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NATURE AND SCOPE OF FINANCIAL MANAGEMENT

Unit Structure:

- 1.0 Learning Objectives
- 1.1 Introduction
- 1.2 Meaning and Definition of Financial Management
- 1.3 Importance of Financial Management in Business
- 1.4 Scope of Financial Management
- 1.5 Goals / Objectives of Finance Management
- 1.6 Qualities of a Successful Finance Manager
- 1.7 Functions of Financial Controller
- 1.8 Exercises

1.0 LEARNING OBJECTIVES

The present chapter attempts to:

- Provide familiarisation with financial objectives and goals of a firm.
- Develop conceptual framework of financial management.
- Focus on nature, and scope of financial management.
- Explaining the role of finance function.
- Discuss the role of finance manager.

1.1 INTRODUCTION

Finance touches every aspect of our life and holds the key to all activities. It has been described as the life blood of any business. The blood in our body needs to be regulated to ensure smooth circulation for healthy survival. Management of finance in an optimal manner is inevitable for success of any business. The finance function has been defined differently by different writers and differently over time. According to G.L. Jones, the simplest way of understanding finance is to say that finance is what finance does. L.J. Gitman has defined finance as the art and science of managing money. The only conclusion one may make with respect to finance is that it has a marvellous ability to evoke different concepts in the minds of men.

1.2 MEANING AND DEFINITION OF FINANCIAL MANAGEMENT

Financial management means money management. Financial management is concerned with the planning and controlling of the financial resources of the business firm. The term financial management has emerged from the generic discipline of management. As an academic discipline, the subject of financial management has undergone radical changes in relation to its scope, functions and objectives. In the past, the financial management was confined to rising of the funds and its procedural aspects. In the broader sense, it is now concerned with the optimum use of financial resources in addition to its procurement. Therefore, financial management is that part of management which is concerned mainly with:

1. Fund Raising: raising the right type of funds in the most economic and suitable manner.

2. Use of Funds: using the funds in the most profitable and safest possible manner.

According to James Van Horne,

"Financial management connotes responsibility for obtaining and effectively utilizing funds necessary for the efficient operation of an enterprise."

According to I.M. Pandey:

"Financial management is that managerial activity which is concerned with the planning and controlling of the firm's financial resources".

Financial management provides the best guide for future resource allocation by the firm. It performs facilitation, reconciliation and control function in an organisation. It permits and recommends investment where the opportunity is greatest. Financial management produces relatively uniform yardsticks for judging most of the enterprise's operations and projects. It is continually concerned with an adequate rate of return on investment which is necessary to assure the successful survival of an enterprise. The problem of attracting new capital and providing funds for capital needs is solved if the return on investments is adequate. Because it Is continuing drawing attention to such matters, financial management is essential to effective top management.

Definitions of Financial Management

The simple definition of Financial Management is `the ways and means of managing money'. This statement can be further expanded to define Financial Management: the determination, acquisition, allocation and utilization of the financial resources with the aim of achieving the goals and objectives of the enterprise.

According to Archer and Ambrosia:

"Financial management is the application of the planning and Control functions to the finance function".

Joseph and Massie:

"Financial management is the operational activity of a business that is responsible for obtaining and effectively utilizing the funds necessary for efficient operation".

Raymond Chambers:

"Financial management may be considered to be the management of the finance function. It may be described as making decisions on financial matters and facilitating and reviewing their execution. It may be used to designate the field of study which lie beneath these processes".

1.3 IMPORTANCE OF FINANCIAL MANAGEMENT IN BUSINESS

The importance of financial management is known from the following aspects:

1. Applicability – The principles of finance is applicable wherever there is cash flow. The concept of cash flow is one of the central elements of financial analysis, planning, control and resource allocation decisions. Cash flow is important because financial health of the firm depends on its ability to generate sufficient amounts of cash to pay its employees, suppliers, creditors and owners. Any organization, whether motivated with earning of profit or not, having cash flow requires to be viewed from the angle of financial discipline. Therefore, financial management is equally applicable to all forms of business like sole traders, partnerships, companies. It is also applicable to non profit organizations like trusts, societies, governmental organizations, public sector enterprises etc.

2. Chances of Failure – A firm having latest technology, sophisticated machinery; high calibre marketing and technical experts etc. may fail to succeed unless its finances are managed on sound principles of financial management. The strength of business likes in its financial discipline. Therefore, finance function is treated as primary, which enable the other functions like production, marketing, purchase, personnel etc. to be more effective in achievement of organizational goals and objectives.

3. Return on investment – Anybody invests his money will mean to earn a reasonable return on his investment. The owners of business try to maximize their wealth. It depends on the amount of cash flows expected to be generated for the benefit of owners, the timing of these cash flows and the risk attached to these cash flows. The greater the time and risk associated with the expected cash flow, the greater is the rate of return required by the owners. The Financial management study the risk-return perception of the owners and the time value of money.

1.4 SCOPE OF FINANCIAL MANAGEMENT

All decisions that have monetary benefits come under the purview of financial management. There are basically, two approaches for understanding the scope of financial management: one is traditional approach and the second one is the modern approach.

1. Traditional approach: Traditional approach views the scope of finance function in a narrow sense of arrangement of funds by business firm to meet their financing needs. Hence, the following three inter-related aspects of raising and administering financial resources were covered:

- a) Arrangement of finance from institution;
- b) Raising funds in the capital market through financial instruments including the procedural aspects;
- c) Legal and accounting aspects involved for raising finance for the firm.

The traditional approach was criticized for the reasons:

- a) It emphasis only the issues relating to procurement of funds and ignored the issues related to internal financial decisions.
- b) It focused only on the problems related to corporate entities ignoring the non-corporate bodies. The scope of financial management was confined only to a particular segment of business enterprises.
- c) It laid more emphasis on the onetime events (episode) such as promotion, incorporation, reorganization, etc., taking place in the corporate life of the concern/ignoring the day-to-day financial problems of the concern.
- d) The focus was more on long term financing. Working capital management was considered to be outside the purview of finance function.

According to Solomon, the traditional approach has ignored the central issues of financial management which comprise the following:

- i) Should the enterprise commit capital funds to certain purpose?
- ii) Do the expected returns meet financial standards of performance?
- iii) How should these standards be set and what is the cost of capital funds to the enterprise?
- iv) How does the cost vary with the mixture of financing methods used?

Therefore, the traditional approach while ignoring the above crucial aspects implied a very narrow scope for financial management. These defects were taken care by the Modern approach.

2. Modern Approach: The traditional approach focused on sources of funds and was too often largely concerned with specific procedural details. Experts pointed out the following two defects of traditional approach:

- i) It does not recognize the relationship between financing mix and the cost of capital and fails to solve the problems relating to optimum combination of finance, and
- ii) It also fails to deal with the problems relating to the valuation of the firm and the cost of capital.

The modern approach aims at formulating rational policies for the optimal use, procurement and allocation of funds; unlike the traditional approach which has focused only on the sources of funds and their procedural details. The modern approach apart for covering the acquisition of external funds; includes the efficient and wise allocation of funds for various uses. Emphasis has shifted from a detailed analysis, of operating procedures in the acquisition, custody and disbursement of funds to the formulation of rational decisions on the optimal use and allocation of funds. Financial decision making has become fully integrated in more advanced companies with top management policy formulation via capital budgeting, loan range planning, evaluation of alternate uses of funds, and establishment of measurable standards of performance in financial terms.

In the words of Solomon, a financial manager should know the following:

- i) How large should an enterprise be and how fast should it grow?
- ii) In what form should it hold its assets?
- iii) What should be the composition of its liabilities?

Thus, the modern approach views the term financial management in a broad sense and provides a conceptual and analytical framework for financial decision making. Therefore, financial management, in the modern sense of the term, can be related to three major decision making areas. They are as follows:

- 1. Investment Decision i.e. Where to invest funds and in what amounts?
- 2. Financing Decisions i. e .Where to raise funds from and in what amount?
- 3. Dividend Decisions i. e how much of profits should be paid by way of dividends and how much should be retained in the business?

All the above three decisions contribute towards the goal of wealth maximization.

1. Investment Decisions: Investment decisions involve identifying the asset or projects in which the firms limited resources should be invested. It involves the major task of measuring the prospective profitability of

investment in assets of the company or in new projects. The decisions relating to acquisition of fixed assets investment are known as capital budgeting decisions and the decisions relating to current assets investment are known as working capital management decisions. Capital budgeting decisions relate to selection of an asset or investment proposal or course of action which have hot long term implications on the cash flows and profitability of such investment. It helps in judging whether it is financial feasible to commit funds in future. An important aspect of working capital, the profitability would be adversely affected, whereas with too inadequate working capital, it would be unable to meet its financial commitment on time and thereby invite the risk of insolvency. The investment in the fixed assets of the company determines the production capacity of the company. The production should be sufficient to demand in the market. Production should not fall short or be too excessive in relation to the demand for the product in the market. Further, the fixed assets must be productive enough to ensure the returns expected from such investment. This should be supported by sufficient investment in the working capital assets. The working capital assets should be adequate enough to maintain sufficient liquidity to augment the sales level. Investment decisions yield returns in future. Future performance is subject to uncertainty and risk. Therefore, investment decisions require careful analysis before substantial amounts are committed in fixed assets. The investment decisions having long term implications and affects the cash inflows in the years to come. Hence any wrong decision taken in the initial year, would adversely affect the future profitability and growth. Hence appropriate techniques need to be adopted for proper evaluation of investment decisions.

2. Financing Decisions: Financing decisions involve deciding on the most cost effective method of financing the chosen investments. Financing decisions relate to the financing pattern of the firm. It involves in deciding as to when, where and how to acquire the funds to meet the firm's investment needs. Different sources of finance have different advantages with different degree of risks. Hence it becomes imperative to decide as to how much finance is to be raised and from which sources. The prime objective of financing decisions is to keep the cost of finance at the minimum with maximum utilization of funds. Primarily, there are two main sources of finance: one is the owned funds and second is the borrowed funds. Owned funds are the shareholder's monies on which dividend are paid. Dividend payment depends upon the profitability of the company and is not binding. There is no commitment involved in the shareholders funds. On the other hand, borrowed funds involve fixed commitments; their repayments are secured by a charge created on the assets and interest payments are obligatory irrespective of the profits or losses of the company. Hence, it increases the financial risk of the company. The borrowed funds are relatively cheaper, but entail a certain degree of risk, therefore, due prudence must be exercised while determining the mix of owned and borrowed funds.

3. Dividend Decision: Dividend Decisions involve the decisions as regards what amount of profits earned should be distributed by way of dividends and what amount should be retained in the business. Dividend policy is to be decided having regard to its implicate on the shareholder wealth in the firm. The aim is to decide an optimum dividend policy which would maximize the market price of shares. This is a crucial decision as it determines the reputation of the management of the company and therefore, the market value of the shares. If the management decides to retain profits, it should be able to generate adequate returns (by investing such retained profits), which should be much more that what the, shareholders could have got, had they received the dividends and invested the amount elsewhere. If the management is not able to generate adequate returns on reinvestment of retained profits, then it should prefer to pay dividends rather than retaining the profits. Therefore, the two important factors which affect the dividend decisions are: firstly, the investment opportunities available to the firms and secondly, the opportunity rate of return of the shareholders. The topic has been dealt in more details in the subsequent chapters of this book.

1.5 GOALS / OBJECTIVES OF FINANCE MANAGEMENT

Many of the well-known authors on the subject have highlighted the following two important goals of financial management. They are as follows:

1. PROFIT MAXIMIZATION:

The objective of making profit is a commercial imperative. Profit generation is essential for survival and growth of the business. Profit generation is also regarded as a measure of success of the business. Profit is an important yardstick for measuring the economic efficiency of any firm. Any business would be making the use of economic and human resources available to generate profits. The cost of these resources is required to be met from the revenue generated from the use of these resources and the surplus remaining would be needed for the growth and expansion of the company. It is only an efficiently run business which can afford to meet the cost of resources and generate profits. Therefore, the survival and growth of any business depends upon its ability in earnings profits. It is therefore contended that profit maximization is one of the primary goals of the organization without which the survival of the organization itself is threatened.

• THE DRAWBACKS OF THE GOAL OF PROFIT MAXIMIZATION

Although profit is an important yardstick for measuring the economic efficiency of any firm, yet it has got certain limitations which are listed below:

1. It ignores the risk which is associated with the investment in such profitable ventures. It ignores the risk or uncertainty of expected returns or benefits. Risk is defined as the chance that the actual outcome of a decision may differ from the expected outcome and in finance; risk investment is one whose potential returns are expected to have a high degree of variation or volatility. Some investments with high profits potential, having a high degree of risk associated with it. When profit maximization is aimed as the main objective, all profitable investment projects are accepted without having regard to the risk factor. An investment may have profit potential but may not be worth the risk.

2. The objective of profit-maximization assumes the existence of perfect market conditions in which various resources are efficiently managed. However, modern markets suffer from many imperfections. It leads to inequitable distribution of income and wealth.

3. It ignores the time value of money without having any regard to the timings of costs and returns. It takes into account only the size of the profits without considering the timings of the prospective earnings.

4. Profit maximization as an objective is considered to be vague and ambiguous. It does not define adequately as to what profits are what profits to be considered, whether from the point of view of funds employed or from the shareholders point of view, or short term or long term profits etc.

5. Profit maximization as an objective ignores other important aspects of financing e.g. borrowing capacity etc.

6. The objective of profit maximization focuses on interests of the owners alone and ignores the interest of other interested parties such as employees, consumers, government and society in general.

7. The perception of the management as regards profit maximization substantially differs from the perception of the shareholders.

Another variant of profit maximization is to consider the rate of return on investment. If the rate of return on investment is higher than the cost of funds, then such investment opportunities can be undertaken.

2. Wealth Maximisation:

According to this objective, the owners of the company i.e. the shareholders are more interested in maximizing their wealth rather than in profit maximization. Maximization of the wealth of the shareholders means maximizing the net worth of the company for its shareholders. This reflected in the market price of the shares held by them. Therefore, wealth maximization means creation of maximum value for company's shareholders which mean maximizing the market price of the share. Wealth maximization refers to the gradual increase in value of the net assets of the organization. Profit generation adds to the increase in the value of the net assets of the organization. With greater profits, the EPS (earnings per share) goes up; resulting in an increase in the value of the net assets belonging to the shareholders of the company.

The market price of the shares is an important indicator of the wealth maximization of the organization. Wealth maximization is the net present value of a financial decision. Net present value is the difference between the gross present value of the revenue generated from such decision and the cost of such decision. A financial action with a positive net present value creates wealth and therefore is desirable. The total cash inflows over the years in terms of present value must be greater the outflows of cash invested for generating such cash inflows. This results in financial advantage leading to increase in the value of net assets. The increase in the value of net wealth should in turn help in generating greater volume of profits. This action results in financial gains to the shareholders increasing the earnings per share.

Prof. Solomon has suggested wealth maximization as the best criterion. According to him "Wealth or net present worth is the difference between gross present worth and the amount of capital investment required to achieve the benefits. Any financial action which creates wealth or which has a net present worth above zero is a desirable one and should be undertaken. Any financial action which does meet this test should be rejected".

Solomon states that wealth maximization provides an unambiguous measure of what financial management should seek to maximize in making investment and financing decisions.

Future earnings of a company are subject to uncertainties and exposed to risk. Financial decisions for which the consequences are known at a later date may either result in increasing or decreasing the net wealth of the shareholders. Unforeseen economic and social conditions may adversely affect the company. Hence the process of wealth generation is a difficult task.

Therefore, the goal of wealth maximization implies a long term perspective of the goal. The interest of the management in maximizing the market price of the share is compatible with that of the shareholders' interest. This helps the management in allocating the resources in the best possible manner balancing the risks and the returns.

- THE MERITS OF THE GOAL OF WEALTH MAXIMIZATION ARE AS FOLLOWS:
- 1. It is a very effective and meaningful criterion to measure the performance of the company.
- 2. The objective of wealth maximization is consistent with the objective of maximization of the shareholders' economic welfare.

- 3. The objective is also consistent with the objective of perpetual survival of the company and its long term profitability.
- 4. It is operationally feasible and logical.
- 5. It includes the motive of profit maximization as it emphasis on maximization of long term profitability and ensures maximum return on owners' investment.
- 6. The objectives allow for timings of profits and also consider the timings of perspective benefits.
- 7. It ensures fait return on the investments, and takes into account the uncertainty of the benefit also.
- 8. It offers rational guidelines for effective use of the resources available.

• THE DRAWBACKS OF THE GOAL OF WEALTH MAXIMIZATION

- i) The basic assumption is that there an efficient capital market wherein the market price of the share is truly reflected. This assumption seldom holds in real practice.
- ii) The market price is influenced by various economic and political factors which are difficult to anticipate and judge.
- iii) The various parties having their stake in the company have conflicting interests and therefore difficult to reconcile their divergent views.

3. OTHER GOALS OR OBJECTIVES OF FINANCIAL MANAGEMENT:

- i) To ensure adequate returns to the shareholders which should be fair in the given market conditions.
- ii) To contribute to the operational efficiency of all other areas of management.
- iii) To infuse financial discipline in the organization.
- iv) To build up a strong financial base so that the enterprise can fall back upon its reverses during lean years and withstand the shocks of the business.

1.6 QUALITIES OF A SUCCESSFUL FINANCE MANAGER

The job of a finance manager is full of duties and responsibilities. He has to perform various duties connected with finance. In order to perform the finance duties successfully, a finance manager should be competent. He should possess the following qualities:

1. Personality is the sum total of physical and mental qualities. A finance manager should have a pleasing personality. Good height, good physique,

good appearance would be an asset to a finance manager. He should be physically and mentally healthy enough to bear the strain of finance in an organization.

2. The job of a finance manager involves analytical work. He should have a high degree of intelligence to understand the finance problems immediately. An intelligent finance manager can control the finance properly.

3. A finance manager should take initiative in performance of work. He should do the job at his own i.e. without being told by others.

4. A finance manager should have vast fund of power of imagination to his credit. He should have a research mind which is very creative. He should be able to bring innovation in financial management of an organization.

5. A finance manager should have self confidence to face the challenges involved in his job.

6. A finance manager is a leader of financial administration. He should have an effective Communication Skill. He should understand the problems of his subordinates and communicate instructions to solve them.

7. The job of a finance manager involves decision making. He has to take various decisions which have financial implications on the working of the organization. He should have the quality to judge the situation and take right decision accordingly.

8. He should be honest in his job. Finance requires utmost honesty on the part of the manager and the subordinates also.

9. He should have an administrative skill to administer the finance function. He should be able to plan, organize, direct, control and coordinate the activities of the finance area. He has to see that the financial decisions are properly implemented.

10. A finance manager should be self-disciplined. He should be able to enforce discipline in the organization.

11. A finance manager should have patience. He should not take hasty decisions which have adverse impact on the financial health of the organization. He should listen to the views of others.

1.7 FUNCTIONS OF FINANCIAL CONTROLLER

The important functions of a financial controller in a large business firm consist of the following:

1. Provision of Capital – To establish and execute programmes for the provision of capital required by the business.

2. Investor Relations – To establish and maintain an adequate market for the company's securities and to maintain adequate liaison with investment bankers, financial analysis and shareholders.

3. Short-term Financing – To maintain adequate sources for company's current borrowing from commercial banks and other lending institutions.

4. Banking and Custody – To maintain banking arrangement, to receive, have custody of and disburse the company's monies and securities.

5. Credit and Collections – To direct the granting of credit and the collection of accounts due to the company, including the supervision of required special arrangements for financing sales, such as time payment and leasing plans.

6. Insurance – To provide insurance coverage as required.

7. Investments – To achieve the company's funds required and to establish policies for investment in pension and other similar trusts.

8. Planning for Control – To establish, coordinate and administer an adequate plan for the control of operations.

9. Reporting and interpreting – To compare performance with operating plans and standards, and to report and interpret the results of operations to all levels of management and to the owners of the business.

10. Evaluating and Consulting – To consult with all segments of management responsible for policy or action concerning any phase of the operation of the business as it relates to the attainment of objectives and the effectiveness of policies, organization structure and procedures.

11. Tax Administration – To establish and administer tax policies and procedures.

12. Government Reporting – To supervise or coordinate the preparation of reports to government agencies.

13. Protection of Assets – To ensure protection of assets for the business through internal control, internal auditing and proper insurance coverage.

14. Economic Appraisal – To appraise continuously economic, social forces and government influences, and to interpret their effect upon the business.

15. Managing Funds – To maintain sufficient funds to meet the financial obligations.

16. Measuring of Return – To determine required rate of return for investment proposals.

17. Cost control – To facilitate cost control and cost reduction by establishment of budgets and standards.

18. Price Setting – To supply necessary information for setting of prices of products and services of the concern.

19. Forecasting Profits – To collect relevant data to make forecast of future profit levels.

20. Forecast Cash flow – To forecast the sources of cash and its probable payments and to maintain necessary liquidity of concern.

1.8 EXERCISES

- 1. Define the scope of financial management. What role should the financial manager plan in the modern enterprise?
- 2. How should the finance function of an enterprise be organized? What functions are performed by the financial officers?
- 3. State the scope of Financial Management.
- 4. State and explain the main functions of a finance manager.
- 5. Explain the role of finance manager in a large corporate enterprise.
- 6. What are the functions of Financial Management?
- 7. "The goal of profit maximization does not provide us with an operationally useful criterion." Comment on this statement.
- 8. What is objective of profit maximization pool? How is its different from objective of profit maximization?
- 9. How does the modern finance manager differ from the traditional finance manager?
- 10. Discuss the contents of modern finance functions.
- 11. Discuss the nature and scope financial management.
- 12. Discuss the nature of financial management as a staff of line functions?
- 13. Describe the functions of finance. In what ways, are these functions related to possible finance objectives of a company?
- 14. Explain the nature and scope of finance function. What are the basic objectives of decision-making in corporate finance?
- 15. Discuss the functions of a Chief Financial Officer.

Multiple Choice Questions

- 1) The investment decisions should aim at investment in assets only when they are expected to earn a return greater than a minimum acceptable return is termed as
 - a) Interest rate c) growth rate
 - b) Hurdle rate d) internal rate of return
- (2) The traditional view of financial management looks at:
 - a) Arrangement of short-term and long-term funds from financial institutions.
 - b) Mobilization of funds through financial instruments.
 - c) Orientation of finance functions with accounting function.
 - d) All of the above
- 3) The modern approach to financial management view:a) the total funds requirement of the firm
 - b) the assets to be acquired
 - c) the pattern of financing the assets.
 - d) All of the above
- 4) The financing of long-term assets should be made from:
 - a) Short-term fund c) long-term funds b) Debt funds d) equity funds
 - a) equity runds
- 5) In fund raising decisions, one should keep in view:
 - a) Cost of various funds and financial risk.
 - b) Advantages and disadvantages of debt component in capital mix.
 - c) Impact of taxation on EPS
 - d) All of the above.
- 6) The financial health of the firm depends on its ability to generate sufficient ______ to pay its employees, suppliers, creditors and owners:
 - a) Profit c) growth
 - b) Cash d) wealth
- 7) Liquidity and profitability are _____ goals for the Finance manager.
 - a) Different c) competing
 - b) Separate d) finance
- Wealth maximization means maximizing the _____ of a course of action.
 - a) NPV c) profit
 - b) IRR d) growth

9) _____ maximization objective considers the risk and time value of money.

