M. Com. IInd Semester **Course MC 2.2**

Financial Management

Lesson 1 to 12

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MC 2.2 FINACIAL MANAGEMENT

MAX MARKS 80

Internal Assessment 20

Note: There will be nine (9) questions in all. The first question is compulsory and consists of ten (10) short-questions having two (2) marks each. The candidate will be required to attempt one question from each unit and each question carries fifteen (15) marks.

Course Contents:

Unit I

Financial Management: Introduction to Financial Management, nature, significance, objectives and Scope of financial management, functions of finance executive in an organizations and recent developments in financial management. The goal of a Firm, Role of Financial Manager.

Financial Planning and Forecasting: Need & importance of financial Planning; tools of financial planning, financial Planning process, Drafting a financial plan; Financial forecasting; meaning, benefits and techniques of financial forecasting; Sources of finance.

Unit II

Aspects of Corporate Financial Structure; Factors affecting capital structure, Theories of Capital structure, Net Income Approach, Net Operating Income Approach, The MM Approach.

Leverages; Financial, Operating and composite leverages. EBIT-EPS Analysis.

Cost of Capital: Significance, computation of cost of capital including cost of debt, cost of equity capital, cost of retained earnings, weighted cost of capital, CAPM, problems in computation of cost of capital.

Unit III

Dividend Policy; Origin of the Dividend Policy, theories of dividend policy.

Capital Budgeting Decisions: Nature & importance, facts influencing capital expenditure decisions, capital budgeting process, Evaluation criteria and risk analysis, capital expenditure control.

Unit IV

Working Capital Management and Control: Need, Types & determinations, assessment of working capital requirements; Management of cash, inventories and receivables, Management of financing of working capital.

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Lesson-1

FINANCIAL MANAGEMENT

Structure:

1.0 Learning Objectives

After studying the lesson, you should be able to:-

1. Explain the nature of finance and its interaction with other management functions.
2. Describe the scope of financial management and functions of financial management.
3. Describe the objectives of financial management.
4. Outline the organization of finance functions.

1.1 Introduction

Financial management during this century has undergone dramatic changes. The financial manager's responsibilities are broadening and becoming more vital for the development of the corporation. Once these responsibilities were mainly concerned with the procurement of funds, preparing reports, instruments and institutions for raising funds etc. At presents, the financial management emerges as immense important discipline both to the academicians and practitioners. They now have a major voice in all aspects of both raising and allocations of funds. It is of great interest to the academicians because subject is still growing and there are certain areas in financial management where controversies exist and no unanimous solutions have been reached yet. The practitioners are interested because they want solution of most crucial problems and financial management helps them in understanding, analyzing and solving the problem.

1.2 Nature of Financial Management

At any movement of time, a business firm can be viewed as a pool of funds come from various sources i.e. equity shares, preference shares, debentures, financial institutions and past earning retained in the business. Funds raised from the sources are committed to a number of uses i.e. fixed assets used in production of goods and services, inventories used to facilitate production and sales, accounts receivable owed by customers and cash and marketable securities used for transactions and liquidity purposes. At a given moment, the pool of funds of the firms is static overtime, however, the pool changes; and these changes are known as funds flow. In an ongoing business, funds flow continually throughout the enterprise. The term finance can be defined as the management of flow of funds through an organization or procurement of funds (in flows) and their effective utilization (out flows).

Finance concerns itself with the actual flows of money, as well as any claims against money.

Finance or financial management is an applied field of business administration. Principles developed by financial managers are borrowed from accounting, economics and other fields are applied to the problems or managing money. Finance has its own theories and principles, but is fundamentally concerned with applications, as a – business discipline, finance must be carefully differentiated from both accounting and economics, Jon Hampton, differentiated as follows:

1. Finance Differentiated form Accounting

Accounting is a systematic way of recording, classifying, summarizing and preparing final account and measuring of business transactions. Using a widely accepted double entry, book-keeping system, accounting provides data on an organization's activities. The data may be historical, as in the case of last year's balance sheet, or they may be a forecast of future operations, as in the case of next year's operating budget. Finance makes use of the information provided by the accounting system to make decisions with respect to inflows and out flows, which help organizations in achieving their objectives. Accounting is a data collection process dealing the accurate recording the reporting; finance is a management or decision-making process.

Although accountants and financial managers perform different tasks carries in the two areas frequently overlap. It is not unusual, for example, for a young man or woman to study accounting and then take a position as an accountant. They may e in a corporate setting or with a firm of certified public accountants. As the accountant masters his discipline he will become aware of the financial problems facing his firm. After a number of years, he may discover that he has become a financial analyzer or manager and is no longer doing any accounting on a day-to-day- basis. When studying finance, one should recognize the close, natural relationship, as well as the differences, between accounting and finance.

2. Finance Differentiated from Economics

Economics is concerned with analyzing the distribution of resources in a society. It studies transactions among people involving goods and services with or without the exchange of money. It is interested in supply and demand, costs and profits, and production and consumption. The broad and highly developed field of economics is closely related to other social sciences, such as sociology, political science; and psychology. Economics may be, conveniently divided into two major categories;

a) Micro-economics

Micro-economics which is basically a. body of theory that studies the way business make decisions about pricing and production in different kinds of markets and under differing assumptions. Also called price theory or theory of the firm. Micro- economics tries to explain how rational persons make business decisions.

b) Macro-economics

Macro-economics, which is the study of the overall economic situation of a nation or group of nations; it attempts to relate such factors as production and consumption into a meaningful view of national economies. It uses definitions such as gross national product (GNP) to measure the level of economic activity and has developed fairly sophisticated means for forecasting the future.

The field of finance rests heavily on the work of economists and makes use of many economic tools'. It begins with the theories and assumptions developed in micro-economics and attempt to apply them to explain the workings of a modern "business firm. It borrows forecasting and other models from macroeconomics and tests them against current situation to predict the result from varying courses of action being considered by the firm. Finance is less concerned with theory than is economics. Finance analyst forecasts for the individual firm; economics forecasts for the industry and the overall level of economic activity.

1.3 Field of Finance

The academic discipline of financial management may be viewed in terms of various specialized fields. In each field, financial manager is dealing with the management of money and claims against money. Distinctions arise because different organizations pursue different 'Objective and do not face the same basic set of problems. Hampton recognized five areas of finance:

1. Public Finance

Central, State and local self governments handle large sums of money, which are received from many sources i.e. tax and non tax revenue. These funds are utilized on developmental and non-development expenditures in accordance with a detailed policies programmes and procedures. Government have the authority to a tax an otherwise raise funds, must dispense funds according to legislative and other limitations. Businesses try to make profits, whereas a government attempt to accomplish social or economic objective. As a result of these and other differences, a specialized field of public finance has emerged to deal with governmental financial matters.

2. Securities and Investment Analysis

Purchases of shares, debentures, bonds and other securities involve analysis and techniques that are specialized. An-investor must study the legal and investment characteristic of each type of security, measure the degree of risk involved with each investment, and forecast probable performance in the market. Usually this analysis occurs without the investor having any direct control over the firm or institution represented by the form of security. The field of investment analysis deals with these matters attempt to develop and increase the likely return from the purchase of selected securities.

3. International Finance

When money crosses international boundaries individuals, businesses, and government must deal with special kinds of problems. Each country has its own national currency; thus a citizen of the

United States must convert dollars of French francs before being able to purchase goods or service in Paris. Most governments have imposed restrictions on the exchange of currencies, and these may affect business transactions. The study of flows between individuals and organizations across national borders and the development of methods of handling the flows more efficiently and properly within the scope of international finance.

4. Institutional Finance

A nation's economic structure contains a number of financial institutions, such as banks, insurance companies, pension fund and credit unions. These institutions gather money from individual savers and accumulate sufficient amounts for efficient investment. Without these institutions, funds would not be readily available to finance business transactions, the purchases or private homes and commercial facilities, and the variety of other activities that require substantial amounts of capital. Institutional finance deals with issues of capital formation and the organizations that perform the financing function of the economy.'

5. Financial Management

Individual business face problem dealing the acquisition of funds to carry on their activities and with the determination of optimum method of employing the funds. In a competitive market place, business must actively manage their funds to achieve their goals. Many tools and techniques have been developed to assist financial managers to recommend proper courses of action. These tools help the manager determine which sources offer the lowest cost of funds and which activities will provide the greatest return on invested capital. Financial management is the field of greatest concern to the corporate financial officer and will be the major thrust of the approach we shall use in studying finance.

1.4 Scope of Financial Management

In order to understand the changing role of the financial manager and the evolution of his functions, it is useful to trace the changing role of financial manager. In the early part of this century, corporate finance emerged as a separate field of study. Whereas before it was considered primarily as part of economics and accounting etc. in a modern enterprise, financial manager occupies a key position and is a dynamic member of the top management team. Now he is neither a store keeper maintaining the accurate records, raising funds, analyzing the firm from outsiders' point of view, nor is a staff officer in a passive role of an adviser. He decides the future of the enterprise and is actively involved in the most important decisions of investments, financing and dividends. He must realize that his action have far reaching consequences for the firm, and as a result effects the wealth of the firm. The financial manager, therefore, must have a clear understanding and a strong grasp of the tools, techniques and methods of financial management.

The Traditional Approach

The traditional approach of financial management is confined to record keeping, preparation of reports on the company's status and performance, and managing cash so that the firm can meet its obligations in time. In this role, financial managers were called upon only when the firm run short of- each, the financial manager was responsible for locating and obtaining funds. It is during the major events e.g. promotion, expansion, merger, reorganization etc. In the life of the firm that a financial manager is called upon to rise funds.

In the routine activities, his duty is to check whether the firm has adequate funds to meet its obligations. Because of the central emphasis on procurement of funds, the financial books till the mid 1950's covered discussions on the instruments, institutions and practices through which funds are procured, the traditional approach to finance function found its first ever manifestations though not very systematically in Greene's book written in 1897, mead's Corporation Finance written in 1910 was another academic publications strengthening the traditional style. It covered topics such as profit determinations, promotion, securities flotation consolidations, readjustment and re-organizations. The traditional concept of financial management is represented in the works of Author S. Beqing's. The Financial Policy of corporation and the early editions of Charles W. Gerstenberg's Financial Organization and Management of Business." At its inception around the turn of the century, corporation finance was generally thought as an economic subject why topics such as investment banking, mergers and consolidations and public regulations received the greatest attention, emphasis was also placed on the economic institutions and courses in finance included much descriptive materials on stocks, bonds, security exchanges the rule and generalizations called from practical business experiences.

The traditional concept of finance received its finest expression in the scholarly work of author S. Dewing, a Harward Professor of finance from 1911 to 1933.

Finance during the forties through the early fifties, was dominated by a traditional approach. This approach, which had evolved during the twenties and thirties, was form the point of view of an outsider such as lender and investor analyzing the firm and did not emphasize decisions making within the firm. The study of external financing was still largely descriptive. During this period, however, a greater emphasis on analyzing the cash flows of the firm and not on the planning and control of these flows from within did develop.

In the middle fifties, great interest developed in capital budgeting and allied consideration. Before 1950's the development of traditional approach to finance, its shortcomings were perceived by a number of critics, writing from different points of view. It was attacked for its lack of analytical Content and heavy emphasis on descriptive, materials. It has also been criticized because it seems the problem of finance from the investment banker's point of view rather than finance decision maker and because it over emphasizes the long term financing decisions at the' expenses of short term decisions.

The traditional approach did not go unchallenged even during the period of its dominance. But the criticism related more to its treatment of various topics than the basic definitions of the finance functions. The basic contents of the traditional approach, which form its limitations, may be summarized as follows.

1. The emphasis in the traditional approach is on raising the funds. The subject of finance is treated from investors' point of view. The point of view of financial decision-maker is given no importance. The traditional view, thus, is the outsider-looking in approach.
2. The traditional approach is circumscribed to the episodic financing function. Thus, it places of emphasis on topics of securities and its markets promotion, expansion, merger and consolidation etc.
3. The traditional approach places great emphasis on the long problems and ignores the importance of working capital management. Certain traditional authors initiated discussion on day-to-day financial problems together with the decision on episodic financial events.

These authors include Gerstenberg Lincoln, and others. The topics like sales forecasting, budgeting, financial control, cost control etc, were emphasized by them. However, the shift in financial management became more pronounced with the publication of Hunt and William's book, case Problems in Finance.

4. The proponents of the modern approach criticize the traditional approach on conceptual and analytical grounds. According to them, the most significance lapse of the traditional approach is that it neglects the allocation of capital to different assets, cost of capital, capital structure, etc.
5. The traditional approach gives insignificant attention to the financing problems or non-corporate enterprises. The reasons for the supremacy of the traditional approach till the early fifties of this century are not difficult to find which are as follows:
   i) During this period a large number of mergers and consolidations took place. The result was the floating of the large blocks of all types of securities.
   ii) Depression of the thirties attracted the attention of the academicians as well as practitioners towards the preservation of liquidity and towards bankruptcy, liquidation and reorganization.
   iii) The fraudulent practice of the forms of the misappropriation of the investor funds involved academicians' interest to discuss the subject matter of the finance from the investment bankers' outsiders' point of view.

However, this situation did not continue for a long period. Government imposed control and control and relations over the firm, e.g., Companies Act, 1956. Securities Contract (Regulation) Act, 1956. Capital Issue Act, 1948 Industrial licensing; Policy, Industries Regulation Act. As a result, the management of the firms have to disclose, the financial information' for the purpose of analysis and comparison.

The Modern Approach

The traditional approach, with its emphasis on the episodic financing and lack of sounds theoretical underpinnings, out lived its utility in the changed business situation since the mid-1950s. The development of a strong corporate sector, technological improvements, widened marketing operations, persistent inflation, increased national concern with environment, a keen and healthy business competition, energy and social issues, government regulations on companies, and growing importance of international relations made it imperative for the management of the firm to optimize the use of its resources for its continued survival. The development of an efficient information system, planning and control-tools, performance evaluation techniques and the growth of the special managerial skills paved way to formalize a system of using and allocating the scarce resources most effectively and efficiently. As a result, the approach to and scope of financial management changed. The emphasis shifted from episodic financial to the managerial financial problem. The new approach is embedded with sound' conceptual and analytical theories.

The new or modern approach is an analytical way of looking into the financial problems of the firm. Financial management is considered a vital and an integral part of overall management. The financial policy is the wise use of funds, and the central process involved is a rational matching of advantages of potential uses against the cost of alternative potential sources so as to achieve the

broad financial goals which an enterprise sets for itself. Thus, in a modem enterprise, the basic financial function is to decide about the expenditure decisions and to determine the demand for capital for funds. However, the allocation of funds is not a new problem. It did exist in the past, but was not considered important in achieving the firm's long run objectives.

The aforementioned factors have required considerable flexibility in order to cope with changing, situations. The "Old ways of doing things" simply is not good enough in a world in which old ways become absolutely quickly. We may conveniently discuss the main developments in the recent period as under.

1. What steps can be taken to increase the value of the firm?
2. Which new proposals for employing capital should be accepted by the firm?
3. How much working capital will be needed to support the company operations?
4. Where should the firm go to raise long term funds and how much will it cost?
5. Should the firm declare dividends on share capital, if yes, then how much dividend should be declared and in what form?

In fact, these questions relate to three broad decision areas of financial management, viz…, the investment decision (including capital budgeting and working capital management), the financing decisions and the dividend decision, These financial decisions directly concern firm's decision to acquire or dispose assets, and requires the commitment or recommitment of funds. Firm's investment, financing and dividend decisions influence on production, marketing and other functions and affect the size, growth, risk and profitability of the firm." The function of financial management is to review and control decisions to commit or recommit funds to new or on going uses. Thus, in addition to raising funds financial management is directly concerned with production, marketing and other 'functions within an enterprise whenever decisions are made about the acquisition or destruction of assets." Thus, although the financial manager has to perform his traditional function of raising funds but his greater concern will be determining the size the technology, in setting the best asset mix, and obtaining the optimum financing mix. The new approach to financial management, which stresses the acquisition and wise use of funds, should be broadened to include profit planning functions also. The terms profit planning refers to the operating decisions made by the executive in the areas of pricing, volume of output, and the firm's selection of product lines, Profit planning is, therefore, a perquisite for optimizing investment and financing decisions.

Relationship with Other Activities

The important functional areas of business firm, namely, production, marketing, finance and personnel are related with each other. The firm raises funds from various sources for financing fixed assets, current assets and in tangible assets (financing activity). The firm generated returns from these investment with the help of production, marketing and personnel activities. All business transaction involves funds directly or indirectly. Thus, finance is closely linked with all activities a that takes place in the business for example, buying an new machine or replacing the old machine for increasing the production capacity, involves outflow of funds. The loose of tight credit policy, sales promotion policies, etc. affect the flow of funds' which are concerned with the marketing department. Similarly, recruitment,

promotions, training, wages fixation, other benefits given to employee etc., Whose financial position is tight cannot afford to follow a liberal credit policy rather giving cash discount to the customer is better.

According to Gitthman and Dongall, “Problems of finance are intimately connected with problems of purchasing production and marketing”. The subjects of finance are interrelated with fields of law and accounting also. As a company is an artificial person created by law, having a perpetual entity with common seal. Its activities are subject to legal restrictions. Any financial decision relating to financial policy must take into consideration its legality. The various statements, prepared by the accountant like statement of income and expenditure, statement of assets and “liabilities, director’s report, author’s report, funds flow statement cash flow statements etc, helps the management in preparing the budgets and future course of action. This master budget helps in coordinating the activities of the various department. Hunt, William and Donaldson expressed the same opinion.

Probably no other functional areas of business are so intimately, interrelated with other areas of business as is the finance function. The successful financial man (manager) in business must be not only a money man; he must be a businessman of wide angled vision.”

From the close nexus of finance with other activities like production, marketing and personnel etc., we should not derive a influence that all activities performed in the business are finance activities. Because of the specialization, complexities and technological advancements in the various activities of business every business activities of business, every business activity is equally important. It is a system, where various activities are interrelated and interact with each other.

1.5 Functions of Financial Management

The functions of financial management can be grouped into three financiaI decisions; the investment decision, the financing decision and the dividend decision. Each must be considered in relation to the objective of the firm, and optimal combination of the three decisions will maximize the wealth of the share holders. As all the decisions are interrelated, we must consider their joint impact on the market price of the firm’s stock.

Investment Decisions

The investment decisions perhaps are the most important of the three decisions. Capital budgeting a major aspect of this decision is the allocation of capital to investment proposals whose benefits are to be realized in future. Because the future, benefits are not known with ‘certainty, investment proposals necessarily involve risk. Consequently, they should be evaluated in terms of both expected future return and the incremental risk they add to the firm as a whole. These are the factors that affect the firm’s valuations in the market place. Besides a decision to commit funds on the investment proposal capital budgeting helps in deciding the recommitment of funds when an old asset become unprofitable.

The other major aspect of the capital budgeting theory relates to the selection of a cut of or hurdle rate against which the expected returns of new investment proposals can be compared. There is a broad agreement about how cost of capital should be computed, but large number of problems, crop p when we compute cost of capital from the available data.

In additions to selecting a new investment opportunity a firm must manager its existing asset, efficiently. The financial manager is charged with varying degrees of operational responsibilities.

Investment in current assets effect firm's liquidity, Profitability and risk. A conflict exists between liquidity and profitably. If firm has excess liquidity then a portion of it will be unutilized and will reduce the profitability and Vice-Versa. If inadequate liquidity now it may become illiquid and may not meet its obligation in time reduced credit worthiness, goodwill etc. there are chances of technical insolvency. Thus a roper trade off must be achieved in liquidity and profitability. In order to ensure this, a financial manager should develop sound techniques of managing current assets such as cash receivable and inventory. He should estimate firms' working capital needs and make sure that funds would be made available when needed.

We consider mergers and acquisitions from the stand point of an investment decision. There external investment opportunities can be evaluated in the same general manner on investment proposal that is generated internally. Also, consolidations, failures are reorganization, which involved decision to liquidate a campaign or to rehabilitate it often by changing its capital structure.

Financing Decisions

The second major decision of the firm is the financing decision. Here, the financial manager is concerned with determining the best financing mix or capital structure of his firm. The financial manager must assess the financial requirements for fired assets, current assets and intangible assets, fixed working capital, variable working capital and intangible assets. Sources can be categorized into long term and short term or internal and external. Thirdly, financial manager of a company has to determine best capital mix. A company can change its valuation simply by varying its capital structure, an optimal capital structure financing would exist where market price per share is maximized. The financing decision should take into account the firm's present and expected future portfolio of assets, for they determine the business risk complexion of the firm as perceived by investors. In turn, perceived business risk affects explicit costs of the various methods of the financing. The central issue before him is to determine the proportion of ownership and creditorship securities in capital structure. Use of creditor ship securities effects the expected returns and financial risk. The return on equity increase with debt capital and also financial risk. Again financial manager has to struck a balance in financial risk and return and examine the various methods by which" a firm goes to the market for raising the long term funds that comprises its capital structure. He has to study the managerial aspects of financing features, concepts and problems associated with alternative methods of financing.

Dividend Decisions

The third important decision of the firm is its dividend policy. The financial manager must decide how much to pay in the form of dividends and how much to retain or distribute all the profits. The dividend payment ratio must be evaluated in the light of the objective of the firm. If investors at margin are not indifferent in the current dividends and capital gains, there will be an optional dividend payment ratio that maximize shareholders wealth. The value of dividend to investors must be balanced against the opportunity cost of retained earnings just as a means of equity financing. Further a financial manager has to consider the preferences of share holders, financial needs of the company, factors and constraints affecting the dividends cash or stock dividends.

Financial management involves the solution of the three decisions of the firm as stated above. These three decisions determine the value of the firm to its shareholders. The firm should strive for an

optimal combination of the three decisions which maximize the shareholders' wealth. Because these are interrelated, they should be solved jointly.

These decisions affect the firm's value through their impact on return-risk character. Almost all financial decisions involve some sort of risk-return trade off. The more risk the firm is willing to assume, the higher the expected return from a given course of action. For example, in the area of working capital management, the less inventory held in hand, the higher the expected return' (since less of the firm's asset are involved in non-income producing functions) but also the greater risk of running out of stock. Similarly, in the other decisions i.e. management of long term assets and financial structure, a manager has to access the risk return trade off available and incorporating this into wealth maximization frame work. This character, in turn, determines, the value that' investors hold regarding returns on their investments. Because these returns are not known with certainty, risk is involved. Financial, manager has to strive a balance in risk return. Theoretically, the most appropriate and most efficient way to consider the joint effect of three decisions is through stock valuation model. It can be represented mathematically.

$V = f(I.F.D) = g\ (r.o)$

Where – V = Value of the firm

I = Investment decision

F = Financing Decision

D = Dividend decision

r = Expected returns of share holders

o = Standard deviation of expected return

In Order to maximize share price we would vary I, F and D jointly to maximize V through r and o. In this equation it is important to recognize that a firm does not influence share price directly through investments financing and dividend policies. Rather share price is determined by the investors who use

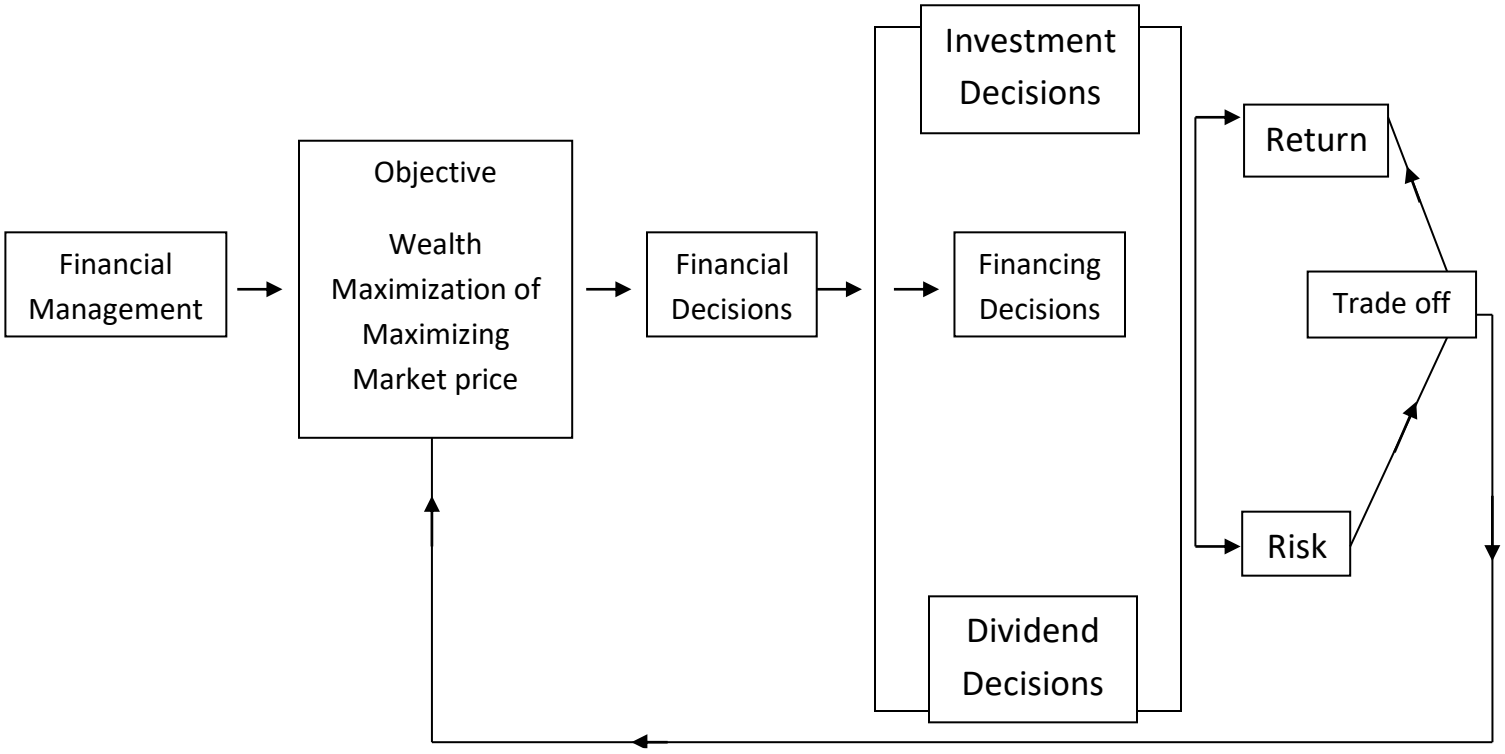

Fig. 1

information with respect to these policies to determine the risk return character of the firm and should be constantly monitored to assure safety and proper utilization of funds.

