	Return on Security	Return on Mkt Portfolio	$(R_i - \overline{R_i})$	$(R_m - \overline{R_m})$	$(R_i - \overline{R_i})(R_m - \overline{R_m})$	$(R_m - \overline{R_m})^2$
1	10	12	-1	0	0	0
2	12	11	1	-1	-1	1
3	15	14	4	2	8	4
4	10	12	-1	0	0	0
5	08	11	-3	-1	3	1
Total	55	60	$(R_i - \overline{R_i})$ = 11	$(R_m - \overline{R_m})$ = 12	10	6

$$\beta = \frac{\text{Cov } (R_i R_M)}{\sigma^2 m} = \frac{10/4}{6/4} = 1.67$$

Ans: Beta on security is 1.67

Illustration 3

Year	Nelco Ltd.	Market Portfolio Returns
1	20	14
2	24	18
3	10	9
4	15	14
5	-10	-8
6	12	10
7	18	16
8	28	30
9	33	35
10	40	42

Solution:

Year	Return on Security	Return on MP	$(R_i - \bar{R}_i)$	$(R_m - \bar{R}_m)$	$(R_i - \bar{R}_i)(R_m - \bar{R}_m)$	$(R_m - \bar{R}_m)$
1	20	14	1	-4	-4	16
2	24	18	5	0	0	0
3	10	9	-9	-9	81	81
4	15	14	-4	-4	16	16
5	-10	-8	-29	-26	754	676
6	12	10	-7	-8	56	65
7	18	16	-1	-2	2	4
8	28	30	9	12	108	144
9	33	35	14	17	238	289
10	40	42	21	24	504	576
	190	**180**			**1755**	**1866**

$R_i = 190/10 = 19$

$R_m = 180/10 = 18$

$$\beta = \frac{\text{Cov } (R_i - \bar{R}_i)}{\sigma^2 m} = \frac{1755/9}{1866/9} = 0.94$$

Illustration 4

Calculate Beta from the following:

Year	Return on Security (%)	Return on Market Portfolio(%)
1	10	12
2	12	10
3	13	10
4	10	12
5	15	15
6	12	14
7	10	20
8	10	15
9	10	20
10	11	22

Solution:

Year	Return on Security	Return on Mkt Portfolio	$(R_i - \overline{R}_i)$	$(R_m - \overline{R}_m)$	$(R_i - \overline{R}_i)(R_m - \overline{R}_m)$	$(R_m - \overline{R}_m)^2$
1	10	12	-3	-3	9	9
2	12	10	-1	-5	5	25
3	13	10	0	-5	0	25
4	16	12	3	-3	9	9
5	10	15	-3	0	0	0
6	12	14	-1	-1	1	1
7	10	20	-3	5	15	25
8	17	15	4	0	0	0
9	10	20	-3	5	15	25
10	20	22	7	7	49	49
Total	130	150	$R_i = 13$	$R_m = 15$	103	168

$$\beta = \frac{\text{Cov } (R_i R_m)}{\sigma^2 m}$$

$$= \frac{\sum^n (R_i - R_i)(R_m - R_m)}{n - 1}$$

Cov $(R_i R_M) = 103/9 = 11.44$

Cov $(R_i R_M) = 168/9 = 18.67$

$$\beta = \frac{\text{Cov } (R_i R_m)}{\sigma^2 m} = \frac{11.44}{18.67} = 0.61274$$

Thus, the security in portfolio indicates beta of 0.61274. It indicates the portfolio is less volatile than the return on market portfolio since the beta of the security is less than 1.

Illustration 5

Compute the beta factors and expected returns for Kapesh Ltd., Malik Ltd., Bhavesh Ltd. and return on Government securities is 9% returns in earlier years are:-

Year	Kapesh Ltd., (%)	Malik Ltd., (%)	Market (%)
1	20	16	14
2	22	18	16
3	20	20	18
4	18	18	12

Solution:

Kalpesh Ltd.:

$R_m = 60/4 = 15$

$R_i = 80/4 = 20$

Year	$(R_i - \overline{R}_i)$	$(R_m - \overline{R}_m)$	$(Ri - \overline{Ri})(R_m - \overline{R}_m)$	$(R_m - \overline{R}_m)^2$
1	0	-1	0	1
2	2	1	2	1
3	0	3	0	9
4	-2	-3	6	9
Total			8	20

$$\beta = \frac{Cov\ (R_iR_M)}{\sigma^2 m} = \frac{8}{20} = 0.4$$

Expected return on Kapesh Ltd. using CAPM

$$R_i\ (Kapesh\ Ltd.) = R_f + \beta\ (R_m - R_f)$$
$$= 9 + 0.4\ (15 - 9)$$
$$= 11.4$$

Malik Ltd.:

$R_m = 60/4 = 15$

$R_i = 72/4 = 18$

Year	$(R_i - R_i)$	$(R_m - R_m)$	$(Ri - Ri)(R_m - R_m)$	$(R_m - R_m)^2$
1	-2	-1	2	1
2	0	1	0	1
3	2	3	6	9
4	0	-3	0	9
Total			8	20

$$\beta = \frac{Cov\ (R_iR_M)}{\sigma^2 m} = \frac{8}{20} = 0.4$$

Expected return on Kapesh Ltd. using CAPM

$$R_i\ Kapesh\ Ltd. \quad = R_f + \beta\ (R_m - R_f)$$
$$= 9 + 0.4\ (15 - 9)$$
$$= 11.4$$

Illustration 6

Mr. Bharat has invested in XYZ Ltd. and ABC Ltd. in the portfolio of 40% and 60%. The returns from these companies are given below:

Year	XYZ Ltd.	ABC Ltd.
1	20	4
2	30	36

Standard Deviation of both the companies is 3. Calculate:

1. Expected return on portfolio
2. Covariance between XYZ Ltd. and ABC Ltd.

(April 2007)

Solution:

1. Calculation of expected returns on Mr. Bharat Portfolio:

$$= 0.40 \left(\frac{20 + 30}{2} \right) + 0.60 \left(\frac{24 + 36}{2} \right)$$

$$= 0.40\ (25) + 0.60\ (30)$$
$$= 10 + 18$$
$$= 28\%$$

2. Covariance between XYZ Ltd. and ABC Ltd.

Security	Return (%)	Expected Return	Difference	Product
XYZ Ltd.	20	28	-8	
XYZ Ltd.	30	28	2	-16
ABC Ltd.	24	28	-4	
ABC Ltd.	36	28	8	-32

Covariance $= 0.40 (20 - 28) (30 - 28) + 0.64 (24 - 28) (36 - 28)$

$= 0.40 (\text{-}8) (\text{-}2) + 0.60 (\text{-}4) (8)$

$= (\text{-}6.4) + (\text{-}19.2)$

$= \text{-}25.6$

Correlation $= \text{-}25.6/9$

$= \text{-}2.8$

3. The correlation coefficient is negative and is very high. Therefore, the risk of Bharat's portfolio is very high.

11.7 EXERCISES

Objective Type Questions
State whether the following statements are True (T) or False (F).

1. The risk and return of securities is marked by Beta.
2. Traditional investors build maximum risk and return.
3. Beta is measured by market movements.
4. Cut-off rate determines values of existing and new securities with the change in Beta.
5. Portfolio selected by borrowing and lending line makes the efficient frontier a straight line.
6. Beta is directly related to optimal portfolio.
7. Sharpe's Model is called the Single Index Model.
8. Indifference curves measure risk and return.

Ans: 1. (T), 2. (F), 3. (T), 4. (T), 5. (T), 6. (T), 7. (T), 8. (T).

Multiple Choice Questions
Choose the right answer

1. Which theory believes that the investors prefer larger to smaller returns from securities?
    (i) Modern   (ii) Traditional
    (iii) Jensen   (iv) Sharpe

2. Which measures the systematic or non-systematic risk of a security?
    (i) Standard deviation   (ii) Variance
    (iii) Range   (iv) Beta

3. Modern portfolio theory _____ the relationship between risk and return

   (i) Maximises (ii) Minimises

   (iii) Quantifies (iv) Assumes

 Ans: 1. (ii), 2. (iv), 3. (iii)

Sums for Practice

1. (a) The risk-free return is 8% and the return on market portfolio is 12% if required return on a stock is 15%, what is beta?

   (b) The risk free-return is 9%. The required return on a stock whose beta is 1.5 is 15%. What is the return of the market portfolio?

2. Mr. Kaushik has a portfolio of three securities. From the following details, compute the portfolio returns and rate of return on individual securities.

Security	Price as on 31.12.94	Price as on 31.12.95	Yearly dividend
A	20	30	2
B	30	40	3
C	50	60	5

3. (a) What will be the expected return on a portfolio composed of the following securities?

Security	Expected Return %	Proportion %
A	10	25
B	15	25
C	20	50

   (b) What will be the expected return if the proportion of each security in the portfolio is 20, 30, and 50 respectively?

4. Mr. Sharma's portfolio return are given below:

Year	Securities	Return
1	X	12
1	Y	10
2	X	18
2	Y	16

 Standard deviation of both the securities is 3.

 Calculate:

 (a) Expected rate of return on his portfolio if it is made up of 50% of X and 50% of Y.

 (b) Covariance of X and Y.

 (c) Portfolio risk made up of 50% of X and 50% of Y.

5. Given below are the particulars of three investment options of a portfolio.

Sr.	Schemes	Standard deviation	Proportion
1	Shares	0.30	30%
2	Mutual funds	0.10	50%
3	Real estate	0.20	20%

The correlation coefficient of 1 and 2 of above is 0.50, that of 2 and 3 is 0.20, and 1 and 3 is 0.25.

You are required to calculate standard deviation of the portfolio.

6. Calculate beta for each of the following two securities and advice which security be preferred for investment. States in one line the reason for your answer.

	JVC Ltd.	PVC Ltd.	Market.
1	10	14	12
2	6	2	5
3	13	19	18
4	-4	-12	-8
5	13	11	10
6	14	19	16
7	4	3	7
8	18	20	15
9	24	28	30
10	22	16	25

7. A firm's current EPS is ₹ 6, its individual payout is 40%, and its growth rate of EPS is 10%. The normal P/E multiple is 15/1. What is the stock's value using the capitalization of earnings method? What is its value in 3 years using the same method?

❏ ❏ ❏

12 CAPITAL ASSET PRICING MODEL
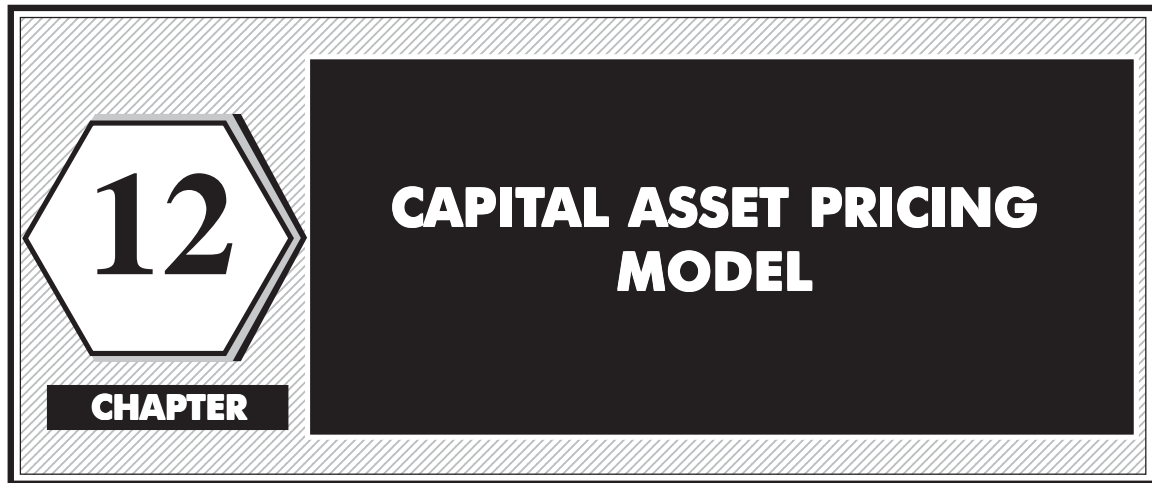
CHAPTER

Chapter Contents:

12.1 INTRODUCTION

Modern theories related to finance provide a theoretical representation of the risks involved in pricing the financial assets in the markets. CAPM model is the theory. The CAPM was developed and modified by financial economists through the sixties – W. Sharpe and Tobin. It can be applied to all capital assets such as share debentures and Government securities.

12.2 CAPM MAJOR IMPLICATIONS

The major implications of CAPM can be stated as the expected return of an asset will be related to a measure of risk for that asset known as beta. CAPM specifies the manner in which expected return and beta related.

According to CAPM, the relationship between risk and return is

$$K_i = R_f + \beta (K_m - R_f)$$

where, K_i = required or expected rate of return on security

R_f = Risk-free rate of return

b = Beta coefficient of a security

K_m = Expected rate of return on market portfolio

A. Return: The RoI is a realizable cash flow earned by the investor or owner during the given period of time.

B. Expected rate of return: It is the average return that one expects to receive on an investment over the long-term. The expected rate of return is calculated as under:

$$K = \sum_{i=1}^{n} P_i K_i$$

where, K = Expected rate of return

P_i = Probability associated with the security returns

K_i = i^{th} possible outcome, For example:

Status	Probability of occurrence	Rate of return
Boom	0.30	25%
Normal	0.50	20%
Recession	0.20	15%

Calculate expected rate of return.