- a) Profit c) value
- b) Wealth d) growth

CONCEPTS IN VALUATION

Unit Structure:

- 2.0 Objectives
- 2.1 Introduction
- 2.2 Time Value of Money
- 2.3 Basic Concepts
- 2.4 Time Value of Money Relationship
- 2.5 Future Value of Single Amount
- 2.6 Future Value of Annuity
- 2.7 Doubling Period
- 2.8 Present Value of an Uneven Series of Payments
- 2.9 Present Value of Annuity
- 2.10 Net Present Value
- 2.11 Mathematical Tables
- 2.12 Bond Valuation
- 2.13 Exercise

2.0 OBJECTIVES

After going through this chapter, you will able to:

- Understand the concept of time value of money
- Compute the time value of money
- Calculate the future value as well as the present value of money
- Understand the concept of present value and future value of annuities

2.1 INTRODUCTION

In our economics life, money is not free. Money has time value. Interest rates give money its time value. If the investor has some spare cash or funds, he can invest it in savings deposit in a bank and receive more money later. If the investor wants to borrow money, he must repay a larger amount in the future due to interest. The result is that Rs. 100 in hand today, is worth more than Rs. 100 to be received a year from now. This is because Rs. 100 today can be invested to provide Rs. 100 plus interest after a year. The interest rates in the economy provide money with its time value. There are two types of decisions which require some consideration of time value. The first decision involves investing money

now in order to receive future cash benefits. The other decision involves borrowing now to take current expenditure at a cost of having less money in the future. The intelligent investor requires familiarity with the concepts of compound interest.

2.2 TIME VALUE OF MONEY:

In the world of finance and investment, time does have a value, Rs. 100 today are more valuable than Rs. 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 case of inflation, Rs. 100 today represents greater real purchasing power as compared to Rs. 100 one year later. The longer the term of a loan, the greater will be 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.

2.3 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) **DISCOUNT FACTOR:** The discount factor is the present value of a rupee received in the future.
- **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.

2.4 TIME VALUE OF MONEY RELATIONSHIP:

The basic time value of money relationships are presented in the following equations:

(1) $PV = FV \times DF$ (2) FV = PV XCFWhereas, PV = Present value FV = Future value $DF = Discounting factor = (\frac{1}{1} + R)t$ CF = Compounding factor = (1 + R) t R = Rate of interestT = time in years.

2.5 FUTURE VALUE OF 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 Rs. 5,000 gets 10 percent interest compounded annually for a period of 3 years, the future value will be:

PV X CF = 5,000 (1.10)3 = 5,000 x 1.331 = Rs. 6,655.

Illustration 1:

Mr Shashikant deposit Rs. 1,00,000 with a bank which pays 10 percent interest compounded annually, for a period of 3 years. How much amount he would get a maturity?

Solution

FV = PV X CF = $1,00,000 \times (1.10)^3$ = $1,00,000 \times 1.331$ = Rs. 1,33,100Mr.Shashikant will get \Box 1,33,100 after 3 years

2.6 FUTURE VALUE OF ANNUITY :

An annuity is a series of payments 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 an annuity due. Normally, it is assumed that the first annuity payment occurs at the end of the first year.

 $FVa = A \frac{(1+R)t-1}{R}$ Where A = Periodic cash payments R = Annual interest rate T = time in years / duration of annuity

The value of $\frac{(1+R)t-1}{R}$ can be determined by using the Time value of money tables.

The Future value Interest Factors (FVIFA) for various years are a 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	2,1200	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	12,487	13,579	14,775	16,085
10	14,486	15,937	17,548	19,337

Illustration 2:

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

Solution

The future value of annuity $FVa = A \frac{(1+R)t-1}{R}$ = Rs. 5,000 x FVIFA @ 8% = Rs. 5,000 x 4.5061 = Rs. 22530.50.

2.7 DOUBLING PERIOD

Sometimes, investor 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 seventy-two years to double your money at 1 percent interest. You can calculate the doubling by dividing 72 by the 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 example, if the interest rate is 12 percent, it will take 6 years to double your money (72+23). On the other hand, if you want to double your money in 6 years, the interest rate should be 12 percent (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 + 69 Thus the doubling period of Interest rate investment of different rates of interest can be determined as follows : As per rule of 69, the doubling period will be

1) Interest rate 12%

$$0.35 + \frac{69}{12} = 0.35 + 5.75 = 6.1$$
 years

2) Interest rate 15%

$$0.35 + \frac{69}{15} = 0.35 + 4.60 = 4.95$$
 years

Illustration 3:

If the interest rate is 10%, what is the doubling periods of an investment at this rate?

Solution

- a) As per rule of 72, the doubling period will be $\frac{72}{10} = 7.2$ years
- b) As per the rule of 69, the doubling period will be

 $0.35 + \frac{69}{15} = 0.35 + 6.9 = 7.25$ years

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 used in determining future value. The general relationship between future value and present value is given in the following formula:

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

Illustration 4:

Find the present value of Rs. 50,000 to be received at the end of four years at 12 percent interest compounding quarterly.

$$PV = FV 1 PV = FV x PVIF at 12\% = Rs. 50,000 x 0.623 = Rs. 31,150$$

2.8 PRESENT VALUE OF AN UNEVEN SERIES OF PAYMENTS:

The annuity includes the constant amount in which cash flows are identical in every period. Many financial decisions involve constant cashflow, however, some important decisions are concerned with uneven cash flows. For example, investment in shares is expected to pay an increasing series of dividends over time. 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.

Illustration 5:

Mr Shah has invested Rs. 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 5^{th} year Machine will be sold at Scarp value of Rs. 5,000. Advice him whether his project to viable, considering interest rate of 10% p.a.

Solution:

Calculation of Present Value of Future Cash Flows :

Year	Inflows (Rs)	PVIF at 10%	PV of Inflows
			(RS.)
2002	12,000	0.9091	10909
2003	15,000	0.8264	12396
2004	18,000	0.7513	13523
2005	25,000	0.6830	17075
2006	30,000	0.6209	21732
2006	5,000		
			75635

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 Rs. 75,635 which is higher than present net cash flow of Rs. 50,000. Thus, the project is viable.

2.9 PRESENT VALUE OF 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 example, A grandfather wants to deposit enough money today to meet the tuition fees of his grand-son 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 inflow of the annuities. The present value of an annuity can be expressed in the following formula:

$$PVA1 = A \frac{1}{(1+R)} + \frac{1}{(1+R)2} + \frac{1}{(1+R)1}$$
$$= \frac{(1+R)t - 1}{R(1+R)t}$$

Where PVA1 = Present value of an annuity with a duration of 't' periods

A = Constant periodic flow

R = Interest Rate

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

Year	PVIF	PVIF	PVIF	PVIF
	@ 8%	@ 10%	@ 12%	@ 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	5.3349	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, PVIFA for the present value of an Annuity is always less than the number of periods the annuity runs, whereas FVIFA for the future value of an annuity is equal to or greater than the number of periods.

Illustration 6:

What is the present value of a 4 years annuity of Rs. 8,000 at 12% interest?

Solution:

$$PVA = A \frac{(1+R)t-1}{R(1+R)t}$$

The value of $\frac{(1+R)t-1}{R(1+R)t}$ as per table is 3.0373
= Rs. 8,000 x PVIF at 12%

= Rs. 8,000 X 3.0373

= Rs. 24,298

2.10 NET PRESENT VALUE:

Net Present Value (NPV) is the most suitable method used for evaluating the capital investment projects. Under this method, cash inflow and outflows associated with each project are worked out. The present value of cash inflows is calculated by discounting the cash flows at the rate of return acceptable to the management. The cash outflows represent the investment and commitments of cash in the project at various points of time. It is generally determined on the basis of cost of capital suitably adjusted to allow for the risk element involved in the project. The working capital is taken as a cash outflow in the initial year. The cash inflow represents the net profit after tax but before depreciation. A depreciation is a non-cash expenditure hence it is added back to the net profit after tax in order to determine the cash inflows. The Net Present Value of cash inflows and the present value of cash outflows. If the NPV is positive the project is accepted, and if it is negative, the project is rejected.

Discounted cash flow is an evaluation of the future net cash flows generated by a project. This method considers the time value of money concept and hence it is considered better for evaluation of investment proposals. If these are mutually exclusive projects, this method is more useful. The Net Present Value is determined as follows:

NPV = Present value of future cash inflows – Present value of cash outflows.

Illustration 7:

Date	Alternative I	Alternative II
01/04/03	20,000	10,000
01/04/04	10,000	20,000
01/04/05	10,000	10,000
01/04/06	10,000	10,000

An investment of Rs. 40,000 made on 1/4/2002 provides inflows as follows:

Which alternative would you prefer in the investor's expected return is 10%? Give reason(s) for your preference.

Solution

Calculation of Present Values: Alternative I

Date	Amount	Discount Factor	PV (Rs)
01/04/03	20,000	0.9091	18182
01/04/04	10,000	0.8264	8264
01/04/05	10,000	0.7513	7513
01/04/06	10,000	0.6830	6830
			40,789

Alternative II

Date	Amount	Discount Factor	PV (Rs)
01/04/03	10,000	0.9091	9091
01/04/04	20,000	0.8264	16528
01/04/05	10,000	0.7513	7513
01/04/06	10,000	0.6830	6830
			39,962

The net present value of all future cash flows is Rs. 40,789 in case of 'alternative I' and Rs. 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 for investment.

Illustration 8:

A Finance company has introduced a scheme of investment of Rs. 40,000. The returns would be Rs. 8,000, Rs. 10,000, Rs. 11,000 and Rs. 12,000 in the next five years. The indicated rate of interest is 10% Compute the present value of the investment and advise regarding the investment.

Solution:

- i) Present value of investment = Rs. 40,000.
- ii) Present value of returns:

Year	Returns (Rs)	PVIF (10%)	Present Value (Rs.)
1	8,000	0.9091	7273
2	9,000	0.8264	7438
3	10,000	0.7513	7513
4	11,000	0.6830	7513
5	12,000	0.6209	7451
			37188

iii) Present value of investment is Rs. 37,188 which is lower than investment of Rs. 40,000. The net present value (i.e. 37,188-40,000 = Rs. 2,812) is negative. Hence the investment is not profitable at 10% interest.

Illustration 9:

The share of Ridhi Ltd (F.V. of Rs. 10) was quoted at Rs. 102 on 01.04.2002 and the price rose to Rs. 132 on 01.04.2005. Dividends were received at 10% on 30th June each year. Cost of funds was 10%. Is it a worth-while investment, considering the time value of money? (Present value factor at 10% were 0.909, 0.826 and 0.751)

Solution

Year Inflow (Rs) **Present Value Factor** Present Value (Rs.) 1 1 0.909 0.909 2 1 0.826 0.826 3 1 + 132 = 1330.751 99.883 101.618 Present Value (-) Present Value of 102.000 Cash Outflow Net Present Value -0.382

Calculation of Present Value of Cash inflows:

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

Illustration 10:

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

Year	1	2	3	4	5
Profit After Tax (Rs.)	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 Re. 1 at 14% discounting rate are 0.8772, 0.7695, 0.6750, 0.5921 and 0.5194.

Depreciation = 20% of 2,00,000 = Rs. 40,000

Profit after tax is given.

Year	PAT	+	CFAT	DF	P.V.
		Depreciation			
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

The cash inflow after tax (CFAT) = Profit After Tax (PAT + Depreciation.

Net Present Value is positive; hence XYZ & Co should invest in the project.

Illustration 11:

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

Face value of debenture	Rs. 1,000
Annual Interest Rate	15%
Expected return	12%
Maturity Period	5 years
(Present values of Re. 1 a	12% are, 0.8929, 0.7972, 0.7118, 0.6355 and
0.5674)	

Solution

PV = I (PVAF) + F (DF)= I(PVAF 12% for 5 years) + F (DF 12% for 5 years) = 150 (3,6048) + 1,000 (0.5674)

- = Rs. 540.72 + 567.40
- = Rs. 1108.12

Illustration 12:

Mr Vishwanathan 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

Solution:

Calculation of Net Present Value

Year	Cash Flow (Rs.)	Discount Factor	Present Value (Rs.)
1	6,000	0.909	5454
2	8,000	0.826	6608
3	15,000	0.751	11265
4	8,000	0.683	5464
		Present value of cash inflow	28791
		(-) Present Value of cash outflow	25000
		Net Present Value	3791

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

Illustration 13:

A machine cost Rs. 80,000 and is expected to produce the following cash flows:

Year		1	2	3	4	5	6	7
Cash (Rs)	Flow	50000	57000	35000	60000	40000	30000	60000

If the cost of capital is 12 percent, is it worth buying the machine?

Solution:

Calculation of Net Present Value

Year	Cash Inflow	D.F. @ 12%	Present Value (Rs.)
1	50,000	0.8929	44645
2	57,000	0.7972	45440
3	35,000	0.7118	24913
4	60,000	0.6355	38130
5	40,000	0.5674	22696
6	30,000	0.5066	15198
7	60,000	0.4523	27138
		Present Value of Cash Inflow	218160
		Present Value of outflow	280000
		Net Present Value	-61840

As the Net Present Value is negative, it is not worth buying the machine.

Illustration 14:

Find the compounded value of annuity where three equal yearly payments of Rs. 2000 are deposited into an account that yields 7% compound interest.

Solution

The future value of annuity FVa = A
$$\frac{(1+R)t-1}{R}$$

= Rs. 2,000 (FVAFA @ 7% for 3 years)
= Rs. 2,000 x 3.215
= Rs. 6,430

Illustration 15:

Calculate the compound value when Rs. 10,000 are invested for 3 years and the interest on it is compounded at 10% p.a. semi annually.

 $FV = PV \times CF$ $FV = PV \times (1 + R)t$

$$\Gamma V = \Gamma V X (1 + K)t$$

= 10,000 X
$$\left(1 + \frac{10}{2}\right) 2 \times 3$$

$$= 10,000(1.05)6$$

= Rs. 10,000 x 1.340

$$=$$
 Rs. 13,400

2.11 MATHEMATICAL TABLES

		-					-			
Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	.9901	.9804	.9709	.9615	.9524	.9434	.9346	.9259	.9174	.9091
2	.9803	.9612	.9426	.9246	.9070	.8900	.8734	.8573	.8417	.8264
3	.9706	.9423	.9151	.8890	.8638	.8396	.8163	.7938	.7722	.7513
4	.9610	.9238	.8885	.8548	.8227	.7921	.7629	.7350	.7084	.6830
5	.9515	.9057	.8626	.8219	.7835	.7473	.7130	.6806	.6499	.6209
6	.9420	.8880	.8375	.7903	.7462	.7050	.6663	.6302	.5963	.5645
7	.9327	.8706	.8131	.7599	.7107	.6651	.6227	.5835	.5470	.5132
8	.9235	.8535	.7894	.7307	.6768	.6274	.5820	.5403	.5019	.4665
9	.9143	.8368	.7664	.7026	.6446	.5919	.5439	.5002	.4604	.4241
10	.9053	.8203	.7441	.6756	.6139	.5584	.5083	.4632	.4224	.3855
11	.8963	.8043	.7224	.6496	.5847	.5268	.4751	.4289	.3875	.3505
12	.8874	.7885	.7014	.6246	.5568	.4970	.4440	.3971	.3555	.3186
13	.8787	.7730	.6810	.6006	.5303	.4688	.4150	.3677	.3262	.2897
14	.8700	.7579	.6611	.5775	.5051	.4423	.3878	.3405	.2992	.2633
15	.8613	.7430	.6419	.5553	.4810	.4173	.3624	.3152	.2745	.2394
16	.8528	.7284	.6232	.5339	.4581	.3936	.3387	.2919	.2519	.2176
17	.8444	.7142	.6050	.5134	.4363	.3714	.3166	.2703	.2311	.1978
18	.8360	.7002	.5874	.4936	.4155	.3503	.2959	.2502	.2120	.1799
19	.8277	.6864	.5703	.4746	.3957	.3305	.2765	.2317	.1945	.1635
20	.8195	.6730	.5537	.4564	.3769	.3118	.2584	.2145	.1784	.1486
21	.8114	.6598	.5375	.4388	.3589	.2942	.2415	.1987	.1637	.1351
22	.8034	.6468	.5219	.4220	.3418	.2775	.2257	.1839	.1502	.1228
23	7954	.6342	.5067	.4057	.3256	.2618	.2109	.1703	.1378	.1117
24	.7876	.6217	.4919	.3901	.3101	.2470	.1971	.1577	.1264	.1015
25	.7798	.6095	.4776	.3751	.2953	.2330	.1842	.1460	.1160	.0923
26	.7720	.5976	.4637	.3607	.2812	.2198	.1722	.1352	.1064	.0839
27	.7644	.5859	.4502	.3468	.2678	.2074	.1609	.1252	.0976	.0763
28	.7568	.5744	.4371	.3335	.2551	.1956	.1504	.1159	.0895	.0693
29	.7493	.5631	.4243	.3207	.2429	.1846	.1406	.1073	.0882	.0630
30	.7419	.5521	.4120	.3083	.2314	.1741	.1314	.0994	.0754	.0573

Tale A- 1 Present Value of Re. 1: $PVIF = \frac{1}{(1+K)n}$

Period	12%	14%	15%	16%	18%	20%	24%	28%	32%	36%
1	.8929	.8772	.8696	.8621	.8475	.8333	.8065	.7813	.7576	.7353
2	.7972	.7695	.7561	.7432	.7182	.6944	.6504	.6104	.5739	.5407
3	.7118	.6750	.6575	.6407	.6086	.5787	.5245	.4768	.4348	.3975
4	.6355	.5921	.5718	.5523	.5158	.4823	.4230	.3725	.3294	.2923
5	.5674	.5194	.4972	.4761	.4371	.4019	.3411	.2910	.2495	.2149
6	.5066	.4556	.4323	.4104	.3704	.3349	.2751	.2274	.1890	.1580
7	.4523	.3996	.3759	.3538	.3139	.2791	.2218	.1776	.1432	.1162
8	.4039	.3506	.3269	.3050	.2660	.2326	.1789	.1388	.1085	.0854
9	.3606	.3075	.2843	.2630	.2255	.1938	.1443	.1084	.0822	.0628
10	.3220	.2697	.2472	.2267	.1911	.1615	.1164	.0847	.0623	.0462
11	.2875	.2366	.2149	.1954	.1619	.1346	.0938	.0662	.0472	.0340
12	.2567	.2076	.1869	.1685	.1372	.1122	.0757	.0517	.0357	.0250
13	.2292	.1821	.1625	.1452	.1163	.0935	.0610	.0404	.0271	.0184
14	.2046	.1597	.1413	.1252	.0985	.0779	.0492	.0316	.0205	.0135
15	.1827	.1401	.1229	.1079	.0835	.0649	.0397	.0247	.0155	.0099
16	.1631	.1229	.1069	.0930	.0708	.0541	.0320	.0193	.0118	.0073
17	.1456	.1078	.0929	.0802	.0600	.0451	.0258	.0150	.0089	.0054
18	.1300	.0946	.0808	.0691	.0508	.0376	.0208	.0118	.0068	.0039
19	.1161	.0829	.0703	.0596	.0431	.0313	.0168	.0092	.0051	.0029
20	.1037	.0728	.0611	.0514	.0365	.0261	.0135	.0072	.0039	.0021
21	.0926	.0638	.0531	.0443	.0309	.0217	.0109	.0056	.0029	.0016
22	.0826	.0560	.0462	.0382	.0262	.0181	.0088	.0044	.0022	.0012
23	.0738	.0491	.0402	.0329	.0222	.0151	.0071	.0034	.0017	.0008
24	.0659	.0431	.0349	.0284	.0188	.0126	.0057	.0027	.0013	.0006
25	.0588	.0378	.0304	.0245	.0160	.0105	.0046	.0021	.0010	.0005
26	.0525	.0331	.0264	.0211	.0135	.0087	.0037	.0016	.0007	.0003
27	.0469	.0291	.0230	.0182	.0115	.0073	.0030	.0013	.0006	.0002
28	.0419	.0255	.0200	.0157	.0097	.0061	.0024	.0010	.0004	.0002
29	.0374	.0224	.0174	.0135	.0082	.0051	.0020	.0008	.0003	.0001
30	.0334	.0196	.0151	.0116	.0070	.0042	.0016	.0006	.0002	.0001

Table A - 1 (continued)

 $\frac{(1+k)n}{k}$ $PVIF = \frac{1}{(1+k)1}$ 8% 1% 2% 3% 4% 5% 6% 7% 9% No. of payments 0.9901 0.9804 0.9709 0.9615 0.9524 0.9434 0.9346 0.9259 0.9174 1 2 1.9704 1.9416 1.9135 1.8861 1.8594 1.8334 1.8080 1.7833 1.7591 3 2.9410 2.8839 2.8286 2.7751 2.7232 2.6730 2.6243 2.5771 2.5313 4 3.9020 3.8077 3.7171 3.5460 3.4651 3.3872 3.3121 3.2397 3.6299 5 4.8534 4.7135 4.5797 4.4518 4.3295 4.2124 4.1002 3.9927 3.8897 6 5.7955 5.6014 5.4172 5.2421 5.0757 4.9173 4.7665 4.6229 4.4859 7 6.7282 6.4720 6.2303 6.0021 5.7864 5.5824 5.3893 5.2064 5.0330 7.6517 5.9713 5.7466 8 7.3255 7.0197 6.7327 6.4632 6.2098 5.5348 9 8.5660 8.1622 7.7861 7.4353 7.1078 6.8017 6.5152 6.2469 5.9952 10 9.4713 8.9826 8.5302 8.1109 7.7217 7.3601 7.0236 6.7101 6.4177 9.7868 7.8869 7.4987 6.8052 11 10.3676 9.2526 8.7605 8.3064 7.1390 12 11.2551 10.5753 9.9540 9.3851 8.8633 8.3838 7.9427 7.5361 7.1607 13 12.1337 11.3484 10.6350 9.9856 9.3936 8.8527 8.3577 7.9038 7.4869 14 13.0037 12.1062 11.2961 10.5631 9.8986 9.2950 8.7455 8.2442 7.7862 13.8651 12.8493 11.9379 11.1184 10.3797 9.7122 9.1079 8.5595 8.0607 15 14.7179 13.5777 12.5611 11.6523 10.8378 10.1059 9.4466 8.8514 8.3126 16 17 15.5623 14.2919 13.1661 12.1657 11.2741 10.4773 9.7632 9.1216 8.5436 16.3983 14.9920 13.7535 12.6593 11.6896 10.8276 10.0591 9.3719 8.7556 18 19 17.2260 15.6785 14.3238 13.1339 12.0853 11.1581 10.3356 9.6036 8.9501 18.0456 16.3514 14.8775 13.5903 12.4622 11.4699 10.5940 9.8181 9.1285 20 21 18.8570 17.0112 15.4150 14.0292 12.8212 11.7641 10.8355 10.0168 9.2922 22 17.6580 15.9369 12.0416 10.2007 19.6604 14.4511 13.1630 11.0612 9.4424 23 20.4558 18.2922 16.4436 14.8568 13.4886 12.3034 11.2722 10.3711 9.5802 24 21.2434 18.9139 16.9355 15.2470 13.7986 12.5504 11.4693 10.5288 9.7066 25 22.0232 19.5235 17.4131 15.6221 14.0939 12.7834 11.6536 10.6748 9.8226 26 22.7952 20.1210 17.8768 15.9828 14.3753 13.0032 11.8258 10.8100 9.9290 23.5596 20.7069 18.3270 16.3296 13.2105 11.9867 10.9352 27 14.6430 10.0266 28 24.3164 21.2813 18.7641 16.6631 14.8981 13.4062 12.1371 11.0511 10.1161 29 25.0658 21.8444 19.1885 16.9837 15.1411 13.5907 12.2777 11.1584 10.1983 30 25.8077 22.3965 19.6004 17.2920 15.3725 13.7648 12.4090 11.2578 10.2737

Table A - 2 Present Value of an Annuity of Re. 1 per period for n periods.