1.6 Objectives of Financial Management

Financial management is concerned with procurement and use of funds. Its main aim is to use business funds in such a way that the firm's value / earnings are maximized. It is the duty of the top management to lay down the objectives or goals which are to be achieved by the business. Objectives provide a framework within which various decisions relating to investment, financing and dividend are to be taken. In other words, objectives lay down a criterion by which the efficiency and profitability of a particular decision is evaluated. The choice of such a criterion lies between profit maximization and wealth maximization. Hence, there are two approaches in this regard:

1. Profit Maximization, and
2. Wealth Maximization.

1. Profit Maximization. Profit earning is the main aim of every economic activity. According to this approach, all activities which increase profits should be undertaken and which decrease profits should be avoided. Profit maximization implies that the financial decision making should be guided by only one test, which is, select those assets, projects and decisions which are profitable and reject those which are not. A business being an economic institution must earn profit to cover its costs and provide funds for growth. No business can survive without earning profit. Profit is a measure of efficiency of a business enterprise. Profits also serve as a protection against risks which cannot be ensured. Thus, profit maximization is considered as the main objective of business. The following arguments are advanced in favour of profit maximization as the objective of business:

1. When profit-earning is the aim of business then profit maximization should be the obvious objective.
2. Profitability is a barometer for measuring efficiency and economic prosperity of a business enterprise
3. Economic and business conditions do not remain same at all times. There may be adverse business conditions like recession, depression, severe competition etc. A business will be able to survive under unfavorable situation, only if it has some past earnings to rely upon. Therefore, a business should try to earn more and more when situation is favorable.
4. Profits are the main sources of finance for the growth of a business. So, a business should aim at maximization of profits for enabling its growth and development.
5. Profitability is essential for fulfilling social goals also. A firm by pursuing the objective of profit maximization also maximizes socio-economic welfare.

However, profit maximization objective has been criticized on many grounds. They are:

1. A firm pursuing the objective of profit maximization starts exploiting workers and the consumers.
2. It is also argued that profit maximization should be the objective in the conditions of perfect competition and in the wake of imperfect competition today, it cannot be the legitimate objective of a firm

3. Profit maximization as an objective of financial management has been considered inadequate. Even as an operational criterion for maximizing owner's economic welfare, profit maximization has been rejected because of the following drawbacks;
   - The term 'profit' is vague and it cannot be precisely defined. It means different things for different people. Should we consider short-term profits or long-term profits? Does it mean total profits or earnings per share? Even if, we take the meaning of profits as earnings per share and maximize the earnings per share, it does not necessarily mean increase in the market value of share and the owner's economic welfare.
   - Profit maximization objective ignores the time value of money and does not consider the magnitude and timing of earnings. It treats all earnings as equal when they occur in different periods. It ignores the fact that cash received today is more important than the same amount of cash received after, three years.
   - It does not take into consideration the risk of the prospective earnings stream. Some projects are more risky than other.
   - The effect of dividend policy on the market price of shares is also not considered in the objective of profit maximization.

2. Wealth Maximization.

This approach is now universally accepted as an appropriate criterion for making financial decisions as it removes all the limitations of profit maximization approach. It is also known as net present value maximization approach. According to this approach the worth of an asset is measured in terms of benefits received from its use less the cost of its acquisition. Benefits are measured in terms of cash flows received from its use rather than accounting profits which was the basis of measurement of benefits in profit maximization approach. Measuring benefits in terms of cash flow avoids the ambiguity in respect of the meaning of the term profit. The second important feature of the wealth maximization criterion is that it considers both quantity and quality dimensions of benefits. At the same time, it also incorporates the time value of money. While measuring the value of future cash flows an allowance is made for time and risk factors by discharging or reducing the cash flows by a certain percentage known as discount rate.

The difference between the present value of future cash inflows generated by an asset and its cost is known as net present value (NPV). A financial action known as an asset or a project which has a positive NPV creates wealth for shareholders and, therefore, undertaken. On the other hand, a financial action resulting in negative NPV should be rejected since it would reduce shareholder's wealth. Hence, the shareholder's wealth will be maximized if this criterion is followed in making financial decision.

The NPV can be calculated with the help of the following formula:

$$W = \frac{A_1}{(1+K)} + \frac{A_2}{(1+K)} + \frac{A_n}{(1+K)^n} \quad \text{---C}$$

Where W = Net Present Worth

A_1, A_2 ------A_n = Stream of cash flows expected to occur from a course of action over a period of time.

K = Appropriate discount rate to measure risk and time.

C = Initial outlay to acquire an asset or pursue a course of action.

Wealth maximization is the appropriate objective of an enterprise. When the firm maximizes the stockholder's wealth, the individual stockholder can use this wealth to maximize his individual utility. It means that by maximizing stockholder's wealth the firm is operating consistently towards maximizing stockholder's utility.

A stockholder's current wealth in the firm is the product of the number of shares owned, multiplied with the current stock price per share.

This objective helps in increasing the value of shares in the market. The share's market price serves as a performance index or report card of its progress. It also indicates how well management is doing on behalf of the shareholder.

However, the maximization of the market price of the shares should be in the long run. Every financial decision should be based on cost-benefit analysis. If the benefit is more than the cost, the decision will help in maximizing the wealth.

Criticism of Wealth Maximization. The wealth maximization objective has also been criticized by certain financial theorists mainly on following accounts;

It is a prescriptive idea. The objective is not descriptive of what the firms actually do.

1. The objective of wealth maximization is not necessarily socially desirable.
2. There is some controversy as to whether the objective is to maximize the stockholders wealth or the wealth of the firm which includes other financial claimholders such as debenture holders, preferred stockholders, etc.,
3. The objective of wealth maximization may also face difficulties when ownership and management are separated as is the case in most of the large corporate form of organizations.

In spite of all the criticism, we are of the opinion that wealth maximization is the most appropriate objective of a firm and the side costs in the form of conflicts between the stockholders and debenture holders, firm and society and stock holders and managers can be minimized.

1.7 Organization of Finance Functions

The individuals in charge of the finance function of large companies are located on the same scalar level as the managers of production, personnel and marketing and report directly to the top management. Weston, in his survey revealed that in most of the organization, the finance manager reports to the president or board of directors. Top management should be very much concerned with the structure of finance department. As much of the fate depends upon the information provided by this department. If some financial information is missing or inaccurate, serious problem may not be detected in time for corrective action or for deciding the course of action. The roles of different finance personnel should be clearly defined to avoid conflicts and overlapping of responsibilities. Thus it is essential to develop a sound and efficient organization for finance functions. The ultimate responsibility of carrying out finance functions lies on top management. Thus, board of directors or financial committee directly

control the financial activities and decide the financial policy of the company. The powers are delegated to the lower staff for routine matters.

Financial decisions are crucial for the survival of the firm. The growth and development of the firm depends upon the financial policies and strategies. Further the financial decisions determine solvency of the firm at no cost a firm can afford to threaten its solvency. Solvency of a firm depends upon the flow of funds in an organization which is a result of various financing decisions.

Finance Department is generally centralized because' it provides a number of economies to the firm. The organization structure of finance department differ from firm to firm. It depends upon the size of the firm, financial requirement for fixed and working capital, nature of the business, capabilities of the personnel working in finance department and financial philosophy of the firm.

The financial requirements of a firm depends upon the nature of the business, size of the business and growth. Manufacturing firms invest a major proportion of the funds on acquiring fixed assets need for production. These firms require' detailed accounting of raw material, work in progress and finished goods. Trading and service rendering concerns have limited concern with financing of production activities. They are more interested in developing a financial system to handle collection from customers, customer credit worthiness, time spent with each customer and services provided, handling cash discount and terms of sales for prompt payment. These needs help in determining the organizational structure of 'the Finance Department.

The training skills and natural abilities of personnel working on financial problems have an important influence on the structure of finance function. If the firm has several highly capable financial managers, they may work in structures that utilize their talents to the fullest extent possible. If the managers are less capable the firm may choose an organization that places less stress on individual personalities.

Some firms make extensive use of computer in record handling whereas other firms employ mechanical system. Some firms do limited long term planning others make extensive use of financial data to forecast condition and decide their long term policies. These considerations effect the organization structure of the finance department.

The variety of designations is used for financial managers. There is no complete unanimity on this, some firms designate as vice-president finance while others directors or finance or financial controller. He is responsible for all financial activities. Two more financial officers may be appointed under his direct supervision. Who assist him in two functional area i.e. assets management and funds management. The functions relating to the funds management comes under the scope of the Controller. In this way finance department is headed by Chief Financial Officer or financial manager or director of finance or vice-president finance or financial controller.

1.8 Functions of Financial Manager, Treasurer and Controller

1. Functions of Chief Financial Officer

The chief financial' officer or director of finance or financial manager reports directly to the managing director or board of directors. In many cases a firm has a finance committee consisting of member of top management. In such a situation the chief financial officer will be a member of that committee. The chief financial officer has both line and staff responsibility. Bacon and Francis

conducted a study on Duties and Problems of Chief Financial Executive and listed the most important-functions performed by them are:-

1. Administration of funds
2. Planning and Controlling Business Operations
3. Acquisition of funds
4. Accounting
5. Protection of assets
6. Tax administration
7. Investor relation
8. Consultation
9. Analysis of acquisitions
10. Government reporting
11. Appraisal of economic outlook
12. Management of the company's financial organization

The Chief financial officer works closely with of the members of the top management team relating to aforementioned financial activities. He also supervises a staff including the treasurer and controller.

2. Functions of Treasurer

Treasurer is responsible for the management of funds. The detailed functions of treasurer are:-

1. Financial Planning

a. Reporting financial results to the officers of the company.
b. Planning the company's investment programme.
c. Planning borrowing requirements.
d. Forecasting cash receipts and disbursements.
e. Advice on dividend policy.

2. Cash Management

a. Opening account and depositing funds in banks.
b. Management of petty cash and bank balance.
c. Payment of company's obligations through proper, disbursement procedure.
d. Maintaining records of cash transactions.

3. Credit Management

a. Determination of Customer's credit risk.
b. Orderly handling of collection.
c. Handling cash discounts and terms of Sale for prompt payment.

4. Security Function

a. Recommendation of type of security most desirable for company.

b. Negotiation with investment bankers.
c. Provision for trustee, registration of transfer agent.
d. Compliance with Government regulations.
e. Retirement of debenture and preferred stock.
f. Shareholder relations, disbursement of dividend etc.
g. Signing of cheques, lease, share and debenture certificates, mortgages, deeds etc.

3. Functions of Controller

The functions relating to management and control of assets comes under the preview of controller. The detailed functions usually assigned to the controller are:-

1. Providing basic information for managerial control through formulation of accounting and costing policies, standards, and procedures, preparation of financial; statements and maintenance of books of account, direction of internal auditing and cost controls.
2. Budgeting and control of corporations and results.
3. Specific activities
   a) General Accounts, primary and subsidiary accounts, devising checks on the company's finance and safeguarding its assets, checking invoices and accounts receivable and payable, controlling cash payment and receipts, payroll accounts, fringe benefits, plant and equipment records cost, accounting activities of the various management functions.
   b) Preparation and interpretation of regular financial reports and statements,
   c) Inventory control
   d) Statistics
   e) Taxes
4. Internal Audits
5. Interpretation of control data.

Distinction between the Functions of the Controller and Treasurer

The controller is the Chief accounting officer and usually an accountant who gathered data, prepare management reports, and monitored the accounting functions of the firm. The treasurer is the Chief Financial Officer with 'responsibilities in the area of funds management. Both the positions are concerned with financial matters. Hampton suggested, it is better to distinguish the two position as the manager of funds (liability side of balance sheet) i.e. treasurer and manager of assets (asset side of balance sheet) i.e. controller.

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Figure 2

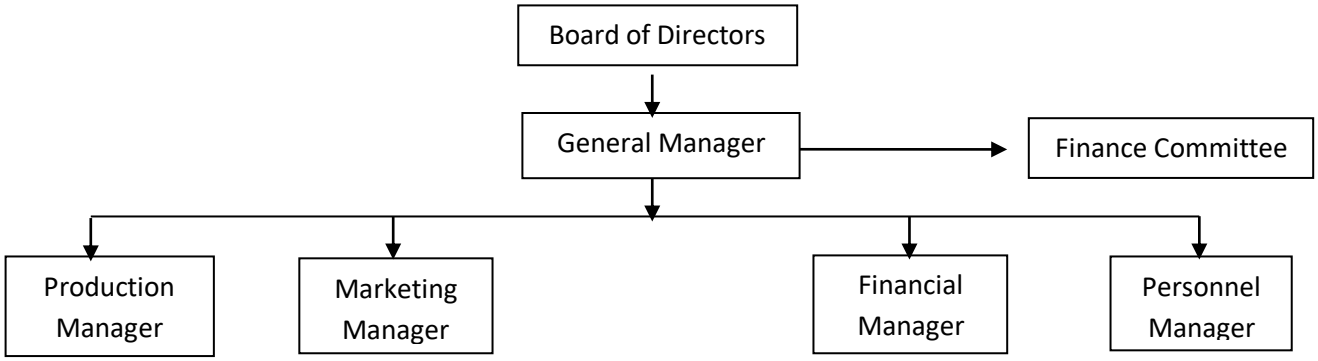
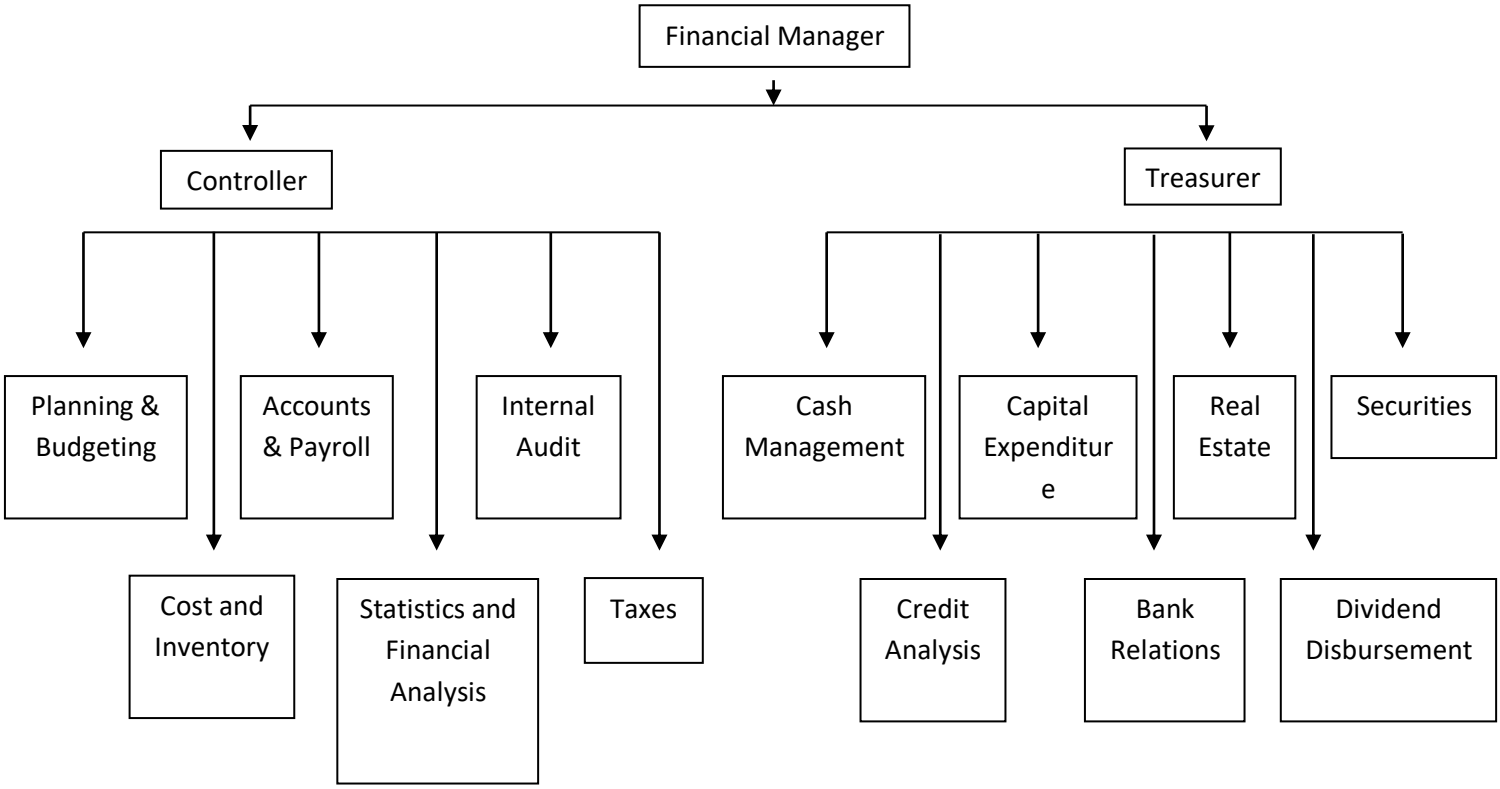


Fig. 3 Organization Structure of a firm



The American pattern of classifying the finance department into controllership and treasurer ship is not followed in India. in India, some companies have the officers with a designation of Controller of Financial Controller, performing the functions of a chief accountant or management accountant. Some of the duties of controller are performed by the company secretary in India. Some companies have a separate economic and statistical and internal audit sections. These can be brought under the control of controller. Financial controller does not control finances, he collects, tabulate and interpret the accounting information needed by the top management for decision purpose

In India, the designation 'of Treasurer is not popular to that extent the controller has. Some functions of the treasurer are again performed by the company secretary. Thus there is a lot of difference in the duties/functions discharged by these officers in India and America.

Self Assessment

Fill in the blanks:

1. In the earlier years, financial management was treated synonymously with the _____.
2. Financial management broader scope includes efficient use of resources in addition to the _____.
3 _____ profit margin is obtained by deducting cost of goods sold from net sales.
4. There is a _____relationship between risk and profit.
5 _____is also known as Value maximization or Net Present Worth maximization.
6. A firm with a stakeholder focus, consciously avoids actions that would prove _____to stakeholders.
7. Financial management can be divided into three major decisions which are investing; Financing; and _____decision.
8. Identification of sources of finance and determination of financing mix is a part of _____decision.
9. Finance is defined as the _____of an organization.
10. _____decisions determine both the mix and the type of assets held by the firm.
11. In the area of financing, funds are procured from _____sources as well as _____ sources.

1.9 Summary:

Financial management holds essence as it has an impact on all the activities of a firm. Its primary responsibility is to discharge the finance function successfully and also touches on all the other business functions. Financial management may be considered to be the management of the finance function.

1.10 Glossary

1. **Financial Management:** It is the operational activity of a business that is responsible for obtaining and effectively utilizing the funds necessary for efficient operations.

2. **Corporate Finance**: Corporate finance is the activity concerned with planning, raising, controlling and administering of the funds used in the business.
3. **Dividend:** Dividend is a part of profits that are available for distribution to shareholders.
4. **Financing Decision**: It is related to the financing mix or capital structure or leverage and the determination of the proportion of debt and equity.
5. **Investment Decision**: Investment decision is related with the selection of assets that a firm will invert.
6. **Wealth Maximization:** It is maximizing the present value of a course of action (i.e. NPV = GPC of benefits—Investment)

1.11 Answers: Self Assessment

1. Raising of funds
2. Procurement of funds
3. Gross
4. Direct
5. Wealth maximization
6. Detrimental
7. Dividend
8. Financing
9. Lifeblood
10. Investment
11. Long-term, short-term

1.12 Terminal Questions:

1. State the objectives of Financial Management.
2. Discuss the scope of Financial Management.
3. What role should the financial manager play in a modern enterprise?

1.13 Suggested Readings:

I.M. Pandey, Financial Management, Vikas Publishing New Delhi.

James C. Van Horne Financial Management and Policy Prentice Hall, New Delhi.

M.Y. Khan and P.K. Jain, Financial Management, Tata McGraw Hill, New Delhi.

Prasanna Chandra, Financial Management, Tata McGrew Hill, New Delhi.

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Lesson-2

FINANCIAL PLANNING

Structure:

2.0 Learning Objectives

After studying the lesson, you should be able to:

- Understand the concept of financial planning and financial forecasting.
- Explain the components of a financial plan.
- Discuss the financial planning process.
- Discuss the techniques of financial forecasting.

2.1 Introduction:

One of the most important functions of the financial manager is that of planning. Strategic planning at its most basic is identifying goals and developing a process to best meet those goals. This seemingly simple process can not only help organizations better utilize their resources, but can improve efficiency and accountability.

Once developed, a strategic plan guides the effective allocation of resources and provides a framework for decision making, helping ensure that organizational resources are allocated appropriately so that strategic goals and objectives are met. This is particularly important when resources are scarce and choices have to be made among competing priorities.

There are many approaches to the strategic planning process. However, regardless of the approaches, a strategic plan will help an entity develop goals, objectives and actions.

- A goal is a broad statement of what will be achieved.
- An objective is specific and result in measurable outcomes.
- An action is work performed in order to achieve each objective.

Effective strategic planning requires the active participation of key organizational stakeholders, both internal and external. Participants should include the governing body, administrators, employees, community leaders, and individuals served by the organization.

Finally, strategic planning and budgeting should work hand in hand. In order to successfully implement a strategic plan, proper funding is needed to make the priorities you have established a reality.

A useful strategic plan should exhibit the following characteristics:

1. A set of priorities

Setting priorities allows for the plan to be adjusted according to changing needs and resources.

2. Achievable, measurable and time sensitive.

Remember, it's better to do a few things well than many things poorly. The plan should contain goals that are measurable and have deadliness.

3. Flexible and responsive to changing conditions

The plan is a road map that may contain unforeseen detours such as an unexpected crisis new opportunities or changes in resources.

4. Short and simple

Plans that are more like a book will sit on a shelf. Keep if focused on the most important things to accomplish.

5. A unit, not a menu

A useful plan is not a wish book. Everything in the plan needs to be accomplished.

6. The means to an end, not an end in itself

The plan is the process by which it reaches its destination; it is not the destination.

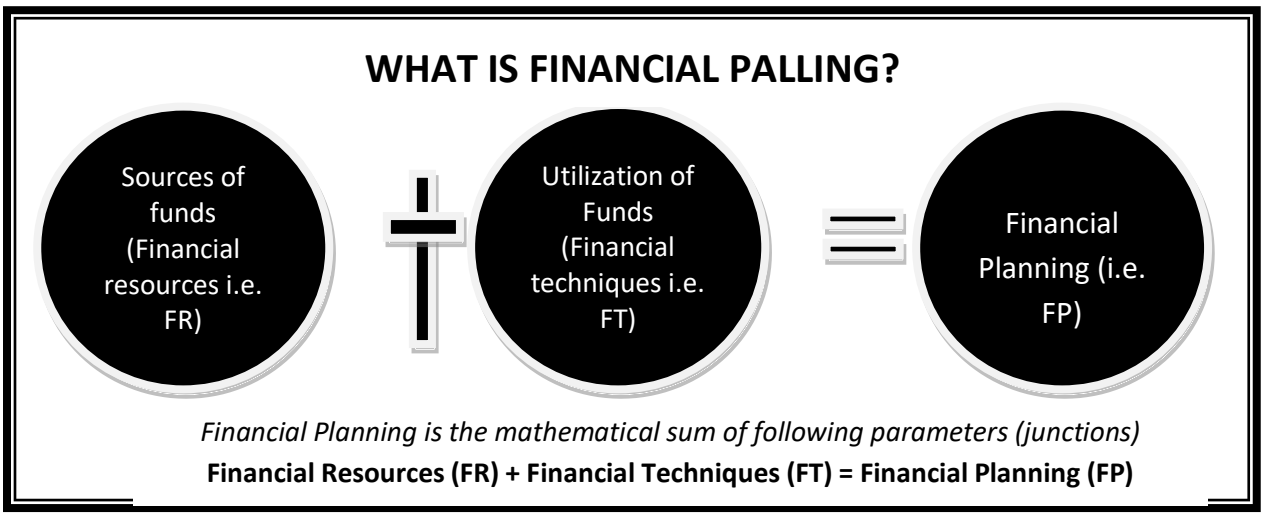
7. Based on a three- to five-year period

The strategic plan should be a living document that has a one-year drop off and a new year added so that it always covers the same time period.

2.2 Financial Planning

Financial planning means to prepare the financial plan. A financial plan is also called plan.

A financial plan is an estimate of the total capital requirements of the company. It selects the most economical sources of finance. It also tells us how to use this finance profitable. Financial plan gives a total picture of the future financial activities of the company.



Financial Planning is the mathematical sum of following parameters: Financial Resources (FR) + Financial Techniques (FT) = Financial Planning. A financial plan contains answers to the following Questions:

How much finance (short-term, medium-term and long-term) will be required by the y?

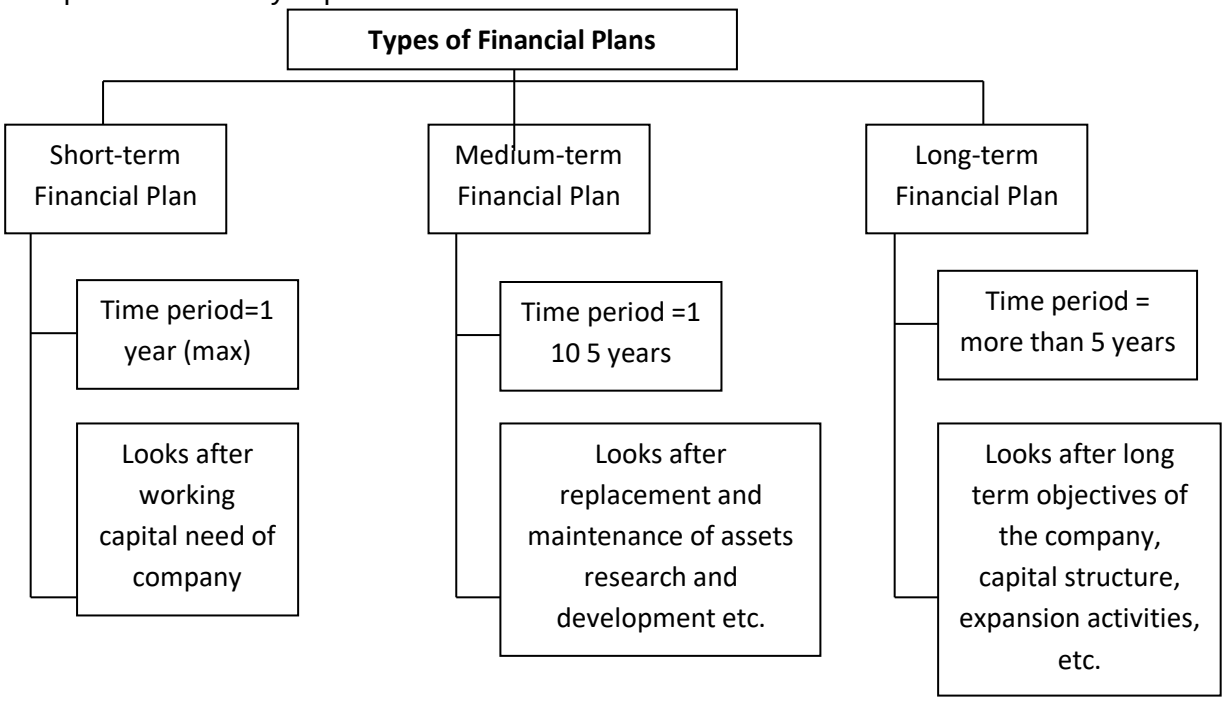
Form where this finance will be acquired (gathered)? In other words, what are the sources of finance? That is owned capital (promoter contribution, share capital) and borrowed capital (debentures, loans, overdrafts, etc.)