K = (0.30 x 25%) + (0.50x 20%) + (0.20 x 15%)

= 7.5+10+3 = **20.5%**

C. Market portfolio: It is the portfolio comprising of all the risky securities that are traded in the market.

D. Risk: Risk means chance of loss. It refers to the variability of possible returns associated with an investment. The greater the dispersion of possible returns, the greater the risk, there are different types of risk namely:

1. Default risk

2. Business risk

3. Systematic risk

4. Interest risk

5. Liquidity risk

6. Market risk

7. Credit risk

8. Power risk etc.

The risk of a *portfolio* comprises *systematic risk,* also known as undiversifiable risk, and *unsystematic risk* which is also known as idiosyncratic risk or diversifiable risk. Systematic risk refers to the risk common to all securities — i.e., *market risk.* Unsystematic risk is the risk associated with individual assets. Unsystematic risk can be *diversified* away to smaller levels by including a greater number of assets in the portfolio (specific risks "average out"). The same is not possible for systematic risk within one market. Depending on the market, a portfolio of approximately 30-40 the securities in developed markets such as UK or the US will render the portfolio sufficiently diversified such that risk exposure is limited to systematic risk only. In developing markets a larger number is required, due to the higher asset volatilities.

A rational investor should not take on any diversifiable risk, as only non-diversifiable risks are rewarded within the scope of this model. Therefore, the required *return* on an asset, that is, the return that compensates for risk taken, must be linked to its riskiness in a portfolio context - i.e., its contribution to overall portfolio riskiness – as opposed to its "standalone riskiness". In the CAPM context, portfolio risk is represented by higher *variance* i.e., less predictability. In other words the beta of the portfolio is the defining factor in rewarding the systematic exposure taken by an investor.

Risk also refers to the dispersion of a probability distribution. In finance it indicates about standard deviation. The standard deviation can be more sophisticated it can be calculated as:

$$\sigma = \sqrt{[\sum{}^{n} P_i - \{K - K)^2]}$$

E. **Beta:** A measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the market as a whole. Beta is used in the capital asset pricing model (CAPM), a model that calculates the expected return of an asset based on its beta and expected market returns, also known as "beta coefficient". Beta is calculated using regression analysis, and you can think of beta as the tendency of a security's returns to respond to swings in the market. A beta of 1 indicates that the security's price will move with the market. A beta of less than 1 means that the security will be less volatile than the market. A beta of greater than 1 indicates that the security's price will be more volatile than the market. For example, if a stock's beta is 1.2, it's theoretically 20% more volatile than the market. Many utilities stocks have a beta of less than 1.

Formula : $\dfrac{\beta = Cov\ (R_i R_m}{\sigma^2 m}$

where, Cov $(R_i R_m)$ is the variance between the return on security and the return on market portfolio 'm'

$$\frac{\text{Cov } (R_i R_m) \sum {}^n (R_i - R_i) - (R_m - R_m)}{(n-1)}$$

s^2m = Variance of return on market portfolio

12.3 BASIC ASSUMPTIONS FROM INVESTOR'S POINT OF VIEW

1. Aim to maximize economic utilities.
2. Are rational and risk-averse.
3. Are broadly diversified across a range of investments.
4. Are price takers, i.e., they cannot influence prices.
5. Can lend and borrow unlimited amounts under the risk-free rate of interest.
6. Trade without transaction or taxation costs.
7. Deal with securities that are all highly divisible into small parcels.
8. Assume all information is available at the same time to all investors.

12.4 CAPITAL MARKET LINE (CML)
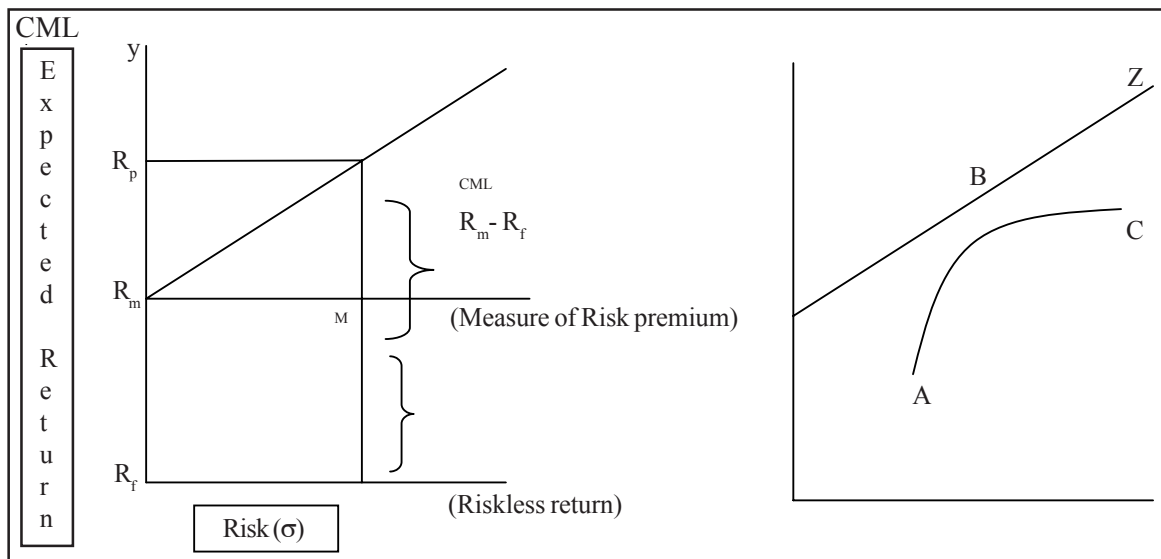
Fig. 1   **Fig. 2**

Figure 1

Point 'R$_f$' is the riskless interest rate. Preferred investments are plotted along the line R$_f$MZ, by the combination of both risky assets and risk-free assets, along with borrowing and lending. This is known as CML. It gives desirable set of investment opportunities between risk-free and risky investments. The slope of R$_f$MZ is the measure of the reward for risk taking. P is the risk free return. R$_m$ – R$_f$ is the measure of the risk premium – a return for the risk taking.

Figure 2

The line R$_f$B represents all possible combination of riskless and risky assets. The portfolio along with the path R$_f$B is called lending portfolio. If it crosses B it becomes borrowing portfolio. (Combination of risky portfolio with borrowing). Borrowing increases both the expected return and the risk while lending (i.e., combining risky portfolio with risk-free asset) reduces the expected return and risk.

Thus, the investors with high risk aversion will prefer to lend and thus hold a combination of risky-asset and risk-free asset. Others with less risk aversion will borrow and invest more in the risky portfolio, ABC represent efficient frontier. ABC line show the investor's portfolio of risky assets. The investors can combine risk-less asset either by lending or borrowing.

ABC is concave curve represent an efficient frontier of risky portfolios.

Introduction of borrowing and lending gives us an efficient frontier that is straight-line throughout.

$$E\,(R_P) = R_f + \frac{E(R_m - R_f)}{\sigma_m} \times \sigma_p$$

where E (R_p) = Portfolio's expected return.

$\quad$ R$_m$ $\quad$ = Expected return on the market portfolio.

$\quad$ σ_m $\quad$ = Standard deviation of market portfolio.

$\quad$ σ_p $\quad$ = Standard deviation of the portfolio.

12.5 SECURITY MARKET LINE (SML)

The risk-return relationship of an efficient portfolio is measured by the capital market line. All portfolios other than efficient portfolios will lie below the CML. The CML does not describe the risk-return relationship of inefficient portfolios of individual securities. The CAPM specifies the relationship between expected return and risk for all securities and all portfolios, whether efficient of 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 of diversifiable risk. As investment

is diversified and more and more securities are added to a 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 security risk is beta. The beta analysis is useful for individual securities and portfolios whether efficient or inefficient.

The relationship between expected return and â of a security can be determined graphically. Let us consider an XY graph where the expected returns are plotted on the OY-axis and beta coefficient on OX-axis. A risk-free asset has expected return equivalent to R_f and beta coefficient is zero (0). The Market Portfolio M has a beta coefficient of I and expected return equivalent to R_m. A straight-line joining these tow point is known as the Security Market Line (SML). The SML helps to determine the expected return for a given security beta. This is explained in the following figure.

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:

$$E (R_j) = R_f + \alpha_i [E(R_m) - R_f]$$
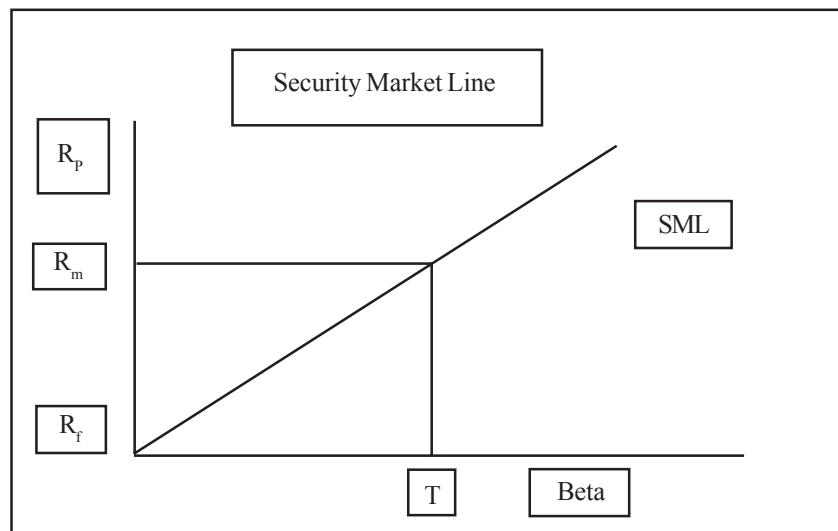
Period	Return on Stock A%	Return on Market Portfolio
1	10	12
2	15	14
3	18	13
4	14	10
5	16	9
6	16	13
7	18	14
8	4	7
9	-9	1

10	14	12
11	15	-11
12	14	16
13	6	8
14	7	7
15	-8	10

Illustration 1

Period	R_f	R_m	R_f-R_f	R_m-R_m	(R_f-R_f) (R_m-R_m)	(R_m-R_m)²
1	10	12	0	3	0	9
2	15	14	5	5	25	25
3	18	13	8	4	32	16
4	14	10	4	1	4	1
5	16	9	6	0	0	0
6	16	13	6	4	24	16
7	18	14	8	5	40	25
8	4	7	-6	-2	12	4
9	-9	1	-19	-8	152	64
10	14	12	4	3	12	9
11	15	-11	5	-20	-100	400
12	14	16	4	7	28	49
13	6	8	-4	-1	4	1
14	7	7	-3	-2	6	4
15	-8	10	-18	1	-18	1
Total	**150**	**135**	**10**	**9**	**221**	**624**

Solution:

$$\text{Cov} (R_i R_m) = 221/9$$
$$= 24.56$$

$$\text{Cov} (R_i R_m) = 624/9$$
$$= 69.33$$

$$\beta = \frac{\text{Cov} (R_i R_m)}{\sigma^2 m} = \frac{24.56}{69.33} = 03542$$

Thus, the security in portfolio indicates beta of 0.61274. It indicates the portfolio is less volatile than the return on market portfolio since the beta of the security is less than 1.

Illustration 2

Calculation of Beta

Year	Return on Security	Return on Market Portfolio
1	10	12
2	12	10
3	13	10
4	10	12
5	8	15
6	11	14
7	16	20
8	12	15
9	18	20
10	20	22

Solution:

Year	R_f	R_m	$(R_i - \bar{R}_i)$	$(R_m - \bar{R}_m)$	$(R_i - \bar{R}_i) - (R_m - \bar{R}_m)$	$(R_m - \bar{R}_m)^2$
1	10	12	-3	-3	9	9
2	12	10	-1	-5	5	25
3	13	10	0	-5	0	25
4	10	12	-3	-3	9	9
5	8	15	-5	0	5	0
6	11	14	-2	2		
7	16	20	3	15		
8	12	15	-1	0		
9	18	20	5	25		
10	20	22	7	49		
N = 0	53	59	= 13	=15	114	168

$$\text{Cov } (R_i R_m) = \frac{114}{9} = 12.67$$

$$\sigma^2 m = \frac{168}{9} = 18.67$$

$$\beta = \frac{12.67}{18.67} = 0.68$$

Illustration 3

Investment in Equity Shares	Initial price	Dividend/ Interest	Market Price (end of the year)	Beta risk factor
Power Ltd.	25	2	50	0.5
Coal Ltd.	35	2	60	0.6
Government bonds	100	140	1005	0.66
Steel Ltd.	45	2	135	0.4

Risk-free return may be taken at 14%

You are required to calculate

1. Expected rate of return of portfolio in each using CAPM model

2. Average return of portfolio

Solution:

1. Calculation of Expected Rate of Return

Investment in Equity Shares	Initial Price	Dividend/ Interest	Capital Gain
Power Ltd.	25	2	25
Coal Ltd.	35	2	25
Government bonds	1000	140	5
Steel Ltd.	45	2	90
Total	**1105**	**146**	**145**

Expected rate of return on market portfolio

$$= \frac{\text{Dividend} + \text{Capital Appreciation}}{\text{Initial Investment}} \times 100$$

$$= \frac{146 + 145}{1105} \times 100 = 26.33\%$$

Applying CAPM,

$K_i = R_f + b (K_m - R_f)$

Power Ltd. = 14 + 0.5 (26.33 – 14) = 20.165

Coal Ltd. = 14 + 0.6 (26.33 – 14) = 21.398

Government bonds = 14 + 0.66 (26.33 – 14) = 22.137

Steel Ltd. = 14 + 0.4 (26.33 – 14) = 18.932

2. Average return of portfolio = $\dfrac{20.165 + 21.398 + 22.137 + 18.932}{4}$ = 20.658%

12.6 EXERCISES

Multiple Choice Questions
Choose the right answer

1. Which theory believes that the investor prefer smaller returns?
   (i) Modern
   (ii) Traditional
   (iii) Jensen D. Sharpe

2. Which measures systematic or non-systematic risk of a security?
   (i) Standard deviation
   (ii) Variance
   (iii) Beta

3. Modern theory _____ the relationship between risk and return.
   (i) Analyze
   (ii) Quantify
   (ii) Qualify

4. CAPM model, correct measure of risk is termed as_____.
   (i) Alpha coefficient
   (ii) Beta coefficient
   (iii) Financial risk

Ans: 1. (ii), 2. (iii), 3. (ii), 4. (ii)

Sums for Practice

1. (a) The risk-free return is 8% and the return on market portfolio is 12% if required return on a stock is 15%, what is beta?