No. of paym- ents	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%
1	0.9091	0.8929	0.8772	0.8696	0.8621	0.8475	0.8333	0.8065	0.7813	0.7576
2	1.7355	1.6901	1.6467	1.6257	3.6052	1.5656	1.5278	1.4568	1.3916	1.3315
3	2.4869	2.4018	2.3216	2.2832	2.2459	2.1743	2.1065	1.9813	1.8684	1.7663
4	3.1699	3.0373	2.9137	2.8550	2.7982	2.6901	2.5887	2.4043	2.2410	2.0957
5	3.7908	3.6048	3.4331	3.3522	3.2743	3.1272	2.9906	2.7454	2.5320	2.3452
6	4.3553	4.1114	3.8887	3.7845	3.6847	3.4976	3.3255	3.0205	2.7594	2.5342
7	4.8684	4.5638	4.2883	4.1604	4.0386	3.8115	3.6046	3.2423	2.9370	2.6775
8	5.3349	4.9676	4.6389	4.4873	4.3436	4.0776	3.8372	3.4212	3.0758	2.7860
9	5.7590	5.3282	4.9464	4.7716	4.6065	4.3030	4.0310	3.5655	3.1842	2.8681
10	6.1446	5.6502	5.2161	5.0188	4.8332	4.4941	4.1925	3.6819	3.2689	2.9304
11	6.4951	5.9377	5.4527	5.2337	5.0286	4.6560	4.3271	3.7757	3.3351	2.9776
12	6.8137	6.1944	5.6603	5.4206	5.1971	4.7932	4.4392	3.8514	3.3868	3.0133
13	7.1034	6.4235	5.8424	5.5831	5.3423	4.9095	4.5327	3.9124	3.4272	3.0404
14	7.3667	6.6282	6.0021	5.7245	5.4675	5.0081	4.6106	3.9616	3.4587	3.0609
15	7.6061	6.8109	6.1422	5.8474	5.5755	5.0916	4.6755	4.0013	3.4834	3.0764
16	7.8237	6.9740	6.2651	5.9542	5.6685	5.1624	4.7296	4.0333	3.5026	3.0882
17	8.0216	7.1196	6.3729	6.0472	5.7487	5.2223	4.7746	4.0591	3.5177	3.0971
18	8.2014	7.2497	6.4674	6.1280	5.8178	5.2732	4.8122	4.0799	3.5294	3.1039
19	8.3649	7.3658	6.5504	6.1982	5.8775	5.3162	4.8435	4.0967	3.5386	3.1090
20	8.5136	7.4694	6.6231	6.2593	5.9288	5.3527	4.8696	4.1103	3.5458	3.1129
21	8.6487	7.5620	6.6870	6.3125	5.9731	5.3837	4.8913	4.1212	3.5514	3.1158
22	8.7715	7.6446	6.7429	6.3587	6.0113	5.4099	4.9094	4.1300	3.5558	3.1180
23	8.8832	7.7184	6.7921	6.3988	6.0442	5.4321	4.9245	4.1371	3.5592	3.1197
24	8.9847	7.7843	6.8351	6.4338	6.0726	5.4510	4.9371	4.1428	3.5619	3.1210
25	9.0770	7.8431	6.8729	6.4642	6.0971	5.4669	4.9476	4.1474	3.5640	3.1220
26	9.1609	7.8957	6.9061	6.4906	6.1182	5.4804	4.9563	4.1511	3.5656	3.1227
27	9.2372	7.9426	6.9352	6.5135	6.1364	5.4919	4.9636	4.1542	3.5669	3.1233
28	9.3066	7.9844	6.9607	6.5335	6.1520	5.5016	4.9697	4.1566	3.5679	3.1237
29	9.3696	8.0218	6.9830	6.5509	6.1656	5.5098	4.9747	4.1585	3.5687	3.1240
30	9.4269	8.0552	7.0027	6.5660	6.1772	5.5168	4.9789	4.1601	3.5693	3.1242

Table A - 2 (continued)

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	1.0100	1.0200	1.0300	1.0400	1.0500	1.0600	1.0700	1.0800	1.0900	1.1000
2	1.0201	1.0404	1.0609	1.0816	1.1025	1.1236	1.1449	1.1664	1.1881	1.2100
3	1.0303	1.0612	1.0927	1.1249	1.1576	1.3910	1.2250	1.2597	1.2950	1.3310
4	1.0406	1.0824	1.1255	1.1699	1.2155	1.2625	1.3108	1.3605	1.4116	1.4641
5	1.0510	1.1041	1.1593	1.2167	1.2763	1.3382	1.4026	1.4693	1.5386	1.6105
6	1.0615	1.1262	1.1941	1.2653	1.3401	1.4185	1.5007	1.5869	1.6771	1.7716
7	1.0721	1.1487	1.2299	1.3159	1.4071	1.5036	1.6058	1.7138	1.8280	1.9487
8	1.0829	1.1717	1.2668	1.3686	1.4775	1.5938	1.7182	1.8509	1.9926	2.1436
9	1.0937	1.1951	1.3048	1.4233	1.5513	1.6895	1.8385	1.9990	2.1719	2.3579
10	1.1046	1.2190	1.3439	1.4802	1.6289	1.7908	1.9672	2.1589	2.3674	2.5937
11	1.1157	1.2434	1.3842	1.5395	1.7103	1.8983	2.1049	2.3316	2.5804	2.8531
12	1.1268	1.2682	1.4258	1.6010	1.7959	2.0122	2.2522	2.5182	2.8127	3.1384
13	1.1381	1.2936	1.4685	1.6651	1.8856	2.1329	2.4098	2.7196	3.0658	3.4523
14	1.1495	1.3195	1.5126	1.7317	1.9799	2.2609	2.5785	2.9372	3.3417	3.7975
15	1.1610	1.3459	1.5580	1.8009	2.0789	2.3966	2.7590	3.1722	3.6425	4.1772
16	1.1726	1.3728	1.6047	1.8730	2.1829	2.5404	2.9522	3.4259	3.9703	4.5950
17	1.1843	1.4002	1.6528	1.9479	2.2920	2.6928	3.1588	3.7000	4.3276	5.0545
18	1.1961	1.4282	1.7024	2.0258	2.4066	2.8543	3.3799	3.9960	4.7171	5.5599
19	1.2081	1.4568	1.7535	2.1068	2.5270	3.0256	3.6165	4.3157	5.1417	6.1159
20	1.2202	1.4859	1.8061	2.1911	2.6533	3.2071	3.8697	4.6610	5.6044	6.7275
21	1.2324	1.5157	1.8603	2.2788	2.7860	3.3996	4.1406	5.0338	6.1088	7.4002
22	1.2447	1.5460	1.9161	2.3699	2.9253	3.6035	4.4304	5.4365	6.6586	8.1403
23	1.2572	1.5769	1.9736	2.4647	3.0715	3.8197	4.7405	5.8715	7.2579	8.9543
24	1.2697	1.6084	2.0328	2.5633	3.2251	4.0489	5.0724	6.3412	7.9111	9.8497
25	1.2824	1.6406	2.0938	2.6658	3.3864	4.2919	5.4274	6.8485	8.6231	10.834
26	1.2953	1.6734	2.1566	2.7725	3.5557	4.5494	5.8074	7.3964	9.3992	11.918
27	1.3082	1.7069	2.2213	2.8834	3.7335	4.8223	6.2139	7.9881	10.245	13.110
28	1.3213	1.7410	2.2879	2.9987	3.9201	5.1117	6.6488	8.6271	11.167	14.421
29	1.3345	1.7758	2.3566	3.1187	4.1161	5.4184	7.1143	9.3173	12.172	15.863
30	1.3478	1.8114	2.4273	3.2434	4.3219	5.7435	7.6123	10.062	13.267	17.449

Table A - 3 Future Value of Re. 1 at the end of n Periods. $PVIF = (1+k) \; n$

Per iod	12%	14%	15%	16%	18%	20%	24%	28%	32%	36%
1	1.1200	1.1400	1.1500	1.1600	1.1800	1.2000	1.2400	1.2800	1.3200	1.3600
2	1.2544	1.2996	1.3225	1.3456	1.3924	1.4400	1.5376	1.6384	1.7424	1.8496
3	1.4049	1.4815	1.5209	1.5609	1.6430	1.7280	1.9066	2.0972	2.3000	2.5155
4	1.5735	1.6890	1.7490	1.8106	1.9388	2.0736	2.3642	2.6844	3.0360	3.4210
5	1.7623	1.9254	2.0114	2.1003	2.2878	2.4883	2.9316	3.4360	4.0075	4.6526
6	1.9738	2.1950	2.3131	2.4364	2.6996	2.9860	3.6352	4.3980	5.2899	6.3275
7	2.2107	2.5023	2.6600	2.8262	3.1855	3.5832	4.5077	5.6295	6.9826	8.6054
8	2.4760	2.8526	3.0590	3.2784	3.7589	4.2998	5.5895	7.2058	9.2170	11.703
9	2.7731	3.2519	3.5179	3.8030	4.4355	5.1598	6.9310	9.2234	12.166	15.916
10	3.1058	3.7072	4.0456	4.4114	5.2338	6.1917	8.5944	11.805	16.059	21.646
11	3.4785	4.2262	4.6524	5.1173	6.1759	7.4301	10.657	15.111	21.198	29.439
12	3.8960	4.8179	5.3502	5.9360	7.2876	8.9161	13.214	19.342	27.982	40.037
13	4.3635	5.4924	6.1528	6.8858	8.5994	10.699	16.386	24.758	36.937	54.451
14	4.8871	6.2613	7.0757	7.9875	10.147	12.839	20.319	31.691	48.756	74.053
15	5.4736	7.1379	8.1371	9.2655	11.973	15.407	25.195	40.564	64.358	100.71
16	6.1304	8.1372	9.3576	10.748	14.129	18.488	31.242	51.923	84.953	136.96
17	6.8660	9.2765	10.761	12.467	16.672	22.186	38.740	66.461	112.13	186.27
18	7.6900	10.575	12.375	14.462	19.673	26.623	48.038	85.070	148.02	253.33
19	8.6128	12.055	14.231	16.776	23.214	31.948	59.567	108.89	195.39	344.53
20	9.6463	13.743	16.366	19.460	27.393	38.337	73.864	139.37	257.91	468.57
21	10.803	15.667	18.821	22.574	32.323	46.005	91.591	178.40	340.44	637.26
22	12.100	17.861	21.644	26.186	38.142	55.206	113.57	278.35	449.39	866.67
23	13.552	20.361	24.891	30.376	45.007	66.247	140.83	292.30	593.19	1178.6
24	15.178	23.212	28.625	35.236	53.108	79.496	174.63	374.14	783.02	1602.9
25	17.000	26.461	32.918	40.874	62.668	95.396	216.54	478.90	1033.5	2180.0
26	19.040	30.166	37.856	47.414	73.948	114.47	268.51	612.99	1364.3	2964.9
27	21.324	34.389	43.535	55.000	87.259	137.37	332.95	784.63	1800.9	4032.2
28	23.883	39.204	50.065	63.800	102.96	164.84	412.86	1004.3	2377.2	5483.8
29	26.749	44.693	57.575	74.008	121.50	197.81	511.95	1285.5	3137.9	7458.0
30	29.959	50.950	66.211	85.849	143.37	237.37	634.81	1645.5	4142.0	10143.

Table A - 4 Sum of an Annuity of Re. 1 per period of n Periods :

$$PVIFA \frac{n}{(1+k)t-1} \frac{(1+k)n-1}{k}$$

No. of Periods	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	2.0100	2.0200	2.0300	2.0400	2.0500	2.0600	2.0700	2.0800	2.0900	2.1000
3	3.0301	3.0604	3.0909	3.1216	3.1525	3.1836	3.2149	3.2464	3.2781	3.3100
4	4.0604	4.1216	4.1836	4.2465	4.3101	4.3746	4.4399	4.5061	4.5731	4.6410
5	5.1010	5.2040	5.3091	5.4163	5.5256	5.6371	5.7507	5.8666	5.9847	6.1051
6	6.1520	6.3081	6.4684	6.6330	6.8019	6.9753	7.1533	7.3359	7.5233	7.7156
7	7.2135	7.4343	7.6625	7.8983	8.1420	8.3938	8.6540	8.9228	9.2004	9.4872
8	8.2857	8.5830	8.8923	9.2142	9.5491	9.8975	10.259	10.636	11.028	11.435
9	9.3685	9.7546	10.159	10.582	11.026	11.491	11.978	12.487	13.021	13.579
10	10.462	10.949	11.463	12.006	12.577	13.180	13.816	14.486	15.192	15.937
11	11.566	12.168	12.807	13.486	14.206	14.971	15.783	16.645	17.560	18.531
12	12.682	13.412	14.192	15.025	15.917	16.869	17.888	18.977	20.140	21.384
13	13.809	14.680	15.617	16.626	17.713	18.882	20,140	21.495	22.953	24.522
14	14.947	15.973	17.086	18.291	19.598	21.015	23.550	24.214	26.019	27.975
15	16.096	17.293	18.598	20.023	21.578	23.276	25.129	27.152	29.360	31.772
16	17.257	18.639	20.156	21.824	23.657	25.672	27.888	30.324	33.003	35.949
17	18.430	20.012	21.761	23.697	25.840	28.212	30.840	33.750	36.973	40.544
18	19.614	21.412	23.414	25.645	28.132	30.905	33.999	37.450	41.301	45.599
19	20.810	22.840	25.116	27.671	30.539	33.760	37.379	41.446	46.018	51.159
20	22.019	24.297	26.870	29.778	33.066	36.785	40.995	45.762	51.160	57.275
21	23.239	25.783	28.676	31.969	35.719	39.992	44.865	50.422	56.764	64.002
22	24.471	27.299	30.536	34.248	38.505	43.392	49.005	55.456	62.873	71.402
23	25.716	28.845	32.452	36.617	41.430	46.995	53.436	60.893	69.531	79.543
24	26.973	30.421	34.426	39.082	44.502	50.815	58.176	66.764	76.789	88.497
25	28.243	32.030	36.459	41.645	47.727	54.864	63.249	73.105	84.700	98.347
26	29.525	33.670	38.553	44.311	51.113	59.156	68.676	79.954	93.323	109.18
27	30.820	35.344	40.709	47.084	54.669	63.705	74.483	87.350	102.72	121.09
28	32.129	37.051	42.930	49.967	58.402	68.528	80.697	95.338	112.96	134.20
29	33.450	38.792	45.218	52.966	62.322	73.639	87.346	103.96	124.13	148.63
30	34.784	40.568	47.575	56.084	66.438	73.639	94.460	113.28	136.30	164.49

Table A - 4 (continued)

No. of Period	12%	14%	15%	16%	18%	20%	24%	28%	32%	36%
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	2.1200	2.1400	2.1500	2.1600	2.1800	2.2000	2.2400	2.2800	2.3200	2.3600
3	3.3744	3.4396	3.4725	3.5056	3.5724	3.6400	3.7776	3.9184	4.0624	4.2096
4	4.7793	4.9211	4.9934	5.0665	5.2154	5.3680	5.6842	6.0156	6.3624	6.7251
5	6.3528	6.6101	6.7424	6.8771	7.1542	7.4416	8.0484	8.6999	9.3983	10.146
6	8.1152	8.5355	8.7537	8.9775	9.4420	9.9299	10.980	12.135	13.405	14.798
7	10.089	10.730	11.066	11.413	12.141	12.915	14.615	16.533	18.695	21.126
8	12.299	13.232	13.726	14.240	15.327	16.499	19.122	22.163	25.678	29.731
9	14.775	16.065	16.785	17.518	19.085	20.798	24.712	29.369	34.895	41.435
10	17.548	19.337	20.303	21.321	23.521	25.958	31.643	38.592	47.061	57.351
11	20.654	23.044	24.349	25.732	28.755	32.150	40.237	50.398	63.121	78.998
12	24.133	27.270	29.001	30.850	34.931	39.580	50.894	65.510	84.320	108.43
13	28.029	32.088	34.351	36.786	42.218	48.496	64.109	84.852	112.30	148.47
14	32.392	37.581	40.504	43.672	50.818	59.195	80.496	109.61	149.23	202.92
15	37.279	43.842	47.580	51.659	60.965	72.035	100.81	141.30	197.99	276.97
16	42.753	50.980	55.717	60.925	72.939	87.442	126.01	181.86	262.35	377.69
17	48.883	59.117	65.075	71.673	87.068	105.93	157.25	233.79	347.30	514.66
18	55.749	68.394	75.836	84.140	103.74	128.11	195.99	300.25	459.44	700.93
19	63.439	78.969	88.211	98.603	123.41	154.74	244.03	385.32	607.47	954.27
20	72.052	91.024	102.44	115.37	146.62	186.68	303.60	494.21	802.86	1298.8
21	81.698	104.76	118.81	134.84	174.02	225.02	377.46	633.59	1060.7	1767.3
22	92.502	120.43	137.63	157.41	206.34	271.03	469.05	811.99	1401.2	2404.6
23	104.60	138.29	159.27	183.60	244.48	326.23	582.62	1040.3	1850.6	3271.3
24	118.15	158.65	184.16	213.97	289.49	392.48	723.46	1332.6	2443.8	4449.9
25	133.33	181.87	212.79	249.21	342.60	471.98	898.09	1706.8	3226.8	6052.9
26	150.33	208.33	245.71	290.08	405.27	567.37	1114.6	2185.7	4260.4	8223.0
27	169.37	238.49	283.56	337.50	479.22	681.85	1383.1	2798.7	5624.7	11197.9
28	190.69	272.88	327.10	392.50	566.48	819.22	1716.0	3583.3	7425.6	15230.2
29	214.58	312.09	377.16	456.30	669.44	984.06	2128.9	4587.6	9802.9	20714.1
30	241.33	356.78	434.74	530.31	790.94	1181.8	2640.9	5873.2	12940.	28172.2

2.13 BONDS VALUATION

What is Bond?

Bonds are financial instrument which represents the borrowings of the issuing authority and pays a fixed amount of interest at a rate specified at the time of issue. From an investors point of view it is a fixed return earning instruments.

Terms related to Bonds

- a. **Principal Value or Face Value:** It is the nominal or principal value of the Bond. It is the price printed on the face of the Bonds issued by the company.
- b. **Interest rate or Coupon rate:** A coupon rate is the specific interest rate which is paid at specific intervals to the bond holders.
- c. **Maturity Period:** It the total time period for which a bond is issued.
- d. **Net Proceeds:** It is the total amount of funds raised by the company by the issue of the bonds.
- e. **Redemption:** It is the repayment of the amount to the bond holders at the time of maturity.
- f. **Redemption Value:** It is the total amount that is paid to the holders of the bond at the time of maturity.

Valuation of Bonds:

The bond is to be valued based on the present value of the expected cash inflows from such bonds in the form of Principal amount repayment and interest received over the life time of the bonds.

V = I (PVIFA r, n) + P (PVIF r, n)

Where,

V = value of the bond

I = Annual interest payable on the bond

P = Principal amount of the bond repayable at the time of maturity (at Par/Premium/Discount)

r = Discount rate or expected rate of return

n = maturity period of the bond.

PVIFA = Present Value Annuity Factor

PVIF = Present Value Interest Factor

Alternatively one can use table to find the value of the Bonds:

Statement showing Valuation of Bond			
	А	В	$C = A \times B$
Year (n)	Cash Inflow	DF @ r%	
1	XX (I)	Х	XXX
2	XX (I)	Х	XXX
3	XX (I)	Х	XXX
4	XX (I)	Х	XXX
5	XX (P + I)	Х	XXX
	Value of the Bond (Sum of Column 'C')		XXX

I = Annual interest payable on the bond
P = Principal amount of the bond repayable at the time of maturity (at Par/Premium/Discount)

r = Discount rate or expected rate of return

n = maturity period of the bond.

Illustration 1:

A bond having par value of \Box 100 bears a coupon rate of 14% and has maturity period of 5 years. The required rate of return on the bond is 12%. What should be the value of the bond?

What will be the answer if the required rate of return if?

- a. 12%
- b. 14%
- b. 16%

Solution:

a. V = I (PVIFA r, n) + P (PVIF r, n) V = 14(3.6048) + 100(0.5674)V = 50.47 + 56.74

$$V = 50.47 + 56.74$$

 $V = 107.21$

0	R
\mathbf{U}	

a.			
Year	Cash Inflow	DF @ 12%	
1	14	0.8929	12.50
2	14	0.7972	11.16
3	14	0.7118	9.97
4	14	0.6355	8.90
5	114 (100 + 14)	0.5674	64.68
		Value of the Bond	107.21

b. V = I (PVIFA r, n) + P (PVIF r, n) V = 14(3.4332) + 100(0.5194) V = 48.06 + 51.94V = 100.00

OR

b.			
Year	Cash Inflow	DF @ 14%	
1	14	0.8772	12.28
2	14	0.7695	10.77
3	14	0.6750	9.45
4	14	0.5921	8.29
5	114 (100 + 14)	0.5194	59.21
		Value of the Bond	100.00

c.
$$V = I (PVIFA r, n) + P (PVIF r, n)$$

V = 14(3.2744) + 100(0.5194)V = 45.84 + 47.61V = 93.45

c. Cash Inflow Year DF @ 16% 1 14 0.8621 12.07 2 14 0.7432 10.40 3 14 0.6407 8.97 4 14 0.5523 7.73 5 114(100 + 14)0.4761 54.28 Value of the Bond 93.45

OR

Illustration 2:

Lion Ltd. has issued a debenture with face value of Rs. 100 bearing coupon @ 10% p.a. maturing after 6 years at par. The expected rate of return of investor is 15%. Should investor buy the debentures if the current market price of debenture is Rs. 85? (TYBAF, May 2016 (Adapted))

Solution:

Statement showing Valuation of Bond:

Year	Cash Inflow	DF @ 15%	Amount
1	10	0.8696	8.70
2	10	0.7561	7.56
3	10	0.6575	6.58
4	10	0.5718	5.72
5	10	0.4972	4.97
6	110 (100 + 10)	0.4323	47.55
		Value of the Debentures	81.08

The value of the Bond is 81.08 and it is priced at Rs. 85 in the market, so it is overpriced and therefore the investor is advised **not to buy the debentures**.