How the company will use this acquired finance? That is, application or utilization of funds.

Financial plan is generally prepared during promotion stage. It is prepared by the Promoters (entrepreneurs) with the help of experienced (practicing) professional. The promoters must be very careful while preparing the financial plan. This is because a bad financial bad financial plan will lead to over-capitalization or under capitalization. It is very difficult to correct a bad financial plan. Hence immense care must be taken while preparing a financial plan.

2.3 Types of Financial Plans:

After company starts, the finance manager does the financial planning. The types of financial plans are depicted and briefly explained below:



There are three types of financial plans, viz.

Short-term financial plan is prepared for maximum one year. This plan looks after the working capital needs of the company.

Medium-term financial plan is prepared for a period of one to five years. This plan looks after replacement and maintenance of assets, research and development, etc.

Long-term financial plan is prepared for a period of more than five years. It looks after the long-term financial objectives of the company, its capital structure, expansion activities, etc.

2.4 Objectives of Financial Planning

Financial Planning has got many objectives to look forward to:

a. Determining capital requirement- This will depend upon factors like cost of current and fixed assets, promotional expenses and long- range planning. Capital requirements have to be looked with both aspects: short-term and long-term requirements.
b. Determining capital structure- The capital structure is the composition of capital, i.e., the relative kind and proportion of capital required in the business. This includes decisions of debt-equity ratio- both short-term and long- term.
c. Framing financial policies with regards to cash control, lending, borrowings, etc.
d. A finance manager ensures that the scarce financial resources are maximally utilized in the best possible manner at least cost in order to get maximum returns on investment.

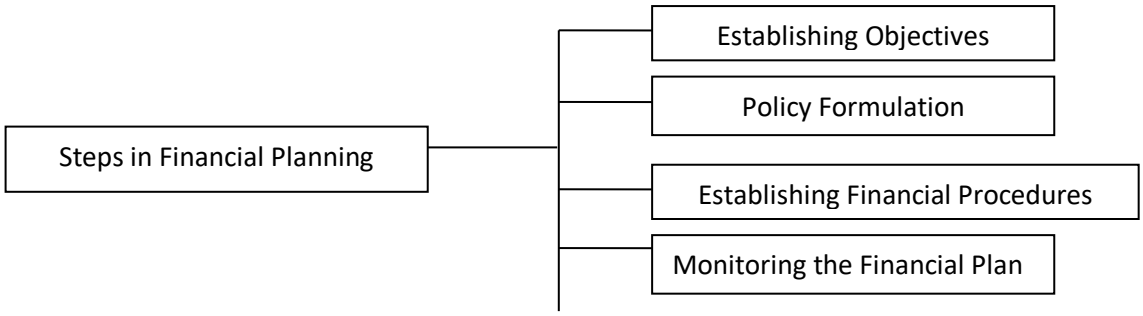
2.5 Importance of Financial Planning

Financial Planning is process of framing objectives, policies, procedures, programmes and budgets regarding the financial activities of a concern. This ensures effective and adequate financial and investment policies. The importance can be outlined as-

1. Adequate funds have to be ensured.
2. Financial Planning helps in ensuring a reasonable balance between outflow and inflow of funds so that stability is maintained
3. Financial Planning ensures that the suppliers of funds are easily investing in companies which exercise financial planning.
4. Financial Planning helps in making growth and expansion programmes which helps in long-run survival of the company.
5. Financial Planning reduces uncertainties with regards to changing market trends which can be faced easily through enough funds.
6. Financial Planning helps in reducing the uncertainties which can be a hindrance to growth of the company. This helps in ensuring stability and profitability in concern.

2.6 Steps in Financial Planning:

The following are the steps in financial planning



1. **Establishing Objectives:** Financial planning starts with the establishment of financial goal/objectives for the overall firm and the various departments like cost reduction, increasing market share by 10 percent and so on. Financial planners should establish both short-term and long sum objectives. The long-run goal of any firm is to use capital in the correct proportion.

2. **Policy Formulation:** Financial policies are guidelines to all actions which deal with procuring, administering and disbursing the funds of business firms. These policies may be classified into several broad categories.

Some of them are given below:-

i) Policies governing the amount of capital required for firms to achieve their financial objectives.

ii) Policies which determine the control by the parties who furnish the capital.

iii) Policies which guide the management in the selection of sources of funds.

3. Establishing Financial Procedures: Once the plan is implemented, the firm needs to review and monitor the progress. Both online monitoring and post-activity monitoring are beneficial to control any deviations.

Tools of Financial Planning: Financial Planning includes various tools which can be used for financial analysis; some of them are as following:

- **Financial Statements:** Financial statements such as the forecasted balance sheet, the statement of income and the cash flow statement assist in the financial planning of a firm.
- **Ratio Analysis:** This tool helps investors, analysts and management to evaluate the business performance and compare it with its competitors.
- **Cost-Volume-Profit (CVP) Analysis:** It establishes the relationship among the cost incurred, volume produced and profits generated by the firm.
- **Budgeting:** It involves forecasting future fund requirement for different activities of the firm. This helps the fund raising process of the firm.

2.7 Financial Forecasting:

The science of financial forecasting is becoming increasingly important as a tool for appraising the real worth of a growing concern. It helps in arriving at the implications of what is contained in the statements themselves. An analysis of the several tools of financial forecasting provides an important basis for evaluating securities and appraising managerial programmes.

2.8 Advantages of Financial Forecasting:

Forecasting is a key components in determining future operations, problems, and opportunities. Good financial forecasts benefit governments by enabling various decisions:

(i) It enables the management to know how much and how long funds are required.

(ii) It indicates to the management the resources which are needed.

(iii) It ensures a method of control by which a corrective action can be taken in time.

(iv) Identify the key variables that cause changes in the level of revenue and expenditures.

(v) It enables the management to co-ordinate preliminary performance for sales and production.

(vi) It enables the management to gather necessary information for the formulation of plan.

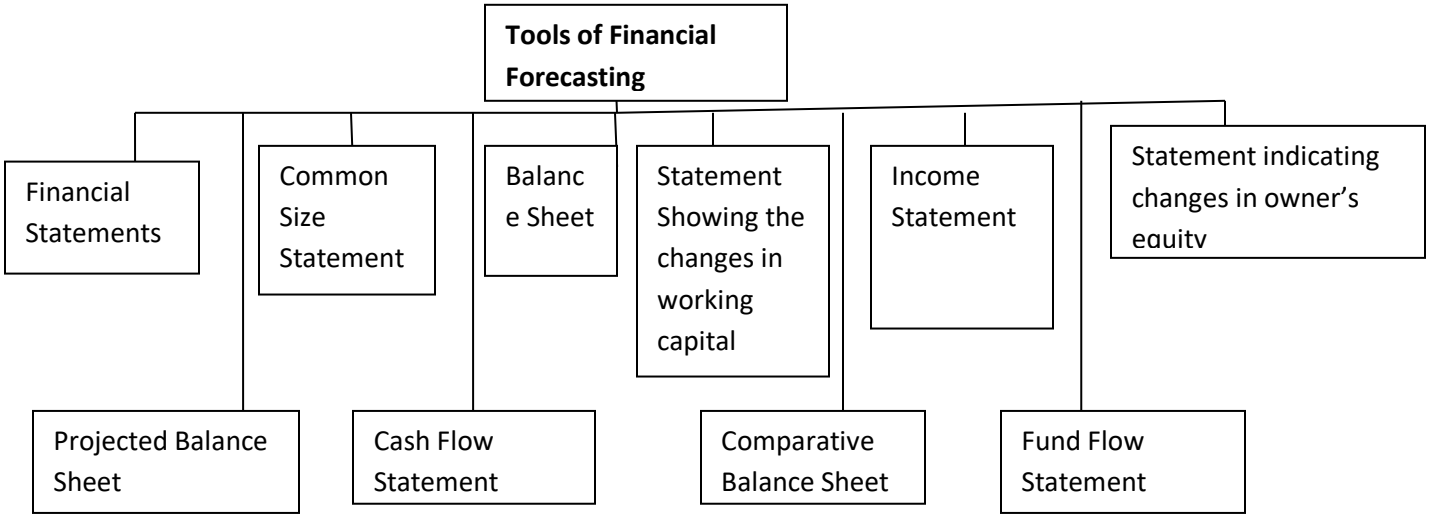
(vii) It enables the management to evaluate plans in financial terms.

(viii) A financial forecasting and analysis is useful in the following managerial decisions:

- (a) Pricing and Product selection Problems;
- (b) Selection of sales methods;
- (c) Property, plant and equipment decisions;
- (d) Selection of Manufacturing methods;
- (e) Maximizing Profits;
- (f) Maximizing rate of return on investment;
- (g) Maximizing profits and minimizing total cost.

2.9 Tools of Financial Forecasting

There are various tools of financial forecasting.



Financial Statements Forecast:

Financial statement plays a vital role in the strategically internal financial control of an enterprise. These should, therefore, be properly constructed, analyzed and interpreted by responsible people including executives, bankers, creditors and investors. Financial statements include data emerging from:

- Recorded facts of business transactions;
- Conventions adopted to facilitate accounting techniques;
- Assumptions for supplementary conventional procedures; and
- Personnel judgements for supporting the application of conventions and assumptions.

Balance Sheet:

A balance sheet is a basic financial statement. It presents data on a company's financial condition on a particular date, based on the conventions and generally accepted principles of accounting. It is prepared at regular intervals and shows what a business enterprise owns and what it owes.

Income Statement:

The results of operations of a business for a period of time are presented in the income statement. By comparing the income statements for successive periods, it is possible to observe the progress of a business.

Projected Balance Sheet:

Internal financial control is necessary for the formulation of a financial plan. Items on the balance sheets are projected forward to a series of future dates. Generally, projected sales are used as the basis for projecting the balance sheet. Having made the projections, the total of the assets is compared with the total of debt and equity.

Comparative Balance Sheet:

The practice of presenting a comparative balance sheet in the annual report is now becoming widespread because it is a connecting link between the balance sheet and income statements. Such considerations as price levels and accounting methods are given due weight at the time of comparison.

Common-Size Statements:

The percentage balance sheet is often known as the common size balance sheet. The balance sheet and the profit and loss account expressed in analytical percentages are referred to as common-size statements. These are useful in the comparative analysis of the financial position and the operating results of the business.

Statement showing changes in Working Capital:

The transactions affecting current assets and current liabilities bring about changes in the working capital. The object is to review financial activities of a business which have caused changes in the current position.

Statement showing Changes in Owner's Equity:

An income statement cannot by itself be relied upon to present all the changes in the owner's equity during and accounting period because it relates only to profit oriented activities. To describe the changes due to capital additions and disbursements, an additional statement or disclosure is required.

Funds Flow Statement:

Funds Flow Statement presents a company's sources and uses of funds during an accounting period. They are often required to be included in the balance sheet and income statements in annual financial reports. The causes of changes in a firm's financial position can be readily observed in a well prepared funds flow statement.

Cash Flow Statement:

A cash flow statement is a financial analysis of the net income or profit. The cash flow is very significant because it represents the actual amount of cash available to the business. A cash flow forecast has three elements:

- To prepare cash inflow forecast.
- To prepare cash outflow forecast.
- To ascertain whether there is a cash surplus or a cash deficit.

Projected cash flow forecast is a normal extension of a cash flow forecast, and is presented to indicate a broad picture of a firm's expected position at the end of a particular period.

Self Assessment

Fill in the blanks:

1. A financial plan is an estimate of the total _____of the company.
2. Short-term financial plan is prepared for maximum _____year.
3. Medium-term financial plan is prepared for a period of _____years.
4. Long-term financial plan is prepared for a period of more than _____years.
5. Financial Planning helps in ensuring a reasonable balance between _____of funds so that stability is maintained
6. _____are guidelines to all actions which deal with procuring, administering and disbursing the funds of business firms.
7. _____establishes the relationship among the cost incurred, volume produced and profits generated by the firm.
8. The transactions affecting current assets and current liabilities bring about changes in the_____.

2.10 Summary:

Financial Planning of a company has close links with strategic planning. The company's strategy establishes an effective and efficient match between its resources, opportunities and risks. Financial plan should be developed within the overall context of the strategic planning. Financial forecasting is an integral part of financial planning. Forecasting uses past data to estimate the future financial requirements. A simple approach to financial forecasting is to relate the items of profit and loss account and balance sheet to sales. Financial Planning is more than forecasting. It is a process of identifying a firm's investments and financial needs, given its growth objectives. It involves trade-off between various investment and financing options. A financial plan may be prepared for a period of three or five years.

2.11 Glossary

1. **Financial planning:** Financial planning is the task of determining how a business will afford to achieve its strategic goals and objectives.
2. **Financial forecasting**: Financial forecasting is the processing or estimating or predicting how a business will perform in the future.
3. **Owner's equity:** Owner's equity represents the owner's investment in the business minus the owner's draws or withdrawals from the business plus the net income (or minus the net loss) since the business began.

2.12 Answers: Self Assessment:

1. Capital requirements
2. One
3. One to five
4. Five
5. Outflow and inflow
6. Financial policies
7. Cost-Volume-Profit (CVP) Analysis
8. Working capital

2.13 Terminal Questions:

1. Define financial Planning.
2. State the steps involved in financial planning.
3. What is financial forecasting?
4. State the different techniques in financial forecasting.

2.14 Suggested Readings:

I.M. Pandey, Financial Management, Vikas Publishing, House Pvt. Ltd, New Delhi.

P.V. Kulkarni and B.G. Satya Prasad, Financial Management, Himalaya Publishing House.

Sheeba Kapil, Financial Management, Pearson, Delhi.

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Lesson- 3

CAPITAL BUDGETING

Structure

3.0 Learning Objective:

After reading this lesson you should be able to

1. Understand the meaning of Capital budgeting
2. Understand the need for capital investment
3. Highlight the importance of capital budgeting
4. Understand the different types of investment projects
5. Describe the capital budgeting process
6. Spell out the factors influencing investment decisions

3.1 Introduction

Every now and then almost all business organizations make new investments. Thus, efficient allocation of capital is one of the most important functions of financial management in modern time. This function involves the firm's decision to commit its funds in long-term assets and other profitable activities. Such investment decisions of the firm have considerable significances as they influence its wealth, determine its size, set the pace and direction of its growth and affect its business risk. These

are problems in which the proposal is to invest funds, that is capital at the present time in the expectation of earning a return on this money over some future period. Such problems are called capital investment decisions.

3.2 Meaning of Capital Budgeting

Capital investment decisions also known as capital budgeting (CB) decisions pertain to long-term assets. These are the decisions, which involve investment of current funds in long-term assets in the most efficient manner in return for an anticipated flow of future benefits over a period of time. These benefits may be either in the form of increased revenue or reduced costs. Expansion of present operations or additions of new product line are expected to bring in additional revenue. On the other hand, replacement proposals when an asset wears off or becomes outdated or some new asset involves low operating cost, may result in reduction of cost, thus, adding to the total earnings of the firm. Capital budgeting aims to evaluate all such investment decisions.

It is important to note that investment decisions affect the firm's value. The firm's value will increase if investments are profitable and add to the shareholder's wealth. This will be achieved if investment results in benefits in excess of the minimum required benefits as per the opportunity cost of capital. Thus, investment should be evaluated on the basis of a criterion which is compatible with the objective of maximization of the shareholders' wealth.

The term capital budgeting consist of two words, capital and budgeting, capital refers to the scarce resources of the organization, which can be put to alternative uses. Budgeting refers to the process of systematic business planning so as to fulfill the objective of value maximization. Thus, capital budgeting can be described as the process of deployment of scarce resources of the organization in the acquisition of fixed assets with the objective of maximizing its value in the long run.

According to "Charles T. Horngreen Capital Budgeting is long-term planning for making and financing proposed capital outlay".

According to Richards & Greenlaw the "Capital Budgeting generally refers to acquiring inputs with long-term returns".

According to Milton H. Spencer "Capital budgeting involves the planning of expenditure for assets, the returns from which will be realized in future time period".

Capital budgeting involves long-term decisions making on the expenditure of capital. According to Weston and Brigham Capital budgeting is defined as "planning the deployment of available capital (the relatively scarce, non-human resources of productive enterprise) for the purpose of maximizing the long term profitability of the firm." Capital budgeting includes the process of planning the expenditures whose returns are expected to extend beyond one year. In other words, capital budget includes such expenditures the benefits of which are expected to be received over several accounting years.

3.3 Characteristics of Capital Budgeting Decisions

1. Long term results:

The benefits/losses associated with such decisions arise in future due to high set up or initial cost and long gestation period involved. Due to high costs involved, in case of losses such firms face serious long-term impacts which affect its profitability. Profitability will be reduced by all such costs and losses incurred.

2. Initial investment in Capital Budgeting decisions are large:

The funds are invested into projects whose nature is such that large investments are required like purchase of fixed asset, Branch expansion, replacement, acquisition etc.

3. Usually Capital Budgeting decisions are irreversible decisions:

There are various reasons to support this view

- Resale value of an input/purchases done as a part of Capital Budgeting decisions is very low.
- The initial costs involved in setting up costs cannot be recovered if the project generates losses. As large time periods are involved in setting up the project and finally implementing it, the value of money with time changes drastically. Future value of same money increases as time passes by and so expected returns are also high. In case of low profits/zero profits cost of project increases manifold with time.

4. Capital investment of any form reveals its growth potential:

The long-term investments are made to generate future revenues/ profits which add to the value of the firm. Thus investments grow with time if profitable investment plans are implemented.

"We know that growth of any company is measured by the expected return multiplied by the amount of funds invested by the firm, i.e., g = b x r."

Where: g is growth of firm

b is the funds retained by the firm only for investment purpose

r is required/ expected rate of return and r > k (cost of capital).

When b is high i.e. funds invested by the firm are large then g will also be large even if r remains constant. Hence once the company decides to go for profitable investment the company will grow. Provided that r > k (cost capital).

Limitations of Capital Budgeting decisions

1. Huge investment costs involved in capital budgeting decisions. Capital budgeting decisions involve large investment due to the nature of investment plans, like purchasing of nay fixed assets, launching a new product, product line, product improvisation, branch expansion etc.

2. If fund availability is certain and uncertain then effectiveness of C.B. is hampered. We know that C.B. decisions required huge outlay hence funds are required in large amount. If these funds are not available freely and at low cost, then C.B. decisions lose their importance. The growth of the firm is delayed and slowed down.

3. Due to long term investment nature C.B. decisions are very rigid. They do not have the component of flexibility. Everything from zero to final result is decided beforehand, thus leaving no scope for contingencies.

4. Investment for a long time period is usually based on forecasting of opportunities, cost involved and future benefits arising. Inaccurate forecasting, may lead to unbalanced investment in Fixed

Assets. All related decisions like financing decision, timing of financing and implementation, benefit/loss arising etc. may all deviate from their actual figures and thus even a bad investment may be taken up as a good investment decisions and finally the firm would face a failure after putting in lots of efforts, time and cost.

5. Long term serious implications of a wrong C.B. decisions are very detrimental for any firm like its
    - Liquidity
    - Profitability
    - Risk structure
    - Competitive and technological edge
    - Manufacturing capacity
    - Existing and potential customers etc.

Thus any firm can be badly affected by a wrong and a non-profitable investment decision.

3.4 Types of Investment Projects

Classifications of capital investment projects in groups help the evaluation of projects. Also, classification helps in understanding the interdependent relationships between and among the projects. These relationships affect the success of capital budgeting. For example, if a machine to produce goods has been purchased, there must be space to operate that machine, and there mused be needed transport vehicle to transfer the goods to different places. Thus, there are interdependent (supplementary) relationships among capital expenditure on machine-land-truck system. These relationships help to determine the size and timing of capital expenditures.

Classification of projects also helps in choosing the suitable techniques for evaluation of projects. Classification helps in proper rationing of scarce funds/capital.

Various approaches may be adopted to classification of the project. The more common approaches are three as given in Chart No. 1.

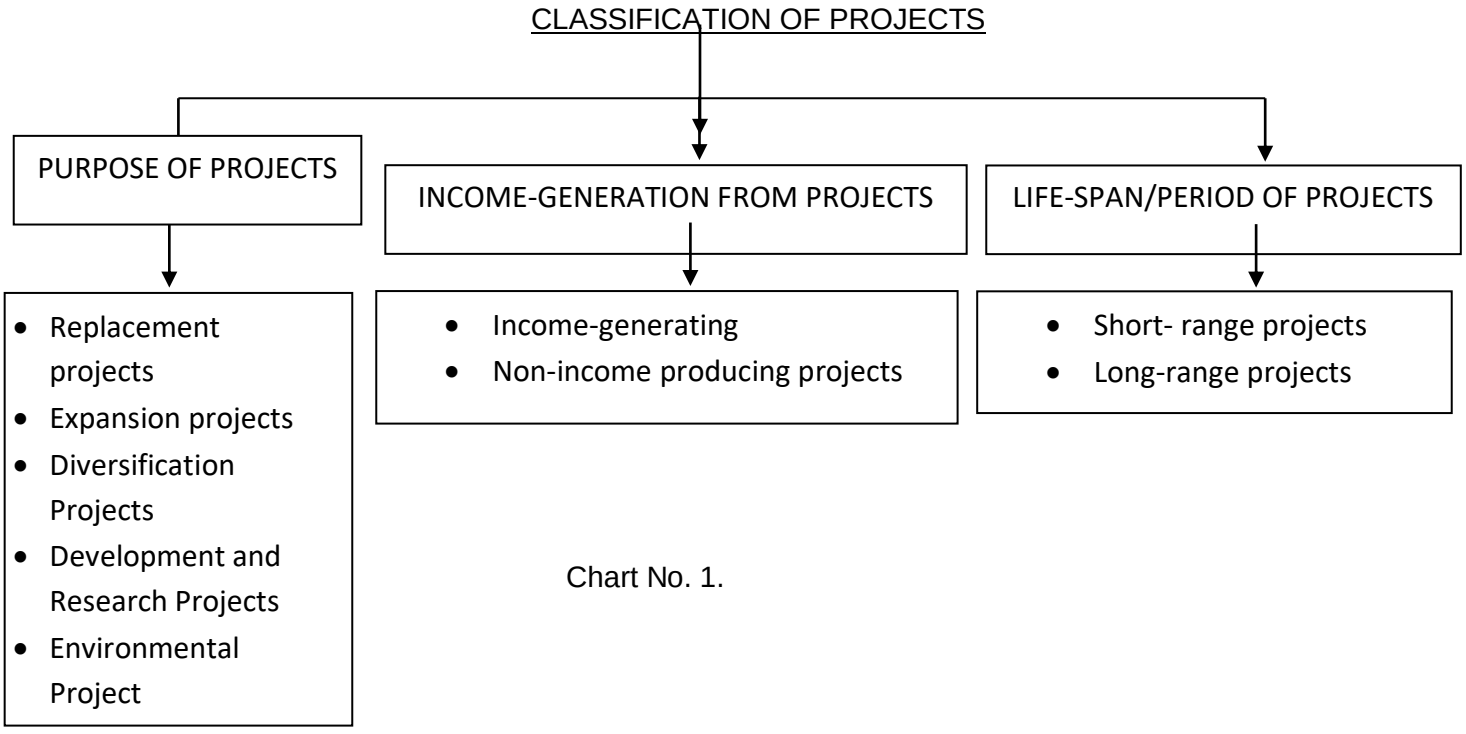


Chart No. 1.

a) Replacement Projects

Replacement of worn-put or obsolete/old machine by a new modern machine for the same work.

b) Expansion projects

To increase the production capacity for production, purchase of additional machines. These projects add to the existing capacity

c) Diversification Projects

Firms may decide to produce more than one line of products or to sell in more than one market with the purpose of reducing risk or earning high contribution, and sustained growth. These decisions are known as diversification decisions. For implementing diversification decisions, the firms acquire and establish new machinery and facilities, including operating offices and divisions. Capital projects for diversifications are grouped as diversification projects.

d) Development and Research Projects

In some industries, technology changes rapidly, in other industries, the change in technology takes some time. But changes in technology are bound to take place. In order to meet the requirements of change in technologies, the firms plan to invest in research and developments projects which are of long-term. Also, such investments are generally large in amount. If amount of investment in new machines and facilities for research and development purposes is large, then such investment is included in the capital budget.

e) Environmental Projects

These projects help in improving working conditions, pollution control, provision of safety. Such projects often require large investments, and provide benefit for long-periods. Though such projects of not directly help in earning profit or achieving other profit oriented goals, these become desirable for their long-term impact on growth and image of the firm.

f) Income-generating Projects

Projects for replacements, expansion, and diversification are income producing projects. The results of such projects can be conveniently measured for evaluation.

g) Non-Income producing Projects

Projects for development, research, improvement in environment help earning income. However, direct measurement of benefits from these projects is difficult. In the short-run the results of these projects cannot be measured in monetary terms with sufficient reliability. Therefore, such projects are classified as non-income producing projects.

h) Short-range Projects

The projects whose entire expenditure is incurred within one accounting year/period are short-range projects. Capital budget of the current year must provide for total costs of such projects. Replacement projects generally are put into this class. These projects have short gestation periods. These projects start producing income in relatively short period of time.

i) Long-range Projects

Such projects have long gestation periods. The expenditures on these projects generally extend over more than one accounting year/period. Generally, a part of these projects is included in the current year's capital budget. These projects are generally the responsibility of top management. Examples of such projects are: projects for expanding facilities, adding new products, disposal of affluent, etc.