   (b) The risk-free return is 9%. The required return on a stock whose beta is 1.5 is 15%. What is return of the market portfolio?

2. Mr. Kaushik has a portfolio of three securities. From the following details, compute the portfolio returns and rate of return on individual securities.

Security	Price as on 31.12.94	Price as on 31.12.95	Yearly dividend
A	20	30	2
B	30	40	3
C	50	60	5

3. (a) What will be the expected return on a portfolio comprised of the following securities?

Security	Expected return %	Proportion %
A	10	25
B	15	25
C	20	50

   (b) What will be the expected return if the proportion of each security in the portfolio is 20, 30, and 50 respectively?

4. Mr. Sharma's portfolio return are given below:

Year	Securities	Return
1	X	12
1	Y	10
2	X	18
2	Y	16

   Standard deviation of both the securities is 3.

   Calculate:

   (a) Expected rate of return on his portfolio if it is made up of 50% of X and 50% of Y.

   (b) Covariance of X and Y.

   (c) Portfolio risk made up of 50% of X and 50% of Y.

5. A portfolio consists of 3 securities 1, 2 and 3. The proportion of these securities is 0.3, 0.5 and 0.2. The standard deviation of returns on these securities is 6, 9 and 10 respectively. The corelation coefficient among security are 1 and 2 = 0.4, 1 and 3 = 0.6 and 2 and 3 = 0.7. What is standard deviation of portfolio return?

6. A firm's current EPS is ₹ 6, its dividend payout is 40%, and growth rate of EPS is 10%. The normal P/E multiple is 15/1. What is the stock's value using the capitalization of earnings method? What is its value in 3 years using the same method?

7. Returns of X Ltd., were 12%, 13%, 12% and 11% in the last four years. Returns of Y Ltd. were 12%, 13%, 9% and 10% in the last four years. While average market returns were 14%, 15%, 14%, 13% in the last four years, return on government returns for X Ltd., and Y Ltd. (using CAPM) and offer your comments.

❑   ❑   ❑

13 CHAPTER

EFFICIENT MARKET HYPOTHESIS

Chapter Contents:

13.1 INTRODUCTION

Efficiency of market implies that all known information is immediately discounted by all investors and reflected in share prices in the stock market. In an ideal efficient market, everyone knows all possible-to-know information simultaneously, interprets it similarly and behaves rationally. In such a situation, the only price changes that would occur are those which result from new information. In an efficient market, liquid capital will channel quickly and accurately where it will do the community the most good. Efficient market will provide ready financing for worthwhile business ventures and drain capital away from corporations which are poorly managed. It is essential that a country has efficient capital markets if it is to enjoy highest possible level of wealth, welfare and education. One of the main reasons that some underdeveloped countries do not advance is that they have insufficient capital markets. In inefficient capital markets prices may be fixed or manipulated rather than determined by supply and demand. Capital may be controlled by a few wealthy people and not be fluid and flow where it is needed.

In an efficient market, all the relevant information is reflected in the current stock price. Information cannot be used to obtain excess return and the information has already been taken into account and absorbed in the prices. Thus, all prices are correctly stated and there are no bargains in the stock market. Efficiency in the security market 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. The investors will also be less likely to discover great bargains and thereby earn extraordinary high rates of return. **The following are the requirements of securities market to be efficient**:

(1) Prices must be efficient so that new innovations and better products will cause a company's securities prices rise and motivate investors to supply capital to the company.

(2) Information must be discussed freely and quickly across the nation so all investors can react to new information.

(3) Transaction costs are ignored (i.e., brokerage or commission).

(4) Taxes are assumed to have no noticeable effect on investment policy.

(5) Every investor is allowed to borrow or lend at the same rate.

(6) Investors must be rational and able to recognize efficient assets and invest money where it is needed most.

13.2 RANDOM WALK THEORY

The first specification of efficient markets and their relationships to the randomness of prices for things traded in the market goes to **Samuelson and Mandelbrot** "Samuelson has proved in 1965, that if a market has zero transaction costs, if all available information is free to all interested parties, and if all market participants and potential participants have the same horizons and expectations about prices, the market will be efficient and prices will fluctuate randomly".

According to the Random Walk Theory, the changes in prices of stock show independent behaviour and are dependent on the new pieces of information that are received but within themselves are independent of each other. Whenever a new price of information is received in the stock market, the market independently receives this information and it is independent and separate from all other pieces of information. For example, a stock is selling at ₹ 40 based on existing information known to all investors. Afterwards, the news of a strike in that company will bring down the stock price to ₹ 30 the next day. The stock price further goes down to ₹ 25. Thus, the first fall in stock price from ₹ 40 to ₹ 30 is caused because of some information about the strike. But the second fall in the price of a stock from ₹ 30 to ₹ 25 is due to additional information on the type of strike. Therefore, each price change is independent of the other because each information has been taken in, by the stock market and separately disseminated. However, independent pieces of information, when they come together immediately after each other show that the price is falling but each price fall is independent of the other price fall.

The basic essential fact of the Random Walk Theory is that the information on stock prices is immediately and fully spread over that other investors have full knowledge of the information. The response makes the movement of prices have an independent nature and therefore, the price of each day is different. The theory further states that the financial markets are so competitive that there is immediate price adjustment. It is due to the effective communication system through which information can be distributed almost anywhere in the country. This speed of information determines the efficiency of the market.

13.3 EFFICIENT MARKET

Michael C. Jensen has defined an efficient market as, "A market is efficient with respect to a given information set, if it is impossible to make profits by trading on the basis of that information set. By economic profit is meant the risk-adjusted returns net of all costs."

Eugene F. Fama has also defined an efficient market as, "Market efficiency requires that in setting the prices of securities at any time t-1, the market correctly uses all available information".

Thus, market efficiency means that all know information is immediately discounted by all investors and reflected in the market price of stocks. This means that no one has an information edge. In an efficient market, every one knows all possible 'to know' information simultaneously. Every one interprets it similarly and behaves rationally. The market is assumed to be efficient in many more senses. One cannot expect to earn superior rates of return by analyzing annual reports, announcements of dividend changes, etc. The strong form asserts that not even those with privileged information can make use of it to secure superior investments results.

13.4 EFFICIENT MARKET HYPOTHESIS

The Random Walk Theory is based on the efficient market hypothesis. The hypothesis that holds that the financial market is in possession of all available information which may influence the price of a share or stock that as a result there is perfect competition in the financial market. The hypothesis assumes that share prices wander in a random fashion because the investors, in a perfectly competitive market, take account of all facts about a share in determining its price. This hypothesis is supposed to take three forms – weak form, semi-strong form and strong form.

(1) **Weak form:** The weak form implies that the knowledge of the past patters of stock prices does not aid investors to attain improved performance. It is opposite of technical analysis which completely relies on charts and past behaviour of stock prices. In this weak form of efficient market the past prices of stocks do not provide help in giving any information about the future prices. Random Walk Theory states that the stock prices move randomly about a trend line which is based on anticipated earnings power. Therefore, analyzing past data does not permit the technician to forecast the movement of prices about the trend line and new information affecting stock prices enters the market in random fashion. Thus, the weak form of efficient market hypothesis is a direct challenge to the chartist or technical analyst.

(2) Semi-strong form: The semi-strong of the efficient market hypothesis concentrates on how rapidly and efficiently market prices adjust to new publicly available information. The investor, in this form of market, will find it impossible to earn a return on the portfolio which is based on the publicity available information in excess of the return which may be said to be commensurate with the portfolio risk. Semi-strong form suggests the fruitlessness of efforts to earn superior rates of return, it represents a direct challenge to traditional financial analysis based on the evaluation of publicly available data. In the semi-strong market any new announcement would bring a reaction immediately upon the announcement. This reaction prior to or immediately after the announcement would be caused by the additional information which is not anticipated by the stock market participants.

(3) Strong form: The strong form is concerned with the possession of inside information. In the strong form of the market it is stated that all information is represented in the security prices in such a way that there is no opportunity for any person to make an extraordinary gain on the basis of any information. The stock prices reflect not only what is generally known through public announcements but also what is generally known through public announcements. Certain groups have monopolistic access to information. This is the most extreme from of the efficient market hypothesis. If the strong form holds, then, any day is as good as other day to buy any stock. However, most of research work, has indicated that the efficient market hypothesis in the strongest form does not hold good. There is no doubt that access to inside information, such as that available to corporate officials and specialists, enables investors to beat the market, this is not surprising and explains why market efficiency is usually restricted to the weak and semi-strong forms.

13.5 RANDOM WALK AND SECURITY ANALYSIS

Random walk is not an attempt at selecting securities or giving information about relative price movements. It does not give information about price movements of markets, industry or firms. The random walk hypothesis is consistent with upward and downward movements in prices and to some extent it supports the fundamental analysis. If random walk theory is valid and security exchanges are efficient markets then stock prices in any point of time will represent good estimates of intrinsic or fundamental values. Thus, additional fundamental analysis is of value only when the analyst has information or new insights not already put into a stock's current market price.

Random walk hypothesis is also contrary to the technical analysts view of behaviour of stock prices. The technical analyst thinks that history repeats itself and by studying the past behaviour of stock prices, future prices can be predicted. However, random walk hypothesis is in direct opposition to the technical analysis. The most general implication of the efficient market hypothesis is that most security analysis is logically incomplete and valueless. A typical analytical report is based on public information and valueless. A typical analytical report is based on public information and indicates the prospects for either improvement or deterioration in the company's profitability. After what is often

a detailed, lucid, accurate and perspectives analysis, the analyst concludes with a recommendation that the stock be bought, held, sold or sold short.

13.6 EXERCISES

1. What is Random Walk Theory? State its importance.

2. Which are the three forms of efficient market hypothesis do you think it is valid?

3. Define and explain the semi-strong efficient market hypothesis.

Objective Type Questions

State with reasons whether the following statements is True or False

1. The Random Walk Theory is not based on the efficient market hypothesis.

2. The strong form of efficient market is not concerned with the possession of public information.

3. Random Walk Theory suggests that the successive price changes are information.

4. Noise trading refers to trading in direct relation to the technical analysis.

  Ans: 1. False, 2. True 3. False, 4. True.

State whether True or False

1. In the weak form of the market, historical prices are reflected.

2. Random Walk Theory suggests that stock market readjusts itself quickly to new equilibrium levels.

3. The strong form of the market states that no investor can continuously make profits on the stock exchange by future forecasts.

4. Run Test and Filter Tests showed market.

5. Mutual fund performance has been tested by Friend in 1972, Sharpe in 1966 and Jensen in 1969 efficiency.

  Ans: 1. (F), 2. (T), 3. (T), 4. (F), 5. (T).

Multiple Choice Questions

Choose the right answer

1. In the weak form of the efficient market the stock price indicates

     (i)   the trading volumes and past prices of the shares

    (ii)   the past price of the shares

    (iii)   demand and supply position of the company

    (iv)   the financial position of a company

2. The efficient market theory states that

   (i)   the price movement of shares depends on previous prices

   (ii) prices of shares are indicated through patterns like line charts

   (iii) each successive change does not depend on previous share prices

   (iv) share prices move in the form of a trend.

3. In the strong form of the efficient market

   (i)   stock prices show the performances of the firm

   (ii) the stock prices reflect past prices of the share

   (iii) all informations reflected on price of share

   (iv) mutual funds are consistently superior to other investors.

Ans: 1. (i), 2. (iii), 3. (iii).