Illustration 3

Darshan Ltd. wants to issue debentures redeemable after 7 years at a premium of 10%. Face value of debentures is Rs. 1,000. The company proposes to issue so as to yield a return of 12% p.a. to the investor. The coupon rate for the first three years will be 13% p.a. which will be increased by 2% p.a. for the remaining life. As CFO of the company advice the issue price of the debenture. (TYBAF, Nov 2016)

Solution:

Statement showing Valuation of Bond

Year	Cash Inflow	DF @ 12%	
1	130	0.8929	116.08
2	130	0.7972	103.64
3	130	0.7118	92.53
4	150	0.6355	95.33
5	150	0.5674	85.11
6	150	0.5066	75.99
7	1,250 (1,100 + 150)	0.4523	565.38
		Value of the Bond	1,134.05

Redemption at Premium: 1,000 + 100 (1,000 x 10% Premium.) •

Kindly Note:

1. When the interest is fluctuating, we should use Table based format.

Illustration 4:

Sanjana Ltd. has issued bonds with face value of Rs. 1,000 bearing interest @ 24% p.a. payable half yearly maturing after 5 years at par. The expected rate of return of an investor is 12%. Should the investor buy the bonds if the current price of bond listed in the market is Rs. 1,000? (Adapted TYBAF Nov. 2016).

Statement showing Valuation of Bond				
Year	Cash Inflow	DF @ 6**%		
1	120*	0.9434	113.21	
2	120	0.8900	106.80	
3	120	0.8396	100.75	
4	120	0.7921	95.05	
5	120	0.7473	89.68	
6	120	0.7050	84.60	
7	120	0.6651	79.81	
8	120	0.6274	75.29	
9	120	0.5919	71.03	
10	1,120 (1,000 + 120)	0.5584	625.41	
		Value of the Bond	1,441.62	

Solution:

* Coupon Rate: 24% p.a. therefore 12% for 6 months

** Interest Rate: DF @ 12% p.a.

Illustration 5:

Credit unlimited Ltd. has issued fully convertible bonds with face value of Rs. 100 with coupon rate of 16% p.a. which will convert in 10 equity shares of Rs. 10 each at the end of 6 years. Find out the value of debentures if the expected rate of return of an investor is 20% p.a. and expected market price of one share after 6 years is Rs. 28.50. Interest on debentures will be paid on half yearly basis. (TYBAF Nov. 2016)

Year	Cash Inflow	DF @ 10%	
1	8	0.9091	7.27
2	8	0.8264	6.61
3	8	0.7513	6.01
4	8	0.6830	5.46
5	8	0.6209	4.97
6	8	0.5645	4.52
7	8	0.5132	4.11
8	8	0.4665	3.73
9	8	0.4241	3.39
10	8	0.3855	3.08
11	8	0.3505	2.80
12	293*	0.3186	93.35
		Value of the Bond	145.31

Solution: Statement showing Valuation of Bond

*Cash Inflow in Last Year = (10 Shares x Rs. 28.50(Converted Value of Debentures + 8)

Yield to Maturity:

Yield to Maturity (YTM) *(alternatively referred as redemption or book <u>yield</u>) is the speculative <u>rate of return</u> or interest rate of a fixed-rate security, such as a <u>bond</u>. The YTM is based on the belief or understanding that an investor purchases the security at the current market price and holds it until the security has matured (reached its full value), and that all interest and coupon payments are made in a timely fashion. In simple words 'Yield to Maturity' is the rate of return, mostly annualised, that an investor can expect to earn if they hold the bond till maturity.*

$$YTM = \frac{I + \frac{R.V. - N.P.}{n}}{\frac{R.V. + N.P.}{2}}$$

Where,
I = Interest

I = Interest R.V. = Redemption Value N.P. = Net Proceeds/Market Value n = no of years/periods Illustration 1: Cairo Ltd.'s bond with a par value of Rs. 500 is currently traded at Rs. 435. The coupon rate is 12% and it has a maturity period of 7 years. What is yield to maturity?

Solution:

$$YTM = \left(\frac{I + \left(\frac{R.V. - N.P.}{n}\right)}{\frac{R.V. + N.P.}{2}}\right) \times 100$$
$$YTM = \frac{60 + \left(\frac{500 - 435}{7}\right)}{\left(\frac{500 + 435}{2}\right)} \times 100$$
$$YTM = \frac{60 + 9.29}{467} \cdot 5 \times 100$$
$$YTM = \frac{69.29}{467.5} \times 100$$

YTM = 14.82%

Illustration 2:

What is YTM of each bond? Which bond will you recommend for investment?

Bond	Coupon Rate	Maturity	Price/□ 100 Par Value	
Bond X	11%	10 years	Rs. 76	
Bond Y	12%	7 years	Rs. 69	
(TYBAF Nov. 2019)				

	Bond X	Bond Y
$Y.T.M. = \left(\frac{Interest + \left(\frac{R.V. + N.P.}{n}\right)}{\left(\frac{R.V. + N.P.}{2}\right)}\right) \times 100$	$\frac{\frac{11 + \left(\frac{100 - 76}{10}\right)}{\left(\frac{100 + 76}{2}\right)} \times 100}{= \frac{13.4}{88} \times 100}$ = 15.23	$\frac{12 + \left(\frac{100 - 69}{7}\right)}{\left(\frac{100 + 69}{2}\right)} \times 100$ $= \frac{16.43}{84.5} \times 100$ $= 19.44\%$

Duration of Bond

The concept of duration is straightforward. Duration is nothing but the average time taken by an investor to collect his/her investment. If an investor receives a part of his/her investment over the time on specific intervals before maturity, the investment will offer him the duration which would be lesser than the maturity of the instrument. Higher the coupon rate, lesser would be the duration.

It measures how quickly a bond will repay its true cost. The longer the time it takes the greater exposure the bond has to changes in the interest rate environment.

Illustration 3:

Calculate the duration of Bond from the following details. Face Value = Rs. 1,000 Coupon Rate (payable annually) = 13 % Years to Maturity = 5 years Redemption value = Rs. 1,000 Current Market Price = Rs. 1036 Yield to Maturity = 12% (TYBAF. Apr. 2019).

	Statement showing calculation of Duration of Bond					
1	2 3 $4 = 2 \times 3$ $5 = 1 \times 4$					
Year	Interest @ 13%	YTM @ 12%	PVCF	Year x PVCF		
1	130	0.8929	116.08	116.08		
2	130	0.7972	103.64	207.28		
3	130	0.7118	92.53	277.59		
4	130	0.6355	82.62	330.48		
5	1130	0.5674	641.16	3,205.80		
			1,036.03	4,137.23		
Duration of Bond = Σ Year x PVCF						

∑ PVCF ∑ PVCF 4,137.23 1,036.03

Duration of Bond =

3.99 Years

Illustration 4:

The following data is available for a bond. Face value is Rs. 100, Coupon rate is 14%, years to maturity is 5 years, and redemption value is Rs. 100. YTM is 15%. Calculate duration of bond.

Statement showing calculation of Duration of Bond						
1	2 3 $4 = 2 \times 3$ $5 = 1 \times 4$					
Year	Interest @ 14%	DF @ 15%	PVCF	Year x PVCF		
1	14	0.8696	12.17	12.17		
2	14	0.7561	10.59	21.17		
3	14	0.6575	9.21	27.62		
4	14	0.5718	8.01	32.02		
5	114	0.4972	56.68	283.40		
			96.65	376.39		

Duration of Bond	=	∑ Year x PVCF	
		$\sum PVCF$	
		376.39	
		96.65	
Duration of Bond	=	3.89	Years

2.13 EXERCISES

- 1. What do you understand by time value of money?
- 2. What are the possible reasons that must have time value despite not being put to use?
- 3. What do you understand by future value and present value of money?
- 4. What are annuities? And why such values are calculated/
- 5. How do you determine the equated monthly installments?
- 1) Indicate the right answer with your reasoning:
 - a) Which provides money its time value?
 - i) Investment
 - ii) Interest Rates
 - iii) Market Rates
 - iv) Call Rates
 - b) In approximately, how many years would you expect to double your money at 8% per annum?
 - i) 8 years
 - ii) 12 years
 - iii) 9 years
 - iv) 10 years
 - c) 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
 - d) When compounding is done more frequently than annually, the effective rate of interest is ______.
 - i) greater than the nominal rate of interest.
 - ii) lower than the normal rate of interest.
 - iii) equal to nominal rate of interest.
 - v) normal

Hint (Ans (a) - ii, (b) - iii, (c) - ii (d) - i)

2) Ramesh deposited Rs. 2,000 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?

- 3) Mohan plan to send his son for higher studies in America after 5 years. He expects the cost of the study to be Rs. 4,00,000. How much should he save annually to have a sum of Rs. 4,00,000 at the end of 5 years. If the interest rate is 9%
- 4) A bank promises to give you Rs. 5,000 after 10 years in exchange of Rs. 2,000 today. What is the interest rate involved in this offer?
- 5) Mukesh deposits Rs. 2,00,000 in Saraswati Co-op Bank which pays 10 per cent interest. How much he withdraw annually for a period of 15 years?
- 6) Avinash wants to invest @ 8% p.a. compound interest, such amount as will amount to Rs. 50,000 at the end of three years. How much should he invest? (Ans. 39,642)
- A company has advertised for deposits from the public. If you deposit
 □ 1,000 now, you would receive Rs. 1,464 at the end of 4 years or Rs. 1,611 at the end of 5 years. What rates of interest is the company paying? (Ans. 10%)
- Four equal annual payments of Rs. 4000 are made into a deposit account that pays and per cent interest per year. What would be the future value of this annuity at the end of 6 years? (Ans. Rs. 29,342)
- 9) You can save Rs. 20,000 a year for 5 years and Rs. 9,000 and Rs. 3,000 a year for 10 years thereafter. What will these saving cumulate to al the end of 15 years if the rate of interest is 10 percent? (Ans. 1,69,913)
- 10) What is the present value of the following cash stream if the discount rate is 12%?

Year	0	1	2	3	4
Cash Flow	5000	6000	8000	10000	12000

(Ans. Rs. 31,479)

11) Find out the present value of debenture from the following:Face Value of debentures Rs. 1000Annual interest rate 12%Expected Return 10%Maturity period 5 years

12) A Bank advertise that it will pay a lump sum of Rs. 45,740 at the end of 8 years to the investors who deposit annually Rs. 4,000 for 8 years what is the interest rate bank is paying?



LEVERAGES

Unit Structure :

- 3.0 Objectives
- 3.1 Introduction
- 3.2 Meaning of Leverage
- 3.3 Types of Leverages
- 3.4 Significance of Leverages
- 3.5 Exercises

3.0 OBJECTIVES

After studying the unit the students will:

- The meaning of leverage
- Business risk & financial risk
- Sources of financing
- Types of leverages
- Importance of leverages

3.1 INTRODUCTION:

A company can raise funds required for investment either by increasing the owners' claims or creditors' claims. The claims of the owners increase when a company raises funds by issuing equity shares. The claims of the creditors increase when the funds are raised by borrowings. Thus, the various means used to raise the funds represent the capital structure of the company. The capital structure decision is of great importance for the management because it influences the debt-equity mix of the company which affects the shareholders' return and risk. If the borrowed funds are more in the capital structure of a company, it results in an increase in shareholders' earnings together with increase in their risk. It is because the cost of borrowed funds is less than that of the shareholders'. The costs on account of borrowed funds are allowable as a deduction for income-tax purpose. However, the borrowed funds carry a fixed rate of interest which has to be paid whether the company is earning profit or not. Thus, the risk of the shareholders increases in case there are a high proportion of borrowed funds in the total capital of a company. If the proportion of the shareholders' funds is more than the proportion of the borrowed capital, the return as well as the risk of the shareholders will be less. The effect of financing or debt-equity mix on the shareholder's earnings and risk can be examined by using the concept of leverage.

3.2 MEANING OF LEVERAGE:

The term leverage refers to a relationship between two interrelated variables. It represents the influence of one financial variable over some other related financial variable. Leverage is used to describe the firm's ability to use fixed cost assets or funds to magnify the return to its owners.

James Horne defined Leverage as "the employment of an asset or funds for which the firm pays a fixed cost or fixed return." Leverage results when a firm employs an asset or source of funds which has a fixed cost. There will be no leverage, if a firm is not required to pay a fixed cost. The fixed cost or return has to be paid or incurred irrespective of the volume of output or sales, the size of such cost or return has considerable influence on the amount of profits available for the shareholders. When the volume of sales changes leverage helps in quantifying such influence. Thus, leverage can be defined as "relative change in profits due to a change in sales." A high degree of leverage means large change in profits due to a relatively small change in sales. Thus, higher the leverage, higher is the risk and higher is the expected return.

3.3 TYPES OF LEVERAGE:

There are three commonly used measures of leverage in financial analysis. These are as follows:

3.3.1 OPERATING LEVERAGE:

The operating leverage is defined as the employment of an asset with a fixed cost in the hope that sufficient revenue may be generated to cover all the fixed and variable costs. It can also be defined as "the tendency of the operating profit to vary disproportionately with sales." It exists when the firm has to pay fixed cost regardless of volume of output or sales. Thus, operating leverage is a function of three factors:

i) Fixed amount of cost.

ii) Variable contribution margin.

iii) Volume of sales.

The operating leverage can be calculated by using the following formula:

Operating leverage =
$$\frac{\text{Contribution}}{\text{Operating profit}}$$

= $\frac{\text{C}}{\text{EBIT}}$

Contribution = Sales - Variable Cost.

Operating profit means Earnings before Interest and Taxes (EBIT).

Operating leverage is the ratio of net operating income before fixed charges to net operating income after fixed charges.

Degree of Operating Leverage:

The degree of operating leverage may be defined as a percentage change in the profits resulting from a percentage change in the sales. It can be put in the form of a formula as follows:

 $DOL = \frac{Percentage change in net operating income}{Percentage change in sales}$

Operating leverage is directly proportional to business risk. It indicates the impact of change in sales on operating income. If a firm has a high degree of operating leverage a small change in sales will have a large effect on operating income. The operating profits of such a firm will increase at a faster rate than the increase in sales. Similarly, the operating profits of such a firm will suffer a greater loss as compared to reduction in its sales. Generally, the firms should not operate under conditions of a high degree of operating leverage because it is a very risky situation where a small decline in sales will affect its profits.

Illustration 1:

A company produces and sells 10,000 calculators. The selling price per calculator is Rs. 500. Variable cost per calculator is Rs. 200 and fixed operating cost is Rs. 20, 00,000. You are required to calculate:

- a) Operating leverage.
- b) If sales are up by 10%, what is its impact on EBIT?

Solution:

a) Statement of Profitability:

	Rs.
Sales Revenue (10,000 × 500)	50,00,000
Variable cost (10,000 × 200)	20,00,000
Contribution	30,00,000
Fixed cost	20,00,000
EBIT (Profit)	10,00,000

 \therefore Operating leverage (OL) = $\frac{\text{Contribution}}{\text{DD}}$

$$=\frac{30,00,000}{10,00,000}=3$$
 Times

b) If sales are up by 10%:

 $OL = \frac{\%\Delta \text{ in EBIT}}{\%\Delta \text{ in sales}}$ $\therefore 3 = \frac{X}{10}$ $\therefore X = 30\%$

	(Rs.)
Revised Sales	55,00,000
Less: Variable cost 40%	22,00,000
Contribution	33,00,000
Less: Fixed cost	20,00,000
EBIT	13,00,000

Thus, if sales are up by 10% the EBIT will increase by 30% (10 x3) which is checked as follows:

: Increase in EBIT = $\frac{3,00,000}{10,00,000} \times 100$

3.3.2 FINANCIAL LEVERAGE:

The financial leverage can be defined as "the tendency of the residual net income to vary disproportionately with operating profit. It may also be defined as the use of funds with a fixed cost in order to increase earnings per share of the company." The financial leverage indicates the change that takes place in the taxable income as a result of change in the operating income. It signifies the existence of fixed interest bearing securities in the capital structure of the company. Financial leverage induces the use of funds obtained at a fixed cost in the hope of increasing the return to he equity shareholders. The financial leverage can be computed using the following formula:

Financial leverage =
$$\frac{\text{EBIT}}{\text{EBT}}$$

Where, EBIT is the Earnings before Interest and Taxes.

EBT is the Earnings before Tax.

Degree of Financial Leverage (DFL) is the ratio of the percentage change in earning before tax to the percentage increase in operating profit i.e. EBIT. This can be put in the following formula:

 $DFL = \frac{Percentage change in taxable income}{Percentage change in the operating income}$

According to Gitman, "financial leverage is the ability of a firm to use fixed financial charges to magnify the effects of changes in EBIT on the company's earning per share." Thus, the financial leverage indicates the percentage change in earning per share in relation to a percentage change in EBIT. Accordingly, the degree of financial leverage can be calculated as per the following formula:

 $DFL = \frac{Percentage change in EPS}{Percentage change EBIT}$

There will be no financial leverage if the result of the above equation is less than 1.

Financial leverage is also termed as 'Trading on Equity'. The concept of trading on equity states that the company uses equity capital as well as borrowed capital while deciding its capital structure. The objective of the term trading on equity is to provide a higher return to the shareholders of the company. However, trading on equity should be used for the term financial leverage only when the financial leverage is favourable. The financial leverage has potentiality of increasing the return to equity shareholders but at the same time it cerates additional risk for the shareholders also.

Illustration 2:

Z Ltd. has given the following details:

	Rs.
Sales	48,00,000
Variable cost	24,00,000
Fixed cost	12,00,000

It has borrowed Rs. 10,00,000 @ 15% p.a. and its equity share capital is Rs.10,00,000

You are required to calculate:

- a) Operating leverage.
- b) Financial leverage.

Solution:

a) Income Statement:

	Rs.
Sales	48,00,000
Less: Variable cost	24,00,000
Contribution	24,00,000
Less: Fixed cost	12,00,000
EBIT	12,00,000
Less: Interest	1,50,000
EBT	10,50,000

 $\therefore \text{ Operating leverage}(\text{OL}) = \frac{\text{Contribution}}{\text{EBIT}}$ $= \frac{24,00,000}{12,00,000}$ = 2 Times

b) Financial leverage =
$$\frac{\text{EBIT}}{\text{EBT}}$$

= $\frac{12,00,000}{10,50,000}$
= 1.14 *Times*

3.3.3 COMBINED LEVERAGE:

Combined leverage expresses the relationship between revenue on account of sales and the taxable income. It may be defined as "the potential use of fixed costs, both operating and financial which magnifies the effect of sales volume on the earnings per share of a company." Thus, degree of combined leverage is the ratio of percentage change in earning per share to the percentage change in sales. It indicates the effect of the change in sales on earning per share.

Operating leverage and financial leverage are closely concerned with the firm's capacity to meet its fixed costs, both operating and financial. If both the leverages are combined, the result obtained will disclose the effect of change in sales over change in taxable profit. Combined leverage can also be called as composite leverage. It helps to find out the resulting change in taxable income due to change in sales. The following formula can be used to find out combined leverage:

Combined leverage = Operating Leverage x Financial Leverage =

```
=\frac{\text{Contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{EBT}}=\frac{\text{Contribution}}{\text{EBT}}
```

The degree of combined leverage can also be calculated as follows:

 $DCL = \frac{Percentage change in EPS}{Percentage change in sales}$

Degree of combined leverage indicates the effect of change in sales on the earning per share.

Illustration 3:

The Income Statement of CRL Ltd. is given below: You are required to calculate

- a) Operating leverage,
- b) Financial leverage, and
- c) Combined leverage.

Income Statement for the year ended 31-12-2008

	Rs.
Sales	21,00,000
Variable cost	15,00,000
Fixed cost	1,00,000
Interest	1,40,000
Tax rate	33%

Solution:

Income Statement for the year ended 31-12-2008

	Rs.
Sales	21,00,000
Less: Variable cost	15,00,000
Contribution	6,00,000
Less: Fixed cost	1,00,000
EBIT	5,00,000
Less: Interest	1,40,000
EBT	3,60,000
Less: Tax	1,20,000
EAT (PAT)	2,40,000

EBT

a) Operating Leverage =
$$\frac{\text{Contribution}}{\text{EDT}}$$

$$=\frac{6,00,000}{5,00,000}$$

= 1.2 Times

b) Financial Leverage =
$$\frac{\text{EBIT}}{\text{EBT}}$$

= 1.39 Times

c) Combined Leverage =OL × FL=
$$\frac{\text{Contribution}}{\text{EBT}}$$

= 1.2 × 1.39 = $\frac{6,00,000}{3,60,000}$

=1.67

3.4 SIGNIFICANCE OF LEVERAGE:

Leverages are the tools used by the financial experts to measure the return to the owners. The financial leverage is considered to be superior of these tools. Financial leverage focuses the attention on the market price of the share. The management of a company always tries to increase the market price of the shares by increasing the net worth of the company. Therefore, the management resorts to trading on equity in order to increase EBIT and then the corresponding increase in the price of the equity shares.

A company has to keep the balance between the two leverages because they have got tremendous effect on EBIT and EPS. A right combination between the two leverages is a very big challenge for the company managements. A proper combination of both operating and financial leverages is a blessing for the company's growth. However, an improper combination may prove to be a curse. Financial or operating leverages exist only when the result of the calculation is more than one.

A high degree of operating leverage together with a high degree of financial leverage makes the position of the company very risky. In this case, a company employs excessively assets for which it has to pay fixed costs and at the same time it uses a large amount of debt capital. The fixed costs for using assets and fixed interest charges bring a greater risk to the company. If the earnings fail, the company may not be in a position to meet its fixed costs. Greater fluctuations in earnings are likely to occur on account of the existence of a high degree of operating leverage. The existence of high degree of operating leverage will result in a more than proportionate change in operating profits even on account of small change in sales. The presence of a high degree of financial leverage causes more than proportionate changes in EPS even on account of a small change in EBIT. Thus, a company having a high degree of financial leverage and a high degree of operating leverage has to face the problems of inadequate liquidity or even insolvency in one or the other way. However, lower leverages indicate the cautious policy of the management but the firm may be losing many profit-earning opportunities. Therefore, a company should make all possible efforts to combine the operating and financial leverage in a way that suits the risk-bearing capacity of the company. Thus, a company with high operating leverage should have low financial leverage so that the combined leverage may be ideal. Similarly, a company having a low operating leverage will stand to gain by having a high financial leverage provided it has enough profitable opportunities for the employment of borrowed funds. Low operating leverage and a low financial leverage is considered to be an ideal situation for the maximization of the profits with minimum of risk.