All the above mentioned projects are reclassified for the point of view of problems involved in selecting the projects form a variety of alternative projects. Such reclassification is given in the following chart No. 2.

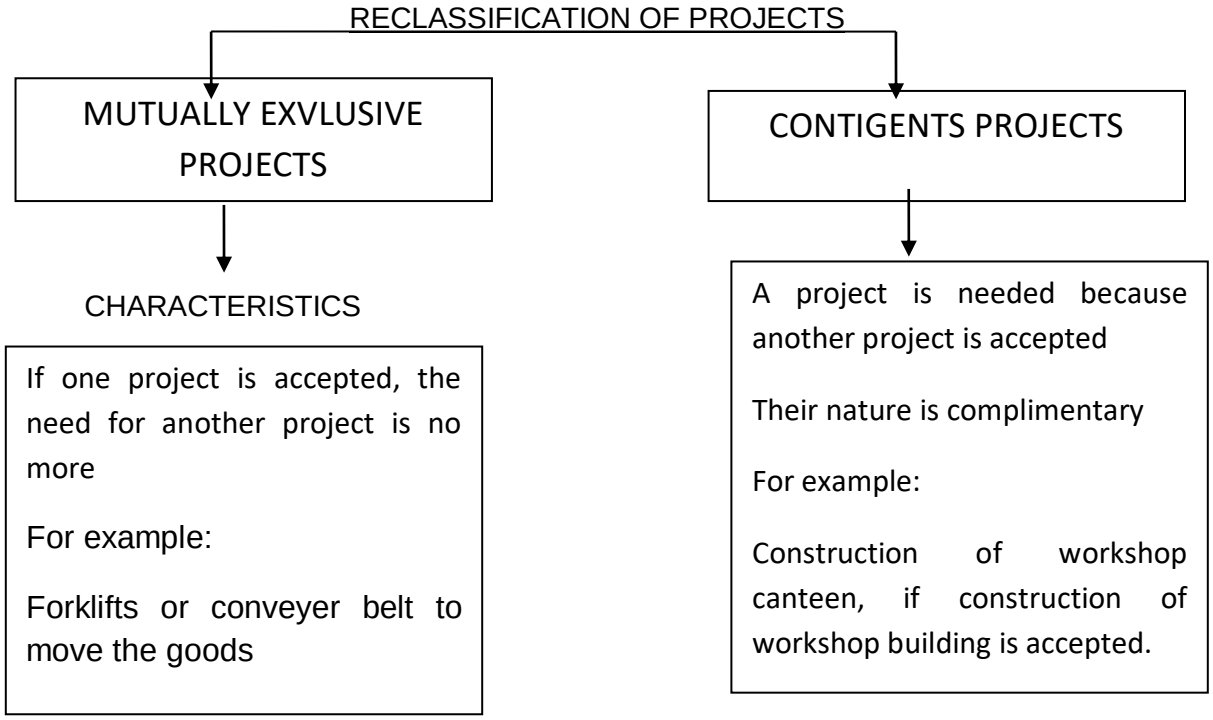


Chart No. 2.

3.5 Capital Budgeting Process

The important steps which are required for taking capital investment decision had been explained by I.M. Pandey in this book on Financial Management.

Chart No. 3 explains that capital budgeting process involved four steps i.e. (i) Project Generation, (ii) Project Evaluation, (iii) Project Selection and (iv) Project Execution. The nature of the formal system for the capital ting process will depend on the size of the firm and nature of projects, and their number complexity and diversity. At the time of establishing such a system, it should be remembered that its cost does not exceed the benefits to be derived. As the expenditure involved is very large the substantial part of this process should be continued to the top management. In this process we assume that the required rate is known and the investment proposals do not suffer from uncertainty.

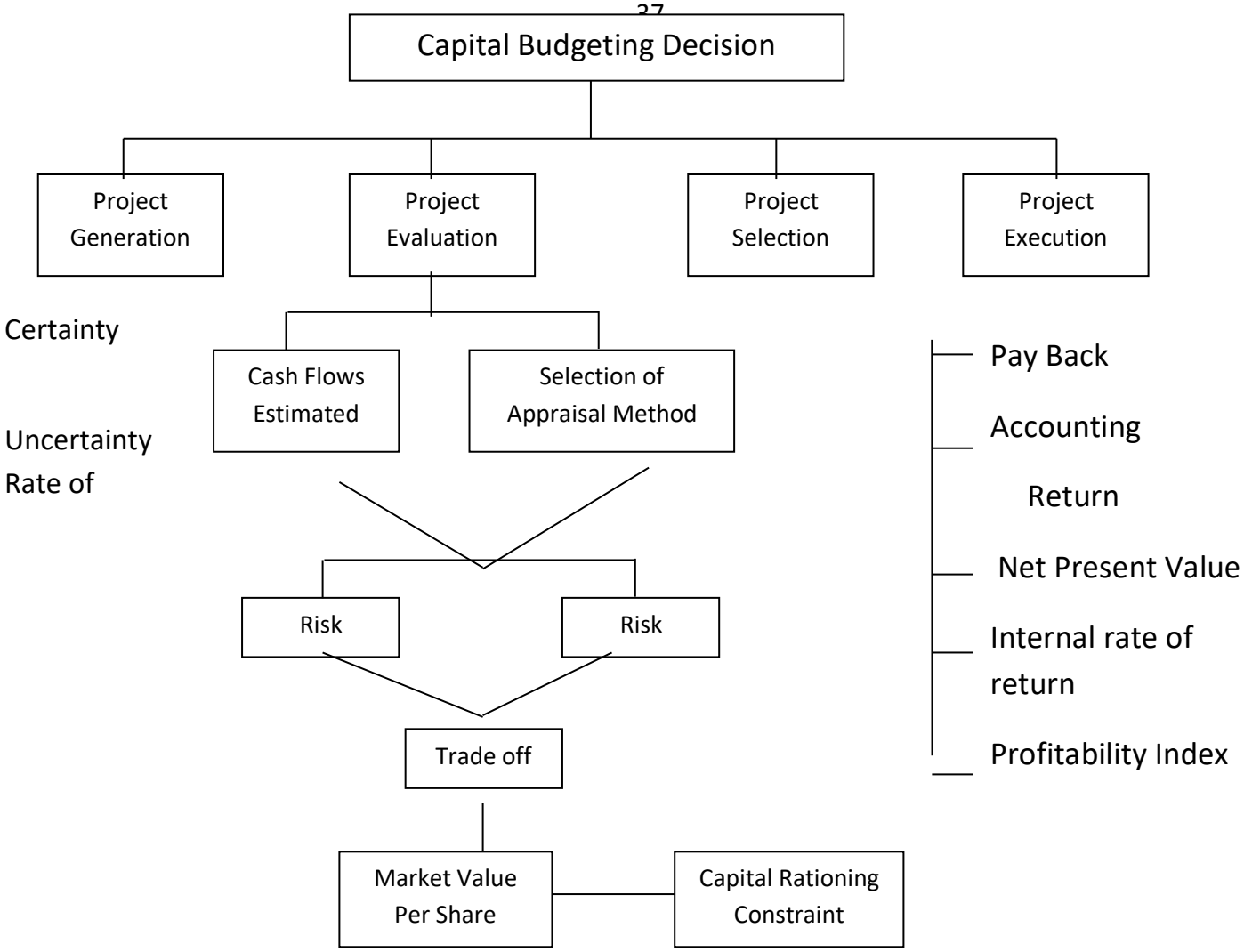


Chart No. 3

Project Generation:

Investment proposals of various nature may originate as different levels within the organization at different times and may relate to one of the following categories:-

A. (i) Proposal to add new produce to the product line.
(i) Proposals to expand capacity in existing product lines.
B. Proposals for reduction in existing product lines.

Any type of investment proposals can originate at any level, from the top management level to the level, of workers. The proposals can originate systematically or haphazardly. If the company wants to introduce a new product in the market, it may emanate from the marketing department or from the plant manager who thinks of a better way of utilizing idle capacity. Similarly, factory level can give suggestions for replacing an old machine or improving the production techniques. So, there should be a systematic procedure for generating proposals and the efficiently utilization of resources.

(a) Project Evaluation:

It involves two steps (a) estimation of benefits and cost; the benefits and costs are measures in terms of each flows and (b) selection an appropriate criterion to judge the desirability of the project.

Because the future is uncertain, so it is very difficult to estimate cash flows. The risk involve in the process should also taken into consideration for taking the decisions.

(b) Project Selection:

For approving the investment proposal no standard administrative procedure can be laid down as it differs from firm to firm. Though the capital investment decision is top management decision is top management decision but, however, projects are screened at multiple levels, sometimes top management delegate, the authority by limiting the amount of cash outlays, prescribing the selection criteria and holding the lower level management accountable for the results.

(c) Project Execution:

After the final selection of the investment proposals, the funds are appropriated for capital expenditure. The formal plan for the appropriation of funds is called the capital budget and the project execution committee must ensure that funds are spent in accordance with budget. Now funds for the purpose of project execution should be spent only after seeking formal permission from the controller. After this systematic procedures should be developed to review the performance of project during their lifetime and after completion.

3.6 Factors Influencing Capital Budgeting Decisions:

The main factors which, influencing capital investment are:

1. Cash flows:

Every firm makes a cash flow budget. Its analysis influences capital investment decision. With its help the firm plans the funds for acquiring the capital asset. The budget also shows the timing of availability of cash flows for alternative investment proposals, thereby helping the management in selecting the desired project.

2. Type of management:

Whether capital investment would be encouraged or not depends, to a large extent, on the viewpoints of the management. If the management is modern and progressive in its outlook, the innovations will be encouraged, whereas a conservative management discourages innovation the fresh investments.

3. Competitors' Strategy:

Many a time an investment is taken to maintain the competitive strength of the firm; if the competitors are installing new equipment to expand output or to improve quality of their products, the firm under consideration will have no alternative but to follow suit; else it will perish. It is, therefore, often found that the competitors' strategy regarding capital investment plays a very significant role in forcing capital decisions on a firm.

4. Technological Change:

In modern times, one often finds fast obsolescence of technology. New technology, which is relatively more efficient, takes the place of old technology; the latter getting downgraded to some less important applications. However, in taking a decision of this type, the management has to consider the cost of new equipment vis-à-vis the productive efficiencies of the new as well as the old equipments. However, while evaluating the cost of new equipment, the management should not-take into, account

its full accounting cost (as the equipment lasts for years) but it incremental cost. Also, the cost of new equipment is often partly offset by the salvage value of the replaced equipment.

5. Return expected from the investment:

In most of the cases, investment decisions are made in anticipation of increased return in future. While evaluating investment proposals, it is therefore essential for the firm to estimate future returns or benefits accruing from the investment.

6. Demand forecast:

The long-run forecast of demand is one of the determinants of investment decision. If it is found that there is a market potential for the product in the long run, the dynamic firm will have to take decisions for capital expansion.

7. Fiscal Policy:

Various tax policies of the government (like tax concessions on investment income, rebate on new investment, method of allowing depreciation deduction allowance) also have favorable or unfavorable influence on capital investment.

3.7 Steps in Capital Budgeting

Capital budgeting decisions involve three steps, that is:

1. Estimating cash flows,
2. Determining the required rate of return
3. Applying acceptance/rejection rule for selecting a project.

3.7.1 Estimating cash Flows:

To evaluate any capital investment proposal, it is important to estimate the future benefits which are expected to accrue from the investment proposal. The future benefits can be measured either in terms of accounting profit based on actual concept or alternatively, in terms of cash flows from the project. The cash flow criteria to measure future benefits are considered better than accounting profit criteria.

Incremental cash flows

For each investment proposal, we need to provide information about expected future cash flows on an after-tax basis. This information must be provided on an incremental basis, so that only the difference between the cash flows of the firm with and without project is analyzed. For example, if a firm wants to introduce a new product which is likely to compete with existing products, it is not appropriate to express cash flows in terms of the estimated sales of the new product. Rather some probable sales of existing products should also be considered and the situation should be analyzed with or without the new investment. In this regard, sunk costs must be ignored. It is the incremental costs and benefits which are relevant and not the recovery of past cost.

Depreciation involves only an accounting entry and does not involve any cash outflow. It is, however, a deductible expense for computing taxes and thus, reduces the firm's tax liability. The savings in tax resulting from depreciation is known as depreciation tax shield.

Net cash flows are the difference between cash receipts and cash payments including taxes. Thus,

I= C—P – T

Where I stands for net cash flows, C for cash receipts, P for cash payments and T for taxes.

Example 1

Suppose that a project requires an initial cash outlay of Rs. 4,00,000. The project is expected to generate annual cash sales of Rs. 2,00,000 and incur total annual cash expenses of Rs. 80,000 over the life of the project. The life of the project is estimated at 10 years and depreciation is to be charged on straight line basis. The tax rate may e assumed at 40 per cent. Determine net cash flows from the project.

Solution:

For determining the tax liability, we need to ascertain profit generated by this project as per profit & Loss Statement:

Statement of Profit & Loss

Revenue	2,00,000
Less Expenses (Cash)	80,000
Earnings before depreciation & Tax	1,20,000
Less Depreciation @ 10% p.a.	40,000
Earnings before Tax	80,000
Less Tax @ 40%	32,000
	48,000

Thus, net cash flows would be equal to:

I = 2,00,000 – 80,000 – 32,000 = Rs. 88,000

Net cash flows can also be calculated in the following manner—

I = EBT – T + D

Where EBT stands for earnings before tax. Thus,

I = 80,000 – 32,000 + 40,000 = Rs. 88,000

It may be noted here that depreciation has provided a tax shield equal to tax rate multiplied by the amount of depreciation.

Ds = T x D

Where Ds stands for depreciation tax shield. Thus, in above example.

Ds = 40,000 x 4.0 = Rs. 16,000

If depreciation was not tax deductible, net cash flows would have been only Rs. 72,000 which go increased by Rs. 16,000 due to tax shield provided by depreciation.

Terminal Cash Flows

The last year of an investment project may generate some additional cash inflows, which are generally in the form of salvage value of the asset. In case of a replacement decision, in addition to the salvage value of the new investment at the end of its life, the following two other salvage values will also have to considered:

a) The salvage value of the existing asset at the time of replacement decision.

b) The salvage value of the existing asset at the end of its life, if it were not replaced.

Besides salvage value, the terminal cash flows may also include release of net working capital. The funds initially tied up in net working capital at the time when project was undertaken would be released in the last year when the project is terminated.

Calculation of Present Value of Cash Inflows:

All investment projects involve cash outflows (investments and related expenses) and cash inflows (cash income received as a result of investments). For evaluating the investment projects, some techniques use present value of cash inflows, which will occur in future as a result of investments in projects.

Due to inflation and earning capacity of money, an amount to be received in future will have less value at present. This is the time value concept of money (cash). For example, if a sum of Rs. 100 is invested at 6% interest p.a. for 5 years, it will become Rs. 133.80 after five years. The present value of Rs. 133.80 is Rs. 100.

Present value concept is opposite to the concept of compound sum.

Compound sum of an amount is computed by the following method:

$S = P (1+I)^n$

S = compound amount:

P = Principal money invested or present value of investment

I = Interest rate on principal money

N = number of periods/years

For computing the present value, the above formula is rewritten:

$P = S \quad \frac{1}{(1+I)n}$

The expression $1/(1 + \mathrm{I})^n$ is a present value factor by which S must be multiplied to compute the present value. S is the cash flow, which will be received in future.

The present value factors for different rates of interest and time-periods can be computed through the use of logarithms. But computed present value factors are readily available. The present value factors are for Rs. 1. To know the present value of any amount, the factors for Rs. 1 are multiple with the amount. The product is the present value:

P = S x p.v. factor for Rs. 1

Where P is the present value S is the amount

p.v. factor may also be called as discount factor, i.e. d.f.

Example 2:

A firm has a choice of receiving Rs. 2500 today or Rs. 6000 after 10 years. The interest rate (discount rate) is 80%. Find the present value of Rs. 6000. Which should the firm choose? What, if the discount rate is 10%

Solution:

P = S x p.v. factor for Rs. 1

The d.f. with 8% after years for Rs. 1 is 463.

With 8% for Rs. 6000 to be received after 10 year:

P = 6000 X 463

= Rs. 2778

With 10% for Rs. 6000 to be received after 10 year:

P = 6000 X 386

= Rs. 2316

Comment:

(i) The present value Rs. 2778 > Rs. 2500 to be received now. The firm should choose to receive Rs. 6000 after 10 years if interest is rate 8%.

(ii) The present value Rs. 2316 > Rs. 2500 to be received now. The firm should choose to receive Rs. 2500 now than to receive Rs. 6000 after 10 years if interest rate is 10%

The higher the interest rate, other things remaining the same, the lower the present value of the sum to be received in future. This is because of the time value of money.

Present Value of an Annuity

Annuity means receipt or inflow of a certain sum every year, for a period of time. For example, if Rs. 1.00,000 is the inflow every year for 5 years in future, then the annuity is Rs. 1,00,000.

Example 3:

A machine costing Rs. 18,000 will save a firm Rs. 3,000 a year for the next 10 years. If a discount rate of 10% is used, is the purchase of the equipment advisable?

Solution:

The amount of annuity is Rs. 3,000

P.V. of Rs. 3000 = 3000 x 6.145

= Rs. 18,435

Since the P.V. of annuity is greater than the investment, the purchase of the machine is advisable.

Interest Rate for an Annuity

When, Period of annuity, amount of annuity and amount of investment is given, the interest rate (yield) can be found out.

The interest rate so found will equate total annuity receipts with the initial amount of the investment or the present value of investment.

There are two steps in calculation:

Step 1: Divide the investment by annuity to find the value.

Step 2: Locate the value nearest to the computed value in step 1 for the given period, looking at the table for annuity. The interest of the closest value is the answer.

Example 4:

An investment of Rs. 2,400 will give inflows (returns) of Rs. 400 per year for the next 10 year. What is the interest (yield) on investment?

Solution:

(i) The value = 2400/4 = 6

(ii) The closest value for 10 years period in the table is 6.145/

The interest rate for 6.145 is 10%. Therefore, approximate yield on investment is 10%.

Present Value of a Deferred Annuity

When the annuity is not received from the very beginning year of the investment, but after a few years, it is called deferred annuity. If an investment gives deferred annuity, the p.v. of deferred annuity is computed.

3.7.2 Estimating required rate of return

Generally, present receipt of cash is preferred to the future receipt of cash due to availability of investment opportunities to which it can be employed to earn additional cash, that is, an individual shall prefer Rs. 100 today than to have the same Rs. 100 after one year if he can earn an interest of say, Rs. 10 by putting it in the fixed deposit in a bank for one year. His total cash after one year will increase to Rs. 110. Thus, the justification for time value of money lies in the availability of investment opportunity.

The time value of money is generally expressed by an interest rate. One component of it is risk-free rate, for example, an investor can forego the opportunity of receiving Rs. 100 if he is offered Rs. 110 after one year. Thus, an individual may be considered in different between Rs. 100 and Rs. 110 a year from today as he considers these two amounts equivalent in value. In reality, an investor may be exposed to some degree of risk. Therefore, he would also expect a rate of return from the investment, which compensates him both for time and risk. Consequently, his required rate of return will be risk free rate plus premium for risk he is bearing.

This required rate of return is used for evaluating the various alternative investment projects. Any project must earn this minimum required rate of return to justify its acceptance and execution. Various cash flows being generated form projects at different times are discounted at this rate to convert them into the amounts of equivalent value at the present (called present value). This minimum required rate or return, therefore, is known as discount rate, that is, a rate at which future cash flows are discounted to determine the worthiness of any project. Since an investor can invest his money in other securities involving equivalent risk, this rate, therefore, is also known as the opportunity cost of capital.

3.7.3 Applying acceptance/rejection rule for selecting a project

The various available projects are to be evaluated in the light of certain decision rules so that only worth projects figure in the list of selected ones and a ranking among them could be worked out in order of preference for each of them. For this purpose, certain evaluation techniques can be used to measure the economic worth of an investment project. The various evaluation techniques will be discussed in the next lesson.

Self Assessment:

Fill in the blanks:

1. _____describes the firm's formal planning process for the acquisition and investment of capital.
2. Capital investment decisions once made, are not easily _____without much financial loss to the firm.
3. A capital budgeting decision is a _____process.
4. It is important to include all _____effects on the remainder of the business.
5. Projects for replacements, expansion, and diversification are _____projects.

3.8 Summary

Capital budgeting is budgeting for capital projects. It is significant because it deals with right kind of evaluation of projects. The exercise involves ascertaining/estimating cash inflows and outflows, matching the cash inflows with the outflows appropriately and evaluation of desirability of the project. It is a managerial technique of meeting capital expenditure with the overall objectives of the firm.

Capital budgeting provides useful tool with the help of which the management can reach prudent investment decision. Capital projects involve huge outlay and last for many years. The Important factors influencing investment decisions include Technological change, competitors' strategy, demand forecast, type of management, fiscal policy, cash flows and return expected form the investment.

The overall objective of capital budgeting is to maximize the profitability of a firm or the return on investment. This objective can be achieved either by increasing the revenues or by reducing costs. Thus, capital budgeting decisions can be broadly classified into tow categories: a) those, which increase revenue, and b) those, which reduce costs.

3.9 Glossary

Short Term Investment: Where funds are invested for a short time period usually for a year or less.

Capital Budget: It is a list of all investment proposals to be undertaken for final evaluation by the firm.

Cash flows: It is the difference between the rupee received and rupee paid.

Opportunity Cost: It is the cost associated with the next best alternative foregone to undertake present alternative.

Net Cash flow: Total cash inflows- total cash outflows.

3.10 Answers: Self Assessment:

1. Capital budgeting
2. Reversible
3. two-sided
4. Incidental
5. Income producing

3.11 Terminal Questions:

1. What is capital budgeting explain the nature and features of capital budgeting.
2. What are the various kinds of capital budgeting decisions? Discuss the capital budgeting process?
3. Describe the Factors Influencing Investment Decisions and need for investment decisions.

3.12 Suggested readings:

1. I.M. Pandey, Financial Management, Vikas Publishing New Delhi.
2. James C. Van Horne Financial Management and Policy Prentice Hall, New Delhi.
3. M.Y. Khan and P.K. Jain, Financial Management, Tata McGraw Hill, New Delhi.
4. Prasanna Chandra, Financial Management, Tata McGrew Hill, New Delhi.

LESSON 4

MEHODS OF VALUATION OF CAPITAL BUDGETING

Structure

4.0 Learning Objectives

After reading this lesson you should be able to:

- Understand different criteria and features for evaluation of projects.
- To analyze techniques of investment appraisal methods.
- To make a decision which method is to be used.
- To make a comparison between NPV & IRR

4.1 Introduction

In the previous lesson we have already learnt what capital budgeting is all about? And we have also learnt how to estimate and determine the relevant cash flows necessary to take capital budgeting decisions? Briefly we can summarize that “capital budgeting is the process of identifying, analyzing and selecting investment projects which will generate future cash flow over a long period of time”. The various investment project proposals for the business enterprise have to be profitable. And out of these proposals the feasible projects and value generating plans are to be selected. In this lesson we will study the various techniques used in appraisal, valuation, and selection of the projects.

4.2 Investment Evaluation Criteria & Features

The capital budgeting process begins with assembling of investment proposals of different departments of a firm. He has to select the best alternative from among the conflicting proposals. This

selection is made after estimating return on the projects and comparing the same with the cost of capital. Investment proposal which gives the highest net marginal return will be chosen. Following are the steps involved in the evaluation of an investment:

1) Estimation of cash flows
2) Estimation of the required rate of return
3) Application of a decision rule for making the choice

A sound appraisal technique should be used to measure the economic worth of an investment project, Porterfield, J.T.S. in his book, Investment Decisions and Capital Costs, has outlined some of the features that must be had by a sound investment evaluation criteria.

- It should consider all cash flows to determine the true profitability of the project.
- It should provide for an objective and unambiguous way of separating good projects from bad projects.
- It should help ranking of projects according to their true profitability.
- It should recognize the fact that bigger cash flows are preferable to smaller ones and early cash flows are preferable to later ones.
- It should help to choose among mutually exclusive projects that project that project which maximize the shareholders' wealth.
- It should be a criterion which is applicable to any conceivable investment project independent of others.

4.3 Methods of Evaluation of Capital Investments

A management accountant faces a number of alternative capital expenditure proposals which compete for allocation of funds. Each capital expenditure project is ranked in terms of its profitability.

There are various methods which can be used for ascertaining the profitability of a capital expenditure project and different firms may use different methods it will depend upon circumstances of the firm that which method is more appropriate. A large company may use more than one technique to appraise each of its investment projects, while small firms by contend with using only one technique which involves minimum funds and time. However, to avoid confusion, some methods should be used uniformly for ever object throughout the firm. Though these appraised techniques will help management in making decisions objectively, still the management must exercise their common sense and management in making the decisions.

The following are the basic methods for evaluation of investment opportunities.

There are:

(A) Traditional Methods of Non-Discounted Cash flow method

(i) Pay Back Period

(ii) Average rate of return (ARR)

(B) Modern Methods or Discounted Cash flow method

(i) Net Present Value (NPV)

(ii) Internal Rate of Return (IRR)

(iii) Profitability Index (IP)

Now let us discuss all these methods

4.3.1 Pay Back Method

This is also known as pay off or payout method. This method is employed to determine the number of years in which the capital expenditure incurred is expected "to pay for itself". This deals with the comparison of the capital expenditure with the flow of income generated there form. It is defined as the number of years required to recover the original cash outlay invested in a project. The payback period is number of years during which the income is expected, when the total earnings from investments equals to the total outlay, that period is the back period of capital investment.

The steps involved in payback period are as follows:

(i) The net earnings before depreciation and after taxes are ascertained by deducting cost of maintenance and repairs and repairs from the total earnings on the capital project.

(ii) Now calculate the original cost of assets by excluding the cost of land and working capital as they are recoverable.

(iii) Calculate the payback period i.e.

Original Cost of asset

Net earnings

(iv) But if the project generates constant annual cash inflows, the payback period can be computed dividing cash outlays by annual cash inflows.

i.e. = Cash outlay (Investment)

Annual cash inflow

Acceptance Rule: It can be used as an accept or rejects criterion as well as method of ranking projects. If they payback calculated for a project is less than the maximum payback period set up by the management, it would be accepts, if not, it would be rejected. It gives highest ranking to the project, which has shortest payback period and ranking to the project with highest payback period. Thus, if the firm has to choose among two mutually exclusive projects, projects with shorter paybacks period will be selected.