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14 CHAPTER

PORTFOLIO FRAMEWORK AND MANAGEMENT
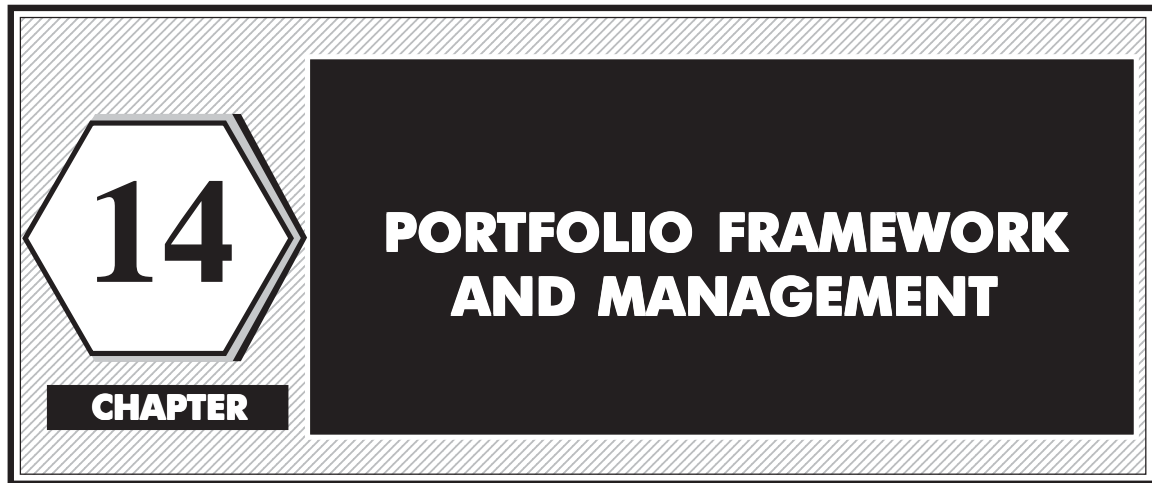
Chapter Contents:

14.1 INTRODUCTION ON PORTFOLIO MANAGEMENT

An investor considering investment in securities is faced with the problem of choosing from among a large number of securities and how to allocate his funds over this group of securities. Again he is faced with problem of deciding which securities to hold and how much to invest in each. The risk and return characteristics of portfolios. The investor tries to choose the optimal portfolio taking into consideration the risk return characteristics of all possible portfolios.

As the risk return characteristics of individual securities as well as portfolios also change. This calls for periodic review and revision of investment portfolios of investors.

An investor invests his funds in a portfolio expecting to get good returns consistent with the risk that he has to bear. The return realized from the portfolio has to be measured and the performance of the portfolio has to be evaluated.

It is evident that rational investment activity involves creation of an investment portfolio. Portfolio management comprises all the processes involved in the creation and maintenance of an investment portfolio. It deals specifically with the security analysis, portfolio analysis, portfolio selection, portfolio revision and portfolio evaluation. Portfolio management makes use of analytical techniques of analysis and conceptual theories regarding rational allocation of funds. Portfolio management is a complex process which tries to make investment activity more rewarding and less risky.

14.2 SELECTION OF PORTFOLIO

The selection of portfolio depends upon the objectives of the investor. The selection of portfolio under different objectives are dealt subsequently.

Objectives and Asset Mix

If the main objective is getting adequate amount of current income, sixty per cent of the investment is made in debt instruments and remaining in equity. Proportion varies according to individual preference.

- **Growth of income and asset mix:** Here the investor requires a certain per centage of growth as the income from the capital he has invested. The proportion of equity varies from 60 to 100% and that of debt from 0 to 40%. The debt may be included to minimize risk and to get tax exemption.

- **Capital appreciation and Asset Mix:** It means that value of the investment made increases over the year. Investment in real estate can give faster capital appreciation but the problem is of liquidity. In the capital market, the value of the shares is much higher than the original issue price.

- **Safety of principle and asset mix:** Usually, the risk adverse investors are very particular about the stability of principal. Generally, old people are more sensitive towards safety.

- **Risk and return analysis:** The traditional approach of portfolio building has some basic assumptions. An investor wants higher returns at the lower risk. But the rule of the game is that more risk, more return. So, while making a portfolio the investor must judge the risk taking capability and the returns desired.

- **Diversification:** Once the asset mix is determined and risk-return relationship is analyzed the next step is to diversify the portfolio. The main advantage of diversification is that the unsystematic risk is minimized.

14.3 INVESTMENT CONSTRAINTS

When creating a policy statement, it is important to consider an investor's constraints. There are five types of constraints that need to be considered when creating a policy statement. They are as follows:

- **Liquidity Constraints:** Liquidity constraints identify an investor's need for liquidity, or cash. For example, within the next year, an investor needs $50,000 for the purchase of a new home. The $50,000 would be considered a liquidity constraint because it needs to be set aside (be liquid) for the investor.

- **Time Horizon:** A time horizon constraint develops a timeline of an investor's various financial needs. The time horizon also affects an investor's ability to accept risk. If an investor has a long time horizon, the investor may have a greater ability to accept risk because he would have a longer time period to recoup any losses. This is unlike an investor with a shorter time horizon whose ability to accept risk may be lower because he would not have the ability to recoup any losses.

- **Tax Concerns:** After tax returns are the returns investors are focused on when creating an investment portfolio. If an investor is currently in a high tax bracket as a result of his income, it may be important to focus on investments that would not make the investor's situation worse, like investing more heavily in tax-deferred investments.

- **Legal and Regulatory:** Legal and regulatory factors can act as an investment constraint and must be considered. An example of this would occur in a trust. A trust could require that no more than 10% of the trust be distributed each year. Legal and regulatory constraints such as this one often can't be changed and must not be overlooked.

- **Unique Circumstances:** Any special needs or constraints not recognized in any of the constraints listed above would fall in this category. An example of a unique circumstance would be the constraint an investor might place on investing in any company that is not socially responsible, such as a tobacco company.

14.4 SELECTION OF ASSET MIX

What Does Asset Mix Mean?

The classification of all assets within a fund or portfolio. Assets are assigned to one of the core asset classes: stocks (equities), bonds (fixed income), cash and real estate. Other categories that are sometimes considered asset classes are commodities, international investments, hedge funds and limited partnership interests.

The asset mix is usually shown as the set of percentages every asset class contributes to the total market value of the portfolio. It is a key determinant of the risk/reward profile of the fund, which in turn is largely determinant of long-term performance results.

Based on your objectives and constraints, you have to specify your asset allocation, that is, you decide how much of your portfolio has to be invested in each of the following asset categories:

1. Cash

2. Bonds

3. Stocks

4. Real estate

5. Precious metals

6. Other

The thrust of this article will be on determining the appropriate mix of 'bonds' and 'stocks' in the portfolio. Before we examine this issue, note the following:

The first important investment decision for most individuals is concerned with their education meant to build their human capital.

The most significant asset that people generally have during their early working years is their earning power that stems from their human capital. Purchase of life and disability insurance becomes a pressing need to hedge against loss of income on account of death or disability.

The first major economic asset that individuals plan to invest in is their own house. Before they are ready to buy the house, their savings are likely to be in the form of bank deposits and money market mutual fund schemes. Referred to broadly as 'cash' these instruments have appeal because they are safe and liquid.

Once the investment in house is made and reasonable liquidity in the form of 'cash' is maintained to meet expected and unexpected expenses in the short-run, the focus shifts to planning for the education of children, providing financial security to the family, saving for retirement, bequeathing, wealth to heirs, and contributing to charitable activities. In this context 'stocks' and 'bonds' become important. Very broadly, we define them as follows:

'Stocks' include equity shares (which in turn may be classified into income shares, growth shares, blue chip shares, cyclical shares, speculative shares, and so on) and units/shares of equity schemes of mutual funds (like Master shares, Birla Advantage, and so on).

'Bonds' defined very broadly, consist of non-convertible debentures of private sector companies, public sector bonds, gilt edged securities, RBI Savings Bonds, units/shares of debt-oriented schemes of mutual funds, National Savings Certificates, Kisan Vikas Patras, bank deposits, post office savings deposits fixed deposits with companies, deposits in provident fund and public provident fund schemes, deposits in the Senior Citizen's Savings Scheme, and so on. The basic feature of these investments is that they earn a fixed or near fixed return.

14.5 SELECTION OF PORTFOLIO

Certain assumptions were made in the traditional approach for portfolio selection, which are discussed below:

- Investors prefer large to smaller returns from securities and take more risk.
- Ability to achieve higher returns depends upon investor's judgement of risk.
- Spreading money among many securities can reduce risk.

An investor can select the best portfolio to meet his requirements from the efficient frontier, by following the theory propounded by Markowitz. Selection process is based on the satisfaction level that can be achieved from various investment avenues.

Stages in the selection process:

The process of selecting a portfolio is very crucial in the investment management and involves four stages which are given below:

- Determination of assets, which are eligible for constructing of a portfolio.
- Computation of the expected return for the eligible assets over a holding period.
- Arriving at an acceptable balance between risk and return for constructing optimum a portfolio, i.e., selecting such a portfolio for which there is highest return for each level of risk.

Selecting the best portfolio mix:

When an infinite number of portfolios are available, investor selects the best portfolio by using the Markowitz portfolio theory. The investors base their selection on the expected return and standard deviation of the portfolio and decide the best portfolio mix taking the magnitude of these parameters. The investors need not,

Evaluate all the portfolios however he can look at only the available portfolios, which lie on the efficient frontier.

The required features of the subset of portfolio are:

They should offer maximum expected return for varying levels of risk, and also offer minimum risk for varying levels of expected returns.

If the above two conditions are satisfied then it is deemed as an efficient set, from this set investors have to select the best set of portfolios.

Construction of efficient set of portfolios:

Considerable effort is required to construct an efficient set of portfolios.

Following parameters are essential for constructing the efficient set:

- Expected returns for each security must be estimated.
- Variance of each security must be calculated.

Optimum Portfolio

Sharpe has identified the optimal portfolio through his single index model, according to Sharpe, the beta ratio is most important in portfolio selection. The optimal portfolio is said to relate directly to the beta value. It is the excess return to the beta ratio. The optimal portfolio is selected by finding out the cut-off rate [c]. The stock where the excess return to the beta ratio is greater than cut-off rate should only be selected for inclusion in the optimal portfolio. Sharpe proposed that desirability of any stock is directly referred to its excess returns to betas coefficient.

$$\frac{Ri - Rf}{\beta}$$

where, Ri = expected return on stock

Rf = risk-free rate of return on asset

β = expected change in the rate of return on stock one associated with 1% change in the market return

Following procedure are involved to select the stocks for the optimum portfolios.

- Finding out the stocks of different risks-return ratios
- Calculate excess return beta ratio for each stock and rank them from the highest to lowest
- Finding out the cut-off rate for each security
- Selecting securities of high rank above the cut-off rate which is common to all stocks

Thus, the optimum portfolio consists of all stocks for which (Ri-Rf) is greater than a particular cut off-point (c*). The selection of the number of stocks depends upon the unique cut-off rate, where all stocks with higher rate (Ri-Rf) will be selected and stocks with lower rates will be eliminated.

14.6 PORTFOLIO EXECUTION

The next step is to implement the portfolio plan by buying and/or selling specified securities in given amounts. This is the phase of portfolio execution which is often glossed over in portfolio management literature. For effectively handling the portfolio execution phase, we have to understand what the trading game is like, what is the nature of key players in this game, who are the likely winners and losers in this game, and what guidelines should be borne in mind while trading.

Trading Game

1. In a typical securities transaction, the motive and even the identity of the other party is not known.
2. A security transaction tends to be a zero sum game. A security offers the same future cash flow stream to the buyer as well as the seller. So, apart from considerations of taxes and

differential risk-bearing abilities, the value of security is the same to the buyer as well as the seller. Hence, the constructive motives which guide the business transactions are not present in most security transactions. This means if one wins the other wins.

Key Players

1. **Value Based Transactors:** A value based transactor (VBT) carries out extensive analysis of publicly available information to establish values. They generally serve as the anchor for the trading system and establish the framework for the operations of dealers.

2. **Information Based Transactors:** An information based transactors (IBT) transacts on the basis of information which is not publicly domain and therefore not reflected in security prices. Since he expects this information to have a significant impact on prices, he is keen to transact soon. To him, time is a great value. They generally employs 'incremental' fundamental analysis and technical analysis.

3. **Liquidity Based Transactors:** A liquidity based transactor, trades primarily due to liquidity considerations. He may be regarded as an informationless trader who is driven mainly by liquidity considerations.

4. **Pseudo-information Based Transactors:** A pseudo-information based transactor (PIBT) believes that he possesses information that can be a source of gain, even though that information is already captured or impounded in the price of the security.

5. **Dealers:** A dealer intermediates between buyers and sellers eager to transact. The dealer is ready to buy or sell with a spread which is fairly small for actively traded securities.

Who Wins, Who Loses

It appears that the IBT's odds of winning are the highest, assuming that his information is substantiated by the market. He is followed by the VBT, LBT, and PIBT in that order.

- The IBT seems to have a distinct edge over others.
- The VBT tends to lose against the IBT but gains against the LBT and PIBT.
- The LBT may have some advantage over the PIBT.

Guidelines

1. **Maintain a dialogue with the broker:** When a trade is seriously contemplated, check with the broker about the sensitivity of the stock to buying or selling pressure, the volume that can be traded without pushing the price out of the desirable range, the manipulative games, if any, being played by operators, and the degree of market resilience.

2. **Place an order which serves best interest:** The more common types of orders are: the market order, the best efforts order, the market-on-open order and the limit order. The *market order* instructs the broker to execute the transaction promptly at the best available

price. The *best efforts order* gives the broker a certain measure of discretion to execute the transaction when he considers the market condition more favourable. The *market-on-open order* instructs the broker to execute the transaction during the opening of the trading day. The limit order instructs the broker to execute the transaction only within the price limits specified in the order.