3.5 SOLVED PROBLEMS

Illustration 4:

'B' Ltd. has the following balance sheet and income statement:

Liabilities	Rs.	Assets	Rs.
Equity Share Capital (Rs. 10 each)	10,00,000	Fixed Assets (net)	20,00,000
Retained Earnings	8,00,000	Current Assets	18,00,000
10% Debentures	10,00,000		
Current liabilities	10,00,000		
	38,00,000		38,00,000

Balance Sheet as on 31-3-2009

Income statement for the year ended 31-3-2009

	Rs.
Sales	6,80,000
Less: Operating Expenses (including Rs. 60,000 as Depreciation)	2,40,000
EBIT	4,40,000
Less: Interest	1,00,000
EBT	3,40,000
Less: Taxes @ 30%	1,02,000
EAT	2,38,000

Required:

a) Determine the degree of operating, financial and combined leverages at the current sales level, if all operating expenses other than depreciation are variable costs.

- b) If total assets remain at the same level, but sales:
 - i) increase by 20 per cent and
 - ii) decrease by 20 per cent.
 - iii) What will be the earnings per share at the new sales levels?

Solution:

a)

Income Statement

	Rs.
Sales	6,80,000
Less: Variable cost	1,80,000
Contribution	5,00,000
Less: Fixed cost	60,000
EBIT	4,40,000
Less: Interest	1,00,000
EBT	3,40,000
Less: Tax @ 30%	1,02,000
PAT	2,38,000

i) Operating leverage =
$$\frac{\text{Contribution}}{\text{EBIT}}$$

= $\frac{5,00,000}{4,40,000}$
= 1.14 Times
ii) Financial leverage = $\frac{\text{EBIT}}{\text{EBT}}$
= $\frac{4,40,000}{3,40,000}$
= 1.29 Times
iii) Combined leverage = OL x FL
= 1.14 x1.29
= 1.47
Alternatively (CL) = $\frac{\text{C}}{\text{EBT}}$
= $\frac{5,00,000}{3,40,000}$
= 1.47 Times

b) Earning per share at the new sales level:

	Sales increase	Sales decrease
	by 20% (Rs.)	by 20% (Rs.)
Sales level	8,16,000	5,44,000
Less: Variable Cost (26.47%)	2,15,995	1,43,997
Contribution	6,00,005	4,00,003
Less: Fixed Cost	60,000	60,000
EBIT	5,40,005	3,40,003
Less: Interest	1,00,000	1,00,000
WBT	4,40,005	2,40,003
Less: Tax	1,32,000	72,000
PAT/EAT	3,08,005	1,68,003
Number of Equity Shares	1,00,000	1,00,000
Earning per share (EPS) Rs.	3.08	1.68

Illustration 5:

Calculate the Operating Leverage, Financial Leverage and Combined Leverage from the following data under situation I and II and Financial Plan A and B:

Installed Capacity	4800 units		
Actual production and sales	75% of the capacity	,	
Selling price	Rs. 30 per unit		
Variable cost	Rs. 15 per unit		
Fixed cost			
Under situation I	Rs. 25,000		
Under situation II	Rs. 30,000		
Capital Structure	Financial Plan		
	A (Rs.)	B (Rs.)	
Equity	1,00,000	1,50,000	
Debt @ 15%	1,00,000 50,000		
	2.00.000 2.00.000		

Solution:

a) Income statement:

	Situation I		Situation II	
Sales (3600 × 30)	1,08,000		1,08,000	
Less: Variable Cost (3600×15)		54,000		54,000
Contribution		54,000		54,000
Less: Fixed Cost		25,000		30,000
Operating Profit (EBIT)		29,000		24,000
	А	В	А	В
Less: Interest	15,000	7,500	15,000	7,500
EBT	14,000	21,500	9,000	16,500
	Situa	tion I	Situation II	
(a) Operating Leverage = Contribution EBIT	<u>54,000</u> 29,000		<u>54,000</u> 24,000	
	= 1.86 Tir	mes 🔶	2.25 Time	es
	Α	В	А	В
(b) Financial Leverage = $\frac{\text{EBIT}}{\text{EBT}}$	= <u>29,000</u> 14,000	<u>29,000</u> 21,500	= <u>24,000</u> 9,000	<u>24,000</u> 16,500
	= 2.07	1.35	2.67	1.45
(c) Combined Leverage:				
Situation I = (OL × FL)	1.86 × 2.07 1		1.86 × 1.35	
	= 3.85		= 2.51	
Situation II = OL × FL	2.25 × 2.67		2.25 × 1.45	
	= 6.00		= 3.26	

Comments: Operating leverage under situation II is higher than situation I. Financial leverage of plan A is higher than Situation II. Combined leverage of Plan A is also higher in situation I. Hence, the financial leverage is higher than operating leverage. Financial plan A is riskier in both the situations.

Illustration 6:

The capital structure of Prakash Industries Ltd. consists of an ordinary share capital of Rs. 10 lakhs (Rs. 10 each) and Rs. 10 lakh of 10% Debentures. Sales increased by 20% from 1,00,000 units to 1,20,000 units. The selling price is Rs. 10 per unit, variable cost amounts to Rs. 6 per unit and fixed expenses amount to Rs. 2,00,000. The income tax rate is 30%. You are required to calculate the following:

- i) The degree of operating leverage.
- ii) The degree of financial leverage.
- iii) The percentage increase in earning per share at 1,00,000 units and 1,20,000 units.

You are also required to comment on the behaviour of operating and financial leverages in relation to increase in production from 1,00,000 units to 1,20,000 units.

Sol	ution:	
	ution.	

Income Statement					
	1,00,000 units Rs.				
Sales	10,00,000	12,00,000			
Less: Variable Cost	6,00,000	7,20,000			
Contribution	4,00,000	4,80,000			
Less: Fixed Expenses	2,00,000	2,00,000			
EBIT	2,00,000	2,80,000			
Less: Interest	1,00,000	1,00,000			
EBT	1,00,000	1,80,000			
Less: Tax @ 30%	30,000	54,000			
PAT	70,000	1,26,000			
Number of Equity Shares	1,00,000	1,00,000			
EPS	0.70	1.26			

% increase in EPS = 1.26 - 0.70 = 0.56 $\therefore \frac{0.53}{0.70} \times 100 = 80\%$ Operating leverage = $\frac{4,00,000}{2,00,000} = \frac{4,80,000}{2,80,000}$ = 2 Times = 1.71 TimesFinancial leverage = $\frac{2,00,000}{1,00,000} = \frac{2,80,000}{1,80,000}$ = 2 Times = 1.56 Times

Comments: On account of increase in sales from 1 lakh units to 1,20,000 units, the EPS has increased by 80%. While the operating leverage has come down from 2 times to 1.71 times and financial leverage has also declined from 2 times to 1.56 times. There is a significant decrease in both the business risk and the financial risk of the company on account of reduction in both the leverages.

Illustration 7:

A firm has sales of Rs. 75 lakhs, variable cost of Rs. 42 lakhs and Fixed cost of Rs. 6 lakhs. It has a debt of Rs. 45 lakhs @ 9% and equity of Rs. 55 lakhs.

- i) What is the firms's ROI?
- ii) Does it have favourable financial leverage?
- iii) If the firm belongs to an industry whose asset turnover is 3, does it have a high or low asset leverage?
- iv) What are the operating, financial and combined leverages of the firm?
- v) If the sales drop of Rs. 50 lakhs, what will be the EBIT?
- vi) At what level of EBT of the firm will be equal to zero?

Solution:

	Rs. Lakhs
Sales	75.00
Less: Variable cost	42.00
Contribution	33.00
Less: Fixed cost	6.00
EBIT	27.00
Less: Interest @ 9%	4.05
EBT	22.95

1) Return of Investment (ROI) = $\frac{\text{EBIT}}{\text{Capital Employed}} \times 100$

$$=\frac{27,00,000}{1,00,000}\times100$$
$$=27\%$$

2) The return on investment at 27 % is higher than the interest payable on debt at 9%. Thus, the firm has a favourable financial leverage.

3) Assets Turnover =
$$\frac{\text{Net Sales}}{\text{Total Sales}}$$

= $\frac{75,00,000}{1,00,00,000}$
= 0.75

The industry average is 3. Hence, the firm has a low asset average.

- 4) (i) Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}}$ = $\frac{33,00,000}{27,00,000}$ = 1.22 Times ii) Financial Leverage = $\frac{\text{EBIT}}{\text{EBT}}$ = $\frac{27,00,000}{22,95,000}$ = 1.1764 Times iii) Combined Leverage = $\frac{\text{Contribution}}{\text{EBT}}$ = $\frac{33,00,000}{22,95,000}$ = 1.438 Times
- 5) If the sales drop to Rs. 50 lakhs, from Rs. 75 lakhs, the fall is by 33.33%. Hence, the EBIT will drop by 40.66 % (33.33 1.22). Hence, the new EBIT will be Rs. 27,00,000 $\left(\frac{100 40.66}{100}\%\right) =$ Rs. 16,02,180.
- 6) EBT to become zero means 100% reduction in EBT. The combined leverage is 1.438. Hence, sales have to drop by 100/1.438 i.e. 69.54%.

The new sales will be Rs. 75,00,000 $\left(\frac{100-69.54}{100}\%\right) = \text{Rs. } 22,84,500.$

Illustration 8:

Prepare income statements from the data given below for P, Q and R companies:

	Particulars			
		Р	Q	R
Variable	Cost as a percent of sales	50	60	70
Fixed co	st as percent of sales	40	30	30
Interest		45,000	20,000	10,000
Degree of	of operating leverage	5:1	4:1	7:1
Degree o	of financial leverage	4:1	5:1	6:1
Income t	ax rate	50%	50%	50%

Compute net profit (after tax) rate for all the three companies. Offer your comments on the leverages and profitability position of all the three companies.

Solution:

	_		_
	Р	Q	R
	Rs.	Rs.	Rs.
Sales	6,00,000	2,50,000	2,80,000
Less: Variable Cost	3,00,000	1,50,000	1,96,000
Contribution	3,00,000	1,00,000	84,000
Less: Fixed Cost	2,40,000	75,000	72,000
EBIT	60,000	25,000	12,000
Less: Interest	45,000	20,000	10,000
EBT	15,000	5,000	2,000
Less: Tax @ 50%	7,500	2,500	1,000
PAT	7,500	2,500	1,000
PAT % of sales	1.25%	1 %	0.36%

Income Statement

Comments:

1)	Leverage			
	Combined leverage:	5 x4 = 20	4 x5 = 20	7 x6 = 42
	_	Very high	Very high	Very very high

- 2) Profitability: Good Satisfactory Poor
- 3) Working: Calculation of sales for 'P'

i) DFL =
$$\frac{\text{EBIT}}{\text{EBT}} = \frac{4}{1}$$

Interest is Rs. 45,000

- \therefore EBIT EBT = Rs. 45,000
- \therefore 4 EBT = EBIT
- $\therefore 4 \text{ EBT} \text{EBT} = 45,000$
- $\therefore 3 \text{ EBT} = 45,000$

:: EBT =
$$\frac{45,000}{3} = Rs.15,000$$

 \therefore EBIT = 15,000 x 4 = Rs. 60,000

ii) DOL = $\frac{\text{Contribution}}{\text{EBIT}}$ = $\frac{5}{1} = \frac{\text{Contribution}}{60,000}$ ∴ Contribution = 5 × 60,000 = 3,00,000

iii) Variable cost as a percentage of sales = 50% Contribution is Rs. 3,00,000
∴ Variable cost is also Rs. 3,00,000
∴ Sales = Rs. 6,00,000

Illustration 9:

From the following information available for four companies, calculate:

i) EBIT

ii) EPS

iii) Operating leverage

iv) Financial leverage

Particulars		Р	Q	R	S
Sales price per unit	Rs.	15	20	25	30
Variable cost per unit	Rs.	10	15	20	25
Quantity	Nos.	20,000	25,000	30,000	40,000
Fixed costs	Rs.	30,000	40,000	50,000	60,000
Interest	Rs.	15,000	25,000	35,000	40,000
Tax rate	percent	40	40	40	40
No. of Equity Shares	Nos.	5000	9000	10,000	12,000

(ICU A/Inter Dec.1996)

Solution:

Income Statement

Particulars	Р	Q	R	S
	Rs.	Rs.	Rs.	Rs.
Sales	3,00,000	5,00,000	7,50,000	12,00,00 0
Less: Variable Cost	2,00,000	3,75,000	6,00,000	10,00,00 0
Contribution	1,00,000	1,25,000	1,50,000	2,00,000
Less: Fixed Cost	30,000	40,000	50,000	60,000
(i) EBIT	70,000	85,000	1,00,000	1,40,000
Less: Interest	15,000	25,000	35,000	40,000
EBT	55,000	60,000	65,000	1,00,000
Less: Tax @ 40%	22,000	24,000	26,000	40,000
PAT	33,000	36,000	39,000	60,000
Number of equity shares	5,000	9,000	10,000	12,000
(ii) EPS (Rs.)	6.60	4.00	3.90	5.00
(iii) Operating leverage = Contribution EBIT	<u>1,00,000</u> 70,000	<u>1,25,000</u> 85,000	<u>1,50,000</u> 1,00,000	<u>2,00,000</u> 1,40,000
	= 1.42	1.47	1.5	1.43
(iv) Financial leverage = EBIT EBT	70,000 55,000	<u>85,000</u> 60,000	<u>1,00,000</u> 65,000	<u>1,40,000</u> 1,00,000
	= 1.27	1.42	1.54	1.40

Illustration 10:

ation 10: The Balance sheet of International Trade Ltd. as on 31st March, 2008 is as under:

Liabilities	Rs. (Lakhs)	Assets	Rs. (Lakhs)
Equity Share Capital (Rs. 10 per share)	90	Building	150
10% Long term debt	120	Machinery	75
Retained Earnings	30	Stock	50
Current Liabilities	60	Debtors	20
		Cash	5
Total	300	Total	300

The income assets turnover ratio of the company is 3, its fixed operating cost is 1/6 of sales and variable operating cost is 50% of sales. The corporate tax rate is 35%.

You are required to calculate:

- a) The operating, financial and combined leverages.
- b) The market price of the share if the P/E multiple is 2.5.
- c) The level of EBIT if the EPS is (a) Rs. 15 and (b) Rs. 25.

Solution:

Workings:

1) Total assets turnover is 3.

 $\therefore \text{ Total Assets Turnover} = \frac{\text{Net Sales}}{\text{Total assets}}$ $3 = \frac{\text{Net Sales}}{300 \text{ lakhs}}$ $\therefore \text{ Net Sales} = 3 \times 300$ = Rs. 900 lakhs. $\therefore \text{ Fixed operating cost} = \frac{1}{6} \times 900 \text{ lakhs}$ = Rs. 150 lakhs $\therefore \text{ Variable operating cost} = 50 \% \text{ of Net sales}$ = Rs. 450 lakhs

2)

Income Statement

	Rs. Lakhs
Sales	900
Less: Variable cost	450
Contribution	450
Less: Fixed cost	150
EBIT	300
Less: Interest	12
EBT	288
Less: Taxes @ 35 %	101
PAT	187
No. of equity shares	9
∴ EPS	Rs. 20.78

a) i) Operating leverage =
$$\frac{Contribution}{EBIT}$$

= $\frac{450}{300}$
= 1.5 *Times*
ii) Financial leverage = $\frac{EBIT}{EBT}$
= $\frac{300}{288}$
= 1.04 *Times*
iii) Combined leverage = $\frac{Contribution}{EBT}$
= $\frac{450}{288}$
= 1.56 *Times* (1.5×1.04)
b) Calculation of Market Price of the share
P/E Ratio = $\frac{Market Price}{EDC}$

EPS $\therefore Market price= P/E Ratio x EPS$ = 2.5 x 20.78 = Rs. 51.95

c) Calculation of the level of EBIT if the EPS is Rs. 15 and Rs. 25:

Income Statement for EPS:

EPS	Rs. 15	Rs. 25
∴ No. of shares	9 lakhs	9 lakhs
∴ PAT	135 lakhs	225 lakhs
Tax @ 35%	72.69	121.15
∴ PBT	207.69 lakhs	346.15 lakhs
Interest	12.00	12.00
:: EBIT	216.69	358.15

3.7 EXERCISES:

- 1) Choose the right answer with your reasoning:
- a) The ______ is the percentage change in operating income that results from a percentage change in sales:
 - i) Degree of operating leverage
 - ii) Degree of financial leverage
 - iii) Degree of combined leverage

- b) A highly leveraged firm is ______ risky than its peers.
 - i) Less
 - ii) More
 - iii) Same
- c) An advantage of Debt financing is _____.
 - i) Lowers the cost of capital
 - ii) Increases the cost of capital
 - iii) Dilutes owners earnings
- d) Combined leverage is the percentage change in relationship between sales and _____.
 - i) Operating income
 - ii) Operating leverage
 - iii) Earning per share
- e) If interest expenses for a firm rise, we know that the firm has taken on more _____.
 - i) Financial leverage
 - ii) Operating leverage
 - iii) Combined leverage
- 2) Define operating leverage and financial leverage. How these leverages are measured?
- 3) What is combined leverage? Explain its significance in financial planning of a firm.
- 4) A firm has sales of Rs. 75 lakhs variable cost of Rs. 42 lakhs and fixed cost of Rs. 6 lakhs. It has a debt of Rs. 45 lakhs at 9% and equity of Rs. 55 lakhs.
 - a) What is its ROI?
 - b) Does it have favourable financial leverage?
 - c) What are the operating, financial and combined leverages of the firm?
 - d) If the sales drop to Rs. 50,00,000, what will be the new EBIT?
 - 5) The Balance Sheet of a company is as under:
 - 6)

Balance sheet as on 31.12.2008

Liabilities	Rs.	Assets	Rs.
Equity Share Capital (Rs. 10 each)	6,00,000	Fixed Assets	15,00,000
10% Long term debt	8,00,000	Current Assets	5,00,000
Retained Earnings	2,00,000		
Current Liabilities	4,00,000		
	20,00,000		20,00,000

The company's total assets turnover is 3.00, its fixed operating costs are Rs. 10,00,000 and variable operating costs ratio is 40%. The income tax rate is 30%.

Calculate:

- a) Operating, financial and combined leverages.
- b) Determine the likely level of EBIT if EPS is (a) Rs. 10 (b) Rs. 30 and (c) Rs. zero.
- 6) Calculate the degree of operating leverage degree of financial leverage and degree of combined leverage for the following companies and interpret the results.

Particulars	Х	Y	Z
Output (units)	3000	7500	5000
Fixed costs Rs.	3,50,000	7,00,000	75,000
Unit variable cost Rs.	100	75	10
Interest Expenses Rs.	25,000	50,000	Nil
Unit selling price Rs.	300	250	50

(7) Find out the financial leverage from the following:

Equity capital Rs.	20,00,000
Debt/Equity ratio	3:1
Interest Rate	12%
Operating profit Rs.	25,00,000

8) A and B are two companies competing with each other. Their revenue statements are given below:

	Rs. lakhs	
Particulars	Α	В
Sales	500	500
– Variable cost	400	150
Contribution	100	350
– Fixed cost	25	250
EBIT	75	100
– Interest	50	50
EBT	25	50
– Tax	7.5	15
PAT	17.5	35
Pref. Dividend	-	5
Equity Dividend	5.0	20
Retained Earnings	12.5	15.00

With the help of leverages, comment on the business risks of the two companies.

Particulars	Rs.
Sales	10,00,000
– Variable cost	4,00,000
Contribution	6,00,000
 Fixed cost 	3,00,000
EBIT	3,00,000
 Interest 	1,00,000
EBT	2,00,000
– Tax @ 35%	70,000
PAT	1,30,000
No. of Equity Shares	1,00,000
EPS	1.30

9) The following particulars relate to X and Co. Ltd.

Using the concept of combined leverage, by what percentage will earnings per share increase, if sales increase by 10%? Verify your answer by calculating earnings per share.

10) From the following data prepare income statement of A, B and C companies.

Particulars	A	В	С
Financial leverage	3:1	4:1	2:1
Interest (Rs.)	2000	3000	10,000
Operating leverage	4:1	5:1	3:1
Variable cost as a % of sales	66	75	50
Income tax rate	30%	30%	30%

TYPES OF FINANCING

Unit Structure :

- 4.0 Objectives
- 4.1 Meaning of Finance
- 4.2 Need for Finance
- 4.2 Sources of Finance
- 4.3 Exercises

4.0 OBJECTIVES

After studying this unit you will understand:

- Meaning of finance
- Need and Importance of Finance
- Sources of long term finance
- Sources of short term finance

4.1 MEANING OF FINANCE

Finance is a broad term that describes activities associated with banking, leverage or debt, credit, capital markets, money, and investments. Basically, finance represents money management and the process of acquiring needed funds. Finance also encompasses the oversight, creation, and study of money, banking, credit, investments, assets, and liabilities that make up financial systems. It is necessary to raise finance from various sources for implementation of the project. The schemes of finance will be determined after consideration of various aspects attached to different sources of finance as following:

- a) Share capital –preference shares and equity shares
- b) Debentures
- c) Term loan from financial institutions
- d) Unsecured loan-banks, promoters, others.

4.1.1 Promoters Contribution

The persons who are involved in implementation of a project are known as promoters .An entrepreneur who promotes the project is also required to participate in the scheme of finance of the project. The extent of promoter's contribution in the project is a sign of interest of the promoters in the project. Promoter's contribution indicates the extent of their involvement the in the project. The promoters contribution can be provided in the form of subscribing to equity and preference shares issued by the company unsecured loans ,seed capital assistance and internal accrual of funds .The bank and financial institution normally participate in the scheme of project finance and they ask the promoters to bring in a certain portion of funds required which is normally between 25% to 50% of the cost of the project into the equity share capital of the company .The promoters contribution can be arranged from outside sources like friends and relatives. For eligibility of the project financing the financial institution may stipulate minimum promoter's contribution which is to be arranged by the promoters.

4.1.2 Margin money

The banks and financial institutions maintain a margin while financing the project cost. They asked the borrowers to bring a certain amount of the cost of the project cost as margin money to safeguard from the changes in the value of assets that are being financed and provided as a security. The quantum of margin money to depend upon the creditworthiness of the borrower and nature of security provided to the institution. Margin money is one of the important factors which are evaluated by the financial institutions while considering the project for financial assistance. The margin money required for working capital will be provided in the project cost .The RBI guidelines provide the amount of capital brought by the promoters in project financing.

4.1.3 Capital Structure

Capital structure refers to the mix of a firm's capitalization and includes long-term source of fund such as debentures, preference shares, equity share, and retained earnings. The decision regarding the forms of financing their requirements and their relative proportions in total capitalization are known as capital structure decision. A firm has the choice to raise capital for financing its project from different sources in different proportions as follows:

(a) exclusive use of equity capital

(b) Use of equity and preference capital

(c) Use of equity and debt capital

(d) Use of equity, preference and debt capital

(e) Use of a combination of debt, equity and preference capital in different proportions.

The choice of combination of these sources is called capital structure mix.

4.1.4 Optimum Capital Structure:

The theory of optimal capital structure deals with the issue of right mix of debt and equity in the long term capital structure of a firm. This theory states that if a company takes on debt the value of the firm increases up to a point, beyond that point if debt continues to increases then the value of the firm will start to decrease. if the company is unable to repay the debt within the specified period, then it will affect the goodwill of the company in the market . Therefore, the company should select its appropriate capital structure with due consideration to the factors of debt and equity.