Example 1: A firm is considering the following two investment alternatives:

	Cash inflows (Rs.)	
Year	**Investment A**	**Investment B**
1.	1000	400
2.	800	400
3.	800	400
4.	-	1200

5.	-	1200
Total	**2600**	**3600**

Each of the investment projects requires initial capital expenditure of Rs. 2200 investment. Rank the investment projects, using payback method, and comment.

Solution:

Computation of Payback Period

(i) Investment A

For recovering Rs. 2200 investment, the period needed is 2 years, and a part of the 3rd year.

Investment A				**Investment B**			
Year	Cash Inflows (Rs.)	Cumulative flow (Rs.)	Payback Period (years)	Year	Cash Inflows (Rs)	Cuml. Flows (Rs.)	Payback period (years)
1	1000	1000		1	400	400	
2	800	1800		2	400	800	
3	800	2600	3rd year	3	400	1200	
				4	1200	2400	4th year
				5	1200	3600	

In firs two years, the amount recovered = Rs. 1800

In the third year, the amount to be recovered:

= Initial investment – Recovered in first two years

= Rs. 2200 – 1800 = Rs. 400

Payback period is $2\frac{1}{2}$ years.

(ii) Investment B

Full recovery of initial investment requires 3 years and a part of the 4th year.

Payback period = 3 years + 1000/1200 years

+ 3 years + 5/6 year = 3 5/6 years.

Comment:

Investment A returns the initial investment earlier, hence it is better.

Weaknesses of Payback Method

Since the decision criterion is crude, the investment decision on the basis of payback is generally poor. This method has the following shortcomings:

(a) Cash inflows beyond the payback period is ignored:

In the example, cash inflows of Rs. 400 Project A and Rs. 1400 i.e. 1200 + 200 for Project B are ignored. If these cash flows are also considered, perhaps Investment B will be the better choice.

No consideration of inflows after payback period is an inferior policy, where strategic long-range planning for entry into new markets is being adopted.

Therefore, the payback method should be used for ranking such projects which give cash inflows for a short period, say 3 to 4 years or even shorter periods.

(b) No consideration of time Value of money:

Two investment proposal having the same payback periods are considered equal by payback method. But, this may not be correct assessment. The reason is difference in pattern of cash flows of the two projects. If the present value concept is used for comparing the cash flows of such projects, the ranking may differ substantially. The other method is used i.e. Discount payback method to overcome this drawback.

Example 2: Rank the following projects using payback method as well as discounted value concept of cash inflows. Use a 10% discount rate.

	Investment X	Investment Y
Initial Investment Cash inflows	Rs. 10100	Rs. 10100
Years	Rs.	Rs.
1	9500	200
2	200	200
3	200	200
4	200	9500
5 to 10 years	800	800

Solution

(i) Payback method. It is important to note the patterns of cash flows of the investments differ significantly.

Payback for X

Years	Flows	Cumulative Flows
1	9500	9500
2	200	9700
3	200	9900
4	200	10100

Payback period for X = 4 years

Similarly, Payback period for Y = 4 years

Ans. Both the projects are equal

(ii) Present value of cash flows using a 10% discount rate (d.f.)

Year	Cash flows	d.f.	P.V.	Year	Cash flows	d.f.	P.V.
1	9500	909	8560	1	200	909	182
2	200	826	165	2	200	826	165
3	200	751	150	3	200	751	150
4	200	683	137	4	9500	683	6489

The p.v. of cash flows of the two projects are significantly different. This is because the patterns of cash flows differ.

Ans. If p.v. concept is used, the two suitable to evaluate projects with different economic lives. So Project X is accepted.

(c) Payback period method is not suitable to evaluate projects with different economic lives.

Merits of Payback Method

A number of arguments are given in favour of this method:

- It is easy to understand.
- It is suitable when liquidity is given higher importance than that given to profitability.
- It gives a reasonable approximation to the possible result which can be had by using advanced techniques like Internal Rate of Return.

4.3.2 Average Rate of Return Method

It is also an important method. This method is know as Accounting Rate of Return Method/Financial Statement Method/Unadjusted Rate of Return Method also. According to this method, capital projects are ranked in order of earnings. Projects which yield the highest earnings are selected and others are ruled out. The return on investment method can be expressed in several way as follows:

(i) Average Rate of Return Method: Under this method we calculate the average annual profit and then we divide it by the total outlay of capital project. Thus, this method established the ratio between the average annual profits and total outlay of the projects.

$$\text{Rate of Return} = \frac{\text{Average Annual Profits}}{\text{Outlay of the Project}} \times 100$$

Thus, the average rate of return method considers whole earnings over the entire economic life of an asset. Higher the percentage of return, the project will be acceptable.

(ii) Return on Average Amount of Investments Method: Under this method the percentage return on average amount of investment is calculated. To calculate the average investment the outlay of the projects is divided by two. As per formula:

$$\text{Average Investment} = \frac{\text{Initial Investment + scrap value}}{2}$$

$$\text{Rate of Return} = \frac{\text{Average Annual Net Income (Sayings)}}{\text{Average Investment}} \times 100$$

Here:

Average Annual Net Income = Average Annual Cash-inflow – Depreciation

Thus, we see that the rate of return approach can be applied various ways. But, however, in our opinion the third approach can be applied in various ways. But, however, in our opinion the third approach is more reasonable and consistent.

Accounting Rate of Return Method – Merits

This approach has the following merits of its own:

1) Like payback method it is also simple and easy to understand.
2) It takes into consideration the total earnings from the project during its entire economic life.
3) This approach gives due weight to the profitability of the project.
4) In investment with extremely long lives, the simple rate of return will be fairly close to the true rate of return. It is often used by financial analysis to measure current performance of a firm.

Accounting Rate of Return Method—Demerits

1) One apparent disadvantage of this approach is that its results by different methods are inconsistent.
2) It is simply an averaging technique which does not take into account the various impacts of external factors on overall profits of the firm.
3) This method also ignores the time factor which is very crucial in business decision.
4) This method does not determine the fair rate of return on investments. It is left to the discretion of the management.

Example 3: A project requires an investment of Rs. 5,00,000 and has a scrap value of Rs. 20,000 after five years. It is expected to yield after depreciation and taxes during the five years amounting to Rs. 40,000, Rs. 60,000, Rs. 70,000, Rs. 50,000 and Rs. 20,000.

Calculate: (i) Average Rate of Return (ii) Return per unit of investment (iii) Return on average investment (iv) Average return on average investment

Solution:

Total Profit = Rs. 40,000 + Rs. 60,000 + Rs. 70,000 + Rs. 50,000 + Rs. 20,000 = Rs. 2,40,000

Average Profit = Rs. 2,40,000 = Rs. 48,000

$$\text{Average Investment} = \frac{\text{Total Investment}}{2} = \frac{5,00,000 - 20,000(\text{Scrap})}{2}$$

$$\text{(i)} \quad \text{ARR} = \frac{\text{Average Annual Profit}}{\text{Net Investment}} = \frac{48,000}{48,000} \times 100 = 10\%$$

(ii) Return Per Unit of investment = $\frac{\text{Total Profit}}{\text{Net investment}} = \frac{2,40,000}{4,80,000} \times 100 = 50\%$

(iii) Return on average investment = $\frac{\text{Total Profit}}{\text{Net investment}} = \frac{2,40,000}{2,40,000} \times 100 = 100\%$

(iii) Average Return on average Investment =

$\frac{\text{Average Profit}}{\text{Average Investment}} \times 100 = \frac{48,000}{2,40,000} \times 100 = 20\%$

4.3.3 Net Present Value Method

Another method of computing expected rates of return is the present value method. The method is popularly known as Discounted Cash flow Method also. This method involves calculating the present value of the cash benefits discounted at a rate equal to the firm's cost of capital.

The financial executive compares the present values with the cost of the proposal. If the present value is greater than the net investment, the proposal should be accepted. Conversely, if the present value is smaller than the net investment, the return is less than the cost of financing. Making the investment in this case will cause a financial loss to the firm.

NPV method is also known as Excess Present Value or Net Gain Method. To implement this approach, we simply find the present value of the expected net cash inflows (Profit before depreciation and after tax) of an investment discounted at the cost of capital and subtract from it the initial cost outlay of the project. If the net present value is positive, the project should be accepted: if negative, it should be rejected.

NVP = Total Present value of cash inflows – Net investment

If the two projects are mutually exclusive the one with higher net present value should be chosen. The following example will illustrate the process:

Assumed that the cost of capital after taxes of a firm is 6%. Assume further, that the net cash-inflow (after taxes) on a Rs. 5,000 investment are forecasted as being Rs. 2,800 per annum for 2 years. The present value of this stream of net cash-inflow discounted at 6% comes to Rs. 5,272 (1,81 X Rs. 2800).

Therefore, the present value of the cash inflow = Rs. 5,272

Less present value of net investment = Rs. 5,000

Net present value = Rs. 272

The NVP method involves finding the total of the present value of future cash inflows discounted at a given (assumed) rate of return or the cost of capital (K) minus the cost of project.

Symbolically:

$NVP = (A_1/(1+K)^1 + A_2/(1+K)^2 + \ldots + An/)1+K)^n -- C$

Where: A_1, A_2… An are cash inflows in different years of the economic life of the project.
K = Cost of capital/desired or assumed rate of return.

O = Cost of the project/investment in the project. Since most of the times, investment takes place in the beginning of the life of the project; the present value of the investment is the same. However, if investments are in installments/in phased manner, then present value of investments in the subsequent years will be calculated. This will be needed to know the p.v. of all cash outflows.

Example 4:

A company has two investment opportunities, each costing Rs. One lakh and each having the expected cash inflows as shown below:

Expected cash inflows

Year	**Project A (Rs.)**	**Project B (Rs.)**
1	50000	20000
2	40000	40000
3	30000	50000
4	10000	60000

After giving due consideration to the risk criterion in each project, the management has decided that project A should be evaluated at a 10% cost of capital and project B, a risky project with a 15% cost of capital. Compare the NPVs and Suggest the course of action for the management, if

(a) Both the project are independent ; and
(b) Both are mutually exclusive.

Solution:

Project A				**Project B**			
Year	**Expected Cash inflows Rs.**	**PV factor at 10%**	**Present value**	**Year**	**Expected Cash inflows Rs.**	**PV factor at 10%**	**Present value**
1	50,000	.90909	45,455	1	20,000	.86957	17,391
2	40,000	.82645	33,058	2	40,000	.75614	30,246
3	30,000	.75131	22,539	3	50,000	.75752	32,876
4	10,000	.68301	6,830	4	60,000	.57175	34,305
Total P.V. of cash inflow			1,07,882	Total P.V. of cash inflow			1,14,818
Investment			1,00,000	NPV			1,00,000
NPV(+)			7,882				14,818

1) If both the projects are independent, accept both the projects, as NPV of both is positive.

2) If both projects are mutually exclusive accept B as its NPV is higher than that of A.

4.3.4 Internal Rate of Return Method

It is a method that arrives at the expected rate of return on investment after taking into account the time value of money. Discount rate is the interest rate at which the present value of the future cash

receipts from an investment is just equal to the present value of the cash outlays for it. In order to judge the profitability of a project, the discount rate is compared with the required rate of return known also as the cut of hurdle rate. In case of alternative projects the one yielding the highest discount rate will be selected.

Now question arises as to how we arrive at the discounted rate of return? The answer is, by trial and error method. The rate is not known before hand hence the discounting has to be done with different rates of interest till the present value of cash inflow is equal to the present value of cash outflows, keeping in mind the fact that higher the interest rate and longer the period of time, lower will be the present value and vice-versa.

In this method one of the following two techniques may be used:

(i) If net annual flows over the life of asset are equal

First, find out present value Factor by dividing initial cost by net annual cash flow:

Then, consult present value annuity table (2) with the number of years equal to life of the asset and find out the rate at which calculated present value factor is equal to given present value of the table.

Example:

Initial Cost	=	Rs. 20,000
Life is Asset	=	5 year
Expected Net Annual Cash Flow	=	Rs. 5,000

Solution:

Present Value Factor = 20,000/5,000 = 4.00

Consulting Annuity Table (2) of Present Values for 5 years with P.V. Factor =4.00

Discounted Cash Flow Rate of Return = 8% approx.

(ii) If Annual Cash Flows are unequal

When expected net annual cash flows are unequal, calculation of internal rate of return cannot be made according to the above method. In such cases rate of return is calculated by trial and crror method. That is, starting with an assumed rate, total present value of annual flows is found out by consulting present value table. The rate at which total present value of annual cash flows becomes equal to initial Investment is the internal rate of return. Sometimes the process of discounting might have to be carried many times before exact rate of return is found out. As guideline, if the total present value of annual cash flows exceeds the initial cost, a higher rate must be tried and if it is less than the initial cost a lower rate is indicated.

4.3.5 Profitability Index Method:

NPV cannot be taken as a reliable evaluation technique in case of project, requiring different initial investments, due to the fact that it is an absolute measure. Profitability index is a better yardstick to evaluate projects in such a situation because it is a relative measure.

The profitability index is the ratio of the present value of future cash inflows to the initial cash outlay.

PV of future cash flows/Initial cash outlay

Acceptable Criteria

As long as the profitability index is 1.00 or greater, the investment proposal is acceptable. Amongst various projects, the projects with highest profitability index shall be ranked number one followed by others in the descending order.

Profitability index is computed on the basis of net rather than aggregate index. The aggregate index is simply the present value of cash inflows over the present value of cash outflows. Net index is used to differentiate the initial cash outlay from subsequent cash outlays. The initial cash outlay is discretionary because the firm can either commit funds to the project or employ them elsewhere. Subsequent cash outflows are not discretionary in this sense, these are embodied in the system. The aggregate index does not differentiate between the cash outlay the firm has to put up initially and subsequent cash outlays. Due to this reason, the net profitability index is a more rational measure of profitability than the aggregate index.

Evaluation of profitability index

Like other time adjusted techniques, the profitability index also takes into consideration the time value of money. Conceptually, it is a sound investment criterion of capital budgeting. It is a better evaluation technique than NPV in a situation of capital rationing since it evaluates the worth of projects in terms of their relative rather than absolute magnitudes. However, with regard to projects of mutually exclusive nature, the NPV method would be superior to be profitability index method.

Net present value method versus internal rate of return

Both the net present value and internal rate of return methods lead to the same acceptance or rejection decision in case of projects which are conventional and independent in nature. A conventional project is one whose cash flows pattern is such that an initial cash outlay is flowed by cash inflows. Cash outflows are restricted to the initial period in case of such investments. Independent project is one of the acceptance of which does not preclude the acceptance of others so that all profitable proposal can be accepted without any constraint. The reason why both methods give similar results, is obvious. As explained earlier, all projects with positive net present value would be accepted under NPV method is the one which has zero net present value. This project would also have internal rate of return equal to the required rate of return. The projects which have positive net present values will also have an IRR higher than the required rate of return.

Terminal Value Method

This approach separates the timing of the cash-inflows and outflows more distinctly. Behind this approach is the assumption that cash-inflow is re-invested in another assets at the certain rate of return from the moment it is received until the termination of the project. Then the present value of the total compounded sum is calculated and it is compared with the initial cash-outflow. The decision rule is that if present value of the sum total of the compounded re-invested cash-inflows is greater than the present value of cash-outflows, the proposed project is accepted otherwise not. The firm would be different if both the values are equal.

This method has a number of advantages. It incorporates the advantage of re-investment of cash-inflows by compounding and then discounting it. Further, it is best suited to cash budgeting

requirements. The major practical problem of this method lies in projecting the future rates of interest at which the intermediate cash inflows received will be re-invested.

Self Assessment:

Fill in the blanks:

1. Under Net Present Value (NPV) method, all cash inflows and outflow are discounted at a _____acceptable rate of return, usually the firm's cost of capital.
2. _____is the ratio of the present value of cash inflows to the present value of the cash outflows.
3. _____is the interest rate that discounts an investment's future cash flows to the present so that the present value of cash inflows exactly equals the present value of the cash outflows.
4. Profitability Index will be less than I when the investment proposal has a _____net present value under the NPV method.
5. 'The process of selecting the more desirable projects among many profitable investments is called _____.
6. The net cash outlay is the different amount of money that will be spent when the investment is made in year_____.
7. The cost of capital is an important element as basic input information in _____ Decisions.

4.4 Practical problems

A company is considering an investment proposal to purchase a machine costing Rs. 2,50,000. The machine has a life expectancy of 5 years and no salvage value. The company's tax rate is 40%. The firm uses straight line method for providing depreciation. The estimated cash flows before tax (CFBT) from the machine are as follows:

Year	CFBT (Rs.)
1	60,000
2	70,000
3	90,000
4	1,00,000
5	1,50,000

Calculate:

a) Pay back period

b) Average Rate of Return

c) Net Present Value and Profitability Index at 10% discount rate

d) Internal Rate of Return.

Solution:

Year	CFBT (Rs.)	Depreciation (Rs.)	Net Profit Before Tax (Rs.)	Tax (Rs.)	Net Profit After Tax (Rs.)	CFAT (Rs.)
1	60000	50000	10000	4000	6000	56000
2	70000	50000	20000	8000	12000	62000
3	90000	50000	40000	16000	24000	74000
4	100000	50000	50000	20000	30000	80000
5	150000	50000	100000	40000	60000	110000
					132000	

a) Payback period

Cumulative cash flows after Tax

Year	CFAT (Rs.)	Cumulative CFAT(Rs.)
1	56000	56000
2	62000	118000
3	74000	192000
4	80000	272000
5	110000	382000

Thus the full investment is recovered within a period of 3 and 4 years.

Payback period = 3 year = 58000/80000 = 3 years 8.7 months

b) Average rate of return

$$\text{ARR} = \frac{\text{Average Income}}{\text{Average Investment}} \times 100$$

$$\text{Average Income} = \frac{\text{Rs. } 132000}{5}$$

$$= \text{Rs. } 62400$$

$$\text{Average Investment} = \frac{\text{Rs. } 250000}{2}$$

$$= \text{Rs. } 1,25,000$$

$$\text{ARR} = \frac{\text{Rs. } 26400}{\text{Rs. } 125000} \times 100$$

$$= 21.12\%$$

c) Net Present Value

Year	CFAT	PV Factor at 10%	Present Value of Cash Flows
1	56000	0.909	50904
2	62000	0.826	51212
3	74000	0.751	55574
4	80000	0.683	54640
5	110000	0.621	68310
			280640

NPV = PV of cash Inflows – Initial Investment

= Rs. 280640 – Rs. 250000

= Rs. 30640

$$\text{Profitability Index} = \frac{\text{Present Value of Cash Inflows}}{\text{Initial Investment}}$$

$$= \frac{2,80,640}{2,50,000} = 1.12$$

d) Internal Rate of Return

Substituting the value in the question, we get

$$-\frac{250000}{(1+r)^0} + \frac{56000}{(1+r)^1} + \frac{62000}{(1+r)^2} + \frac{74000}{(1+r)^3} + \frac{80000}{(1+r)^4} + \frac{110000}{(1+r)^5} = 0$$

To solve this equation we will have to follow trial and error approach. As is clear from the following table, the value of IRR lies between 14 percent and 15 percent:

Year	CRAT (Rs.)	PV Factor at 14%	PV of cash flows	PV factor at 15% Rs.	PV of Cash flows
1	56000	0.877	49112	0.870	48720
2	64000	0.769	49216	0.756	48384
3	74000	0.675	49950	0.658	48692
4	80000	0.592	47360	0.572	45760
5	110000	0.519	57090	0.497	54670
			252728		246226

IRR = 14 + 2,52,728 – 2,50,000 X 1 = 14.42%

2,52,728 - 2,46,226

Example:

XYZ Ltd. has got Rs. 20,000 to invest. The following proposals are under consideration:

Project	Initial Outlay	Annual Cash inflows	Life (in years)
A	10000	2500	5
B	8000	2600	7
C	4000	1000	15
D	10000	2400	20
E	5000	1125	5
F	6000	2400	6
G	2000	1000	2

a) Rank these projects in order of their desirability under the Payback Period Method.

b) Rank these projects under the net present value index assuming the cost of capital to be 10%

Solution:

a) Ranking under Payback Period Method

Project (1)	**Initial Outlay (2)**	**Annual Cash inflow (Rs.) (3)**	**Payback Period (Years.) (2+3) (4)**	**Rank (5)**
A	10000	2500	4.00	**IV**
B	8000	2600	3.08	**III**
C	4000	1000	4.00	**IV**
D	10000	2400	4.17	**V**
E	5000	1125	4.45	**VI**
F	6000	2400	2.50	**II**
G	2000	1000	2.00	**I**

b) Ranking under Net Present Value Method

Project	**Initial Outlay Rs.**	**Life (yrs)**	**PVA Factor at 10%**	**Annual Cash flow Rs.**	**P.V. of Total Cash Inflow (Rs.)**	**NPV**	**Rank**
A	10000	5	3.791	2500	9,478	(-) 522	Rejected
B	80200	7	4.868	2600	12,657	4657	II
C	4000	15	7.606	1000	7,606	3,606	IV
D	10000	20	8.514	2400	20,434	10,434	I

E	5000	5	7.606	1125	8,557	3,557	V
F	6000	6	4.355	2400	10,452	4,452	III
G	2000	2	1.736	1000	1,736	(-)264	Rejected

Comments: From the above table we can conclude that projects A and G result in loss and therefore should be rejected out rightly without further consideration.

4.5 Summary

Capital budgeting is a double-edge tool that analysis investment opportunities and cost of capital simultaneously while evaluating worthwhile ness of a project. A wide range of criteria has been suggested to judge the worth whileness of investment projects. Capital projects need to be thoroughly evaluated as to costs and benefits. The capital budgeting process begins with assembling of investment proposals of different departments of a firm. The departmental head will have innumerable alternative projects available to meet his requirements. He has to select the best alternative from among the conflicting proposals. This selection is made after estimating return on the projects and comparing the same with the cost of capital. Investment proposal which gives the highest net marginal return will be chosen. Following are the steps involved in the evaluation of an investment: 1) Estimation of cash flows, 2) Estimation of required rate of return and 3) Application of a decision rule for making the choice. A sound appraisal technique should be used to measure the economic worth of an investment project. The various techniques of investment appraisal methods include: Discounted Cash Flow (DCF) Criteria i) Net present value (NPV), ii) Internal rate of return (IRR) and iii) Profitability index (PI). Non-discounted Cash Flow Criteria i) Pay-back period, ii) Discounted payback period and iii) Accounting rate of return (ARR).

4.6 Glossary

Payback period: A method of evaluating investment proposal which determine the time a project's cash inflows will take to repay the original investments of the project.

Average rate of return: Also known as the accounting rate of return (ARK)< return on investment (ROT) or return on assets (ROA), is obtained by dividing average annual post-tax profit by the average investment.

Discount rate: The rate at which cash flows are discounted. This rate may be taken as the required rate of return on capital, or the cost of capital.

Internal rate of return: The IRR is a method of evaluating investment proposals. It is that rate of discount (or interest rate) that equals the present value of outflows to the present value of inflows, thus making NPV=Q.

Mutually exclusive projects: A situation in which the acceptance of one investment proposal leaves out the acceptance of another proposal.

Net present value: A method of evaluation consisting of comparing the present value of all net cash flows (discounted by cost of capital as the interest rate) to the initial investment cost.

4.7 Answers: Self Assessment:

1. Minimum

2. Profitability index
3. Internal rate of return
4. negative
5. capital rationing
6. zero
7. capital investment

4.8 Terminal Questions:

1. What are the mutually exclusive projects? Explain the conditions when conflicting ranking would be given by the internal rate of return and net present value methods to such projects.
2. Explain the investment criteria. Discuss the various methods of appraisal of investment proposals.
3. (a) Differential between NPv and IRR method
4. Do the NPV and Profitability index always lead to the same investment decision? Discuss.
5. Company is considering an investment proposal to purchase a machine costing Rs. 2,50,000. The machine has a life expectancy of 5 years and no salvage value. The company's tax rate is 40%. The firm uses straight line method for providing depreciation. The estimated cash flows before tax (CFBT) from the machine are as follows.

Year	CFBT (Rs.)
1	60,000
2	70,000
3	90,000
4	1,00,000
5	1,50,000

4.9 Suggested readings:

1. I.M. Pandey, Financial Management, Vikas Publishing New Delhi.
2. James C. Van Horne Financial Management and Policy Prentice Hall, New Delhi.
3. M.Y. Khan and P.K. Jain, Financial Management, Tata McGraw Hill, New Delhi.
4. Prasanna Chandra, Financial Management, Tata McGrew Hill, New Delhi.

Lesson 5

CAPITAL BUDGETING UNDER RISK AND UNCERTAINTY

Structure

5.0 Learning Objectives:

After studying this lesson, you should be able to:

- Know the meaning of risk and uncertainty
- To describe the types of risk and uncertainties
- To identify the risk and investment proposals
- Describe the methods of capital budgeting under risk and uncertainty.

5.1 Introduction

The risk with reference to capital budgeting refers to the difference between the actual and expected cash inflows. The actual cash inflows depend upon a variety of factors such as cost of raw materials, sales volume, price, effectiveness of advertising campaign, degree of competition etc. The accuracy of the estimates of future cash inflows would largely depend upon the extent of accuracy with which these factors are forecast. Although, forecasts cannot be made with perfection or certainty since the future events on the basis of which the forecasts are made are uncertain, the less accurately they are forecast, the more likely would be the risk involved in capital budgeting.

In case the cash flows estimated from a project are known with certainty then there would be no risk. For example, if a person invests Rs.1, 00,000 in 8% short term government bonds, there would be no risk because he can accurately estimate the return on the investment. However, instead of investing in government bonds, he purchases the share of a company, then it is not possible to estimate the future returns with accuracy. Because of high degree of uncertainty associated with the future returns, the investment in shares would be considered risky. Thus risk is related to the variability of future returns.

5.2 Meaning of Risk and Uncertainty

Risk and uncertainty are quite inherent in capital budgeting decisions. Future is uncertain and involves risk. Risk involves situations in which the probabilities of an event occurring are known and these probabilities are objectively determinable. Uncertainty is a subjective phenomenon. In such situation, no observation can be drawn from frequency distribution. The risk associated with a project may be defined as the variability that is likely to occur in the future returns from the project. A wide range of factors give rise to risk and uncertainty in capital investment, viz. competition, technological development, changes in consumer preferences, economic factors, both general and those peculiar to the investment, political factors etc. Inflation and deflation are bound to affect the investment decision in future period rendering the deeper of uncertainty more severe and enhancing the scope of risk. Technological developments are other factors that enhance the degree of risk and uncertainty by rendering the plants or equipments obsolete and the product out of date. It is worth noting that distinction between risk and uncertainty is of academic interest only. Practically no generally accepted methods could so far be evolved to deal with situation of uncertainty while there are innumerable techniques to deal with risk. In view of this, the terms risk and uncertainty are used exchangeable in the discussion of capital budgeting.