3. **Avoid serious trading errors:** The worst trading errors appear to be following:

- a VBT sells time too cheaply,
- an IBT buys time too expensively, and
- an LBT, by appearing motivated by information, evokes very defensive responses from dealers and other market participants

14.7 PORTFOLIO REVISION

Having constructed the optimal portfolio, the investor has to constantly monitor the portfolio to ensure that it continues to be optimal. As the economy and financial markets are dynamic, the changes take place almost daily. The investor now has to revise his portfolio. The revision leads to purchase of new securities and sale of some of the existing securities from the portfolio.

Need for Revision

- Availability of additional funds for investment
- Availability of new investment avenues
- Change in the risk tolerance
- Change in the time horizon
- Change in the investment goals
- Change in the liquidity needs
- Change in the taxes

14.8 EXCERCISES

Sums for Practice

1. A and B are two portfolios. A has a sample mean of success 12% and B has a sample mean of success 16%. The respective standard deviation are 15% and 18%. The mean return for the market index is 12 and standard deviation is 8 while the risk-free rate is 8%. Compute the Sharpe index for the portfolios and the market.

2. You are asked to analyze the two portfolio having the following characteristics:

Particulars		Fund X	Fund Y
Average return	(R) – Per cent	17	15
Standard deviation	(σ) – Per cent	16	12
Risk-free rate	(Rf) – Per cent	9.5	9.5

3. You are asked to analyze the two portfolios having the following characteristics:

Portfolio	Average return	Beta	Standard deviation
A	18%	2	3
B	12%	1.5	2

The risks free return is 9%. The return on the market portfolio is 15%. The standard deviation of the market is 6%.

(i) Treynor's index.

(ii) Sharpe's index for market portfolio.

(iii) Evaluate the portfolio performance.

4. The actual results of the portfolio and the market index during the past three years are given below:

Portfolio	Return on portfolio	Portfolio beta	Risk-free interest rate
A	15	1.2	8%
B	12	0.8	8%
C	16	1.5	8%
Market index	13	1.0	8%

You are required to rank these portfolios according to Jenesen's measure of portfolio evaluation.

5. The details of three portfolios are given below. Compare these portfolios on performance using the Sharpe, Treynor and Jensen's measures.

Portfolio	Average return	Standard deviation	Beta
1	15%	0.25	1.25
2	12%	0.30	0.75
3	10%	0.20	1.10
Market index	12%	0.25	1.20

The risk-free rate of return is 9%.

6. Following are the details of comparative returns of the two mutual funds schemes and market portfolio.

Year fund	Kotak growth	Birla growth	Market portfolio
2001	20	28	22
2002	25	29	6
2003	30	27	8
2004	15	20	9
2005	25	6	25

Risk-free rate of return is 10%.

Calculate Sharpe, Treynor's and Jensen's differential index for both the funds and for market portfolio. Rank their performance.

7. Consider the following data for a particular sample period:

Particulars	Portfolio X	Market portfolio
Average returns beta	30%	20%
Standard deviation	2	1.2
Risk-free return	40%	30%

Calculate the performance measures of the portfolio X and market portfolio. Compare the performances.

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APPENDIX

1. TB: Treasury Bill
2. CD: Certificate of Deposit
3. PPF: Public Provident Fund
4. KVP: Kisan Vikas Patra
5. IVP: Indira Vikas Patra
6. HDFC: Housing Development and Financial Corporation
7. NSC: National Saving Certificate
8. MMMF: Money Market Mutual Fund
9. GOI Bond: Government of India Bond
10. CP: Commercial Paper
11. IDBI: Industrial Development Bank of India
12. IRFC: Indian Railway Finance Corporation Ltd.
13. NRI: Non Resident Individual
14. HUF: Hindu Undivided Family
15. TDS: Tax Deducted at Source
16. UTI: Unit Trust of India
17. SEBI: Securities Exchange Board of India
18. ICICI: Industrial Credit and Investment Corporation of India
19. ULIPS: Unit Link Insurance Plan

20. NSE: National Stock Exchange

21. BSE: Bombay Stock Exchange

22. OTCEI: Over The Counter Exchange of India Ltd.

23. NSDC: National Security Depository Limited

24. SENSEX: Sensitive Index

25. CDSL: Central Depository Services Limited

26. NEAT: National Exchange for Automated Training

27. NSMS: National Stock Market System

28. BOLTS: Brokers Online Trading System

29. VSAT: Very Small Aperture Terminal

30. CCI: Controller of Credit Issue

31. PMS: Portfolio Management Services

APPENDIX

Appendix 1: Future Value Interest Factor (FVIF)

$$FVIF\ (r,\ n) = (1 + r)^n$$

Period n	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	1.010	1.020	1.030	1.040	1.050	1.060	1.070	1.080	1.090	1.100	1.110	1.120	1.130
2	1.020	1.040	1.061	1.082	1.102	1.124	1.145	1.166	1.188	1.210	1.232	1.254	1.277
3	1.030	1.061	1.093	1.125	1.158	1.191	1.225	1.260	1.295	1.331	1.368	1.405	1.443
4	1.041	1.082	1.126	1.170	1.216	1.262	1.311	1.360	1.412	1.464	1.518	1.574	1.630
5	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539	1.611	1.685	1.762	1.842
6	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677	1.772	1.870	1.974	2.082
7	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828	1.949	2.076	2.211	2.353
8	1.083	1.172	1.267	1.369	1.477	1.594	1.718	1.851	1.993	2.144	2.305	2.476	2.658
9	1.094	1.195	1.305	1.423	1.551	1.689	1.838	1.999	2.172	2.358	2.558	2.773	3.004
10	1.105	1.219	1.344	1.480	1.629	1.791	1.967	2.159	2.367	2.594	2.839	3.106	3.395
11	1.116	1.243	1.384	1.539	1.710	1.898	2.105	2.332	2.580	2.853	3.152	3.479	3.836
12	1.127	1.268	1.426	1.601	1.796	2.012	2.252	2.518	2.813	3.138	3.498	3.896	4.335
13	1.138	1.294	1.469	1.665	1.886	2.133	2.410	2.720	3.066	3.452	3.883	4.363	4.898
14	1.149	1.319	1.513	1.732	1.980	2.261	2.579	2.937	3.342	3.797	4.310	4.887	5.535
15	1.161	1.346	1.558	1.801	2.079	2.397	2.759	3.172	3.642	4.177	4.785	5.474	6.254
16	1.173	1.373	1.605	1.873	2.183	2.540	2.952	3.426	3.970	4.595	5.311	6.130	7.067
17	1.184	1.400	1.653	1.948	2.292	2.693	3.159	3.700	4.328	5.054	5.895	6.866	7.986
18	1.196	1.428	1.702	2.026	2.407	2.854	3.380	3.996	4.717	5.560	6.544	7.690	9.024
19	1.208	1.457	1.754	2.107	2.527	3.026	3.617	4.316	5.142	6.116	7.263	8.613	10.197
20	1.220	1.486	1.806	2.191	2.653	3.207	3.870	4.661	5.604	6.728	8.062	9.646	11.523
25	1.282	1.641	2.094	2.666	3.386	4.292	5.427	6.848	8.623	10.835	13.585	17.000	21.231
30	1.348	1.811	2.427	3.243	4.322	5.743	7.612	10.063	13.268	17.449	22.892	29.960	39.116

Appendix 1 (*contd.*)

Period n	14%	15%	16%	17%	18%	19%	20%	24%	28%	32%	36%	40%
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	1.140	1.150	1.160	1.170	1.180	1.190	1.200	1.240	1.280	1.320	1.360	1.400
2	1.300	1.322	1.346	1.369	1.392	1.416	1.440	1.538	1.638	1.742	1.850	1.960
3	1.482	1.521	1.561	1.602	1.643	1.685	1.728	1.907	2.097	2.300	2.515	2.744
4	1.689	1.749	1.811	1.874	1.939	2.005	2.074	2.364	2.684	3.036	3.421	3.842
5	1.925	2.011	2.100	2.192	2.288	2.386	2.488	2.392	3.436	4.007	4.653	5.378
6	2.195	2.313	2.436	2.565	2.700	2.840	2.986	3.635	4.398	5.290	6.328	7.530
7	2.502	2.660	2.826	3.001	3.185	3.379	3.583	4.508	5.629	6.983	8.605	10.541
8	2.853	3.059	3.278	3.511	3.759	4.021	4.300	5.590	7.206	9.217	11.703	14.758
9	3.252	3.518	3.803	4.108	4.435	4.785	5.160	6.931	9.223	12166	15.917	20.661
10	3.707	4.046	4.411	4.807	5.234	5.695	6.192	8.549	11.806	16.060	21.647	28.925
11	4.226	4.652	5.117	5.624	6.176	6.777	7.430	10.657	15.112	21.199	29.439	40.496
12	4.818	5.350	5.936	6.580	1.288	8.064	8.916	13.215	19.343	27.983	40.037	56.694
13	5.492	6.153	6.886	7.699	8.599	9.596	10.699	16.386	24.159	36.937	54.451	79.372
14	6.261	7.076	7.988	9.007	10.141	11.420	12.839	20.319	31.961	48.751	74.053	111.120
15	7.138	8.137	9.266	10.539	11.974	13.590	15.407	25.196	40.565	64.359	100.712	155.568
16	8.137	9.358	10.748	12.330	14.129	16.172	18.488	31.243	51.923	84.954	136.969	217.795
17	9.276	10.761	12468	14.426	16.672	19.244	22186	38.741	66.461	112.139	186.278	304.914
18	10.575	12.375	14.463	16.879	19.673	22901	26.623	48.039	85.071	148.023	253.388	426.879
19	12056	14.263	16.777	19.748	23.214	27.252	31.948	59.568	108.890	195.391	344.540	597.630
20	13.743	16.367	19.461	23.106	27.393	32.429	38.338	73.864	139.380	257.916	468.574	836.683
25	26.462	32.919	40.874	50.658	62.669	77.388	95.396	216.542	478.905	1033.590	2180.081	4499.880
30	50.950	66.212	85.850	111.065	143.371	184.675	237.376	634.820	1645.504	4142075	10143.019	24201.43

Appendix 2: Future Value Interest Factor for an Annuity (FVIFA) $FVIFA\,(r, n) = \dfrac{(1 + r)n - 1}{r}$

Period n	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	2.010	2.020	2.030	2.040	2.050	2.060	2.070	2.080	2.090	2.100	2.110	2.120	2.130
3	3.030	3.060	3.091	3.122	3.152	3.184	3.215	3.246	3.278	3.310	3.342	3.374	3.407
4	4.060	4.122	4.184	4.246	4.310	4.375	4.440	4.506	4.573	4.641	4.710	4.779	4.850
5	5.101	5.204	5.309	5.416	5.526	5.637	5.751	5.867	5.985	6.105	6.228	6.353	6.480
6	6.152	6.308	6.468	6.633	6.802	6.975	7.153	7.336	7.523	7.716	7.913	8.115	8.323
7	7.214	7.434	7.662	7.898	8.142	8.394	8.654	8.923	9.200	9.487	9.783	10.089	10.405
8	8.286	8.583	8.892	9.214	9.549	9.897	10.260	10.637	11.028	11.436	11.859	12.300	12.757
9	9.369	9.755	10.159	10.583	11.027	11.491	11.978	12.488	13.021	13.579	14.164	14.776	15.416
10	10.462	10.950	11.464	12.006	12.578	13.181	13.816	14.487	15.193	15.937	16.722	17.549	18.420
11	11.567	12.169	12.808	13.486	14.207	14.972	15.784	16.645	17.560	18.531	19.561	20.655	21.814
12	12.683	13.412	14.192	15.026	15.917	16.870	17.888	18.977	20.141	21.384	22.713	24.133	25.650
13	13.809	14.680	15.618	16.627	17.713	18.882	20.141	21.495	22.953	24.523	26.212	28.029	29.985
14	14.947	15.974	17.086	18.292	19.599	21.015	22.550	24.215	26.019	27.975	30.095	32.393	34.883
15	16.097	17.293	18.599	20.024	21.579	23.276	25.129	27.152	29.361	31.772	34.405	37.280	40.417
16	17.258	18.639	20.157	21.825	23.657	25.673	27.888	30.324	33.003	35.950	39.190	42.753	46.672
17	18.430	20.012	21.762	23.698	25.840	28.813	30.840	33.750	36.974	40.545	44.501	48.884	53.739
18	19.615	21.412	23.414	25.645	28.132	30.906	33.999	37.450	41.301	45.599	50.396	55.750	61.725
19	20.811	22.841	25.117	27.671	30.539	33.760	37.379	41.446	46.018	51.159	56.939	63.440	70.749
20	22.019	24.297	26.870	29.778	33.066	36.786	40.995	45.762	51.160	57.275	64.203	72.052	80.947
25	28.243	32.030	36.459	41.646	47.727	54.865	63.249	73.106	84.701	98.347	114.413	133.334	155.620
30	34.785	40.568	47.575	56.805	66.439	79.058	94.461	113.283	136.308	164.494	199.021	241.333	293.199