4.1.5 Trading on Equity

The term 'trading on equity' is derived from the fact that debts are contracted and loans are raised mainly on the basis of equity capital. The concept of trading on equity provides that the capital structure of a company should include equity as well as debt. Again the proportion of debt in the capital structure should also be optimal. Those who provide debt have a limited share in the firm's earnings and hence want to be protected in term of earning and values represented by equity capital. Since fixed charges do not vary with the firm's earnings before interest and tax, a magnified effect is produced on earning per share. The determination of optimal level of debt is a formidable task and is a major policy decision .EBIT-EPS analysis is a widely used tool to determine the level of debt in a firm.

4.2 NEEDS AND IMPORTANCE OF FINANCE

What is the main purpose of business finance? or Why is finance so important?

1. Establishment of Business Enterprises:

The promotion of any establishment or any type of enterprise basically requires finance.

Finance is required at every stage of the business establishment like

- a. During registration of the company,
- b. At the incorporation stage,
- c. For obtaining the certificate for starting the business and
- d. also for obtaining various permissions

Besides, expenditure on these requirements, finance is required for arranging the Assets such as working place, plant and machinery, and furniture and equipment, for short term items like working material, furnishing and salaries of the employees.

Thus, finance is required to complete the initial activities of the business enterprise.

2. Proficient Operation of Business

Operations of business cannot be efficiently operated without finance. The activities such as purchase of raw materials, sending of products to the consumers, conversion of raw materials into finished product and sale cannot be done without efficient finance.

3. Development and Expansion of Business

Finances are required for the overall development and extension of all business activities in compatibility with advance technology. With finances, various commodities can be upgraded with the purchases or sold or produced. Besides, finance (capital) is also required for the purchasing of techniques, machinery, and equipment, the establishment of Laboratories, etc.

4. Sound Business Position

Finance is an important measure by which the position of a business is measured i.e. whether it is strong or weak, Few examples of business transactions like payments to the suppliers, remuneration and facilities to the Employees and payment of principal amount and interest can be paid to the lender within due date only when sufficient funds are available.

5. Surviving in the Competition Era

One of the biggest threats to any business units are their competitors. Performing with an aim to meet the expectations of the customers and having edge over the competitors requires finance. To gain such edge one organisation has to look in many aspects. So there should be proper policies and allocation of required funds towards relating advertisement and publicity, production and distribution of commodities and services, incentives to the consumers, sale promotion, providing services and commodities at a fair price are required, to face present-day competitors.

6. Infrastructural Facilities:

Finance is also required for arranging infrastructural facilities which are essential for any business entrepreneurship. The volume of finance required depends upon the nature of the business organisation i.e. Proprietary business, may be high or low, according to the coverage of various Enterprises. Substantial capital is required for all infrastructural facilities, place, land, office site, plant installation for the establishment of industries, place for conversion of raw materials into finished products, water, electricity, telephone, etc.

7. Modernization of Business

In this era there dynamism and ever changing technologies, there is always need for upgradation. Finances are required for technical knowhow, research and development, new techniques, new machinery, various new products, and computerization, which are essential for the upgradation, modernization and operation of the business.

8. Labour Welfare and Social Security

For the success of any business or enterprise, human relations between employers and workers should be cordial. In order to ensure the same, entrepreneurs should essentially safeguard the interests of the employees and workers. Employer should proper facilities like – that of housing, primary treatment, health, education, libraries, and reading rooms, travel, etc. In addition, they are also to be provided provident fund, gratuity, pension, old age, personal or group insurance and accidental insurance, etc. All these need a substantial volume of finance.

4.3 SOURCES OF FINANCE

The sources from which a business meets its financial requirements can be classified on the basis of time, ownership and source of generation as explained in Figure 4.1.





4.3.1 Long Term Sources of Finance

Long-term financing means capital requirements for a period of more than 5 years to 10, 15 or 20 years or maybe more depending on other factors. Capital expenditures in fixed assets like plant and machinery, land and building etc. of a business are funded using long-term sources of finance. Part of working capital which permanently stays with the business is also financed with long-term sources of finance. Long term financing sources can be in form of any of them:
- (a) Equity Shares.
- (b) Preference Shares.
- (c) Debentures
- (d) Bonds.
- (e) Term Loans.
- (f) Venture Funding
- (g) Assets Securitization
- (h) International Financing

(a) Equity Shares

Equity share is a main source of finance for any company giving investors rights to vote, share profits and claim on assets. We call it stock, ordinary share, or shares, all are one and the same. Normally, a company is started with equity finance as its first source of capital from the owners or promoters of that company. The company then finds an investor in the form of friends, relatives, venture capitalists, mutual funds, or any such small group of investors and issue fresh equity shares to these investors. A point comes where the company reaches a very big level and requires huge capital investment for business growth. It then offers its equity share to the general public. This is called Initial Public Offer (IPO). More such issues in future are called Follow-on Public Offer (FPO).

They are categorized under long-term sources of finance because legally they are irredeemable in nature. For an investor, these shares are certificate of ownership in the company by virtue of which investors are entitled to share the net profits and have a residual claim over the assets of the company in the event of liquidation. Investors have voting rights in the company and their liability to the company is limited to the amount of investment.

Types of Equity Shares

There are various types of equity shares classified based on various things:

- i Authorized Share Capital: It is the maximum amount of capital which can be issued by a company. It can be increased from time to time. Some fee is required to be paid to legal bodies accompanied with some formalities.
- ii Issued Share Capital: It is that part of authorized capital which is offered to investors.
- iii Subscribed Share Capital: It is that part of Issued capital which is accepted and agreed by the investor.
- iv Paid Up Capital: It is the part of subscribed capital, the amount of which is paid by the investor.

Normally, all companies accept complete money in one shot and therefore issued, subscribed and paid capital becomes one and the same. Conceptually, paid up capital is the amount of money which is actually invested in the business.

There are other types of equity shares discussed below:

- i Rights Share: These are the shares issued to the existing shareholders of a company. Such kind of shares is issued to protect the ownership rights of the investors.
- ii Bonus Share: These are the type of shares given by the company to its shareholders as a dividend. There are various advantages and disadvantages of bonus shares like dividend, capital gain, limited liability, high risk, fluctuation in the market, etc.
- iii Sweat Equity Share: These shares are issued to an exceptional employees or directors of the company for their exceptional job in terms of providing know-how or intellectual property rights to the company.

Various Prices of Equity Shares

- i Par or Face Value: It is the value of a share of which it is accounted in books of accounts.
- ii Issue Price: It is the price at which the equity share is actually offered to the investor. Normally, the issue price and face value of a share are same in the case of new companies.
- iii Share Premium and Share at Discount: When a share is issued at a price higher than face value, the excess amount is called premium. Contrary to it, if the share is issued at a price lower than face value, it is said to be issued at a discount.
- iv Book Value: It is the ratio of the total of paid-up capital and reserves and surplus divided by total no. of shares. This is the balance sheet value of shares.
- v Market Value: In the case of companies listed on stock exchanges, the market value of the share is the price at which they are sold currently sold in the market.

Investing and Financing Angle of Equity Shares

When talking about equity shares, there are two angles. One is an investor's angle wherein the investor invests in equity shares and second financing angle where a company accepts the finance in the form of equity. There are pros and cons of both of these as described below.

ADVANTAGES

- i Dividend: An investor is entitled to receive a dividend from the company. It is one of the two main sources of return on his investment.
- ii Capital Gain: The other source of return on investment apart from dividend is the capital gains. Gains which arise due to rise in market price of the share.
- iii Limited liability: Liability of shareholder or investor is limited to the extent of the investment made. If the company goes into losses, the share of loss over and above the capital investment would not be borne by the investor.
- iv Exercise control: By investing in the company, the shareholder gets ownership in the company and thereby he can exercise control.
- v Claim over Assets and Income: An investor of equity share is the

owner of the company and so is the owner of the assets of that company. He also enjoys a share of the incomes of the company.

- vi Rights Shares: Whenever companies require further capital for expansion, growth, entering into new areas etc., they tend to issue 'rights shares'. By issuing such shares, ownership and control of existing shareholders are preserved and the investor receives investment priority over other general investors.
- vii Bonus Shares: At times, companies decide to issue bonus shares to its shareholders. It is also a type of dividend. Bonus shares are free shares given to existing shareholders and many times they are given in lieu of dividends.
- viii Liquidity: The shares of the company which is listed on stock exchanges have the benefit of any time liquidity. The shares can very easily transfer ownership.
- ix Stock Split: Stock split means splitting a share into parts. How should an investor be benefited by this? By splitting of share, the per-share price reduces in the market which eventually increases the readability of share. At the end, stock split results in higher volumes with a number of investors leading to high liquidity of the share.

Disadvantages

- i Dividend: The dividend which a shareholder receives is neither fixed nor controllable by him. The management of the company decides how much dividend should be given.
- ii High Risk: Equity share investment is a risky share compared to any other investment like debts etc. The money is invested based on the faith an investor has in the company. There is no collateral security attached with it.
- iii Fluctuation in Market Price: The market price of any equity share has a wide variation. It is always very difficult to book profits from the market. On the contrary, there are equal chances of losses.
- iv Limited Control: An equity investor is a small investor in the company, therefore, it is hardly possible to impact the decision of the company using the voting rights.
- v Residual Claim: An equity shareholder has a residual claim over both the assets and the income. Income which is available to equity shareholders is after the payment of all other stakeholders' viz. debenture holders etc.

(b) Preference shares:

Preference Shares: Preference shares are one of the special types of share capital having fixed rate of dividend and they carry preferential rights over ordinary equity shares in sharing of profits and also claims over assets of the firm. Preference shares are long-term source of finance for a company. They are neither completely similar to equity nor equivalent to debt. The law treats them as shares but they have elements of both equity shares and debt. For this reason, they are also called 'hybrid financing instruments'.

Features of Preference Shares Similar to Debt

- i **Fixed Dividends:** Like debt carries a fixed interest rate, preference shares have fixed dividends attached to them. But the obligation of paying a dividend is not as rigid as debt. Non-payment of a dividend would not amount to bankruptcy in case of preference share.
- ii **Preference over Equity:** As the word preference suggests, these type of shares get preference over equity shares in sharing the income as well as claims on assets. Alternatively, preference share dividend has to be paid before any dividend payment to ordinary equity shares. Similarly, at the time of liquidation also, these shares would be paid before equity shares.
- iii **No Voting Rights:** Preference shares holders normally does not have any voting rights. They are similar to debenture holders and do not have any say in the management of the company.
- iv No Share in Earnings: Preference shareholders can only claim two things. One agreed on percentage of dividend and second the amount of capital invested. Equity shares are entitled to share the residual earnings and residual assets in case of liquidation which preference shares are not entitled.
- v **Fixed Maturity:** Just like debt, preference shares also have fixed maturity date. On the date of maturity, the preference capital will have to be repaid to the preference shareholders. A special type of shares i.e. irredeemable preference shares is an exception to this. They do not have any fixed maturity.

Features of Preference Shares similar to Equity Shares:

- i **Dividend from PAT:** Equity share dividend is paid out of the profits left after all expenses and even taxes and same is the case with preference shares. The preference dividend is paid out of the divisible profits of the company. Out of the divisible profits, the preference dividend would be paid first and the remaining profits can be utilized for paying any dividend to equity shareholders.
- ii **Management Discretion over Dividend Payment:** The payment of preference dividend is not compulsory and is a decision of the management. Equity shareholders also do not have any right to ask for dividends, the dividends are paid at the discretion of the management of the company. Unlike debt, the nonpayment of a dividend of preference shares does not amount to bankruptcy.
- iii **No Fixed Maturity:** The maturity of a special variant of preference share is not fixed just like equity shares. This variant is popularly known as irredeemable preference shares.

Types of Preference Shares

There are various Types of Preference Shares with differences in their structure. Some of these are cumulative, non-cumulative, participating, non-participating, redeemable, irredeemable, convertible, non-convertible, callable, adjustable rate preference shares.

i Convertible and Non-Convertible Preference Shares

Convertible preference shareholders possess an option or right

whereby they can be converted into an ordinary equity share at some agreed terms and conditions. Non-convertible simply does not have this option but has all other normal characteristics of a preference share.

ii Redeemable and Irredeemable Preference Shares

Redeemable preference share is very commonly seen preference share which has a maturity date on which date the company will repay the capital amount to the preference shareholders and discontinue the dividend payment thereon. Irredeemable preference shares are little different from other types of preference shares. It does not have any maturity date. However after introduction of Companies Act, 2013, no irredeemable preference shares can be issued and even the existing irredeemable preference shares have to be redeemed.

iii Cumulative and Non-Cumulative Preference Shares

If the shares are cumulative preference shares, the dividends are cumulated and therefore paid when the company makes the profit. In short, a dividend of cumulative preference shares will have to be paid as long as the company earns the profit in any year. Whereas, for noncumulative preference shares, a company can skip the dividend in the year, the company has incurred losses.

iv Preference Shares with Callable Options

These are another innovative preference shares in which the company has an option to buy the share at a predetermined price and on or before a certain date.

v Adjustable Rate Preference Shares

These are some of the innovative types of instruments where the rate of dividend is not fixed and is formulated based on some calculations relating to the current interest rates etc.

BENEFITS OF PREFERENCE SHARE

There are several benefits of a preference share from the point of view of a company which is discussed below:

- i No Legal Obligation for Dividend Payment: There is no legal compulsion for payment of preference dividend. This dividend is not a fixed liability like the interest on the debt which has to be paid in all circumstances.
- ii Improves Borrowing Capacity: Preference shares become a part of net worth and therefore reduces debt to equity ratio. This is how the overall borrowing capacity of the company increases.
- iii No dilution in control: Issue of preference share does not lead to dilution in control of existing equity shareholders because the voting rights are not attached to the issue of preference share capital. The preference shareholders invest their capital with fixed dividend percentage but they do not get control rights with them.
- iv No Charge on Assets: While taking a term loan security needs to be given to the financial institution in the form of primary security and

collateral security. There are no such requirements and therefore, the company gets the required money and the assets also remain free of any kind of charge on them.

DISADVANTAGES OF PREFERENCE SHARES

- i Costly Source of Finance: Preference shares are considered a very costly source of finance which is apparently seen when they are compared with debt as a source of finance. The interest on the debt is a tax-deductible expense whereas the dividend of preference shares is paid out of the divisible profits of the company i.e. profit after taxes and all other expenses.
- ii Skipping Dividend Disregard Market Image: Skipping of dividend payment may not harm the company legally but it would always create a dent on the image of the company.
- iii Preference in Claims: Preference shareholders enjoy a similar situation like that of an equity shareholder but still gets a preference in both payment of their fixed dividend and claim on assets at the time of liquidation.

(c) Debentures:

A debenture is a debt instrument used by the companies to raise money for medium to long term at a specified rate of interest. It consists of a written contract specifying the repayment of the principal and the interest payment at the fixed rate. Generally, a debenture is not secured by any collateral and is only backed by the reputation of the issuer.

FEATURES / ATTRIBUTES OF DEBENTURES:

Trust Indenture

It is an agreement which has to be entered into by the 'Issuing Company' and the 'Trust' which is involved in taking care of the interest of the general investors. Normally the trustee is a bank or a financial institution who is appointed by a debenture trust deed.

Coupon Rate

It is the rate of interest which is promised by the company to pay to the debenture holder on a regular interval which may vary from case to case. The rate of interest may be fixed or floating.

Tax Benefit

Most important element from the company point of view is that the interest paid is a tax deductible expense. Effectively, the company will get the tax benefit because the taxable income will be reduced by the extent of interest paid. Due to this, the effective cost of borrowing gets reduced.

Date of Maturity

For all the debentures, the issuing company has to issue repayment to the debenture holders on the date of maturity. This date is also mentioned on the certificates

Security

Here, we should classify debentures into two – secured debentures and unsecured debentures. Secured debentures are secured by some or other immovable assets of the company whereas the unsecured assets are issued based on the general credit of the company. The general legal preference of debt is available to all types of debentures i.e. in the event of liquidation debenture will stand prior to preference shares and ordinary equity shares.

Convertibility

Certain types of debentures are issued with the option of conversion into equity. The ratio of conversion and the time period after which conversion will take place is mentioned in the agreement of debenture. Debentures may be fully or partly convertible in nature.

Credit Rating

Normally, an investor would not go and check the credibility and the risk involved with the debentures. Credit rating agencies are given this task and they rate the debentures and the overall company. Involving a rating agency is compulsory for the issuing company normally in every country.

A debenture is the primary source of long-term capital for companies to fulfill their financial requirements. Other instruments to raise long term capital are bank loans, bonds, and equity shares. Though all these instruments are used widely in different combinations, they differ from each other in many ways. The article clarifies how debenture is different from the bank loan, equity shares, and bonds respectively.

Types of Debentures:

There are various types of debentures like redeemable, irredeemable, perpetual, convertible, non-convertible, fully, partly, secured, mortgage, unsecured, naked, first mortgaged, second mortgaged, the bearer, fixed, floating rate, coupon rate, zero coupon, secured premium notes, callable, puttable, etc.

Redeemable and Irredeemable (Perpetual) Debentures:

Redeemable debentures carry a specific date of redemption on the certificate. The company is legally bound to repay the principal amount to the debenture holders on that date. On the other hand, irredeemable debentures, also known as perpetual debentures, do not carry any date of redemption. However after introduction of Companies Act, 2013, no irredeemable debentures can be issued and even the existing irredeemable debentures have to be redeemed.

Convertible and Non-Convertible Debentures

Convertible debenture holders have an option of converting their holdings into equity shares. The rate of conversion and the period after which the conversion will take effect are declared in the terms and conditions of the agreement of debentures at the time of issue. On the contrary, non-convertible debentures are simple debentures with no such option of getting converted into equity. Their state will always remain of a debt and will not become equity at any point of time.

Fully and Partly Convertible Debentures

Convertible Debentures are further classified into two – Fully and Partly Convertible. Fully convertible debentures are completely converted into equity whereas the partly convertible debentures have two parts. Convertible part is converted into equity as per agreed rate of exchange based on an agreement. Non-convertible part becomes as good as redeemable debenture which is repaid after the expiry of the agreed period.

Secured (Mortgage) and Unsecured (Naked) Debentures

Debentures are secured in two ways. One when the debenture is secured by the charge on some asset or set of assets which is known as secured or mortgage debenture and another when it is issued solely on the credibility of the issuer is known as the naked or unsecured debenture. A trustee is appointed for holding the secured asset which is quite obvious as the title cannot be assigned to each and every debenture holder.

Registered Unregistered Debentures (Bearer) Debenture

In the case of registered debentures, the name, address, and other holding details are registered with the issuing company and whenever such debenture is transferred by the holder; it has to be informed to the issuing company for updating in its records. Otherwise, the interest and principal will go the previous holder because the company will pay to the one who is registered. Whereas, the unregistered commonly known as bearer debenture. can be transferred by mere delivery to the new holder. They are considered as good as currency notes due to their easy transferability. The interest and principal are paid to the person who produces the coupons, which are attached to the debenture certificate. and the certificate respectively.

Fixed and Floating Rate Debentures

Fixed rate debentures have fixed interest rate over the life of the debentures. Contrarily, the floating rate debentures have the floating rate of interest which is dependent on some benchmark rate say LIBOR etc.

Secured Premium Notes / Debentures

These are secured debentures which are redeemed at a premium over the face value of the debentures. They are similar to zero coupon bonds. The only difference is that the discount and premium. Zero coupon bonds are issued at the discount and redeemed at par whereas the secured premium notes are issued at par and redeemed at the premium.

Callable and Puttable Debentures / Bond:

Callable debentures have an option for the company to buyback and repay to the investors whereas, in the case of puttable debentures, the option lies with the investors. Puttable debenture holders can ask the company to redeem their debenture and ask for principal repayment.

(d) Bonds:

Bond is a financial instrument whereby the issuer of the bond raises (borrows) capital or funds at a certain cost for certain time period and pays back the principal amount on maturity of the bond. Interest paid on bonds is usually referred to as coupon. In simple words, a bond is a loan taken at a certain rate of interest for a definite time period and repaid on maturity.

From a company's point of view, the bond or debenture falls under the liabilities section of the balance sheet under the heading of Debt. A bond is similar to the loan in many aspects however it differs mainly with respect to its tradability. A bond is usually tradable and can change many hands before it matures; while a loan usually is not traded or transferred freely.

Common features of bonds and the financial terms related to bonds.

- 1. Issuer: The entities that borrow money by issuing bonds are called as issuers.
- 2. Face Value: Every bond that is issued has a face value; which is usually the principal amount that is borrowed and returned on maturity. In layman's term, it is the value of the bond on its maturity.
- 3. Coupon: The rate of interest paid on the bond is called as a coupon.
- 4. Rating: Every bond is usually rated by credit rating agencies; higher the credit rating lower will be the coupon required to pay by the issuer and vice versa.
- 5. Coupon Payment Frequency: The coupon payments on the bond usually have a payment frequency. The coupons are usually paid annually or semi-annually; however, they may be paid quarterly or monthly as well.
- 6. Yield: The effective return that the investor makes on the bond is called as a return. Assuming a bond was issued for a face value of □ 1000 and a coupon rate of 10% on initiation. The Price at a later date may rise or fall and hence the investor who invests at a rate other than □ 1000 will still receive a coupon payment of □100 (1000 * 10%) but the effective earning shall be different since investment amount is not □ 1000. That effective return in layman's term is called as the yield. If the holding period is considered for a year this is referred to as current yield and if it is held to maturity it is referred to as yield to maturity (YTM).

DIFFERENT TYPES OF BONDS Plain Vanilla Bonds

A plain vanilla bond is a bond without any unusual features; it is one of the simplest forms of bond with a fixed coupon and a defined maturity and is usually issued and redeemed at the face value. It is also known as a straight bond or a bullet bond.

Zero Coupon Bonds

A zero coupon bond is a type of bond where there are no coupon payments made. It is not that there is no yield; the zero coupon bonds are issued at a price lower than the face value (say \Box 950) and then pay the face value on maturity (\Box 1000). The difference will be the yield for the investor. These are also called as discount bonds or deep discount bonds if they are for longer tenor.

Deferred Coupon Bonds

This type of bond is a blend of a coupon-bearing bond and a zero coupon bond. These bonds do not pay any coupon in the initial years and thereafter pay a higher coupon to compensate for no coupon in the initial years. Such bonds are issued by corporates whose business model has a gestation period before the actual revenues start. Examples of a company which may issue such type of bonds include construction companies.

Convertible Bonds

Convertible bonds are a special variety of bonds which have an inbuilt feature of being converted to equity shares at a specified time at a pre-set conversion price.

Foreign currency convertible Bonds

Foreign currency convertible bond is a special type of bond issued in the currency other than the home currency. In other words, companies issue foreign currency convertible bonds to raise money in foreign currency.