5.3 Types of risks and uncertainties in Capital Budgeting

There are numerous kinds of risks and uncertainties to be taken into account when considering capital budgeting including:

- **Project-specific risk**- This risk is related to the difference between the actual and expected cash inflows of the project. A project may yield higher or lower cash inflows than expected, either because of the wrong estimation or because of factors specific to the project.
- **Corporate risk**- This risk assumes the project a company intends to pursue is not a single asset but incorporated with a company's other assets. As such, the risk of a project could be diversified away by the company's other assets. It is measured by the potential impact a project may have on the company’s earnings.
- **International risk (including currency risk)** - Multinational firms who holds projects in various countries face such type of risk. It includes exchange rate movements and political changes.
- **Industry-specific risk**- It arises due to the changes in technology, change in the cot of raw materials being used in the specific industry and change in the price of goods and services that are produced.
- **Market risk** - Market risk involves the risk of losses in position due to movement in market positions.
- **Stand-alone risk**- This risk assumes the project a company intends to pursue is a single asset that is separate from the company's other assets. It is measured by the variability of the single project alone. Stand-alone risk does not take into account how the risk of a single asset will affect the overall corporate risk.
- Apart from the above risk there are several types of uncertainties present which are important to the producer, as he formulates plans and designs courses of actions for procuring resources at the present time for a product forthcoming at a future date. The types of uncertainties can be

classified as (i) Price uncertainty (ii) Production uncertainty (iii) Production technology uncertainty (iv) Political uncertainty (v) Personal uncertainty; and (vi) Peoples' uncertainty.

5.4 Risk and Investment Proposals

There are two measures of incorporating risk in the decision – making. They are: 1) The expected value and 2) The standard deviation.

1) The Expected Value: In a situation of certainty, any investment gives only one possible cash flow out in a risky situation several cash flows are possible, each with a given probability. By as certaining the average of all such possible outcomes (X)1 weighed by their respective probabilities (P) we can get a single value for the cash flows. The value is known as expected value E (X), whose generalized expression is

$$E(X) = \sum_{i=1}^{n} X_i p_i$$

3) **The Standard Deviation**: The statistical concept of standard deviation is used as a yard stick that reflects the variations of possible outcomes from its mean value. The standard deviation is calculated as:

$$\sigma = \sum_{i=1}^{n} (X_i - X)^{-2} P_i$$

Where, σ = standard deviation

X, X and P represent the same.

Note:

The combination of expected value and standard deviation helps in choosing between projects. However, if the two projects have identical expected values, the project with the minimum dispersion in returns i.e., lower standard deviation is preferred as it is less risky project.

5.5 Methods of Capital Budgeting Under Risk and Uncertainty

A capital expenditure decision may not be sound, if taken on the basis of only one set of assumptions as regards the profitability, without perceiving the risk and uncertainty connected with the assumptions. Well then, how the firm perceives uncertainty. There are different techniques developed for the purpose, both simple and highly complicated and mathematical. Common and non-mathematical Methods of Capital Budgeting Under Risk and Uncertainty are discussed below:

1. *Shorter Payback Period*

According to this method, projects with shorter payback period are normally preferred to those with longer payback period. It would be more effective when it is combined with "cut off period". Cut off period denotes the risk tolerance level of the firms. For example, a firm has three projects. A , B and C for consideration with different economic lives say 15,16 and 18 years respectively and with payback periods of say 6, 7 and 5 years. Of these three, project C will be preferred, for its payback period is the shortest. Suppose, the cut off period is 4 years, .then all the three projects will be rejected.

2. Risk Adjusted Discount Rate

The risk-adjusted discount rate is based on the risk-free rate and a risk premium. The risk premium is derived from the perceived level of risk associated with a stream of cash flows for which the discount rate will be used to arrive at a net present value. The risk premium is adjusted upward if the level of investment risk is perceived to be high. When a high risk-adjusted discount rate is applied to a stream of cash flows, the net present value of those cash flows will be greatly reduced. Conversely, a low risk-adjusted discount rate will result in a higher net present value. A proposed investment with a higher net present value is more likely to be accepted. Thus, the discount rate is used to judge whether a proposed investment is acceptable.

An estimation of the present value of cash for high risk investments is known as **risk-adjusted discount rate**. A very common example of risky investment is the real estate. Risk adjusted discount rate is representing required periodical returns by investors for pulling funds to the specific property. It is generally calculated as a sum of risk free rate and risk premium. The variation of risk premium is depending on the risk aversion of investor and the perception of investor about the size of property's investment risk.

Though the use of a risk-adjusted discount rate initially appears to be a highly regimented and quantitatively sound approach to evaluating risky investments, it is subject to one significant flaw, which is how the risk premium is derived. Managers could break the system by first calculating the maximum discount rate that will still result in their project being approved, and lobby in favor of the application of that discount rate - irrespective of the actual risk profile of the project.

Risk-adjusted discount rate = Risk free rate + Risk premium

Under CAPM or capital asset pricing model

Risk premium= (Market rate of return - Risk free rate) x beta of the project

The risk-adjusted discount rates declare for that by altering the rate depending on possibility of risks of investment projects. For higher risk investment project a higher rate will be used and for a lower risk investment project, a low rate will be used. The net present value is inversely proportional to risk-adjusted discount rate as an increase in adjusted rate will decrease net present value, representing that the task is less acceptable and perceived as riskier one. A rate which would be used to discount the cash flow is the sum of risk free rate and compensation for investment risk. Suppose risk free rate is 10% and compensation of investment risk is 5%, then a rate of 15% will be use for discount cash flow.

Advantages of Risk Adjusted Discount Rate

The risk-adjusted discount rate is that the concept is easy to understand and it is a reasonable attempt to quantify risk. However, as just noted, it is difficult to arrive at an appropriate risk premium, which can render the results of the analysis invalid. This approach also assumes that investors are risk-averse, which is not always the case. Some investors will accept a high level of risk if they perceive a potentially large payoff in the future.

Limitations of Adjusted Discount Rate

The main disadvantage of this technique is the arbitrariness associated with the adjustment of rate of return. Though it may be possible to divide the investments into risk classes and assign different rates

of return, such a categorization is based on only hunch and intuition. Moreover, it does not use all the information which is available from a probability distribution of cash-inflows.

3. Certainty Equivalents (CE): This is an alternative method to risk adjusted rate of return in which the adjustment is done for risk in the expected future cash flows before arriving at the present value. The expected uncertain cash-flows before arriving at the present value. The expected uncertain cash-flows of each year are modified by multiplying them with what is known as **'certainty equivalent coefficient**'(CEC) to remote the element of uncertainty. This co-efficient is determined by management's preference with respect to risk.

For example, assume that the expected cash-flow from an investment at the end of the first year is Rs.10,000 and that the management ranked this investment on par with another alternative investment with a certain cash-flows of Rs.7,000. The CEC in this case is 0.7 that is equal to Certain cash-flows divided by Uncertain cash-flows.

CEC=Certain cash-flows/ Uncertain cash-flows

Similarly, a CEC can be assigned to each year's expected uncertain cash-flows and convert them into certainty equivalents and then proceed to ascertain the rate of return or NPV. CE approach also presents practical problem of implementation as it is very difficult to assign the exact CEC's for a given stream to expected future cash flows. However, it is superior to risk adjusted rate of return because distant discount rate implies that risk increases at a constant rate with time which is not realistic. But under CE approach CEC is determined period by period recognizing increasing uncertainty as the future advances.

The CEC varies invertly with the risk. Again CE approach is upheld on the ground that it is the future cash-flow a project which is subject to risk and not the rate of return.

4. Sensitivity Analysis

This provides information about cash flows under three assumptions: i) pessimistic, ii) most likely and iii) optimistic outcomes associated with the project. It is superior to one figure forecast as it gives a more precise idea about the variability of the return. This explains how sensitive the cash flows or under the above mentioned different situations. The larger is the difference between the pessimistic and optimistic cash flows, the more risky is the project.

5. The Probability Approach –

It has already been pointed out that the capital budgeting decision based on estimation of only one set of cash-flows and profitability of a prospective project may prove to be erroneous for the simple reason that we are dealing with uncertain future. Let us assume that two alternative projects 'A' and 'B' offer the same profitability, say, DRR of 20%. If we do not analyze further both are equally desirable. Let us further assume that in case of project 'A' there is a possibility of DRR going down to 10% if benefits are not fully realized and up to 30% if benefits are better than expected and that the corresponding figures for project 'B' are 5% and 35%. The lowest return expected (pessimistic return) from 'A' is 10% and the maximum (optimistic) return is 30% giving an average (most likely) return of 20%. The corresponding estimates for project B' are 5%, 35% and 20th. Both have the same most likely DRR. Which would be preferred? The answer is project 'A' for, its profitability is less variable (or dispersed) compared to that of project `B' investment. 'A' has a profitability range of 20% (30-10) and project 'B'

has 30% (35-5). Project 'B' is considered more risky as it has a wider profitability range. For a more accurate result standard deviation of Profitability may be used as measure of dispersion instead of range.

The above analysis could be made more meaningful and realistic through probability approach. Instead of estimating the pessimistic, most likely and optimistic values arbitrarily is possible to assign definite probabilities to each of the expected stream of cash-flows and construct a probability distribution. Probability of something is an expression of the chances or the likelihood of its occurrence.

For example, the probability of getting a head when a coin is tossed is .5. which is the ratio of number of ways can occur divided by all possible outcomes. However, this theoretical approach to probability is not applicable to business situations. What is applicable is the subjective approach whereby probability is determined on the basis of strength of belief, experience and educated guess. 'Reasonable men base the probabilities which they assign to events in the real world on their experience with events in the real world, and where two reasonable men have roughly the same experience with a certain kind of event they assign it roughly the same probability. Two methods are widely used under probability approach to incorporate risk and uncertainty in capital budgeting decision.

Dispersion on of Probability Distribution:

The first step is to construct a probability distribution of cash flows by assigning probabilities (which vary from 0 total and the sum of which is always 1) to each stream of expected cash-flows. For instance, the probability of cash-flows being Rs.10,000 in the first year is, say, .5, being Rs.15,000, is .3 and being Rs.7,500 is .2, the probabilities adding upto 1. The most probable cash-flow would be the sum of the expected cash-flow multiplied by its probability, which, in this case, is (10,000 x .5) – 4 – (15,000 x .3) + (7,500 x .2)= $11,000.

Secondly, the probability distribution of cash-flows, obtained as above, of two or more proposals may be represented on a graph for the purpose of comparison of probability distribution. Probability of occurrence is plotted on the 'Y' axis and cash- flows on the 'X' axis. Alternatively, a measure of dispersion (usually standard deviation) may be computed for each of the alternative's probability distribution for comparison. Finally, decision is made in favor of the investment that has the lowest dispersion or variability of cash-flows from the expected cash-flow.

6. Decision Tree Analysis

Decision tree analysis is another technique which is helpful in tackling risky capital investment proposals. Decision tree is a graphic display of relationship between a present decision and possible future events, future decisions and their consequence. The sequence of event is mapped out over time in a format resembling branches of a tree. In other words, it is pictorial representation in tree from which indicates the magnitude probability and inter-relationship of all possible outcomes.

Elements of Decision Theory

Managerial Economics focuses attention on the development of tools for finding out an optimal or best solution for the specified objectives in business. Any decision has the following elements:

1. The Decision Maker.
2. Objectives or goals sought to be achieved by the decision maker; for example, maximisation of profit or sales revenue may be the objective of the business

3. A set of choice alternatives, for example the available projects in Capital budgeting.
4. A set of outcomes or pay-offs with each alternatives; that is net benefits from the projects. Outcomes may be certain or uncertain. In case of former, the selection of any alternative leads uniquely to a specific pay-off. In case of later, any one of a number of outcomes may be associated with any specific decision.
5. A number of states of the environment whose occurrence determines the possible outcomes. For example, inflation and depression would be two alternative states, in the absence of risk and uncertainty, the outcome of a project is known. Therefore only one state of the environment is possible. The study of Managerial Economics begins with developing awareness of the environment within which managerial decisions are made.
6. Criteria derived from the general objectives which enable the decision taker to rank the various alternatives in terms of how far their pay-offs lead to the achievement of the decision maker's goals. This is known as the decision process.
7 Constraints on the alternatives when the decision maker may select. For example, the government policy on monopoly control; top management directions regarding business undertakings, diversification of business or diversifying an existing product line or to refrain from certain types of business, etc.

Self Assessment:

Fill in the blanks:

1. In the context of capital budgeting, the term_____, refers to the chance that a project will prove unacceptable.
2. Risk is associated with the _____of future returns of a project.
3. Business firms using Payback method usually prefer _____payback.
4. Under Certainty equivalent approach method, risk element is compensated by adjusting cash inflows rather than adjusting the_____.
5. A _____approach is a pictorial representation in tree form along with branches of the magnitude, probability and inter relationship of all possible outcomes.
6. _____analysis provides more than one estimate of future return of a project.

5.6 Summary

We know that the resources are always limited and the demand for them far exceeds their availability, It is for this reason that the firm cannot take up all the projects though profitable, and has to select the combination of proposals that will yield the greatest profitability.

Risk and uncertainty are quite inherent in capital budgeting decisions. Future is uncertain and involves risk. Risk involves situations in which the probabilities of an event occurring are known and these probabilities are objectively determinable. Uncertainty is a subjective phenomenon. In such situation, no observation can be drawn from frequency distribution. The risk associated with a project may be defined as the variability that is likely to occur in the future returns from the project. A wide range of factors give rise to risk and uncertainty in capital investment, viz. competition, technological

development, changes in consumer preferences, economic factors, both general and those peculiar to the investment, political factors etc. The types of uncertainties can be classified as (i) Price uncertainty (ii) Production uncertainty (iii) Production technology uncertainty (iv) Political uncertainty (v) Personal uncertainty; and (vi) Peoples' uncertainty.

The methods /techniques used to handle risk may be classified as shorter payback period, risk-adjusted discount rate, certainty equivalents approach, sensitivity analysis, probability analysis; decision-tree analysis etc.

5.7 Glossary

1. **Risk-free Rate:** The rate at which the future cash flows of a project which is not subjected to risk are discounted.
2. **Risky Investment:** Risk in an investment refers to the variability that is likely to occur between the estimated returns and the actual returns.
3. **Decision Tree Analysis:** Decision tree analysis is a technique which is helpful in tackling risky capital investment proposals. It is pictorial representation in tree which indicates the magnitude probability and inter-relationship of all possible outcomes.

5.8 Answers: Self Assessment:

1. risk
2. variability
3. short
4. discount rate
5. decision tree
6. Sensitivity

5.9 Terminal Questions:

1. Explain the concept of risk analysis in capital budgeting.
2. What are the different types of risks that may affect the capital budgeting decision?
3. What is risk- adjusted discount rate with reference to capital budgeting?
4. How certainty equivalent approach useful in capital budgeting?
5. What is meant by decision tree analysis?

5.10 Suggested Readings:

1. I.M. Pandey, Financial Management, Vikas Publishing New Delhi.
2. James C. Van Horne Financial Management and Policy Prentice Hall, New Delhi.
3. M.Y. Khan and P.K. Jain, Financial Management, Tata McGraw Hill, New Delhi.
4. Prasanna Chandra, Financial Management, Tata McGrew Hill, New Delhi.

LESSON 6

COST OF CAPITAL

Structure

6.0 LEARNING OBJECTIVES

After reading this lesson you should be able to

- Understand the basic concept of cost of capital.
- Know the importance of cost of capital
- Identify the problems in determination of cost of capital
- Understand the various methods of measuring the cost of capital of specific sources of long term finance.

6.1 Introduction

We have already learnt that Business should invest only when the value of the firm and the wealth of the shareholders is maximized. The funds utilized for business investments and overall operations of the business can be derived from different sources like:- a) Different types of debt

available in the market (b) Preferred stock (c) Common stock etc. Optimal financing mix of any given firm is that ideal financing mix which maximizes the value of the firm and wealth of the shareholders.

Under capital expenditure decisions cost of capital assesses profitability of long-term investments and justifies their adoption by the firm by comparing it to its cost. Thus after estimating the total funds required for operational activities and capital investments, the firm estimates the total cost of its total funds. Cost of capital is the minimum acceptable rate of return on funds capital employed by the company. This minimum acceptable rate of return is the compensation for the time and risk in the use of the funds by the company. Cost of capital helps the company in evaluating its investment decisions, designing its debt structure, deciding its dividend decisions, investment in current assets and appraisal of financial performance of the firm.

6.2 Meaning & Definition of Cost Capital

The term cost of capital has been defined in number of ways by various authors. Therefore, there is no agreement among authorities in finance on the meaning of cost of capital. In a layman's language cost of capital is understood to be the price which is paid b the firm for the use of capital to those who provide such capital. Thus cost of capital is the rate of return on capital which a firm has to pay for the use of capital to those who supply such capital to the firm.

Some authors view cost of capital as the minimum rate of return expected by its investors. Form the firm's point of view, cost of capital may be defined as the minimum rate of return which a firm must earn on its investment to justify such investment. A firm would justify its investment if the rate of return on its investment is equal to the rate of return which it has to pay to the investors for the use of capital invested in the business. In the case of projects financed by raising share capital or retaining net earnings, the rate of return should be at least equal to the rate of return expected by the shareholders. Thus cost of capital (in the case of share capital and retained earnings) can also be defined as the minimum rate of return expected by the shareholders.

According to Milton H. Spenser, "The cost of capital is the required rate of earning or the cut off rate for capital expenditures."

Hunt, William and Donaldson, "Cost of capital may be defined as the rate that must be earned on the net proceeds to provide the cost elements of the burden at times they are due."

G.S. Philippatos, "The Cost of capital is the minimum required rate of return, the hurdle or the target rate, the cut off rate of the financial standard or performance of a project."

Johan Hampton defined as, " Cost of capital is the rate of return the firm requires from investment in order to increase the value of firm in the market place."

James C. Van Horne, " Cost of equity capital can be defined as the minimum rate or return that a company must earn on equity-financed portion of its investments in order to leave unchanged the market price of its stock."

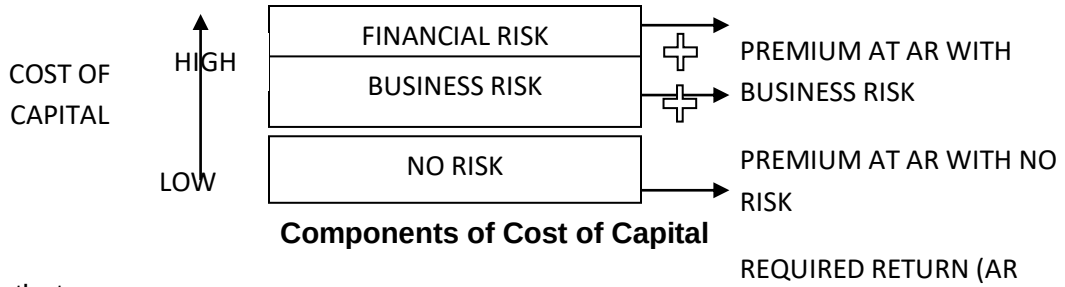
In essence, a firm's cost of capital is the rate or return which is required on its investments to increase the value of the firm in the market place. There are four major characteristics of cost of capital:

i. Cost of capital is really a rate of return; it is not a cost as such.

ii. Cost of capital is a minimum rate of return, just to maintain the market value of the firm.

iii. Cost of capital is a minimum rate of return which is required on new projects to increase the value of the firm.

iv. Cost of capital has three components: Return at zero risk level; Premium for business risk; and Premium for financial risk (it is illustrated by the following figure).



Components of Cost of Capital

It is clear that

(i) Cost of capital with Business Risk > Cost of capital with no risk; and

(ii) Cost of capital with Financial Risk > Cost of capital with Business Risk > Cost of capital with No Risk.

Business risk is a possibility that the firm will not be able to operate successfully in the market. Greater the business risk, the higher the cost of capital. Financial risk is a possibility that the firm will not earn sufficient profits to make payment of interest on loans, and or to pay dividends. Greater the financial risk, the higher the cost of capital. Besides financial risk and business risk, the following risks also affect the cost of capital:

- Purchasing Power Risk
- Money Rate Risk
- Market Risk

Purchasing power risk arises due to changes in purchasing power of money. Purchasing power of money is indicated by changes in price level. Higher the degree of stability in prices, the lower the purchasing power risks.

Money rate risk means the risk of an increase in future interest rates. Creditors, particularly debenture-holders, may be sensitive to this form of risk. Increase in demand for funds (due to increase in productivity of capital) increases the interest rate. As a result, there is an upward shift in the costs of funds.

Market risk is also called liquidity risk. It means the ability of a supplier of funds to sell his shares/debentures/bonds quickly. Stock exchanges provide for this liquidity. But all shares and securities cannot be sold with the same degree of ease.

6.3 Importance of Cost of Capital

Although idea has been given earlier about significance of cost of capital, yet it is explained here as:

a) As mentioned earlier, cost of capital plays a crucial role in “capital budgeting” decisions. It normally serves as a ‘cut off point or the hurdle rate. If rate of return of a project is at least equal or more than cost of capital, it is acceptable.

b) Concept of cost of capital is equally important while designing ‘capital structure’ of a business. Capital structure is said to be optimum when the combined/average cost is minimized and value of a company is maximum. There are two schools of thought for relation of cost of capital and capital structure. One is known as Modigliani-Miller approach which claims that corporation’s cost of capital is constant and is independent of the method and level of financing, where as the other point of view is that cost of capital varies with the method and level of financing.

c) Cost of capital signifies the ‘level of risk’ in the business. Higher the cost of capital, more risky is the proposal.

d) Cost of capital also has an impact on the dividend policy of the firm.

e) Besides assisting in designing capital structure of a business cost of capital assists in deciding the ‘the mode of financing’ for a particular need in the business.

f) Like its influence on capital structure, cost of capital is useful for deciding the source of working capital fund.

6.4 Different Concepts of Cost of Capital

The term cost of capital is viewed differently by different analysts, thus cost of capital has a number of concepts. The concept of cost of capital to be used decision making by a user depends upon the circumstances of the case. Following are the various concepts of cost of capital.

a) Specific Cost and Combined Cost

As every firm raises funds from different sources e.g. equity, loans, debentures, preference shares etc., the cost of different sources of funds individually is known as specific cost like, cost of debt capital. The specific cost of capital helps us in designing capital structure of the firm. In capital structure the source with least cost is preferred. Suppose cost of debt is 8 percent where as cost of equity capital is 12 percent, it is not possible at all that only debt funds should constitute the capital structure. On the other hand, this concept is also useful in capital budgeting decisions. Suppose a project is to be financed by debt funds with cost of 8 percent but return on the project is likely to be less than 8 percent, such project will be rejected.

Whereas at combined cost is an inclusive cost of capital from all sources i.e. debt, equity, preference share etc. this is also known as weighted cost of capital. This concept is most important when we undertake capital budgeting decisions keeping the firm as a whole in view and this is what is desirable, even if for a particular project only one type of fund is arranged.

b) Explicit Cost and Implicit Cost

Explicit cost of capital of any source of fund may be defined as the discount rate that equates the present value of the cash-in-flow net of underwriting and other cost, with present value of expected cash out-flows. This known as internal rate of return of the cash flows of financing authority. The out

flows refer to payment of dividends, interest and also repayment of principal amount, if any. This definition can be put in an algebraic relationship as follows:

$$\text{NP} = \frac{C_1}{(1+K)} + \frac{\text{C}_1}{(1+K)^2} + - + \frac{\text{C}}{(1+\text{K})^{\text{n}}}$$

Where 'k' the discounting factor is the explicit cost, NP is initial net cash in-flow. C_1 is the cash out flow in first year and similarly payments for 2nd, 3rd,….., nth year are denoted by C_2, C_1,….., C^n. The payments are to be made in future are to be estimated. This equation implies that explicit cost arises only if some payment is to made in times to come, consequently we can say that there is no explicit cost for 'retained earnings' since it is not paid out.

But is business finance we take into account the cost of retained earnings and it is said to have 'opportunity cost' or 'implicit cost'. Implicit cost is a hypothetical cost. Such cost takes shape when a business evaluates alternative uses of the funds raised. It is the rate of return foregone by accepting the present proposal. The basic concept under implicit cost is that by availing itself to a particular opportunity, a firm has to sacrifice other investment proposal. Thus, the implicit cost may be defined as:

"The rate of return associated with the best investment opportunity for the firm and its shareholders that will be foregone if the project under consideration by the firm were accepted".

This concept is of great use in capital rationing situation of capital budgeting. It is interesting to note that implicit cost of a particular source arises only when it is not used it.

c) Future Cost and Historical Cost

In financial decisions instead of historical cost of capital, future cost of capital is of relevance. This is why in capital budgeting we calculate cost on the future flows of cash. Efforts are always made by finance manager to minimize the future cost of capital by designing capital structure in a desired manner. Historical costs can at the most be used as standards or to predict the future.

6.5 Problems Involved in Determination of Cost of Capital

It is not an early task to determine the cost of capital of a firm. While determining the cost of capital of a firm, the funds manager is confronted with a large number of problems both conceptual and practical.

(i) **Computation of cost of equity:** The cost of equity capital is the minimum rate of return that a company must earn on that portion of its capital employed, which is financed by equity capital so that the market price of the shares of the company remains unchanged. This implies that to find out the cost of equity capital one has to quantity the expectations of the shareholders from the particular equity shares. As it is a difficult task, a precise measure of cost of equity capital is also an arduous task.

(ii) **Computation of cost of retained earnings and depreciation funds:** The cost of capital raised through these sources will depend on the approach adopted for computing the cost of capital. As there are different views, the funds manager has to face a different task in subscribing and selecting an appropriate approach.

(iii) **Marginal Vs average cost of capital:** For decision – making purposes, it is the future cost of capital and not historical cost of capital which is relevant. It therefore creates another problem

whether to consider marginal cost of capital, i.e., cost of additional funds or the average cost of capital.

(iv) **Problem of weights:** The assignment of weights of each type of funds is a complex issue. If a financial executive wants to ascertain the average cost of capital than the problem of weights also arises. The finance manger has to make a choice between the book value of each source of funds and the market value of each source of funds. Both have their one merits as well as weaknesses.