Appendix 2 *(contd.)*

Period n	14%	15%	16%	17%	18%	19%	20%	24%	28%	32%	36%	40%
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	2.140	2.150	2.160	2.170	2.180	2.190	2.200	2.240	2.280	2.320	2.360	2.400
3	3.440	3.473	3.S06	3.539	3.572	3.606	3.640	3.778	3.918	4.062	4.210	4.360
4	4.921	4.993	5.066	5.141	5.215	5.291	5.368	5.684	6.016	6.362	6.725	7.104
5	6.610	6.742	6.877	7.014	7.154	7.297	7.442	8.048	8.700	9.398	10.146	10.946
6	8.536	8.754	8.977	9.207	9.442	9.683	9.930	10.980	12.136	13.406	14.799	16.324
7	10.730	11.067	11.414	11.772	12.142	12.523	12.916	14.615	16.534	18.696	21.126	23.853
8	13.233	13.727	14.240	14.773	15.327	15.902	16.499	19.123	22.163	25.678	29.732	34.395
9	16.085	16786	17.518	18.285	19.086	19.923	20.799	24.712	29.369	34.895	41.435	49.153
10	19.337	20.304	21.321	22.393	23.521	24.709	25.959	31.643	38.592	47.062	57.352	69.814
11	23.044	24.349	25.733	27.200	28.755	30.404	32.150	40.238	50.399	63.122	78.998	98.739
12	27.271	29.002	30.850	32.824	34.931	37.180	39.580	50.985	65.510	84.320	108.437	139.235
13	32.089	34.352	36.786	39.404	42.219	45.244	48.497	64.110	84.853	112.303	148.475	195.929
14	37.518	40.505	43.672	47.103	50.818	54.841	59.196	80.496	109.612	149.240	202.926	275.300
15	43.842	47.580	51.660	56.110	60.965	66.261	72.035	100.815	141.303	197.997	276.979	386.420
16	50.980	55.717	60.925	66.649	72.939	79.850	87.442	126.011	181.868	262.356	377.692	541.988
17	59.118	65.075	71.673	78.979	87.068	96.022	105.931	157.253	233.791	347.310	514.661	759.784
18	68.394	75.836	84.141	93.406	103.740	115.266	128.117	195.994	300.252	459.449	700.939	1064.697
19	78.969	88.212	98.603	110.285	123.414	138.166	154.740	244.033	385.323	607.472	954.277	1491.576
20	91.025	102.440	115.380	130.033	146.628	165.418	186.688	303.601	494.213	802.863	1298.817	2089.206
25	181.871	212.793	249.214	292.105	342.603	402.042	471.981	898.092	1706.803	3226.844	6053.004	11247.199
30	356.787	434.745	530.321	647.439	790.948	966.712	1181.882	2640.916	5873.231	12940.859	28172.276	60501.081

Appendix 3: Present Value Interest Factor (FVIF)

$$PVIF\ (r, n) = (1 + r)^{-n}$$

Period n	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	0.901	0.893	0.885
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826	0.812	0.797	0.783
3	0.971	0.924	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751	0.731	0.712	0.693
4	0.961	0.924	0.889	0.855	0.823	0.792	0.763	0.735	0.708	0.683	0.659	0.636	0.613
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621	0.593	0.567	0.543
6	0.942	0.888	0.838	0.790	0.746	0.705	0.666	0.630	0.596	0.564	0.535	0.507	0.480
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	.513	0.482	0.452	0.425
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467	0.434	0.404	0.376
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424	0.391	0.361	0.333
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386	0.352	0.322	0.295
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350	0.317	0.287	0.261
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319	0.286	0.257	0.231
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290	0.258	0.229	0.204
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263	0.232	0.205	0.181
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239	0.209	0.183	0.160
16	0.853	0.728	0.623	0.534	0.458	0.394	0.339	0.292	0.252	0.218	0.188	0.163	0.141
17	0.844	0.714	0.605	0.513	0.436	0.377	0.311	0.270	0.231	0.198	0.170	0.146	0.125
18	0.836	0.700	0.587	0.494	0.416	0.350	0.296	0.250	0.212	0.180	0.153	0.130	0.111
19	0.828	0.686	0.570	0.475	0.396	0.331	0.276	0.232	0.194	0.164	0.138	0.116	0.098
20	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149	0.124	0.104	0.087
25	0.780	0.610	0.478	0.375	0.295	0.233	0.184	0.146	0.116	0.092	0.074	0.059	0.047
30	0.742	0.552	0.412	0.308	0.231	0.174	0.131	0.099	0.075	0.057	0.044	0.033	0.026

Appendix 3 (*contd.*)

Period n	14%	15%	16%	17%	18%	19%	20%	24%	28%	32%	36%	40%
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	0.877	0.870	0.862	0.855	0.847	0.840	0.833	0.806	0.781	0.758	0.735	0.714
2	0.769	0.756	0.743	0.731	0.718	0.706	0.694	0.650	0.610	0.574	0.541	0.510
3	0.675	0.658	0.641	0.624	0.609	0.593	0.579	0.524	0.477	0.435	0.398	0.364
4	0.592	0.572	0.552	0.534	0.516	0.499	0.482	0.423	0.373	0.329	0.292	0.260
5	0.519	0.497	0.476	0.456	0.437	0.419	0.402	0.341	0.291	0.250	0.215	0.186
6	0.456	0.432	0.410	0.390	0.370	0.352	0.335	0.275	0.227	0.189	0.158	0.133
7	0.400	0.376	0.354	0.333	0.314	0.296	0.279	0.222	0.178	0.143	0.116	0.095
8	0.351	0.327	0.305	0.285	0.266	0.249	0.233	0.179	0.139	0.108	0.085	0.068
9	0.308	0.284	0.263	0.243	0.226	0.209	0.194	0.144	0.108	0.082	0.063	0.048
10	0.270	0.247	0.227	0.208	0.191	0.176	0.162	0.116	0.085	0.062	0.046	0.035
11	0.237	0.215	0.195	0.178	0.162	0.148	0.135	0.094	0.066	0.047	0.034	0.025
12	0.208	0.187	0.168	0.152	0.137	0.124	0.112	0.076	0.052	0.036	0.025	0.618
13	0.182	0.163	0.145	0.130	0.116	0.104	0.093	0.061	0.040	0.027	0.018	0.013
14	0.160	0.141	0.125	0.111	0.099	0.088	0.078	0.049	0.032	0.021	0.014	0.009
15	0.140	0.123	0.108	0.095	0.084	0.074	0.065	0.040	0.025	0.016	0.010	0.006
16	0.123	0.107	0.093	0.081	0.071	0.062	0.054	0.032	0.019	0.012	0.007	0.005
17	0.108	0.093	0.080	0.069	0.060	0.052	0.045	0.026	0.015	0.009	0.005	0.003
18	0.095	0.081	0.069	0.059	0.051	0.044	0.038	0.021	0.012	0.007	0.004	0.002
19	0.083	0.070	0.060	0.051	0.043	0.037	0.031	0.017	0.009	0.005	0.003	0.002
20	0.073	0.061	0.051	0.043	0.037	0.031	0.026	0.014	0.007	0.004	0.002	0.001
25	0.038	0.030	0.024	0.020	0.016	0.013	0.010	0.005	0.002	0.001	0.000	0.000
30	0.020	0.015	0.012	0.009	0.007	0.005	0.004	0.002	0.001	0.000	0.000	0.000

Appendix 4: Present Value Interest Factor for an Annuity (PVIFA) $PVIFA\ (r, n) = 1 - \dfrac{1/(1+r)n}{r}$

Period n	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	0.901	0.893	0.885
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736	1.713	1.690	1.668
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487	2.444	2.402	2.361
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170	3.102	3.037	2.974
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791	3.696	3.605	3.517
6	5.795	5.601	5.417	5.242	5.076	4.917	4.766	4.623	4.486	4.355	4.231	4.111	3.998
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868·	4.712	4.56:4	4.423
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335	5.146	4.968	4.799
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759	5.537	5.328	5.132
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145	5.889	5.650	5.426
11	10.368	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495	6.207	5.938	5.687
12	11.255	10.575	9.945	9.385	8.863	8.384	7.943	7.536	7.161	6.814	6.492	6.194	5.918
13	12.134	11.348	10.635	9.986	9.394	8.853	8.358	7.904	7.487	7.103	6.750	6.424	6.122
14	13.004	12.106	11.296	10.563	9.899	9.295	8.745	8.244	7.786	7.367	6.982	6.628	6.302
15	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.559	8.060	7.606	7.191	6.811	6.462
16	14.718	13.578	12.561	11.652	10.838	10.106	9.447	8.851	8.312	7.824	7.379	6.974	6.604
17	15.562	14.292	13.166	12.166	11.274	10.477	9.763	9.122	8.544	8.022	7.549	7.120	6.729
18	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.372	8.756	8.201	7.702	7.250	6.840
19	17.226	15.678	14.324	13.134	12.085	11.158	10.336	9.604	8.950	8.365	7.839	7.366	6.938
20	18.046	16.351	14.877	13.590	12.462	11.470	10594	9.818	9.128	8.514	7.963	7.469	7.025
25	22.023	19.523	17.413	15.622	14.094	12.783	11.654	10.675	9.823	9.077	8.422	7.843	7.330
30	25.808	22.397	19.600	17.292	15.373	13.765	12.409	11.258	10.274	9.427	8.694	8.055	7.496

Appendix 4 (contd.)

Period n	14%	15%	16%	17%	18%	19%	20%	24%	28%	32%	36%	40%
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	0.877	0.870	0.862	0.855	0.847	0.840	0.833	0.806	0.781	0.758	0.735	0.714
2	1.647	1.626	1.605	1.585	1.566	1.547	1.528	1.457	1.392	1.332	1.276	1.224
3	2.322	2.283	2.246	2.210	2.174	2.140	2.106	1.981	1.868	1.766	1.674	1.589
4	2.914	2.855	2.798	2.743	2.690	2.639	2.589	2.404	2.241	2.096	1.966	1.849
5	3.433	3.352	3.274	3.199	3.127	3.058	2.991	2.745	2.532	2.345	2.181	2.035
6	3.889	3.784	3.685	3.589	3.498	3.410	3.326	3.020	2.759	2.534	2.339	2.168
7	4.288	4.160	4.039	3.922	3.812	3.706	3.605	3.242	2.937	2.678	2.455	2.263
8	4.639	4.487	4.344	4.207	4.078	3.954	3.837	3.421	3.076	2.786	2.540	2.331
9	4.946	4.772	4.607	4.451	4.303	4.163	4.031	3.566	3.184	2.868	2.603	2.379
10	5.216	5.019	4.883	4.659	4.494	4339	4.193	3.682	3.269	2.930	2.650	2.414
11	5.453	5.234	5.029	4.836	4.656	4.486	4.327	3.776	3.335	2.978	2.683	2.438
12	5.660	5.421	5.197	4.988	4.793	4.611	4.439	3.851	3.387	3.013	2.708	2.456
13	5.842	5.583	5.342	5.118	4.910	4.715	4.533	3.912	3.427	3.040	2.727	2.469
14	6.002	5.724	5.468	5.229	5.008	4.802	4.611	3.962	3.459	3.061	2.740	2.478
15	6.142	5.847	5.575	5.324	5.092	4.876	4.675	4.001	3.483	3.076	2.750	2.484
16	6.265	5.954	5.669	5.405	5.162	4.938	4.730	4.033	3.503	3.088	2.758	2.489
17	6.373	6.047	5.749	5.475	5.222	4.990	4.775	4.059	3.518	3.097	2.763	2.492
18	6.647	6.128	5.818	5.534	5.273	5.033	4.812	4.080	3.529	3.104	2.767	2.494
19	6.550	6.198	5.877	5.584	5.316	5.970	4.844	4.097	3.539	3.109	2.770	2.496
20	6.623	6.259	5.929	5.628	5.353	5.101	4.870	4.110	3.546	3.113	2.772	2.497
25	6.873	6.464	6.097	5.766	5.467	5.195	4.948	4.147	3.564	3.122	2.776	2.499
30	7.003	6.566	6.177	5.829	5.517	5.235	4.979	4.160	3.569	3.124	2.778	2.500

Section – I

N.B.: Answer all the questions in this section.

1. (a) Choose the right answer with your reasoning: (10)

(i) Which of the following is a tax saving investment?

    (a) Shares   (b) Debentures

    (c) PPF   (d) Real Estate

(ii) The object of portfolio is to _____ by diversification.

    (a) Risk   (b) Return

    (c) Uncertainty   (d) Percentage

(iii) When the payments are made at the end of each year, it is known as _____.

    (a) EMI   (b) Perpetuity

    (c) Annuity   (d) Hire Purchase

(iv) EPS is ₹ 4.28 and P/E ratio is 12 times. The market price of the share is _____.

    (a) ₹ 40   (b) ₹ 50

    (c) ₹ 60   (d) ₹ 70

(v) _____ a speculation on the stock exchange who expects a rise in the price of a certain security.

    (a) Bull   (b) Bear

    (c) Index   (d) BSE

(b) Give the full form of the following:

(1) YTM   (2) SEBI

(3) NSDL   (4) RONW

(5) PVIF

(2) Compare the following portfolio performance using (a) Sharpe, (b) Treynor and (c) Jensen's measures and rank them according to their performance: (15)

Portfolio	Average Return	Standard Deviation	Beta
Equity	15%	0.20	1.25
Debt	12%	0.35	0.75
Balanced	10%	0.15	1.20
Market Index	12%	0.25	1.00

The risk-fee rate of return is 6%.