Difference between Debentures & Bonds

Debenture and bond are used often as interchangeable terms. However, there are subtle and noteworthy differences between the two instruments:

- Security: A bond is a more secure instrument than a debenture. A debenture does not have any collateral backing; whereas a bond will always have collateral attached.
- Rate of Interest: Debenture holders are entitled to a higher rate of interest in comparison to bond holders. The reason is that debenture is an unsecured loan and therefore, is riskier than a bond.
- Liability: In a case of a bankruptcy, the company is liable to pay bondholders on priority, whereas debenture holders are paid later.
- Periodical Payments: Debenture holders are paid periodical interest on their loan and the principal is paid back at the completion of the entire term. Bondholders, on the other hand, are not paid any periodical payments. They receive the accrued interest and the principal upon the term completion at one go.

(e) Term Loan:

A term loan provides borrowers with a lump sum of cash upfront in exchange for specific borrowing terms. Term loans are normally meant for established small businesses with sound financial statements. In exchange for a specified amount of cash, the borrower agrees to a certain repayment schedule with a fixed or floating interest rate. Term loans may require substantial down payments to reduce the payment amounts and the total cost of the loan.

Types of Term Loans

Term loans come in several varieties, usually reflecting the lifespan of the loan. These include:

Short-term loans: These loans are generally for a period of less than a 12 months.

Intermediate-term loans: These loans are generally for a period of one to three years.

Long-term loans: These loans last anywhere above three to twemty five years.

(f) Venture Funding:

Venture funding is a funding process in which the venture funding companies manage the funds of the investors who want to invest in new businesses which have the potential for high growth in future. The venture capital funding firms provide the funds to start ups in exchange for the equity stake. Such a startup is generally one that possesses the ability to generate high returns. However, the risk for venture capitalists is high.

There are five stages of venture funding. They are as follows:

- Stage 1: Seed Capital
- Stage 2: Startup Capital
- Stage 3: Early Stage / Second Stage Capital
- Stage 4: Expansion Stage
- Stage 5: Bridge / Pre IPO Stage

Stage 1: Seed Capital

In this first stage of venture funding, the venture or the startup company in need of the funds contacts the venture capital firm or the investor. The venture firm shall share its idea of business with the investors and convince them to invest in the project. The investor or venture capital firm shall then conduct research on the business idea and analyze its future potential. If the expected returns in future are good, the investor (Venture capitalist) shall invest in the business.

Stage 2: Startup Capital

Startup capital is the second stage of venture funding. If the venture is able to attract the investor, the idea of the business of the venture is brought into reality. A prototype product is developed and fully tested to know the actual potential of the product. Generally, a person from the venture capital firm takes a seat in the management of the business to monitor the operations regularly and keep a check that every activity is done as per the framed plan. If the idea of business meets the requirement of the investor and has sufficient market in the trail run, the investor agrees to participate in the future course of the business.

Stage 3: Early Stage / Second Stage Capital

After the startup capital stage comes the early/first/second stage capital. In this stage, the investor significantly increases the capital invested in the venture business. The capital increase is mainly towards increasing the

production of goods, marketing or other expansion say building a network etc. The company with higher capital inflow moves towards profitability as it is able to reach a wide range of customers.

Stage 4: Expansion Stage

This is the fourth stage of venture funding. In this stage, the company expands its business by way of diversification and differentiation of its products. This is possible only if the company is earning good profits and revenue. To reach up to this stage the company needs to be operational for at least 2 to 3 years. The expansion gives the venture new wings to enter into untapped markets.

Stage 5: Bridge / Pre IPO Stage

This is the last stage of venture funding. When the company has developed substantial share in the market with its products, the company may opt for going public. One main reason for going public is that the investors can exit out of the company after earning profits for the risks they have taken all the years. The company mainly uses the amount received by way of IPO for various purposes like merger, elimination of competitors, research and development, etc.

(g) American Depository Receipt

American Depository Receipt represents the shares of a foreign company issued by U.S bank which can be traded in U.S. equity markets.

Meaning of American Depository Receipt

American Depository Receipt (ADR) is a certified negotiable instrument issued by an American bank suggesting the number of shares of a foreign company that can be traded in U.S. financial markets. American Depository Receipts provide US investors with an opportunity to trade in shares of a foreign company.

American Depository Receipt Process

The domestic company, already listed in its local stock exchange, sells its shares in bulk to a U.S. bank to get itself listed on U.S. exchange.

The U.S. bank accepts the shares of the issuing company. The bank keeps the shares in its security and issues certificates (ADRs) to the interested investors through the exchange.

Investors set the price of the ADRs through bidding process in U.S. dollars. The buying and selling in ADR shares by the investors is possible only after the major U.S. stock exchange lists the bank certificates for trading.

The U.S. stock exchange is regulated by Securities Exchange Commission, which keeps a check on necessary compliances that need to be complied by the foreign company.

Advantages of American Depository Receipt

The American investor can invest in foreign companies which can fetch him higher returns.

The companies located in foreign countries can get registered on American Stock Exchange and have its shares trades in two different countries.

The benefit of currency fluctuation can be availed.

It is an easier way to invest in foreign companies as there are no restrictions to invest in ADR.

ADR simplifies tax calculations. Trading in shares of foreign company in ADR would lead to tax under US jurisdiction and not in the home country of company.

The pricing of shares of foreign companies in ADR is generally cheaper. Hence it provides additional benefit to investors.

Disadvantages of American Depository Receipt

Even though the transactions in ADR take place in US dollars, still they are exposed to the risk associated with foreign exchange fluctuation.

The number of options to invest in foreign companies is limited. Only few companies feel the necessity to register themselves through ADR. This limits the choice available to US investor to invest.

The investment in companies opting for ADR often becomes illiquid as investor needs to hold the shares for long term to generate good returns.

The charges for entire process of ADR are mostly transferred on investors by the foreign companies.

Any violation of compliance can lead to strict action by Securities Exchange Commission.

Conclusion:

ADRs provide the US investors with ability to trade in foreign companies shares. ADR makes it easier and convenient for the domestic investors in US to trade in foreign companies shares. ADR provides the investors an opportunity to diversify their portfolio by investing in companies which are not located in America. This eventually leads to investors investing in companies located in emerging markets, thereby leading to profit maximization for investors.

(h) Global Depository Receipt

Global Depository Receipt (GDR) is an instrument in which a company located in domestic country issues one or more of its shares or convertibles bonds outside the domestic country. In GDR, an overseas depository bank i.e. bank outside the domestic territory of a company, issues shares of the company to residents outside the domestic territory. Such shares are in the form of depository receipt or certificate created by overseas the depository bank.

Issue of Global Depository Receipt is one of the most popular ways to tap the global equity markets. A company can raise foreign currency funds by issuing equity shares in a foreign country.

Global Depository Receipt Example

A company based in USA, willing to get its stock listed on German stock exchange can do so with the help of GDR. The US based company shall enter into an agreement with the German depository bank, who shall issue shares to residents based in Germany after getting instructions from the domestic custodian of the company. The shares are issued after compliance of law in both the countries.

Global Depository Receipt Mechanism

The domestic company enters into an agreement with the overseas depository bank for the purpose of issue of GDR.

The overseas depository bank then enters into a custodian agreement with the domestic custodian of such company.

The domestic custodian holds the equity shares of the company.

On the instruction of domestic custodian, the overseas depository bank issues shares to foreign investors.

The whole process is carried out under strict guidelines.

GDRs are usually denominated in U.S. dollars

Advantages of GDR The following are the advantages of Global Depository Receipts:

GDR provides access to foreign capital markets.

A company can get itself registered on an overseas stock exchange or over the counter and its shares can be traded in more than one currency.

GDR expands the global presence of the company which helps in getting international attention and coverage.

GDR are liquid in nature as they are based on demand and supply which can be regulated.

The valuation of shares in the domestic market increase, on listing in the international market.

With GDR, the non-residents can invest in shares of the foreign company. GDR can be freely transferred.

Foreign Institutional investors can buy the shares of company issuing GDR in their country even if they are restricted to buy shares of foreign company.

GDR increases the shareholders base of the company.

GDR saves the taxes of an investor. An investor would need to pay tax if he purchases shares in the foreign company, whereas in GDR same is not the case.

Disadvantages

The following are the disadvantages of Global Depository Receipts: Violating any regulation can lead to serious consequences against the company.

Dividends are paid in domestic country's currency which is subject to volatility in the forex market.

It is mostly beneficial to High Net-Worth Individual (HNI) investors due to their capacity to invest high amount in GDR.

GDR is one of the expensive sources of finance.

(i) Public Fixed Deposits:

Public deposits refer to the unsecured deposits invited by companies from the public mainly to finance working capital needs. A company wishing to invite public deposits makes an advertisement in the newspapers.

Any member of the public can fill up the prescribed form and deposit the money with the company. The company in return issues a deposit receipt. This receipt is an acknowledgement of debt by the company. The terms and conditions of the deposit are printed on the back of the receipt. The rate of interest on public deposits depends on the period of deposit and reputation of the company.

A company can invite public deposits for a period of six months to three years. Therefore, public deposits are primarily a source of short-term finance. However, the deposits can be renewed from time-to-time. Renewal facility enables companies to use public deposits as medium-term finance.

Public deposits of a company cannot exceed 25 per cent of its share capital and free reserves. As these deposits are unsecured, the company having public deposits is required to set aside 10 per cent of deposits maturing by the end of the year. The amount so set aside can be used only for paying such deposits.

Thus, public deposits refer to the deposits received by a company from the public as unsecured debt. Companies prefer public deposits because these deposits are cheaper than bank loans. The public prefers to deposit money with well-established companies because the rate of interest on public deposits is higher than on bank deposits. Now public sector companies also invite public deposits. Public deposits have become a popular source of industrial finance in India.

Merits of Public Deposits:

1. Simplicity:

Public deposits are a very convenient source of business finance. No cumbersome legal formalities are involved. The company raising deposits has to simply give an advertisement and issue a receipt to each depositor.

2. Economy:

Interest paid on public deposits is lower than that paid on debentures and bank loans. Moreover, no underwriting commission, brokerage, etc. has to be paid. Interest paid on public deposits is tax deductible which reduces tax liability. Therefore, public deposits are a cheaper source of finance.

3. No Charge on Assets:

Public deposits are unsecured and, therefore, do not create any charge or mortgage on the company's assets. The company can raise loans in future against the security of its assets.

4. Flexibility:

Public deposits can be raised during the season to buy raw materials in bulk and for other short-term needs. They can be returned when the need is over. Therefore, public deposits introduce flexibility in the company's financial structure.

5. Trading on Equity:

Interest on public deposits is paid at a fixed rate. This enables a company to declare higher rates of dividend to equity shareholders during periods of good earnings.

Public deposits enable a company to build up contacts with a wider public. These contacts prove helpful in the sale of shares and debentures in future.

Demerits of Public Deposits:

1. Uncertainty:

Public deposits are an uncertain and unreliable source of finance. The depositors may not respond when economic conditions are uncertain. Moreover, they may withdraw their deposits whenever they feel shaky about the financial health of the company.

Depositors are entitled to withdraw their deposits at any time after giving prior notice to the company. During times of financial tightness or distress the depositors may get panicked and wish to withdraw their deposits.

Moreover, if a large number of depositors simultaneously withdraw their deposits during slump, the company may find it difficult to repay a huge

sum at once. Therefore, public deposits are described as 'fair weather friends'.

2. Limited Funds:

A limited amount of funds can be raised through public deposits due to legal restrictions.

3. Temporary Finance:

The maturity period of public deposits is short. The company cannot depend upon public deposits for meeting long-term financial needs.

4. Limited Appeal:

Public deposits do not appeal as a mode of investment to bold investors who want capital gains. Conservative investors may also not like these deposits in the absence of proper security.

5. Unsuitable for New Concerns:

New companies lacking in sound credit standing cannot depend upon public deposits. Investors do not like to deposit money with such companies.

(j) Concept of Securitization:

Securitization is a structured process by which a pool of loans and other receivables are packaged and sold in the form of asset-backed securities to the investors to raise the required funds from them. By this process relatively illiquid assets are converted into securities. Securitization falls under the broad category termed as structured finance transactions. Structured finance refers to securities where the promise to repay the investors is backed by the value of the underlying financial asset or the credit support of a third party to the transaction or some combination of the two. Thus, securitization is nothing but liquefying assets comprising loans and receivables of an institution through systematic issuance of financial instruments.

(i) The process of securitization starts with identification by the company (the originator) the loans or bills receivable in its portfolio, to prepare a basket or pool of assets to be securitized.

(ii) The pool of assets so identified is then sold to a specific purpose vehicle (SPV) or trust. Usually an investment banker performs the task of an SPV, which is also called an issuer, as it ultimately issues the securities to investors.

(iii) Once the assets are acquired by SPV, the same are split into individual shares/securities which are reimbursed by selling them to investors. These securities are called 'Pay or Pass Through Certificates' (PTC) which are so structured as to synchronize for redemption with the maturity of the securitized loans or bills. (iv) Repayments under the securitized loans or bills keep on being received by the originator and passed on to the SPV. To this end, the contractual relationship between the originator and the borrowers/obligates is allowed to subsist in terms of the pass through transaction; alternatively a separate agency arrangement is made between the SPV (Principal) and the originator (agent).

(v) Although a PTC could be with recourse to its originator, the usual practice has been to make it without recourse. Accordingly, a PTC holder takes recourse to the SPV and not the originator for payment to the principal and interest on the PTCs held by him. However, a part of the credit risk, as perceived (and not interest risk), can be absorbed by the originator, by transferring the assets at a discount, enabling the SPV to issue the PTCs at a discount to face value.

(vi) The debt to be securitized and the PTC issues are got rated by rating agencies on the eve of the securitization. The issues by the SPV could also be guaranteed by external guarantor-institutions to enhance creditability of the issues. The PTCs, before maturity, are tradable in a secondary market to ensure liquidity for the investors.



(h) Long term financial institution:

Long term loans are provided by specify financial institutions in India.

The following are the specialised financial institution:

- (i) The industrial financial corporation in India.
- (ii) Industrial development bank of India.
- (iii) Industrial Reconstruction Corporation in India.
- (iv) Small industries development bank of India.

- (v) Life insurance Corporation of India.
- (vi) State financial corporation.
- (vii) Exime book.

Term loans are provided by these institutions at deferent rate of interest under scheme of financial institution. it is also to be repaid according to a stipulated repayment schedule these institution stipulate a number of condition management and certain and other financial policy of a company.

Term loan represent secured borrowing. It is the most important source of finance for new project. They generally carry a rate of interest inclusive interest tax depending on the credit rating of the borrower, the perceived risk of lending. The loan are generally repayable over a period of 60 to 10 years in annul, half yearly or quarterly installment. For last scale project all India financial institution provides the bulk of term finance either singly or in consortium with other financial institution.

(b) Loan from commercial banks:

The banks' in India also provide term loans to the companies .banks normally provides term loans to projects in the small and medium scale sectors . The primary role of commercial banks is to cater to the short term requirement of the industry. However banks have started taking an interest on term financing of industries in several ways. The proceeds of the term loan from banks are generally used for fixed assets or for expansion of plant capacity. Their repayment is scheduled over a period of time. Term loans proposals involve an element of risk because of changes in the conditions affecting the borrowers. The bank making such a proposal has to access the situation to make a proper appraisal. The decision in such a situation would depend upon various factors affecting the conditions of the industry concerned and the earning potential of the borrower.

(c) Retained earnings:

Retained earnings are the profits retained in the business. Every company retains certain portion every year in the form of reserve. Even the balance of profit after declaration of dividend is also carried forward in the balance of sheet. It is known as ploughing backs of profits. Such funds belong to the ordinary shareholder's and increase the net worth of company. a public limited company has to plough back a reasonable amount of profit every year keeping in view the legal requirements and its own expansions plans. However, retained earnings can be used by existing and financially sound companies. A new company or a loss making company cannot follow this method. Retained earnings are used as a longterm capital without any cost.

4.3.2 Short Term Source of Finance

Short-term financing deals with raising of money required for periods varying from a few days to one year. It may sometimes exceed for a period above one year but still be called as short-term finance.

1. Trade Credit

Trade credit is credit received by an business organisation from the manufacturers or wholesalers or suppliers. It is also known as mercantile credit. The usual duration of this credit ranges from 30 to 90 days. It is granted to the company or firm on "Open account" without any security except that of the goodwill and financial standing of the buyer. Trade credit does not provide the cash but it facilitates the purchase of materials without immediate payment. Usually no interest is charged on trade credits. Trade credit depends upon the buyer's need for it and also the willingness of the supplier and factors such as:

The financial resources of the supplier. His eagerness to dispose of his stock. Degree of competition in the market. Credit worthiness of the firm.

2. Consumer Credit or Customer Advance

Many times the manufacturers or the suppliers insist on, advance by the customers particularly in case of special orders or big orders. The customer advance forms part of the price of the products ordered by him. Sometimes, the customer also tenders the full price. This is an interest free source of finance. The period of such credit depends upon the time taken to deliver the goods. The availability of this credit also depends on the following factors:

Competitive conditions in the market Customs of the trade and usage. Reputation of the supplier.

3. Installment Credit

This is also called consumer credit. Retailers for selling consumer durable generally use it. Here, however, we use the term "Installment credit" to denote the facility provided by the equipment suppliers on easy installments as this serves to provide capital to a firm in kind. Installment includes interest on unpaid sums and is suitably spread so as to enable the purchasing company to meet them out of current cash flows. Commercial banks and financial institutions, now-a-days provide this form of credit on liberal terms. Hire purchase system is also a modified form of the installment credit. In the hire purchase system, the title over the machinery or equipment remains with the supplier until the full price amount is settled.

4. Factoring

Under this method, a financing company purchases the account receivables from the customers or money is advanced on the security of the accounts receivable. In financial accounting, it is denoted as Trade Debtors, and this item appears on the asset side of the Balance Sheet. Since credit sales are unavoidable in trading transactions, every trader has always a larger amount locked up in the form of Account Receivables. This account receivable is a right to property and a right to collect the amount from the client.

5. Short-term Loans

Commercial banks also provide loans to the business concern to meet the short-term financial requirements. When a bank makes an advance in lump sum against some security it is termed as loan. Loan may be in the following form:

(a) Cash credit: A cash credit is an arrangement by which a bank allows his customer to borrow money up to certain limit against the security of the commodity.

(b) Overdraft: Overdraft is an arrangement with a bank by which a current account holder is allowed to withdraw more than the balance to his credit up to a certain limit without any securities.

MONEY MARKET INSTRUMENTS IN INDIA

1. Treasury Bills

T-bills are one of the most popular money market instruments. They have varying short-term maturities. The Government of India issues it at a discount for 14 days to 364 days. These instruments are issued at a discount and repaid at par at the time of maturity. Also, a company, firm, or person can purchase TB's. And are issued in lots of Rs. 25,000 for 14 days & 91 days and Rs. 1,00,000 for 364 days.

2. Commercial Bills

Commercial bills, also a money market instrument, works more like the bill of exchange. Businesses issue them to meet their short-term money requirements. These instruments provide much better liquidity. As the same can be transferred from one person to another in case of immediate cash requirements.

3. Certificate of Deposit

Certificate of deposit or CD's is a negotiable term deposit accepted by commercial banks. It is usually issued through a promissory note. CD's can be issued to individuals, corporations, trusts, etc. Also, the CD's can be issued by scheduled commercial banks at a discount. And the duration of these varies between 3 months to 1 year. The same, when issued by a financial institution, is issued for a minimum of 1 year and a maximum of 3 years.

4. Commercial Paper

Corporates issue CP's to meet their short-term working capital requirements. Hence serves as an alternative to borrowing from a bank. Also, the period of commercial paper ranges from 15 days to 1 year. The Reserve Bank of India lays down the policies related to the issue of CP's. As a result, a company requires RBI's prior approval to issue a CP in the market. Also, CP has to be issued at a discount to face value. And the market decides the discount rate.

Denomination and the size of CP: Minimum size – Rs. 25 lakhs Maximum size – 100% of the issuer's working capital

5. Call Money

It is a segment of the market where scheduled commercial banks lend or borrow on short notice (say a period of 14 days). In order to manage dayto-day cash flows. The interest rates in the market are market-driven and hence highly sensitive to demand and supply. Also, the interest rates have been known to fluctuate by a large % at certain times.

4.4 EXERCISES:

1 Which of the following is a liability of a bank?

- (a) Treasury Bills
- (b) Commercial Papers
- (c) Certificate of Deposits
- (d) Junk Bonds
- 2. Commercial paper is a type of
- (a) Fixed coupon bond
- (b) Unsecured short-term debt
- (c) Equity share capital
- (d) Government bond

3. In India, Commercial Papers are issued as per the guidelines issued by

- (a) Securities and Exchange Board of India
- (b) Reserve Bank of India
- (c) Forward Market Commission
- (d) None of the above

4. Commercial paper are generally issued at a prices

- (a) Equal to face value
- (b) More than face value
- (c) Less than face value
- (d) Equal to redemption value

5. Which of the following is not applicable to commercial paper?

- (a) Face Value
- (b) Issue Price
- (c) Coupon rate
- (d) None of the above

6. Which of the following is true with respect to commercial paper (CP)?

- (a) These are issued in multiples of 1 lakh
- b) The minimum amount to be invested by a single investor is 5 lakhs
- (c) The minimum maturity period is 30 days
- (d) The issuer cannot buy back these instruments
- (e) These can be raised up to the extent of 80% of working capital limit

- 7. Which of the following statements is/are true with respect to Short-term bank finance
- i) Under the cash credit arrangement the customer is permitted to borrow up to a limit called the cash credit limit
- ii) Cash credit account operates against security in the form of pledge of shares and securities.
- iii) Under letter of credit agreement the bank assumes the risk and also provides the credit
- (iv) Security in the form of hypothecation is limited to movable properties
 - (a) Only (ii) above
 - (b) Only (iv) above
 - (c) Both (i) and (iv) above
 - (d) Both (ii) and (iii) above
- 8. Which of the following statements is not true with respect to Commercial Papers (CPs)
- (a) These are short-term usance promissory notes with a fixed maturity period
- (b) It is also referred to as Corporate Paper
- c) is mostly used to finance the current transactions of a company
- (d) it helps to meet the seasonal need for funds
- (e) it cannot be issued by body corporate
- 9. which of the following statements is true with regard to public deposit to a company?
- (a) The procedure involved in raising public deposit is fairly complex
- (b) A public deposit with maturity period of less than 1 year is also treated as long term liability
- (c) After-tax cost of public deposits will be much less than the after-tax cost of bank borrowing
- (d) Security is offered in the case of public deposit
- (e) Public deposit will have restrictive covenants in respect of dividends payments appointment of senior executives
- 10. The type of collateral (security) used for short-term loan is
- (a) Real estate
- (b) Plant and Machinery
- (c) Stock of good
- (d) Equity share capital

Solution

1. C	6. B
2. B	7. C
3. B	8. C
4. C	9. D
5. D	10. E

- 1. What are the sources of long-term finance?
- 2. Explain the concept of financial feasibility of a Project?
- 3. Explain the advantages of equity financing?
- 4. What is debenture (debt) financing? Why debentures are considered cheaper than equity as a source of long-term finance?
- 5. Write short notes on the following:
- (a) Trading on equity
- (b) Promoter's contribution.
- (c) Preference Shares
- (d) Money Market Instruments
- (e) Loan syndication.