6.6 Measurement of Cost of Capital

The cost of the different sources of financing represents the components of continued cost. Each firm has ideal capital mix of various sources of funds; external sources (debt, preferred stock and equity stock) and internal sources (reserves and surplus). Determining of cost of capital involves relating the expected outcome of the specific source of capital to the market or book value of that source. Expected income in this context comprises interest, discount on debt, dividends, EPS or similar other variables most suitable to the particular case. The computation of the cost of capital involves two steps, i) The computation of the different elements of the cost in terms of the cost of the different source of finance, and ii) the calculation of the overall cost by combining the specific cost into a composite cost.

6.6.1 Cost of Debts

a) The cost of debt is the rate of interest payable on debt. For example, a company issues Rs. 2,00,000 10% debentures at per; the before-tax cost of this debt issue will also be 10%. By way of a formula, before-tax-cost of debt may be calculated as:

$$Kdb = \frac{I}{P}$$

Where, K = Before tax cost of debt

I = Interest

And P = Principal

b) In case the debt is raised at premium or discount, we should consider P as the amount of net proceeds received form the issue and not the face value of securities. The formula may be changed to

$$K = \frac{I}{NP}$$ (where, NP = Net Proceeds)

c) Further, when debt is used as a source of finance, the firm saves a considerable amount in payment of tax as interest is allowed as a deductable expense in computation of tax. Hence, the effective cost of debt is reduced. The after-tax cost of debt may be calculated with the help of following formula:

$$Kda = Kdb\ (I\text{-}t) = \frac{I}{NP}\ (I\text{-}t)$$

Where Kda = After-tax cost of debt

t= Rate of tax

d) Cost of Redeemable Debt usually, the debt is issued to be redeemed after a certain period during the life time of a firm. Such a debt issue is known as redeemable debt. The cost of redeemable debt capital may be computed as:

1. Before-tax cost of debt,

$$\text{Kab} = \frac{\text{I} + \frac{\text{I}}{N}(P - NP)}{\frac{I}{2}(P + NP)}$$

Where, I = Interest, N=Number of years in which debt is to be redeemed, P=Proceeds at par, NP=Net Proceeds

2. After-tax cost of debt, Kda =Kdb (1-t)

$$\text{Where Kdb} = \frac{\text{I} + \frac{\text{I}}{N}(P - NP)}{\frac{I}{2}(P + NP)}$$

e) Cost of Debt Redeemable at Premium Sometimes debentures are to be redeemed at a premium:-i.e.; at more than the face value after the expiry of a certain period. The cost of such debt redeemable at premium can be computed as below:

1. Before tax cost of debt, $\text{Kdb} = \frac{\text{I} + \frac{\text{I}}{N}(RV - NP)}{\frac{I}{2}(RV + NP)}$

Where I=Interest, n=Number of years in which debt is to be redeemed, RV=Redeemable value of debt, NP=Net Proceeds

2. After-tax cost of debt, K=Kdb (1-t)

Where, t-Tax Rate, k = Same as in (i) above

f) Cost of debt redeemable in installments: Financial institutions generally require principal to be amortized in installments. A company may also issue a bond or debenture to be redeemed periodically. In such a case, principal amount is repaid each period instead of lump sum at maturity and hence cash outflows each period include interest and principal. The amount of interest goes on decreasing each period as it is calculated on the outstanding amount of debt. The before-tax cost of such a debt can be calculated as below:

$$\text{Vd} = \frac{I_1 + P_1}{(I + K\text{d})^1} + \frac{I_2 + P_2}{(I + K\text{d})^2} + \cdots \ldots + \frac{I^{\text{n}} + P^{\text{n}}}{(I + K\text{d})^{\text{n}}}$$

$$\text{Vd} = \sum_{t=1}^{n} \frac{I_1 + P_1}{(I + K\text{d})^1}$$

Where Vd=Present value of bond or debt

$I_1, I_2 \ldots, I_n$= Annual interest (Rs.) in period 1,2,….., and so on

$P_1, P_2, \ldots\ldots P_n$ = Periodic payment of principal in period 1,2,….. and so on

N= Number of years to maturity

Kd= Cost of debt or Required rate of return.

g) cost of Zero coupon Bonds: Sometimes companies issue bonds or debentures at discount from their eventual maturity value and having zero interest rate, No interest is payable on such debentures before their redemption and at the time of redemption the maturity value of the bond is to be paid to the investors. The cost of such debt can be calculated by finding the present values of cash flows as below:

i. Prepare the cash flow table using an arbitrary, assumed discount rate to discount the cash flows to the present value (For present value tables, please refer to the chapter of capital budgeting or the Appendix given at the end of the book).
ii. Find out the net present value by deducting the present value of the outflows from the present value of the inflows.
iii. If the net present value is positive, apply higher rate of discount.
iv. If the higher discount rate still gives a positive net present value, increase the discount rate further until the NPV becomes negative.
v. If the NPV is negative at this higher rate, the cost of debt must be between these two rates.

Example-1

a) X Ltd. issues Rs. 100,000 8% debentures at par. The tax rate applicable to the company is 50%. Computer the cost of debt capital.
b) X Ltd. issues Rs. 1,00,000 8% debentures at a premium of 10%. The tax rate applicable to the company is 60%. Compute of debt capital.
c) X Ltd. issues Rs. 1,00,000 8% debentures at a discount of 5%. The tax rate is 50%. Compute the cost of debt capital.
d) X Ltd. issues Rs. 2,00,000 9% debentures at a premium of 10%. The cost of floatation are 2%. The tax rate applicable is 60%. Compute cost of debt-capital.

Solution:-

In all cases, we have computed the after-tax cost of debt as the firm saves on account of tax by using debt as a source of finance.

a) Kda= $\frac{\mathrm{I}}{NP}$ (I-t)

$\frac{8000}{1{,}00{,}000}$ (1-0.5) = 4.10%

b) Kda= $\frac{\mathrm{I}}{NP}$ (I-t)

$\frac{8000}{1{,}10{,}000}$ (1-0.6) = 2.91%

c) Kda= $\frac{\mathrm{I}}{NP}$ (I-t)

$\frac{8000}{958000}$ (1-0.5) = 4.21%

d) Kda= $\frac{\mathrm{I}}{NP}$ (I-t)

$\frac{18000}{2{,}15{,}600}$ (1-0.6) = 3.34%

Example-2

A 5-year Rs. 100 debenture of a firm can be sold for a net price of Rs. 96.50. The coupon rate of interest is 14 percent per annum, and the debenture will be redeemed at 5 percent premium on maturity. The firm's tax rate is 40 percent. Compute the after-tax cost debenture.

Solution

Before-tax cost of debt-redeemable at premium,

$$\text{Kdb} = \frac{\mathrm{I}+\frac{\mathrm{I}}{n}(RV-NP)}{\frac{I}{2}(RV+NP)}$$

$$= \frac{14+\frac{1}{5}(105-96.50)}{\frac{I}{2}(105-96.50)} = \frac{15.70}{100.75} = 15.58\%$$

After-tax cost of debt,

Kda=Kdb (1-t)

= 15.58 (1-0.4) = 15.58 x 0.6 = 9.35%

6.6.2 Cost of Preference Share Capital

A security sold in a market place promising a fixed rupee return per period is known as a preference share or preferred stock. Dividends on preferred stock are cumulative in the sense that if the firm is unable to pay when promised by it, then these keep on getting accumulated until paid, and these must be paid before dividends are paid to ordinary shareholders. The rate of dividend is specified in case of preference shares. Preference shares are of two kinds: the redeemable and irredeemable preference shares. In case of redeemable preference shares the period of repayment is specified, while for irredeemable ones this is not done.

The important difference in the true cost of debentures and preference shares must be noted. Interest on debentures is considered as an expense by tax authorities and is, therefore, deducted from company's income for tax purposes. That is why the true cost of debentures is the after tax cost. On the other hand, the dividends are paid to preference shareholders after the company has paid tax on its income (including that portion of income which is be paid to preference shareholders).

a) The cost of preference capital which is perpetual can be calculated as:

$$Kp = \frac{D}{P}$$

Where Kp = Cost of Preference Capital

D = Annual Preference Dividend

P = Preference Share Capital (Proceeds)

b) If preference shares are issued at ***Premium or Discount*** or when *costs of floatation* are incurred to issue preference shares, the nominal or par value of preference share capital has to be adjusted to find out the net proceeds from the issue of preference shares. In such a case, the coast of preference capital can be computed with the following formula:

$$Kp = \frac{D}{NP}$$

It may be noted that as dividends are not allowed to be deducted in computation of tax, no adjustment is required for taxes.

c) Sometimes Redeemable Preference Shares are issued which can be redeemed or cancelled on maturity date. The cost of redeemable preference share capital can be calculated as:

$$Kpr = \frac{D + \frac{MV - NP}{n}}{\frac{1}{2}(MV + NP)}$$

Where, Kpr=Cost of Redeemable Preference Shares

D= Annual Preference Dividend

MV=Maturity Value of Preference Shares

NP= Net proceeds of Preference Shares

Example-3

A company issues 20,000 10% preference shares of Rs. 100 each. Cost of issue is Rs. 2 per share. Calculate cost of preference capital if these shares are issued (a) at par, (b) at a premium of 10% and (c) at a discount of 5%.

Solution:- Cost of Preference Capital, $Kp = \frac{D}{NP}$

a) $Kp = \frac{2,00,000}{20,00,000-40,000} \times 100 \frac{2,00,000}{1960,000} \times 100 = 10.2\%$

b) $Kp = \frac{2,00,000}{20,00,000+2,00,000-40,000} \times 100 = \frac{2,00,000}{21,60,000} \times 100 = 9.26\%$

c) $Kp = \frac{2,00,000}{20,00,000+1,00,000-40,000} \times 100 = 10.75\%$

6.6.3 Cost of Equity Share Capital

Cost of equity capital can be defined as the minimum rate of return which a firm must earn on the equity capital financed portion of its investment to justify such investment. Unlike cost of debt and

cost of preference capital, cost of equity capital is very difficult to compute. This is so because there is not any stipulated rate of return which has to be paid on equity capital. The rate of equity dividend varies from year to year depending upon the profits of the company and its need for funds for further expansion. The cost of equity capital is dependent upon the future stream of dividends expected by the equity shareholders. It is very difficult to make an exact forecast about future stream of dividends expected by the equity shareholders.

In actual practice, a number of approaches are used for the computation of cost of equity capital. Some of the important approaches to the computation of cost of equity capital are discussed below.

a) Dividend Price (D/P) Ratio Method

According D/P Ratio approach to the computation of the cost of equity capital, cost of equity capital is the rate of discount which equates the present value of future stream of dividends per equity share with the current market price (net proceeds) of a share. Cost of equity capital is computed from the following:

$$\text{Ke} = \frac{\text{D}}{NP}$$

Where P= Current market price of the equity share

D= Annual dividend per equity share

Ke= Cost of equity capital

D/P ratio approach to computation of cost of capital assumes that, (i) shareholders give prime importance to dividends and (ii) risk complexion of the firm remains (iii) dividend per share remains same.

D/P ratio method of cost of equity capital suffers from the following limitations. (i) if ignores the growth in the rate of dividend (ii) it ignores retained earnings and (iii) it ignores the expectations of shareholders about increase in share prices.

b) Dividend yield growth in dividend method

The D/P ratio method does not take care of future growth in the rate of dividend. In actual practice share holders expect growing rate of dividend on their investment. In a situation when the dividend of the company are expected to grow at a constant rate of g percent for ever, the cost of equity capital is Ke is the following:

$$\text{Ke} = \frac{\text{D}}{NP}$$

Where D= Dividend for share after one year.

P= Current market price of the share

G=Rate of growth in dividend

The dividend yield plus growth in dividend method, is based upon the following assumptions, (i) Price earning ratio does not change (ii) The pay-out ratio (the percentage of earnings distributed as dividend) does not change and (iii) The market price of the share increase in proportion to the increase in the rate of dividend.

c) Earning price (E/P) Ratio Approach

According to E/P Ratio approach to cost of equity capital, cost of equity capital is the rate of discount which equates the present value of future stream of earning per share with the current market price of the equity share. Symbolically:

$$Ke = \frac{D}{NP}$$

Where ke =cost of equity capital, E= Earning per share,

P = current market price of the equity share

E/P ratio method of computing cost of equity capital is based upon the following assumptions; (i) Earning per share is expected to remain constant in future, (ii) Market price of the equity rate share depends upon earning per share and (iii) The firm can earn on the new projects at the same rate at which it earns on the existing projects.

d) Earning price ratio plus growth in earnings method

The E/P ratio methods does not take care of increase in the ratio of earnings of the company. The earnings of a company are usually expected to grow in future. If the EPS of the company is expected to grow at a constant rate of growth, the cost of equity capital can be found out by solving the following formula:

$$Ke = \frac{D}{NP} + g$$

Where ke= cost of equity capital, E = Earning for share, P = Current market price of the share, G = The rate of growth in EPS.

e) Realized yield approach

One of the problems in the measurement of cost of equity capital is that the expectations of the shareholders regarding the rate of return on their investment in the company cannot be estimated accurately. The realized yield approach overcomes this problems by assuming that the shareholders would expect the same rate of return in the future as they have realized in the past. According to this method average rate of return realized by the equity shareholders in the past is considered to be cost of equity capital. To compute the realized yield in the past both dividend received by the shareholders in the past as well as appreciation in the value of equity shares are considered. The yield on an equity share for a particular year is computed by the following formula:

$$Yt = \frac{Dt+Pt}{Pt-I} - 1$$

Where Yt = Realized yield for year t

Dt= Dividend per share for year t payable at the end of the year

Pt= Price of the equity share at the end of year t.

Pt-1= Price per share at the beginning of year t.

f) Bond yield plus risk premium approach

Bond yield plus risk premium approach assumes that equity shareholders are risk averse. They expect a premium for investing in risky capital. Investment in equity capital is riskier as compared to

investment in debt. The debt holders are entitled to a fixed rate of interest irrespective of the profits of the company. Moreover, they have a priority in the return of their capital over the equity shareholders in the event of winding up of the company. Therefore the shareholders can legitimately expect a return higher than the return on debt. The excess return over the return on bonds (debt) sought by the equity shareholders in known as risk premium.

$$Ke=Pb+Rp$$

Where Ke =cost of equity capital, Rb = yield on long term bonds of the firm

Rp = Risk premium for investment in equity shares

g) Cost of equity using capital asset pricing model (CAPM)

The value of an equity share is a function of cash inflows expected by the investors and the risk associated with the cash inflows. It is calculated by discounting the future stream of dividends at the required rate of return, called the capitalization rate. The required rate of return depends upon the element of risk associated with investment in shares. It will be equal to the risk-free rate of interest plus the premium for risk. Thus, the required rate of return, K, for a share is

Ke = Risk-free Rate of Interest + Premium for Risk

According to CAPM, the premium for risk is the difference between market return form a diversified portfolio and the risk-free rate of return. It is indicated in terms of *beta co-efficient (B);* i.e.

Risk-Premium = (Market Return of a diversified portfolio-Risk free return) x $\beta_i = \beta_i (Rm – Rf)$

Thus, cost of equity, according to CAPM, can be calculated as below:

Ke = Rf =Bi (Rm – Rf)

Where, Ke= Cost of equity capital, Rf = Risk-free rate of return, Rm = Market return of a diversified portfolio, β_i = Beta co-efficient of the firm's portfolio.

Example-4

a) The market price of the equity share of a company is Rs. 40 (par value Rs 10). The company has been paying dividend at 25% for the last 10 years and plans to pay the same rate of dividend in future also. Calculate cost of equity capital.
b) The price of the equity share of company is Rs. 60. The expected dividend after one year is Rs. 3 per share. Thereafter dividend is expected to grow constantly a 5% for annum. Compute the cost of equity capital.
c) The current EPS of a company is Rs. 4. EPS of the company is expected to remain same in future also. Its equity shares are sold @ Rs. 30 per share. Find out the cost of equity capital of the company.
d) The current market price of the equity share of a company is Rs 140 per share. The expected earning per share after one year is Rs. 4 per share. Thereafter EPS is expected to grow constantly at 2% per annum. Find out the cost of equity capital.

SOLUTIONS

a) Cost of equity capital using D/P ratio approach is;

Ke = $\frac{D}{P} = \frac{Rs.2.5}{Rs.40} = 0.0625 \text{ or } 6.25\%$

b) The cost of equity capital of the company is computed below by following the dividend yield plus growth in dividend model.

Ke = $\frac{D}{P} + g = \frac{Rs.3}{Rs.60} = 0.05 \text{ or } 10\%$

c) Using E/P ratio method the cost of equity capital of the company is computed below.

Ke = $\frac{E}{P} = \frac{Rs.4}{Rs.30} = 0.1333 \text{ or } 13.33\%$

d) The cost of equity capital of the company has been computed by using the E/P ratio plus growth in EPS, approach to the cost of equity capital.

Ke = $\frac{E}{P} + g = \frac{Rs.4}{Rs.40} + 0.02 = 0.12\text{pr } 12\%$

6.6.4 Cost of Retained Earnings

The part of income which a firm is left with after paying interest on debt capital and dividend to its shareholders is called retained earnings. These also involve cost in the sense that by withholding the distribution of part of income to shareholders the firms is denying them the opportunity cost.

It must be noted that retaining the earnings is equal to forcing the shareholders to increase their equity position in the firm by that amount. But retained earnings are cheaper when it is realized that shareholders would have to pay personal tax on the additional dividends, if distributed. Retained earnings avoid the payment of personal income tax on dividends and the brokerage fee connected with any reinvestment. However, the amount to be paid as personal income tax differs from shareholder shareholders, depending upon the tax bracket to which he belongs. Thus, before-tax cost of retained earnings (C) and before-tax cost of equity capital (C) are equal; but once the impact of tax is also included then the cost of retained earnings is less than the cost of equity capital, the difference being the personal income tax.

Though the cost of retained earnings is always lower than cost of equity capital, a company can depend upon this source of finance only to the extend of availability of funds and willingness of shareholders.

Cost of retained earnings can be computed with the help of following formula:

$$Kr = \frac{D}{NP} + g$$

Where, Kr = Cost of retained earnings, D=Expected dividend

NP = Net proceeds of share issue, G = Rate of Growth

Further, it is important to note that shareholders, usually, cannot obtain the entire amount of retained profits by way of dividends even if there is 100 per cent pay-out ratio. It is so because the

shareholders are required to pay tax on their dividend income. So, some adjustment has to be made for tax. However, tax adjustment in determining the cost of retained earnings is a difficult problem because all shareholders do not fall under the same tax bracket. Moreover, if the shareholders wish to invest their after-tax dividend income in alternative securities, they may have to incur some costs of purchasing the securities, such as brokerage. Hence, the effective rate of return realized by the shareholders from the new investment will be somewhat lesser than their present return from the firm. To make adjustment in the cost of retained earnings for tax and costs of purchasing new securities, the following formula may be adopted:

$$Kr = \left(\frac{D}{NP} + G\right) x\ (1 - t) x\ (1 - b)$$

Or Kr = Ke (1-t) (1-b)

Where K= Cost of retained earnings, D=Expected dividend,

G= Growth Rate, NP=Net proceeds of Equity Issue, t=Tax rate

B= Cost of purchasing new securities, or brokerage costs

Ke= Rate of return available to shareholders.

Example-5

A firm's Ke (return available to shareholders) is 15%, the average tax rate of shareholders is 40% and it is expected that 2% is brokerage cost that shareholders will have to pay while investing their dividends in alternative securities. What is the cost of retained earnings?

Solution:- cost of Retained Earnings, Ke =Ke (1-t) (1-b)

Where Ke = Rate of return available to shareholders, t=Tax rate

B= Brokerage cost

So, Ke = 15% (1-4) (1-.02)

= 15% x 0.6 x 0.98 = 8.82%

6.6.5 Cost of Internal Funds Raised Through Depreciation

It is believed by some firms that the amount of depreciation is available to the firm without any cost because no fresh capital is raised, no fresh assets are to be acquired and no earnings are expected on these funds. But this is not correct. The current thinking on this problem requires that the cost consideration relating to the retained earnings should also apply to the depreciation funds. The cost of depreciation funds should be equal to their opportunity costs to the equity-holders. When an internal project cannot earn at-least the rate that the equity shareholders can obtain from outside investments, money should be distributed as a partial liquidating dividend and the company should start a programme of gradual dissolution.

The practice generally prevailing is to consider the cost of additional funds available at the cheapest possible rate, as the cost of capital. The effect of this fresh raising on the existing capital structure and the future of the company is not considered at all. As against this the other practice prevailing is to consider only the cost of the costliest form of capital available in the expectation that worse cannot happen. Both these views are extreme. An averaging method would be preferred to these methods.

Averaging: In practice the funds belong to a pool and cannot be separated and hence the newly acquired funds that become due to taking up of a particular project are not earmarked for the project. The pooling process leads to consideration of averaging out the cost of all funds old and new, internal and external, in order to arrive at the cost of capital.

6.6.6 Weighted Average Cost of Capital: Weighted average cost of capital is the average cost of various sources of financing. It is also known as Composite Cost of Capital, Overall Cost of capital, average accost of capital. Once the cost of specific source of capital is determined, weighted average cost of capital can be computed by putting weights to the specific costs of capital in proportion of the various sources of funds to the total. The CIMA defines the weighted average cost of capital " as the average cost of company's finance (equity, debentures, bank loans) weighted according to the proportion each elements bears to the total pool of capital, weighting is usually based on market valuation current yields and costs after tax."

The averaging is done through weighing to indicate the influence of various costs. In the process of weighting the following practices are adopted:

a) **Weighted average on the basis of existing Capital Structure**

In this case it is presumed that the cost at which funds are being utilized at present would be the cost of future with proper mix being applied.

Let in assume that the Punjab Chemicals Ltd. has the following capital structure:

Equity	Rs. 20 lakh	Imputed cost	12%
Preference	Rs. 10 lakh	Imputed cost	10%
Debt	Rs. 30 lakh	Imputed cost	8%

In this weighted average cost of capital will be calculated as follows:

$$= \frac{\text{Rs. } 2.4\text{lakh } + \text{ Rs. } 1\text{lakh } + \text{ Rs. } 2.4\text{lakh}}{\text{Rs. } 20\text{lakh } + \text{ Rs. } 10\text{lakh } + \text{ Rs. } 30\text{lakh}} = \frac{9.4\text{lakhs}}{60\text{lakhs}}$$

Imputed cost: It means that this should be reduced by the rate of Income tax applicable to the company since to the extent, the interest will be borne by the government.

b) **Weighted average on the basis of ideal Capital structure**

The existing capital structures might tend towards under capitalization or over capitalization. Assuming that the effort henceforth would be to shift towards an ideal capital structure, the cost of capital should be based on the long term ideal structure rather than the present one for purpose of assessing long term investments.

c) **Weighted average on the basis of future Capital Structure**

This is slight different from ideal capital structure basis. Instead of an ideal which might not be attained, a look is taken at what might be attained in the relevant future, and the executed future weighing of the capital structure from the basis. This may also mean taking incremental cost into consideration.

d) **Weighted average on the basis of market Value of Capital**

The cost that is being incurred actually should not be considered relevant for raising fresh capital or future developments. The market value of the issues is available for the company and that should be considered as a correct indicator.

So the common concept of cost of capital takes into account the non-current items appearing on the liabilities side of the balance sheet viz., equity, preference, debt and retained earnings. The funds actually available for investment are more. The major sources of these additional funds is depreciation, current borrowings are more. The major sources of these depreciation is not applied towards increase in working capital the amount is always available for investment. A reduction in working capital is unusual but could form part of resources. Hence while weighing, the cash flow concept of availability of funds be used rather than the balance-sheet concept. At least the amount of depreciation available for reinvestment should form a part of computations. This last method by taking into account all the sources appears to be more realistic and does not normally need adjustment on account of market value.

It is also important to note that after calculating the cost of capital the sources of funds become immaterial for making the budgeting decision.

e) **Marginal Cost of Capital**

The marginal cost of capital is the weighted average cost of new capital calculated by using the marginal weights. The marginal weights refer to the proportions in which the firm wants or intends to raise funds from different sources. In other words, the proportions in which additional funds required to finance the investment proposals will be raised are known as marginal weights. So, in case of marginal weights, the firm in fact, calculates the actual WACC of the incremental funds. Theoretically, the system of marginal weights seems to be good enough as the return from investment will be compared with the actual cost of funds. Moreover, if a particular source which has been used in the past but is not being used now to raise additional funds, or cannot be used now for one or the other reason then why should it be allowed to enter the decision process even through the weighing system.

However, there are some shortcomings of the marginal weights system. In particular, the capital budgeting decision process requires the long-term perspective whereas the marginal weights ignore this. In the short run, the firm may be tempted to raise funds only from cheaper sources and thereby accepting more & more proposals. However, later on when other sources will have to be resorted to, some projects, which should have been accepted otherwise, will be rejected because of higher cost of capital.

FORMULA

$$Kw = \frac{\Sigma XW}{W}$$

Where,

Kw = weighted average cost of capital

X = Cost of specific source of finance

W = Weight, proportion of specific source of finance

Relevance of Cost of Capital in Capital Structure Planning

Many economists and authors on financial management have discussed the role of capital in planning capital structure or to decide optimum capital structure. Different views prevail. Some experts view that overall cost of capital (ko) can be changed by changing the debt-equity mix in the total capitalization. These are traditional theorists. Their views are known as Traditional Approach. The traditional theory states that the use of debt in a certain ratio in total capitalization reduces the cost of capital. Another approach is given by Modigliani and Miller. It is known as M.M. Approach. Modigliani and Miller argue (as mentioned earlier) that overall cost of capital (ko) of an enterprise is not affected by debt-equity mix or capital structure. In other words, ko cannot be planned and changed by changing debt-equity mix there is no relevance of cost of capital in capital structure decision and planning.

Self Assessment:

Fill in the blanks:

1. Cost of capital represents the _____that the firm must pay to the fund suppliers, who have provided the capital.
2. Investor defines Cost of capital as "the measurement of the sacrifice made by him in_____."
3. In the Net Present Value (NPV) method, the present values of cash inflows are calculated by discounting the rate known as_____.
4. A _____cost is the additional cost incurred to obtain additional funds required by a firm.
5. _____is the cost of capital that is expected to raise funds to finance a capital budget or investment proposal.
6. Cost of debenture is equal to the_____, when debenture is issued at par and without considering tax.
7. Cost of preference share is the _____that equates the present value of cash inflows with the present value of cash outflows.
8. Retention of earnings involves an _____cost.
9. The weighted average cost of new or incremental, capital is known as the _____.
10. The _____cost of capital lies between the least and most expensive funds.