Section – II

N.B.: Answer any three questions from this section.

(3) The following is the information of stock 'X' and stock 'Y' under the different states of nature: (10)

State of Nature	Probability	Return on 'X'	Return on 'Y'
Boom	0.40	20	26
Normal	0.30	15	18

MODEL PAPER - 1

TIME: 2 HOURS.   TOTAL MARKS: 60

SUB: SECURITY ANALYSIS.

Q.1.(A) Select appropriate terms as an answer with reasoning.   (10 marks)

  (i) Return on investment is determined by _____.

    (a) net worth   (b) net profit and capital employed

    (c) net profit   (d) capital employed.

  (ii) Which provides money with its time value?

    (a) Investment   (b) Interest Rates

    (c) Market Rates   (d) Call Rates.

  (iii) Which analysis provides a simplified picture of price behaviour of a share?

    (a) Fundamental   (b) technical,

    (c) Ratio   (d) funds flow.

  (iv) The fundamental analysis is a method of finding out _____.

    (a) Ratios   (b) value of share

    (c) tips   (d) Future of a security.

  (v) Investors who use technical analysis, start checking the market action of the share if it is _____.

    (a) Favourable   (b) Unfavourable

    (c) Desirable   (d) Profitable.

  (B) State full forms of following terms: (5 marks)

    (i) NSE

    (ii) CD

    (iii) POSB

    (iv) RBI

    (v) PPF

OR

Q.1.(A) What is the difference between investor and speculator.?   (8 marks)

   (B) What is a bond? What are the different type of bonds?   (7 marks)

Q.2.(A) Mr. Rama has been considering an investment in stock "A" or "B", he has estimated the following probability distribution of return of the stocks.

State of nature	Probability	Return "A"	Return "B"
1	10	-10	05
2	25	0	10
3	40	10	15
4	20	20	20
5	05	30	25

(i)   calculate the expected return on A and B.

(ii) calculate the standard deviation of stock A and B.

(iii) state which stock is worth investing.   (8 marks)

(B) Calculate the return in the following example:

	"S". Ltd. (₹)	"T". Ltd. (₹)
Price as on 31-3-2008	30	15
Price as on 31-3-2009	20	20
Dividend for the year	2	2

(7 marks)

OR

Q.2.(A) What are the advantages of technical analysis? Explain in detail   (8 marks)

(B) What are the investment objectives? Explain in detail   (7 marks)

Q.3.(A) What are the application of financial statement analysis.   (8 marks)

(B) Mr. Raj is planning to buy a machine which would generate cash flow as follows:

Year	0	1	2	3	4
Cash Flow	(25000)	6000	8000	15000	8000

If discount rate is 10%, is it worth to invest in machine?

Year	1	2	3	4
Discount Factor	0.909	0.826	0.751	0.683

Q.3 (B) Write short note on guilt-edged securities.   (7 marks)

OR

Q.3.(A) Following information is given in respect of 3 mutual funds and market:

Mutual Funds	Average return	Std. Deviation	Beta
A	12	18	1.1
B	10	15	0.9
C	13	20	1.2
MARKET	11	17	1.0

The mean risk-free rate 6%. Calculate the Teynor's measure and Sharpe's measure and rank the portfolios.   (10 marks)

   (B) Write short note on section of asset mix.   (5 marks)

Q.4.(A) Compute following ratios and briefly comment on each one of them: (10 marks)

   (i) Dividend yield,   (ii) EPS,

   (iii) Book value per share, and   (iv) P/E ratio.

   Meena Ltd., has presented its financial information for the year ended 31st March, 2006.

   Earnings before interest and taxes   ₹ 8,00,000

   1,00,000 Equity shares of ₹ 10each   ₹ 10,00,000

   10% debentures   ₹ 15,00,000

   R and S (before adjustments)   ₹ 5,00,000

   Provision for taxation   30%

   Proposed Dividend   20%

   Market price per share   ₹ 32

   (B)   Write a note on holding period return.   (5 marks)

OR

Q.4.(A) Write short Note on: (15 marks)

   (i) Money market Instruments,

   (ii) Dow Theory,

   (iii) Risk in investment.

❑   ❑   ❑

MODEL PAPER - 2

TIME: 2HOURS.   TOTAL MARKS: 60

SUB: SECURITY ANALYSIS.

Q.1. (A) Select appropriate terms as an answer with reasoning.   (10 marks)

  (i) Which of the following is a tax saving investment _____?

   (a) Shares   (b) FCD

   (c) G. Sec   (d) bank fixed deposit for 5years.

 (ii) Which of the following analysis provides a simplified picture of price behavioor of a share?

   (a) fundamental   (b) financial

   (c) Technical   (d) conventional

(iii) In case of a limited company, the term financial statements include ____.

   (a) P and L a/c,   (b) Balance Sheet,

   (c) P and L a/c & Balance Sheet,   (d) P and L Appropriate a/c.

 (iv) Which of the following is a financial investment?

   (a) Purchase of shares.   (b) Purchase of farm house.

   (c) Purchase of a car.   (d) Purchase of T.V. set.

  (v) Doubling period is a rule of_____

   (a) 55 and 9   (b) 72 and 69

   (c) 69 and 70   (d) 72 and 60

  (B) State full forms of following terms: (5 marks)

   (i) EPS

  (ii) CP

 (iii) NSE

  (iv) BOLTS

   (v) NASDAQ

OR

Q.1.(A) What is portfolio management? State the elements of portfolio management?   (8 marks)

 (B) What is security? What are the important securities traded in the stock market?

                                                                            (7 marks)

2. (A) Mr. Shah purchased 400 shares of Sundar Ltd., @ ₹ 61 each on 15ᵗʰ October, 2004. He paid brokerage of ₹ 600. The company paid the following dividends:

June, 2005	₹ 800
June, 2006	₹ 1000
June, 2007	₹ 1200

He sold all his holding for ₹ 34,500 (net) on October, 2007.

  (i) What is the holding period return?

 (ii) What is the annualized return?

(iii) Is Mr. Shah a good investor?   (8 marks)

(B) Calculate the return in the following example:

	A. Ltd. (₹)	B. Ltd. (₹)
Price as on 31-3-2005	20	10
Price as on 31-3-2006	15	15
Divident for the year	1	1

(7 marks)

OR

Q.2. (A) What is portfolio revision? What is the difference between portfolio rebalancing and portfolio upgrading?   (8 marks)

(B) What are the limitations of technical analysis?

Q.3. (A) What is an investment? How does it differ from speculation?   (8 marks)

(B) Find out the present value of a debenture from the following:

Face value of debenture	₹ 1,000
Annual Interest Rate	15%
Expected return	12%
Maturity period	5 years

(Present values of rupee one at 12% are, 0.8929, 0.7972, 0.7118, 0.6355 and 0.5674)

(7 marks)

OR

Q.3. (A) Following information is given in respect of 3 portfolios and market:

Portfolio	Average return	Std. Deviation	Beta
1	16%	0.20	1.25
2	13%	0.30	0.75
3	9%	0.25	1.10
MARKET	12%	0.25	1.20

The mean risk-free rate 9%. Calculate the Sharpe, Teynor's measures and Jensen's measure and rank the portfolios.   (10 marks)

(B) Write short note on guilt-edged securities.   (5 marks)

Q.4. (A) Compute following ratios and briefly comment on each one of them: (10 marks)

  (i)   Dividend yield

  (ii) EPS,

  (iii) Dividend payout ratio

  (iv) P/E ratio.

  (v)   Dividend payout ratio

  (vi) Book value per share and state whether it is worth investing in the equity shares of the company.

Raj Ltd., has presented its financial information for the year ended 31st March, 2008.

Profit before interest and taxes	₹ 16,50,000
Provision for taxation	30%
Proposed Dividend	25%
10% preference share capital	₹ 15,00,000
80,000 Equity shares of ₹ 10each	₹ 8,00,000
15% debentures of ₹ 100 each	₹ 7,00,000
R and S	₹ 12,00,000
Market price per share	₹ 50

(B) Write a note on demat trading.   (5 marks)

OR

Q.5. (A) Short Note on: (15 marks)

  (i)   Treasury Bills,

  (ii) Mutual Fund schemes,

  (iii) Repo program.

❐   ❐   ❐

MODEL PAPER - 3

TIME: 2HOURS.   TOTAL MARKS: 60

SUB: SECURITY ANALYSIS.

Q.1. (A) Select appropriate terms as an answer with reasoning.   (10 marks)

 (i) The object of portfolio is to reduce _____ by diversification.

     (a) uncertainties   (b) certainties,

     (c)   ratios   (d) balance sheet.

 (ii) Which of the following is a tax saving investment?

     (a) Fixed deposit,   (b) Shares,

     (c) PPF,   (d) Post office savings

 (iii) Which of the following is a tax saving investment _____?

     (a) Shares   (b) FCD

     (c) G. Sec   (d) bank fixed deposit for 5 years.

 (iv) Which theory quantifies the relationship between risk and return?

     (a) modern portfolio   (b) traditional portfolio,

     (c) efficient market   (d) equity portfolio.

 (v) The maturity of a treasury bill is for a period of ____months.

     (a) 3   (b) 6,

     (c) 9   (d) 12.

 (v) Which of the following is market for short-term financial instruments?

     (a) money,   (b) capital,

     (c) securities,   (d) commodities.

 (B) State full forms of following terms: (5 marks)

     (i) BSE

     (ii) CAPM

     (iii) MMMF

     (iv) ZCB

     (v) SEBI

OR

Q.1. (A) What are the role of SEBI in regulating securities market?   (8 marks)

 (B) What is the basic difference between Sharpe's and Treynor's Indexes of portfolio performance?

                                                                        (7 marks)

Q.2. (A) The following is the information of stock A and stock B under the possible states of nature:

State of nature	Probability	Return "A"	Return "B"
1	0.10	5%	0%
2	0.30	10%	8%
3	0.50	15%	18%
4	0.10	20%	26%

   (i) calculate the expected return on A and B.

   (ii) calculate the standard deviation of stock A and B.

   (iii) if you want to invest in any stock, which stock would you prefer?   (8 marks)

   (B) Calculate the expected rate of return in the following example:

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

(7 marks)

OR

Q.2. (A) What are the advantages of investment in Life Insurance Schemes?   (8 marks)

   (B) What are the advantages of technical analysis?   (7 marks)

Q.3. (A) Following information is given in respect of 3 portfolios and market:

Portfolio	Average return	Std. Deviation	Beta
1	16%	0.20	1.25
2	13%	0.30	0.75
3	9%	0.25	1.10
MARKET	12%	0.25	1.20

   The mean risk free rate 9%. Calculate the Sharpe, Teynor's measures and Jensen's measure and rank the portfolios.   (10 marks)

   (B) Write short note on guilt-edged securities.

OR

Q.3. (A) Following information is given in respect of 3 portfolios and market:

Portfolio	Average return	Std. Deviation	Beta
1	15%	0.25	1.25
2	12%	0.30	0.75
3	10%	0.20	1.10
MARKET	12%	0.25	1.20

The mean risk free-rate 9%. Calculate the Sharpe,Teynor's measure and Jensen's measure an rank the portfolios. (10 marks)

    (B) Write short note on Primary Market. (5 marks)

Q.4.(A) Compute following ratios and briefly comment on each one of them:

    (i) Dividend yield   (ii) EPS,

    (iii) Preference & equity cover   (iv) P/E ratio.

The capital of SRK Ltd., consists of:

	₹
10% Preference shares (₹ 10/- each)	30,00,000
Equity shares (₹ 10/- each)	10,00,000
15% debentures	10,00,000
Net profit before tax is tax rate is 40%	8,00,000

(10 marks)

    (B) Write a note on Fundamental Analysis (5 marks)

OR

Q.4.(A) Write short note on:- (15 marks)

    (i) Liquidity Ratios,

    (ii) LIC Policies,

    (iii) Elements of Investments.

❏   ❏   ❏

MODEL PAPER - 4

TIME: 2 HOURS.   TOTAL MARKS: 60

SUB: SECURITY ANALYSIS.

N.B: (1) All questions are compulsory. Each question has option.

(2) Figures to the right indicate the marks.

Q.1.(A) State with reasons whether the following statements are true or false: (10 marks)

  (i) Technical analysis believes that stock market movement is 10% psychological and 90% logical.

  (ii) Treasury Bills have lot of individual investors as they are profitable.   .

  (iii) A jobber gives one quotation as a dealer in securities.

  (iv) Delisting means temporary removal of a security of a listed company from a stock exchange.

  (v) A falling wedge which shows declining trend will have defensive sellers.

(B) Give the full form of the following: (5 marks)

  (i) SSNNL

  (ii) SBTs

  (iii) NSMS

  (iv) CML

  (v) RBI

OR

Q.1.(A) What is portfolio? What are the objectives of construction of portfolio?   (8 marks)

(B) What are investment avenues? State the different investment avenues for investment.   (7 marks)

Q.2.(A) Mr. B has two alternative projects available at hand, out of the two he can choose only one. Project A requires an initial investment of ₹ 75,000, whereas Project B requires an initial investment of ₹ 85,000. Both projects are to be started on 1/04/2010 and are expected to generate following cash flows over a period of their life of 4 years.