COST OF CAPITAL

Unit Structure:

- 5.0 Objectives
- 5.1 Introduction
- 5.2 Definition of Cost of Capital
- 5.3 Measurement of Cost of Capital
- 5.4 Cost of Debt
- 5.5 Cost of Bonds
- 5.6 Cost of Preference Shares
- 5.7 Cost of Equity
- 5.8 Cost of Retained Earnings
- 5.9 Weighted Average Cost of Capital (WACC)
- 5.10 Exercises

5.0 OBJECTIVES

After studying this chapter you will be able to:

- Understand the concept of Cost of Capital
- Understand the different sources of capital
- Understand the cost of employing each of these sources of capital
- Know the concept of weighted average cost of capital
- The importance of cost of capital in financial management

5.1 INTRODUCTION

The financing decision relates to the composition of relative proportion of various sources of finance. The sources are;

1. Owned Capital- i.e. Equity Share Capital, Preference Share Capital, Accumulated profits.

2. Borrowed Capital-: Debentures, loans from financial institutions.

The financial management weighs the merits and demerits of different sources of finance while taking the financing decisions.

Whether the companies choose shareholders funds or a combination of both, each type of fund carries a cost.

The cost of equity is the minimum return the shareholders would have received if they had invested elsewhere. Borrowed fund cost involves interest payment. Both types of fund incur cost and this is the cost of capital to the company. This means, cost of capital is the minimum return expected by the company.

Whenever funds are to be raised to finance investments, capital structure decision is involved.

A demand for raising funds generates a new capital structure since a decision has to be made as to the quantity and forms of financing.

5.2 MEANING OF COST OF CAPITAL

In simple terms cost of capital refers to the discount rate that is used in determining the present value of the estimated future cash flows of the business/new project and eventually deciding whether the business/new project is worth undertaking or not.

It is also the minimum rate of return that a firm must earn on its investment which will maintain the market value of shares at its current level.

It can also be stated as the opportunity cost of an investment, i.e. the rate of return that company would otherwise be able to earn at the same risk level as the investment that has been selected. For example, when an investor purchases a stock in a company, he/she expects to see a return on that investment. Since the individual expects to get back more than his/her initial investment, the cost of capital is equal to this minimum return that the investor expects to receive which is termed as investor's opportunity cost.

The cost of each source of capital is called specific cost of capital. When these specific costs are combined for all the sources of capital for a business, it is termed as overall cost of capital for a business.

5.3 MEASUREMENT OF COST OF CAPITAL

The first step in the measurement of cost of capital of the firm is the calculation of the cost of individual sources of raising funds. From the viewpoint of capital budgeting decisions, the long term sources of funds are relevant as they constitute the major sources of financing the fixed assets. In calculating the cost of capital, therefore, the focus on long-term funds which are:-

- i. Long term debt (including debentures)
- ii. Preference shares
- iii. Equity Capital
- iv. Retained Earnings

5.4 COST OF DEBT

The calculation of the cost of debt is relatively easy. A debt may be in the form of Bond or Debenture. A Bond is a long term debt instrument or security. Bonds are issued by the government. Therefore, they do not have any risk of default. The government honours obligations on its Bonds. Bonds of the public sector companies in India are generally secured, but they are not free from the risk of default.

The private sector companies also issue bonds, which are called as Debentures in India. A company in India can issue secured or unsecured debentures.

5.4.1 COST OF DEBENTURES

The cost of debentures and long term loans is the contractual interest rate adjusted further for the tax liability of the company. For a company, the higher the interest charges, the lower the amount of tax payable by the company. The interest on debentures or bonds is debited to the profit and loss account. Therefore, the taxable profit of the company is reduced. It is an indirect saving to the company. Therefore the cost of debt capital is reduced to the extent of the tax liability.

Illustration 1: Two companies X and Y are having their capital structure as follows;

	Company X	Company Y
Earnings before interest and taxes (EBIT)	100	100
(Rs. In lakhs)		
Interest (I) (12%)	-	40
Profit before tax (PBT)	100	60
Tax (T) @ 35%	35	21
Profit after Tax (PAT)	65	39

The tax rate applicable to the company is 35 percent.

Solution:

Cost of Debt = (I-t) where I = interest rate and t = tax rate Cost of debt of X = 0, there is no debt. Cost of debt of Y = (I - T) = (12 - 35%) = 12 - 4.2 = 7.8%The important point to remember, while calculating the average cost of capital, is that the post-tax cost of debt should be used and not the pre-tax cost of debt.

5.4.2 COST OF IRREDEEMABLE DEBENTURES

Cost of debentures not redeemable during the life time of the company.

$$Kd = \frac{I(1-t)}{NP} \times 100$$

where,

 $K_d = \text{cost of debt after tax}$

I = Annual interest payment

NP = Net proceeds of debentures

t = Tax rate

Illustration 2

A company issues 1,000 15% debentures of the face value of \Box 100 each at a discount of \Box 5. The under-writing and other costs are \Box 5000 /- for the total issue. The interest per annum is \Box 15,000. The income tax rate is 40%. Calculate the cost of Debt.

$$Kd = \frac{I(1-t)}{NP} x \ 100$$

$$Kd = \frac{15(1-0.40)}{90} x \ 100$$

$$Kd = \frac{15(0.6)}{90} x \ 100$$

$$Kd = \frac{9}{90} x \ 100$$

$$Kd = 10%$$

The net proceeds of the debenture = $1000 \times 95 = \Box 95,000$ $\Box 95,000 - \Box 5,000 = \Box 90,000$

Net proceeds per debenture = $90,000/1,000 = \Box 90$

Though the interest on debenture is 15%, the net cost of debenture is 10%.

5.4.3 Cost of Redeemable debentures

If the debentures are redeemable after the expiry of a fixed period, the cost of debentures would be:

$$Kd = \frac{I(1-t) + \left(\frac{(RV - NP)}{n}\right)}{\frac{(RV + NP)}{2}} \times 100$$

where,

- I = Annual interest payment
- NP = Net proceeds of debentures
- RV = Redemption values of debentures
- t = Tax rate
- n = Life of debentures

Illustration 3:

A company issued 10,000, 10% debentures of Rs 100 each on 1.4.2007 to be matured on 1.4.2012. If the market price of the debenture is Rs.80. Compute the cost of debt assuming 35% tax rate.

Solution :

$$Kd = \frac{I(1-t) + \left(\frac{(RV - NP)}{n}\right)}{\frac{(RV + NP)}{2}} \times 100$$

$$Kd = \frac{10(1 - 0.35) + \left(\frac{(100 - 80)}{5}\right)}{\frac{(100 + 80)}{2}} \times 100$$
$$Kd = \frac{10(0.65) + \left(\frac{20}{5}\right)}{\frac{(180)}{2}} \times 100$$
$$Kd = \frac{6.5 + 4}{90} \times 100$$

Kd = 11.67%

Illustration 4

Five years ago, Sonata Limited issued 12 per cent irredeemable debentures at Rs. 103, at Rs. 3 premium to their par value of Rs 100. The current market price of these debentures is Rs. 94. If the company pays corporate tax at a rate of 35 per cent what is its current cost of debenture capital?

Solution:

 $K_d = 12/94 = 12.8$ per cent K_d (after tax) = 12.8 x (1-0.35) = 8.3 per cent

5.5 COST OF BONDS

It is easy to find out the present value of a bond since its cash flows and the discount rate can be determined easily. If there is no risk of default, then there is no difficulty in calculating the cash flows associated with a bond. The expected cash flows consist of annual interest payments plus repayment of principal. The appropriate capitalization or discount rate would depend upon the risk of bond. The risk in holding the government bond is less than the risk associated with a debenture issued by a company. Therefore, a lower discount rate would be applied to the cash flows of the government bond and a higher rate to the cash flows of the company debenture.

5.6 COST OF PREFERENCE SHARES

The cost of preference share capital is the dividend expected by its holders. Though payment of dividend is not mandatory, non-payment may result in exercising of voting rights by them.

The payment of preference dividend is not adjusted for taxes as they are paid after taxes and is not deductible.

The cost of preference share capital is calculated by dividing the fixed dividend per share by the price per preference share.

Illustration 5:

Suzlon Energy has issued preference shares at Rs. 100 per share, with a stated dividend of Rs. 12% and a flotation cost of 3% what is the cost of preference share?

Solution

$$K_{p} = \frac{\text{Preference Dividend}}{\text{Market Price of Preference Share (1-flotation cost)}}$$
$$= \frac{\text{Rs.12}}{\text{Rs.100(1-0.03)}} = 12/97 = 12.37\%$$

5.6.1 COST OF IRREDEEMABLE PREFERENCE SHARES

Cost of irredeemable preference shares $=\frac{PD}{PO}$

Where,

PD = Annual preference dividend

PO = Net proceeds in issue of preference shares.

Cost of irredeemable preference shares where Dividend Tax is paid over

the actual dividend payment = $\frac{PD(1-Dt)}{PO}$

Where,

PD = Annual preference dividend PO = Net proceeds in issue of preference shares Dt = Tax on preference dividend

Illustration 6:

X Ltd. issued 2,000 10% preference shares of Rs 100 each at Rs. 95 each. Calculate the cost of preference shares.

Solution

$$Kp = \frac{PD}{P0}$$
$$Kp = \frac{10}{95}$$
$$Kp = 10.53\%$$

5.6.2 COST OF REDEEMABLE PREFERENCE SHARES:

If the preference shares are redeemable after the expiry of a fixed period the cost of preference shares would be:

$$K_p = \frac{PD + (RV - NP) / N}{\frac{RV + NP}{2}}$$

Where,

- PD = Annual Preference Dividend
- RV = Redemption value of Preference Shares
- NP = Net proceeds on issue of Preference Shares
- N = Life of Preference Shares

However, since dividend of preference shares is not allowed as deduction from income for e tax purposes, there is no question of tax advantage in the case of cost of preference shares.

The cost of redeemable preference share could also be calculated as the discount rate that equates the net proceeds of the sale of preference shares with the present value of the future dividends and principal payments.

Thus, in the case of debt as well as preference shares, cost of capital is calculated by reference to the obligations incurred and proceeds received.

Illustration 7:

Y Ltd. issued 2,000 10% preference shares of Rs 100 each at Rs 95 each. The company proposes to redeem the preference shares at the end of 10 years. Calculate the cost of preference shares.

Solution :

$$K_{p} = \frac{PD + (RV - NP) / N}{\frac{RV + NP}{2}}$$

$$K_{p} = \frac{\left[\frac{10 + 100 - 95}{10}\right]}{\left[\frac{100 + 95}{2}\right]}$$

$$= 0.107(approx)$$

$$= 10.7\%$$

5.7 COST OF EQUITY

It may prima facie appear that equity capital does not carry any cost. But this is not true. The market share price is a function of return that equity shareholders expect and get. If the company does not meet their requirements, it will have an adverse effect on the market share price. Also, it is relatively the highest cost of capital. Since expectations of equity holders are high, higher cost is associated with it.

In simple words cost of equity capital is the rate of return which equates the present value of expected dividends with the market share price. In theory the management strives to maximize the position of equity holders and the effort involves many decisions. Different methods are employed to compute the cost of equity capital.

a) DIVIDEND PRICE APPROACH

Here, cost of equity capital is computed by dividing the current dividend by average market price per share. However, this method cannot be used to calculate cost of equity of units suffering losses.

This dividend price ratio expresses the cost of equity capital in relation to what yield the company should pay to attract investors.

$$K_e = \frac{D_1}{P_0}$$

Where, K_e = Cost of equity D_1 = Annual dividend P_0 = Market price of equity

This model assumes that dividends are paid at a constant rate to perpetuity. It ignores taxation.

Earnings and dividends do not remain constant and the price of equity shares is also directly influenced by the growth rate in dividends. Where earnings, dividends and equity share price all grow at the same rate, the cost of equity capital may be computed as follows:

$$K_e = (D_1/P_0) + G$$

Where,

 $D_1 = [D_0 (1+G)]$ i.e. next expected dividend $P_0 =$ Current Market price per share G =Constant Growth Rate of dividend

Cost of newly issued shares, Kn , is estimated with the constant dividend growth model so as to allow for flotation costs.

 $K_n = (D_1 / P_0 - F) + G$

Where, F = Amount of flotation cost per share

Illustration 8:

A company has paid a dividend of Rs 1 per share (of face value of Rs 10 each) last year and it is expected to grow @10% next year. Calculate the cost of equity if the market price of share is Rs 50.

Solution

$$K_e = \frac{D+G}{P}$$

= $\frac{1(1+0.10)}{50} + 0.10$
= $0.12 \text{ or } 12\%$
Ke= D + G

b) EARNING/PRICE APPROACH:

This approach co-relates the earnings of the company with the market price of its share.

The cost of ordinary share capital would be based upon the expected rate of earnings of a company. The argument is that each investor expects a certain amount of earnings, whether distributed or not from the company in whose shares he invests.

If an investor expects that the company in which he is going to subscribe for shares should have at least a 20% rate of earning the cost of ordinary share capital can be construed on this basis Suppose the company is expected to earn 30%, the investor will be prepared to pay Rs 150 Rs30 x 100 for each share of Rs 100.

So, cost of equity will be given by:

$$\begin{bmatrix} K_e = \frac{E / P}{20} \end{bmatrix}$$

Ke= (E/P)

where, E= Current earnings per share P= Market share price

Since earnings do not remain constant and the price of equity shares is also directly influenced by the growth rate in earning, we need to modify the above calculations with an element of growth.

So, cost of equity will be given by: $K_e = (E/P) + G$

where, E = Current earnings per share P = Market share price G = Annual growth rate of earnings

The calculation of 'G' (the growth rate) is an important factor in calculating cost of equity capital. The past trend in earnings and dividends may be used as an approximation to predict the future growth rate if the growth rate of dividend is fairly stable in the past.

 $G = 1.0 (1+G)^n$ where n is the number of years

The Earning Price Approach is similar to the dividend piece approach; only it seeks to nullify the effect of changes in the dividend policy.

c) REALIZED YIELD APPROACH:

According to this approach, the average rate of return realized in the past few years is historically regarded as 'expected return' in the future. The yield of equity for the year is:

$$Y_t = \frac{D_t + P_{t-1}}{P_{t-1}}$$

where,

 Y_t = Yield for the year t D_t = Dividend for share for end of the year t P_t = Price per share at the end of the year t P_{t-1} = Price per share at the beginning and at the end of the year t

This approach provides a single mechanism of calculating cost of equity. It has unrealistic assumptions. If the earnings do not remain stable, this method is not practical.

d) CAPITAL ASSET PRICING MODEL APPROACH (CAPM):

CAPM model describes the risk-return trade-off for securities. It describes the linear relationship between risk and return for securities. The risks to which a security is exposed are divided into two groups, diversifiable and non-diversifiable.

The diversifiable risk can be eliminated through a portfolio consisting of large number of well diversified securities.

The non-diversifiable risk is attributable to factors that affect all businesses. Such risks are:-

Interest rate changes Inflation Political changes etc.

Thus, the cost of equity capital can be calculated under this approach as:

$$K_e = R_f + b (R_m - R_f)$$

where, $K_e = Cost \text{ of equity capital}$ $R_f = Rate \text{ of return on security}$ b = Beta coefficient $R_m = Rate \text{ of return on market portfolio}$

Therefore, required rate of return = risk free rate + risk premium

The idea behind CAPM is that investors need to be compensated in two ways-time value of money and risk.

The time value of money is represented by the risk-free rate in the formula and compensates the investors for placing money in any investment over a period of time.

The other half of the formula represents risk and calculates the amount of compensation the investor needs for taking on additional risk. This is calculated by taking a risk measure (beta) which compares the returns of the asset to the market over a period of time and compares it to the market premium.

Illustration 9:

Calculate the cost of equity capital of Shanthi ltd, whose risk free rate of return equals 10%. The firm's beta equals 1.75 and the return on the market portfolio equals to 15%.

Solution

$$\begin{split} K_e &= R_f + b \; (R_m \text{-} \; R_f) \\ K_e &= 0.10 + 1.75 \; (0.15 - 0.10) \\ &= 0.10 + 1.75 (0.05) \\ &= 0.1875 \\ &= 18.75\% \end{split}$$

5.8 COST OF RETAINED EARNINGS

Like other sources of fund, retained earnings involve cost. It is the opportunity cost of dividends forgone by shareholders.

The given future depicts how a company can either keep or reinvest cash or return it to the shareholders as dividends. If the cash is reinvested, the opportunity cost is the expected rate of return that shareholders could have obtained by investing in financial assets.

There are two approaches to measure this opportunity cost. One approach is by using discounted cash flow (DCF) method and the second approach is by using capital asset pricing model.

a) by DCF :
$$K_S = \frac{D_1 + G}{P_0}$$

where, $D_1 = Dividend$ $P_o = Current$ market price G = Growth rate

b) By CAPM : $K_S = R_f + b (R_m - R_f)$

where, $K_s = Cost \text{ of equity capital}$ $R_f = Rate \text{ of return on security}$ b = Beta coefficient $R_m = Rate \text{ of return on market portfolio}$

Illustration 10: A Ltd provides the following details:

 $D_0 = Rs \ 4.19$ $P_0 = Rs \ 50$ G = 5%

Calculate the cost of retained earnings based on DCF method.

Solution :

$$K_{S} = \frac{D_{1} + G}{P_{0}}$$

$$= \frac{D_{0} (1 + G)}{P_{0}} + G$$

$$= \frac{Rs. 4.19 (1.05) + 0.05}{Rs. 50}$$

$$= 0.088 + 0.05$$

$$= 138$$

$$= 13.8\%$$

Illustration 11: C Ltd provides the following details:

 $R_f = 7\%$ b = 1.20 $R_m = 13\%$

Calculate the cost of retained earnings based on CAPM method.

Solution $K_s = R_f + b (R_m - R_f)$ = 7% + 1.20(6%) = 7% + 7.20 $K_s = 14.2\%$

5.9 WEIGHTED AVERAGE COST OF CAPITAL (WACC)

WACC (Weighted Average Cost of Capital) represents the investors' opportunity cost of taking on the risk of putting money into a company.

Since every company has a capital structure i.e. what percentage of funds comes from retained earnings, equity shares, preference shares, debt and bonds, so by taking a weighted average, it can be seen how much cost/interest the company has to pay for every rupee it borrows/invest. This is the weighted average cost of capital.
The weighted average cost of capital for a firm is of use in two major areas:-

1. In consideration of the firms position;

2. Evaluation of proposed changes necessitating a change in the firm's capital. Thus, a weighted average technique may be used in a quasimarginal way to evaluate a proposed investment project, such as the construction of a new building.

Thus, weighted average cost of capital is the weighted average after tax costs of the individual components of firm's capital structure. That is, the after tax cost of each debt and equity is calculated separately and added together to a single overall cost of capital.

 $K_0 = \% D(mkt) (K_i) (1 - t) + (\% Psmkt) K_p + (Csmkt) K_e$

where,

 K_0 = Overall cost of capital K_i = Before tax cost of debt 1 - t = 1 - Corporate tax rate K_p = Cost of preference capital K_e = Cost of equity % Dmkt = % of debt in capital structure % Psmkt = % of preference share in capital structure % Cs = % of equity share in capital structure

The cost of weighted average method is preferred because the proportions of various sources of funds in the capital structure are different. Therefore, cost of capital should take into account the relative proportions of different sources of finance.

Illustration 12:

Calculate the WACC using the following data (a) Book value weights Basis (b) Market value weights Basis

The capital structure	e of the company is as under:
Rs.	Debentures (Rs 100 per debenture)
5,00,000	· _ · ·
	Preference shares (Rs 100 per share)
5,00,000	
	Equity shares (Rs 10 per share)
10,00,000	

The market prices of these securities are:DebentureRs 105 per debenturePreferenceRs 110 per preference shareEquity Rs 24 each

Additional information:

- 1) Rs 100 per debenture redeemable at par, 10% coupon rate, 4% flotation costs, 10 year maturity.
- 2) Rs 100 per preference share redeemable at par, 5% coupon rate, 2% flotation cost and 10 year maturity.
- 3) Equity shares have Rs 4 flotation cost.

The expected dividend is Rs 10 with annual growth of 5%. The firm has a practice of paying all earnings in the form of dividend.

Corporate tax rate is 30%.

Solution

Cost of equity = $K_e = \frac{10}{20} + 0.05$
= 0.05 + 0.05 = 0.10 = 10%
Cost of Debt = $K_d = \frac{10(1-0.3) + \frac{(100-96)}{10}}{\frac{(100+96)}{2}}$
$= \left[\frac{7+0.4}{196}\right] \times 2$ = 0.0755 = 7.55%
Cost of preference shares = $K_p = \left[\frac{5 + \frac{2}{10}}{\frac{198}{2}}\right]$
$=\frac{5.2}{99}$
= 0.0535
= 5.35%

a) Calculation of WACC using book value weights

Source of capital	Book value	Specific cost (K%)	Total cost
10% Debentures	5,00,000	5.55	27,500
5% preference shares	5,00,000	5.3	26,500
Equity shares	10,00,000	10.0	1,00,000
Total	20,00,000		1,54,000

 $K_0 = \frac{Rs.1,54,000}{Rs.20,00,000}$ = 0.077= 7.7%

b) Calculation of WACC using market value weights;

Source of Capital	Book value	Specific cost (K %)	Total cost
10% Debentures	5,25,000	5.5	28,875
5 % Preference shares	5,50,000	5.3	29,150
Equity shares	24,00,000	10.00	2,40,000
	34,75,000		2,98,025



5.10 EXERCISES

- 1. Indicate whether the following statements are true or false :
 - a) Cost of capital is the cost of borrowing funds.
 - b) Retained earnings do not have explicit cost.
 - c) Cost of Preference Share capital is higher than the cost of equity capital.
 - d) The higher is the corporate tax rate, the higher is the cost of debt.
 - e) Overall cost of capital decreases on payment of entire long term debt.

(Answers: a-False, b-True, c-False, d-False, e-False)

- 2. What is cost of capital? Explain the problems faced in determining cost of capital.
- 3. Explain the different approaches to the calculation of cost of equity capital.
- 4. What is weighted average cost of capital? Explain the rationale behind the use of weighted average cost of capital.
- 5. Explain the approach to determine the cost of retained earnings.
- 6. A company has the following specific cost of capital along with the indicated book and Market Value weights' :

Type of Capital	Cost %	Book Value Weights	Market Value Weights
Debentures	5	30	25
Preference Shares	10	20	17
Equity Shares	12	40	46
Retained Earnings	12	10	12

Calculate the weighted average cost of capital using book value and market value weights. (Answers : Ko = 9.5%, 9.9%)

7. Two companies, A and B are in the same business and hence similar operating risks. However, the capital structure of each of them is different. The following are the details :

Particulars	A (Rs.)	B(Rs.)
Equity Share Capital (face value Rs.10)	5,00,000	2,50,000
Market value per share	12	20
Dividend per share	2.88	4.00
Debentures	2,50,000	1,00,000
Market value per debenture	80	125
Interest Rate	8	10

Assume that current levels of dividends are generally expected to continue indefinitely and the income tax rate is 35 percent. Compute the weighted Average Cost of capital of each company. (Answers : 19%, 17%)