Date	Project A (in ₹)	Project B (in ₹)	Discount Factor @ 10%
1/4/11	48,000	15,000	0.9091
1/4/12	15,000	27,000	0.8264
1/4/13	16,000	17,000	0.7513
1/4/14	12,000	55,000	0.6830

Which alternative would you prefer if the expected return is 10%. Give reason (s) for your preference.   (8 marks)

(B) Vir is considering investment in one of the following Bond: (7 marks)

Bond	Coupon Rate	Maturity	Price/₹ 100 Par Value
Bond X	11%	10 years	₹ 75
Bond Y	12%	7 years	₹ 68

Recommend which bond should be purchased. Will your answer change if the required rate of return is 22% (7 marks)

OR

Q.2.(A) What is a securities market? What are its features? (8 marks)

(B) What are Financial Ratios? What are their limitations? (7 marks)

Q.3.(A) The details of three portfolios of Mr. Azim are given below. Compare these portfolios on performance using the Sharpe, Treynor and Jensen's measure. (8 marks)

Portfolio	Average Return	Standard Deviation	Beta
1	15%	0.25	1.25
2	12%	0.30	0.75
3	10%	0.20	1.10
Market Index	12%	0.25	1.00

The risk-free rate of return is 9%

(B) Idea Limited is currently paying dividend of ₹ 1.50 on its face value of ₹ 10. Earnings and dividends are expected to grow at 5% annual rate indefinitely. Investors require 9% rate of return on their investments. The company is considering several business strategies and wishes to determine the impact of these strategies on the market price of the share.

 (i) Continuing the present strategy will result in the expected growth rate and required rate of return as above.

(ii) Expanding sale will increase the expected dividend growth rate to 7% but will increase the risk of the company. As a result the investor's required rate of return will increase by 12%.

(iii) Integrating into retail stores will increase the dividend growth rate to 6 per cent and increase the required rate of return to 10 per cent.

You are required to find out the best strategy from the point of view of the market price. (7 marks)

OR

Q.3.(A) What is an option? What are the different types of options? (8 marks)

(B) What is charting technique? What are the different types of charting techniques?

(7 marks)

Q.4.(A) ABC Limited paid the following dividend per share and had following market price per Share during the period 2007-12. (8 marks)

Year	Dividend per share (₹)	Market price per share (₹)
2007	1.53	31.25
2008	1.53	20.75
2009	1.53	30.88
2010	2.00	67.00
2011	2.00	100.00
2012	3.00	154.00

Calculate the annual rate of return for the last 5 years.

(B) The expected returns and Beta of three securities are as follows: (7 marks)

Securities	A	B	C
Expected Returns (%)	18	11	15
Beta Factor	1.7	0.6	1.2

If risk-free rate is 9% and market returns are 14%, which of the above securities are over, under or correctly valued in the market? What should be your strategy?

Q.4.(A) Write short notes on the following: (15 marks)

   (i) Random Walk Theory

   (ii) Optimal Portfolio

   (iii) Benefits of NSE to investors

❒ ❒ ❒

MODEL PEPER – 5 ANSWERS FOR SAPM OF TYBBI SEMESTER V

TIME: 2 HOURS.   TOTAL MARKS: 60

SUB: SECURITY ANALYSIS.

Q.1.(A) True or False with reasons:- 2 marks each 5

(1 mark for True/False and 1 mark for the reason.)   (10 marks)

(i) Technical Analysis believes that Stock Market is 10% psychological and 90% logical. False. Technical Analysis believes that Stock Market is 90% psychological and 10% logical.

(ii) Treasury Bills have lot of individual investors as they are profitable.

False. It carries low rate of return due to short period and hence it fails to attract individual investors for profitable investment.

(iii) A Jobber gives one quotation as a dealer in securities.

False. A Jobber gives two quotations as a dealer in securities.

(iv) Delisting means temporary removal of a security of a listed company from a Stock Exchange.

False. Delisting means permanent removal of a security of a listed company from a Stock Exchange.

(v) A falling wedge which shows declining trend will have defensive sellers.

False. A falling wedge which shows declining trend will have aggressive sellers.

Q.1.(B) Abbreviations:-1 mark 5   (5 marks)

(i) SSNNL: Sardar Sarovar Narmada Nigam Limited

(ii) SBTs: Screen Based Trading By System

(iii) NSMS: National Stock Market System

(iv) CML: Capital Market Line

(v) RBI: Reserve Bank of India

OR

Q.1.(A) Portfolio: Portfolio means combined holding of many kinds of financial Securities, i.e., shares, debentures, government bonds, units and other financial assets. The term investment portfolio refers to the various assets of an investor which are to be considered as a unit. Objectives of Portfolio Management   (8 marks)

(a) Stability of Income

(b) Capital Growth

(c) Liquidity

(d) Safety

(e) Tax Incentives

Q.1.(B) Investment avenues are the outlets of funds. There are variety of investment avenues or alternatives. Investors are free to select any one or more alternative avenues depending upon their needs. All categories of investors are equally interested in safety, liquidity and reasonable return on the funds invested by them. An investor can select the best avenue after studying the merits and demerits of the following investment alternatives: (7 marks)

  (i) Shares and Debentures

 (ii) Government Bonds

(iii) Money Market Instruments

 (iv) Public Deposits

  (v) Bank Deposits

 (vi) Post Office Savings

(vii) Housing Bank Schemes

(viii) Mutual Fund Schemes

 (ix) Public Provident Fund

  (x) Gold-Silver

 (xi) Life Insurance Schemes

(xii) Real Estate

Q.2.(A) Computation of NPV

Project A

Year	Cash Flow (₹)	Discount factor	Discount Cash
1	48,000	0.9091	43,637
2	15,000	0.8264	12,396
3	16,000	0.7513	12,021
4	12,000	0.6830	8,196

Total Discounted Cash Inflow = ₹ 76,250

NPV = Discounted Cash Inflow – Initial Investment

    = 76,250 - 75,000

    = ₹ 1,250

Project B

Year	Cash Flow (₹)	Discount Factor	Discounted Cash Flow
1	15,000	0.9091	13,637
2	27,000	0.8264	22,313
3	17,000	0.7513	12,772
4	55,000	0.6830	37,565

Total Discounted Cash Inflow = ₹ 86,287

NPV = Discounted Cash Inflow – Initial Investment

$\qquad$ = 86,287-85,000

$\qquad$ = ₹ 1,287

Comment: We will prefer Project B.

Reason: It has higher NPV. $\hfill$ (8 marks)

A.-2. (B) $YTM = \dfrac{\dfrac{I+F-P}{N}}{\dfrac{F+P}{2}}$

$Bond\,X = \dfrac{11+100-75}{10}$ $\qquad$ $Bond\,Y = \dfrac{12+100-68}{7}$

$\qquad\dfrac{100+75}{2}$ $\qquad\qquad\qquad\dfrac{100+68}{2}$

$\qquad = 11+25/10$ $\qquad\qquad = 12+32/7$

$\qquad 175/2$ $\qquad\qquad\qquad 168/2$

$\qquad = 11+2.5/87.5$ $\qquad\qquad =12+4.57/84$

$\qquad = 15.43\%$ $\qquad\qquad\qquad = 19.73\%$

Comment: We recommend Bond Y. If the required rate of return is 22% then we cannot invest in both the bonds. $\hfill$ (7 marks)

OR

Q.2.(A) A market where the securities are bought and sold is called Government Securities Market. They are Bonds, Treasury Bills, Special Rupee Securities. They offer a safe avenue of investment.

Features

    (i) Dealing in securities take place through the mechanism provided by the RBI.

    (ii) There is Primary and Secondary Market.

    (iii) The Securities are issued in the form of Stock Certificate, Promissory Notes and Bearer Bonds.   (8 marks)

2. (B) Financial Ratio Analysis is a study of relationship between various items in financial statements. The various types of financial ratios are:

    (i) Liquidity ratios

    (ii) Profitability Ratios

    (iii) Solvency ratios

    (iv) Leverage ratios

    (v) Efficiency ratios

    (vi) Ratios Relevant For Equity Shares   (7 marks)

3. (A) Sharpe Measure

$$\text{Sharpe Measure} = \frac{R - Rf}{\text{Standard Deviation}}$$

1. $15\text{-}9/0.25 = 6/0.25 = 24$

2. $12\text{-}9/0.30 = 3/0.30 = 10$

3. $10\text{-}9/0.20 = 1/0.20 = 5$

4. Market $= 12\text{-}9/0.25 = 12$

Rank i-1, ii-2, iii-3.

$$\text{Treynor Measure} = \frac{R - Rf}{\text{Beta}}$$

1. $15\text{-}9/1.25 = 4.8$

2. $12\text{-}9/0.75 = 4$

3. $10\text{-}9/1.10 = 0.91$

4. Market $= 12\text{-}9/1 = 3/1 = 3$

Rank i-1, ii-2, iii-3.

Step I Rp $=$ Rf+ Beta (Rm–Rf)

1. Rp $= 9\% + 1.25\ (12\%\text{–}9\%)$

    $= 9\% + 1.25\ (3\%)$

$= 9\% + 3.75\%$

$= 12.75\%$

Step II Alpha = Average Return – CAPM Return

$= 15\% - 12.75\%$

$= 2.25\%$

Step I Rp = Rf + Beta (Rm–Rf)

2. Rp $= 9\% + 0.75 (12\% - 9\%)$

$= 9\% + 0.75 (3\%)$

$= 9\% + 2.25\%$

$= 11.25\%$

Step II Alpha = Average Return – CAPM Return

$= 12\% - 11.25\%$

$= 0.75\%$

Step I Rp = Rf + Beta (Rm–Rf)

3. Rp $= 9\% + 1.10 (12\% - 9\%)$

$= 9\% + 1.10 (3\%)$

$= 9\% + 3.30\%$

$= 12.30\%$

Step II Alpha = Average Return – CAPM Return

$= 10\% - 12.30\%$

$= -2.30\%$

Rank - i-1, ii-2, iii-3. (8 marks)

3.(B)

(i) Do = ₹ 1.50 g = 5 % ke = 9%

Pe = D1/ke-g = 1.575/0.09–0.05 = 1.575/0.04 = ₹ 39.375

(ii) 1.605/0.05 = ₹ 32.10

(iii) 1.59/0.04 = ₹ 39.75

Comment: Strategy III is ideal. This is because the price is highest. (7 marks)

OR

Q.3.(A) Option- A derivative transaction that gives the option holder the right but not the obligation to buy or sell the underlying asset at a price, called the strike price during a period for payment of premium is called Option. (i) Call Option: Holder has right to buy and no obligation, (ii) Put Option: Holder has right to sell and no obligation. (8 marks)

Q.3.(B) Charting Techniques: Technicians basically rely on charts of prices of stocks and trading volumes for the analysis of the market movement and individual stocks. The purpose of charting techniques is to determine the probable strength of demand and supply of various levels of stock prices and to predict the probable direction in which stock will move and where it probably stop. The following are the different types of charts: (i) Line Chart (ii) Bar Chart (iii) Candlestick Chart   (7 marks)

Q.4.(A) Computation of Annual Rate of Return

Year	DPS (₹)	MPS (₹)
0	1.53	31.25
1	1.53	20.75
2	1.53	30.88
3	2.00	67.00
4	2.00	100.00
5	3.00	154.00

$$\text{Annual rate of Return} = \frac{(\text{Closing Price - Opening Price}) + \text{Dividend}}{\text{Initial Investment}} * 100$$

1. $(2.75\text{-}31.25)+1.53/31.25\text{--}l00 = -28.70\%$

2. $(30.88\text{-}20.75)+1.53/20.75\text{--}100 = 56.19\%$

3. $(67\text{-}30.88)+2/30.88\text{--}100 = 123.45\%$

4. $(100\text{-}67) + 2/67\text{--}100 = 52.24\%$

5. $(154\text{-}100)+3/100\text{--}100 = 57\%$

Q.4.(B) Security A $= 9\% + 1.7(14\%\text{--}9\%) = 17.5\%$

Security B $= 9\% + 0.6(14\%\text{--}9\%) = 12\%$

Security C $= 9\% + 1.2(14\%\text{--}9\%) = 15\%$

Strategy

Strategy	Expected Returns (%)	Returns as per CAPM (%)	Valuation	Strategy
A	18	17.50	Undervalued	Buy
B	11	12	Overvalued	Sell
C	15	15	Correctly Valued	Hold

OR

Q.4. (i) Random Walk Theory: According to the Random Walk Theory, the changes in price of stock show independent behaviour and are dependent on the new prices of information that are received but within themselves are independent of each other. Information spreads immediately. Investors have full knowledge. There is immediate price adjustment.

(ii) Optimal Portfolio: The portfolio construction is made on the basis of the investment strategy set out for such investor. Optimal portfolios cannot be built overnight. It requires time and patience. Portfolio should be diversified. It should be reviewed periodically. It should be managed periodically. One should concentrate on number of stocks in portfolio and review the portfolios at periodic intervals.

(iii) Benefits of NSE Investors: The investor is assured of the best price in the market. Price and brokerage are separately shown on contract notes. Date and time of trade are indicated. System will be better monitored. Settlement is quick and money is received fast. Safety of securities is enhanced in a depository. (15 marks)

❐ ❐ ❐