Example-6

A company is considering raising of funds of about Rs. 100 lakhs by one of two alternative methods, viz., 14% institutional term loan and 13% non-convertible debentures. The term loan option would attract no major incidental cost. The debentures would have to be issued at a discount of 2.5% and would involve cost of issue of Rs. 1 lakh.

Advice the company as to the better option based on the effective cost of capital in each case, Assume a tax rate of 50%.

Solution:

Calculation of effective cost of capital

		Options	
		I (*14% Institutional)* *(Term Loan)* *(Rs. In lakhs)*	II *(13% non-convertible)* *(Debentures)* *(Rs. In lakhs)*
(i)	Net Effective Amount of Capital Face value less: Discount	100.00 -----	100.00 2.50
	Less: Cost of issue Effective Amount of Capital	100.00 --	97.50 1.00
		100.00	96.50
(ii)	Net Cost of Capital: Interest Less: Saving in Tax (50%) Net Cost of Capital	14.00 7.00	13.00 6.50
(iii)	Effective Cost of Capital $\frac{\text{Net Cost}}{\text{Net Amount of Capital}} X\ 100$	7.00 $\frac{7}{100} x\ 100$	6.50 $\frac{6.5}{96.5} x\ 100$
		=7%	6.736%

As the effective cost of capital of non-convertible debentures (6.736%) is less than the cost of institutional loan (7.0%); it is better to raise funds by issue of 13% non-convertible debentures.

Example-7

The following items have been extracted from the 'Liabilities' side of the Balance sheet of XYZ company as on 31st December 2006:

Paid-up Capital:	Rs.
50,000 Equity Shares of Rs. 10 each	5,00,000
Reserves and Surplus	7,00,000
Loans:	
70% non-Convertible Debentures	2,00,000
16% Institutional Loans	6,00,000

Other information about the company as relevant is given below:

Year ended 31st Dec.	Dividend per share	Earnings per share	Average Market Price per share (Rs.)
2006	5.00	9.00	60.00
2005	4.00	7.50	50.00
2004	5.00	6.00	40.00

You are required to calculate the weighted average cost of capital, using book values as weights and Earnings/Price (E/P) ratio as the basis of cost of equity. Assume 50% tax rate.

Solution:

Capital Structure or Type of Capital	Book Value (Rs.)	Basis of Cost	After-Tax Rate	After-Tax Cost (Rs.)
Equity funds (5,00,000+ 7,00,000)	12,00,000	E/P Ratio $\frac{9.0}{60} x\ 100$	50%	1,80,000
17% Non-Convertible Debentures	2,00,000	After-Tax Interest (17% -50% of Tax)	8.5%	17,000
16% Institutional Loan	6,00,000	After-tax Interest (16% -50% Tax)	8.0%	48,000
Total	20,00,000			2,45,000

$$\text{Weighted Average Cost of Capital} = \frac{6.5}{96.5} x\ 100$$

6.7 Summary

Cost of capital plays an important role in the capital budgeting decisions. It determines the acceptability; of all investment opportunities regardless of the techniques employed to judge the financial viability of a project. Cost of capital serves as capitalization rate used to determine capitalization of a new concern. With the help of this very rate real worth of various investments of the firm can be evaluated. Cost of capital provides useful, guidelines in determining optimal capital structure of a firm. It refers to the minimum rate of return of a firm which must earn on its investment so that the market value of the company's equity share may not fall. The determination of the firm's cost of capital! Is important form the point of view of both capital budgeting as well as capital structure planning decision.

In order to compute the overall cost of capital, the manager of funds has to take the following steps: i) to determine the type of funds to be raised and their share in the total capitalization of the firm,

ii) To ascertain the cost of each type of funds, and iii) To calculate the combined cost of capital if the firm by assigning weight to each type of funds in terms of quantum of funds so raised.

The cost of the different sources of financing represents the components of continued cost. Each firm has ideal capital mix of various sources of funds; external sources (debt, preferred stock and equity stock) and internal sources (reserves and surplus). Determining of cost of capital involves relating the expected outcome of the specific source of capital to the market or book value of that source. Expected income in thin context comprises interest, discount on debt, dividends, EPS or similar other variables most suitable to the particular case. The computation of the cost of capital involves two steps, i) The computation of the different elements of the cost in terms of the cost of the different source of finance, and ii) the calculation of the overall cost by combining the specific cost into a composite cost. Weights are given in proportion to each source of funds in the capital structure; then weighted average cost of capital is calculated.

6.8 Glossary

Cost of capital. It is the rate of return the firm must earn on its assets to justify the using and acquiring of investible resources.

Capital asset pricing model (CAPM). This model is based on the premise that degree of risk and returns are related. Relative risks among stocks is measured using the beta coefficient. β coefficient > 1 means the variation in returns on that stock is greater than that of the average stock, β coefficient is a necessary element in determining a stock's required rate of return.

Dividend valuation method. According to this method, the return required by the investor is equal to the current dividend yield on the common stock plus an expected growth rate for dividend payments. It is also known as dividend growth model.

Weighted average cost of capital. Weights are given in proportion to each source of funds in the capital structure; then weighted average cost of capital is calculated.

6.9 Answers: Self Assessment:

1. Rate of return
2. Capital formation
3. Cost of Capital
4. Marginal
5. Future Cost
6. Interest rate
7. Discount rate
8. Opportunity
9. Marginal cost of capital
10. Composite

6.10 Terminal Questions:

Q.1. What is cost of capital? How is the cost of debt computed? How does it differ fun the cost of preference capital?

Q.2. (a) The equity capital is cost free. Do you agree? Give reasons.

(b) 'Debt is the cheapest source of funds'. Explain.

Q.3. What is weighted average cost of capital? How is the weighted average cost of capital calculated?

Q.4. Examine the importance of cost of capital and also discuss what are the problems involved in determination of cost of capital?

Q.5. (a) How will you calculate cost of preference share capital?

(b) How will you calculate cost of retained earnings?

6.11 Suggested Readings:

1. I.M. Pandey, Financial Management, Vikas Publishing New Delhi.
2. James C. Van Horne Financial Management and Policy Prentice Hall, New Delhi.
3. M.Y. Khan and P.K. Jain, Financial Management, Tata McGraw Hill, New Delhi.
4. Prasanna Chandra, Financial Management, Tata McGrew Hill, New Delhi.

LESSON 7

CAPITAL STRUCTURE-I

STRUCTURE:

7.0 Learning objectives:

After you have gone through this lesson you should be able to:

- Define Capital structure and Financial Structure.
- Capital Structure planning
- Analyze alternative financial plans
- Differentiate traditional and other theories.

7.1 INTRODUCTION

Finance is a important input for any type of business and is needed for working capital and for permanent investment. The total funds employed in a business are obtained from various sources. The owners bring in a part of the funds are permanently held in business, such as share capital and reserves (owned funds), some others are held for a long period such as long-term borrowings or debentures, and still some other funds are in the nature of short-term borrowings. The entire composition of these funds constitutes the overall financial structure of the firm. The entire composition of these funds constitutes the overall financial structure of the firm. You are aware that short-term funds keep on shifting quite often. As such the proportion of various sources for short-term funds cannot

perhaps be rigidly laid down. The firm has to follow a flexible approach. A more definite policy is often laid down for composition of long-term funds, known as capital structure. More significant aspects of the policy are the debt equity ratio and the dividend decision. The latter affects the building up of retained earning which is an important component of long term owned funds. Since the permanent of long term funds often occupy a large portion of total funds and involve long-term funds policy decision. The term financial structure is often used to man the capital structure of the firm.

7.2 MEANING & DEFINATION OF CAPITAL STRUCTURE

As stated above, capital structure decision in concerned with the decision making about the mix of various sources of capital viz equity capital, preference capital, retained earnings and long term debt in the total capital of a firm.

According to Gerstenberg," capital structure of a firm refers to the composition of makeup of its capitalization and it includes all long term capital resources viz loans, reserves, shares and bonds".

R.H Wessel defined it," *The term capital structure is frequently used to indicate the long term sources of funds employed in a business enterprise."*

According to Weston and Brigham," Capital structure is the permanent financing of the firm represented by the long term debt, preferred stock and net worth."

All the above definitions bring clearly the fact that capital structure refers to make ups of the capitalization of the firm i.e., the proportions in which the firm raises its long term funds from various sources of capital.

Capital structure is ordinary implies the proportion of debt and equity in the total capital of a company. Since a company may tap any one or more of the different available sauces of funds to meet its total financial requirement. The total capital of a company may, thus, be composed of all such tapped sources. The term structure has been associated with the term capital the term capital may be defined as the long-term funds of the firm.

Capital is the aggregation of the items appearing on the left hand side of the balance sheet minus current liabilities in order words capital may also be expressed as follows: Capital "Total Assets—Current Liabilities. Further, Capital of a company may broadly be categorized into 'equity' and debt.

- **Equity consists of the following** :

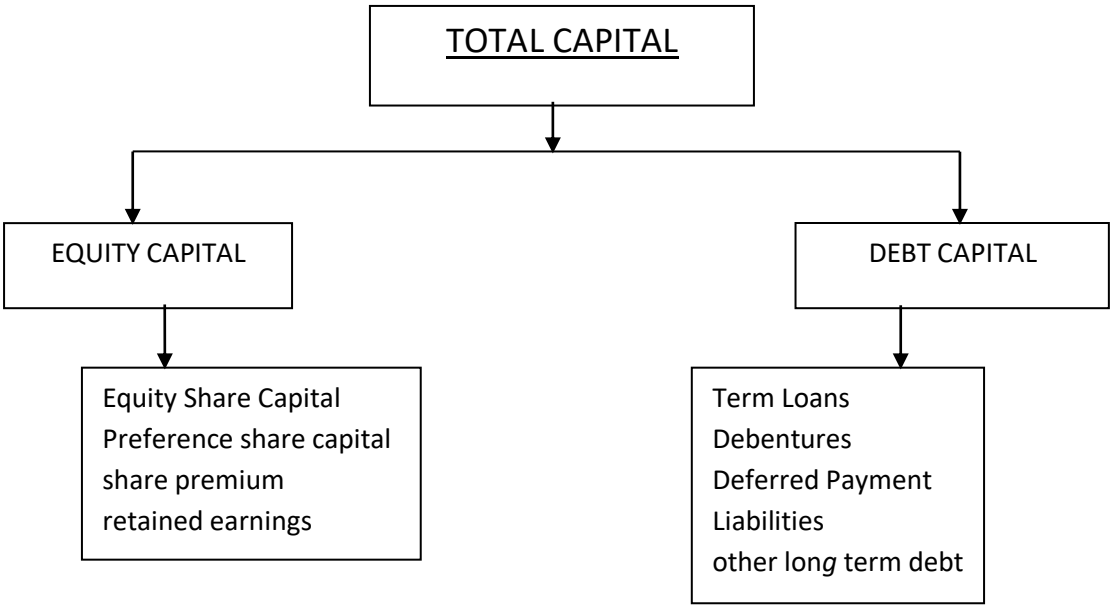
Equity share capital Preference share capital + share premium + Free resaves + Surplus profits + Discretionary provisions for contingency + Development rebate reserve.

- **Debt consists of the following**:

All borrowing form government, semi-government statutory financial corporations and other agencies + Term Loans from Banks, financial institution etc + Debentures + All deferred payment liabilities.

The total capital structure of a firm is represented in

Figure 1



The distinguishing characteristics of debt, preference share capital, equity share capital and retained earnings are summarizing in Table 1.

Table 1 characteristic of long-term sources of funds

Debt	**Preference share Capital**	**Equity share Capital**	**Retained Earnings**
1. Firm must pay back money with interest	**1.** Similar to debt in that preference dividends are limited in amount to rate specified in the	1. Money is raised by selling ownership rights	1. Lowers amount of money for current dividends but can increase future dividends
2. Interest rate is based on risk of principal and interest payment as perceived by lenders.	2. Dividends are not legally required, but equity, dividends are not paid; also, usually cumulative and passing dividend for a stated number of years may give preference share-holders voting rights.	2. Value of the share is determined by investors	2. Shareholders forgo dividend income but they do not they do not lose ownership rights, if new equity share are issued.
3. Amount of money to be repaid is	3. No maturity but usually callable.	3. Dividends are not contractually	3. Funds are internal no need for external

specified by debt contract		payable. No maturity	involvement
4. Lenders can take action to get their money back	4. Preference shareholders come next, when lenders are paid in liquidation.	4. Equity shareholders get the residual assets prorate after lenders are met in liquidation	
5. Interest payments are text-deduct able	5. Preference Dividends are not tax-deductible	5. Equity dividends are not tax-deductible	

The term capital structure must be distinguished from two other closely related terms; capitalization and financial structure. The term capitalization signifies the total long term funds raised by a firm.

According to Hoagland," capitalization is the equivalent to the valuation placed upon the fixed capital by corporation measured by stocks and bonds outstanding."

Capitalization comprises:

(i) Ownership capital which includes capital-stock and surplus in whatever form it may appear; and

(ii) Borrowed capital, which consists of bonds or similar evidences of long-term debt.

From the above discussion it can be said that the accumulated profits. Capital structure refers to the proportions in which these funds have been raised from various sources of capital. Financial structure is a broader term as compared to capital structure. It refers to the makeup of the entire liability side of the balance sheet of a firm i.e., it is the proportion of various sources of funds whether long term or short term in the total funds raised by a firm.

According To Nemmers and Grunewold. *"Financial structure refers to all the financial resources marshaled by the firm, short as well as long term and all form of debt as well as equity."*

From the above discussion it can be said that term capitalizing refers to the total of long term funds raised by a firm, capital structure refers to the proportions of various long term sources of capital in the capitalization of the firm and financial structure refers to the proportions of all sources of funds whether long term short term in the total funds raised buy a firm.

7.3 IMPORTANCE OF CAPITAL STRUCTURE

Capital structure planning is one of the strategic functions of financial management. Considerable attention is needed for designing the capital structure of a firm. Capital structure decision directly affects the cost of capital, financial risk and value of a firm. A right capital structure decision can reduce the cost of capital and increase the value of the firm. On the other hand, a wrong capital structure decision can adversely. Affect the value of the firm. As stated earlier different source of capital differ in risk of the firm depend upon the way the capital of the firm is raised. Thus a financial manager can contribute to the fulfillment of value maximization objective of a firm through the design of an

appropriate capital structure. The following reasons make capital structure decisions as one of most important decisions.

1. Financial risk assumed by a firm depends upon its capital structure.
2. Capital structure affects the cost of capital of the firm.
3. Capital structure affects the value of the firm by either affecting it s cost of capital or financial risk or both.
4. Financial flexibility of a firm depends upon its capital structure.
5. Capital structure of a firm depicts the attitude of the management of a firm towards risk and return.

The term capital structure refers to the relationship between the various long-term forms of financing such as debenture preference share capital and equity share capital.

Financing the firm's assets is a very crucial problem in every business and as a general rule there should be a proper mix of debt and equity capital in financing the firm's assets the use of long-term fixed interest bearing debt and preference share capital along with equity shares is called **Financial Leverage or trading on equity;** the long term fixed interest bearing debt is employed by a firm to earn more from the use of these sources than their cost so as to increase the return on owner's equity. It is true that capital structure cannot affect the total earnings of a firm but it can affect the share of earnings available for equity shareholders. However, leverage can operate adversely also it the rate the interest on long-term loans is more than the expended rate of earnings of the firm.

ILLUSTRATION 1

A Ltd. Company has equity share capital of Rs. 5, 00,000 dividends into share of Rs. 100 each. It wishes to raise further Rs. 3, 00,000 for expansion cum modernization plans. The company plans the following financing schemes:

(a) All common stock
(b) Rs. One Lakh in common stock and Rs. 2 lakh in debt @ 10% p.a
(c) All debts at 10% p.a
(d) Rs.1 lakh in common stock and Rs. 2 lakh in preference capital with the rate of dividend at 8%

The company's existing earnings before interest and tax (EBIT) are Rs. 1, 50,000. The corporate rate of tax is 50%. Determine the earnings per share. (EPS) in each plan and comment on the implication financial leverage.

Solution:

	Plan I	Plan II Rs.	Plan III Rs.	Plan IV Rs.
Earnings before interest & tax	1,50,000	1,50,000	1,50,000	1,50,000

Less Interest	----------	20,000	30,000	----------
	1,50,000	1,30,000	1,20,000	1,50,000
Less Tax @ 50%	75,000	65,000	60,000	75,000
Earnings after Tax	75,000	65,000	60,000	75,000
Les: preference dividend @ 8%	---------	----------	---------	------
Earnings for equity shareholder	75,000	65,000	60,000	59,000
No. of equity Shares	8,000	6,000	5,000	6,000
Earnings per share	9.375	10.83	12	9.83

COMMENT:

In the four plans of fresh financing, plan III is leveraged of all. In this case, raising loans @ 10% interest does additional financing. Plan II has fresh capital stock of Rs. One lakh while Rs. Two lakhs are raised from loans. Plan IV does not have fresh loans but preferences capital has been raised for Rs. Two lakhs.

The earnings per share are highest in plan III, i.e., 12. The analysis of this information shows that financial leverage has helped in improving earnings per share for equity shareholders. it helps to conclude that higher the ratio of debt to equity the greater the return for equity stockholders.

7.4 CAPITAL STRUCTURE THEORIES:

These theories seek to provide an answer to the question, whether the capital structure decision of a firm can affect its market value? The capital structure decision is considered relevant if this decision is relevant or irrelevant? The capital structure decision is considered relevant if this decision can affect the cost of capital and the market or not capital and the market value of a firm. One viewpoint strongly supports the close relationship between capital structure decision and the market value of a firm. Another equally strong opinion rules out any relationship between the capital structure decision and the value of a firm. These viewpoints are found in various capital structure theories propounded by various authors like Durans, Ezra soloman and modigiant and miller.

Capital structure theories are based on following assumptions.

1. All investors are assumed to have same subjective probability distribution of the future expected operating earnings of the firm.

2. Equity share capital and perpetual risk-less debt are the only sources of funds used by a firm.
3. The pay out ratio of the firm is 100 percent i.e. the firm has a policy of paying 100 percent of the earning in the form of dividends.
4. The investment decisions of the firm are constant its assets are given and do not change.
5. Debt and equity capital can be replaced by each other without any transaction costs.
6. The operating earnings (EBIT) of the firm are assumed to remain unchanged.
7. There are no corporate taxes. This assumption is removed later.
8. The business risk of the firm is given and is independent of its capital structure decision.

7.4.1 NET INCOME APPROACH

According to this approach a firm can minimize the weighted average cost of capital and increase the value of the firm as well as marked price of equity shares by using debt financing to the maximum possible extent. The theory propounds that a company can increase its value and reduces the overall cost of capital by increasing the proportion of debt in its capital structure. This approach is based upon the following assumption:

(i) The cost of debt is less than the cost of equity.

(ii) There are no taxes.

(iii) The risk perception of investor is not changed by the use of debt.

The line of argument in favor of net income approach is that as the debt financing in capital structure increase, the proportion of a less expensive sources of funds increase. This results in the decrease in structure increase, the proportion of a less experience source of funds increase in the value of the firm. The reason for assuming cost of debt to be less than the cost of equity are that interest rates are usually lower than dividend rates due to element of risk and the benefit of tax as the interest is a deductible expenses.

The total market value of a firm on the bases of net income approach can be ascertained as below:

$$V = S + D$$

Where, V = Total market value of a firm

S = Market Value of equity shares

D = Market value of debt

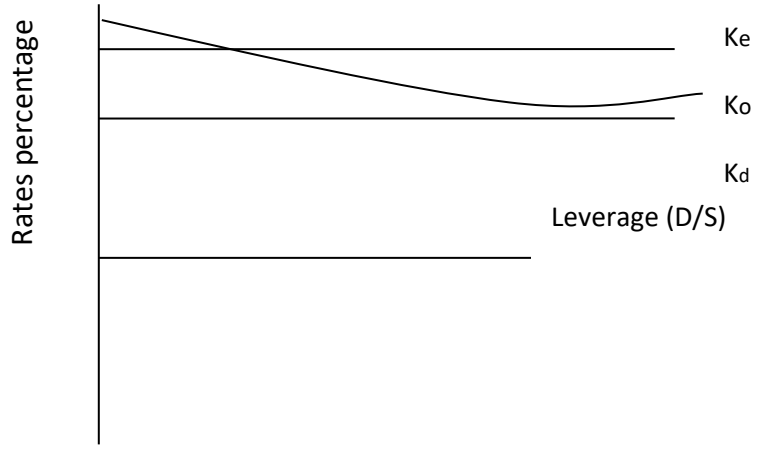
$$V = \frac{\text{Earnings Available to equity shareholders (NI)}}{\text{Equity capitalization Rate}}$$

And overall cost of capital or weighted average cost of capital can be calculated as:

K = EBIT/V

This can be explained with the help of flowing fig. No.1.

Fig No.1



7.4.2 NET OPERATIONG INCOME APPROACH

This theory as suggested by Durand is another extreme of the effect of leverage on the value of the firm. It is diametrically opposite to the net income approach. According to this approach, change in the capital structure of a company does not affect the market value of the firm and the overall cost of capital remains constant irrespective of the method of financing. It implies that the overall cost of capital remains the same whether the debt-equity mix is 50:50 pr20:80 or 0:100 thus, there is nothing as an optimal capital structure and every capital structure is the optimum capital structure. This theory presumes that:

(i) The market capitalizes the value of the firm as a whole;

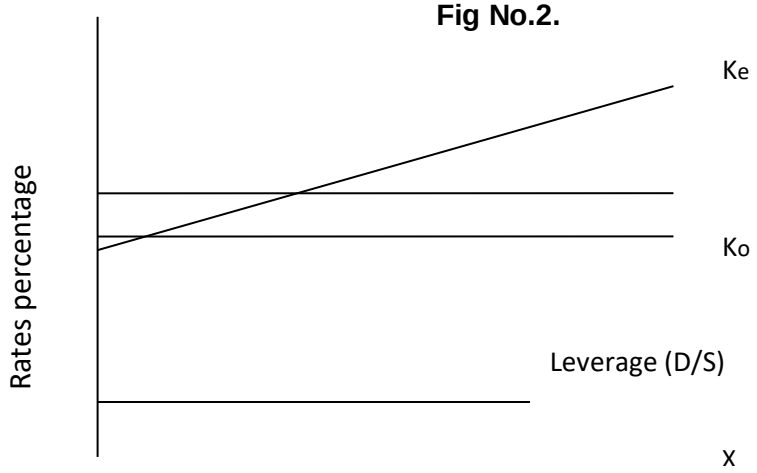
(ii) The business risk remains constant at every level of equity mix;

(iii) There are no corporate taxes

The reasons propounded for such assumption are that the increased use of debt increases the financial risk of the equity shareholders and hence the cost of equity increases. On the debt remains constant with the increasing proportion of debt, as the financial risk of the lenders is not affected of equity.

The value of a firm on the basis of Net Operating Income Approach can be determined as below. This can be explained by Fig.No.2

Fig No.2.



Leverage (D/S)

V = EBIT/Ko

Where, V= value of a firm

EBIT = Net operating income of earnings before interest tax

K0 = Overall cost of capital.

Illustration No.2

Companies X and Y are identical in all respects including risk factors except for debt/equity, X having issued 10% debenture of Rs. 18 Lakhs while Y has issued only equity. Both the companies earn 20% before interest and taxes on their total assets of Rs. 30 lakhs.

Assuming a tax rate of 50% and capitalization rate of 15% for all-equity Company, compute the value of companies X and Y using (i) net income approach and (ii) net operating income approach.

Solution:

(i) Net Income Approach

	Company X (Rs.)	**Company Y (Rs.)**
Earnings Before Interest and Taxes (EBTI) @20% on Rs. 30,00,000	6,00,000	6,00,000
Less: Interest @ 10%	1,80,000	
	4,20,000	6,00,000
Less: Tax @ 50%	2,10,000	3,00,000
Earnings available for equity shareholders	2,10,000	3,00,000
Capitalized Value of Equity at 15%		
Company X:		
2,10,000 x 100/15	14,00,000	
Company Y:		20,00,000
3,00,000 x 100/15		
Add: Value of Debt		----------
	18,00,000	
Total Value of company	32,00,000	20,00,000

(ii) Net Operating Income Approach

Value of Unleveled Company Y, (Vu) = EBIT (1-t)/Ke

= 6,00,000 (1-0.5)/.15

= Rs. 20,00,000

Value of Levered Company X, (VL td)

= 20,00,000 + .5 X 18,00,000

= 20,00,000 + 9,00,000

= Rs. 29,00,000

7.4.3 TRADITIONAL APPROACH

The traditional approach, also known as intermediate approach, is a compromise between the two extreme of net income approach. According to this theory, the value of the firm can be increased initially or using more debt, as the debt is a cheaper source of funds than equity can decrease the cost of capital. Thus, a proper debt-equity mix can reach optimum capital structure. Beyond a particular point, the cost equity increases because increased debt increases the financial risk of the equity shareholders. The advantage of cheaper debt at this point of capital structure is offset by increased cost of equity. After this there comes a stage when the increased cost of equity cannot be offset by the advantage of low-cost debt. Thus, overall cost of capital, according to this theory decrease up to a certain point, remains more or less unchanged for moderate increase in debt thereafter; and increases or raises beyond a certain point. Even the cost of debt may increase at this stage due to increased financial risk.

According to the traditional approach the manner in which the overall cost of capital to and the firm respond to changes in the degree of financial leverage can be divided into three stages.

In the first stage, the use of increased debt in the capital structure leads to increase in the value of the firm and decrease in the overall cost of capital. In this stage cost of equity ke, remains constant or rises very slowly. The cost debt also remains constant or rises negligible since the market views the use of debt as a reasonable policy. In this stage, with the increase in leverage, a relatively cheaper source of funds debt replaces a relatively costlier source of funds equity consequently the overall cost of capital decreases and the value of the firm rises.

In the second, increase in the financial leverage does not affect the value of the firm and its cost of capital. In this stage; the increase in the cost of equity ke, completely neutralizes the advantage of using cheaper debt capital. Within that range or at a particular level of leverage the value or firm will be highest and the cost of equity will be lowest. This happens due to (i) owing to increased financial risk, ke will rise sharply, (ii) the creditors will also raise the rate of interest as they may require compensation for higher risk.

The three stages in the behavior of overall cost of capital suggest that it is a function of financial leverage. It decreases in the initial stages with the increase in leverage and after reaching a minimum point it starts increasing. The behavior of Kd, ke and ko has been depicted in Fig.3

The cost of equity rises very slowly in the initial stages in response to rise in the financial leverage but starts rising sharply in the later stages. Cost of debt Kd remains constant up to a certain point and thereafter it also starts rising.

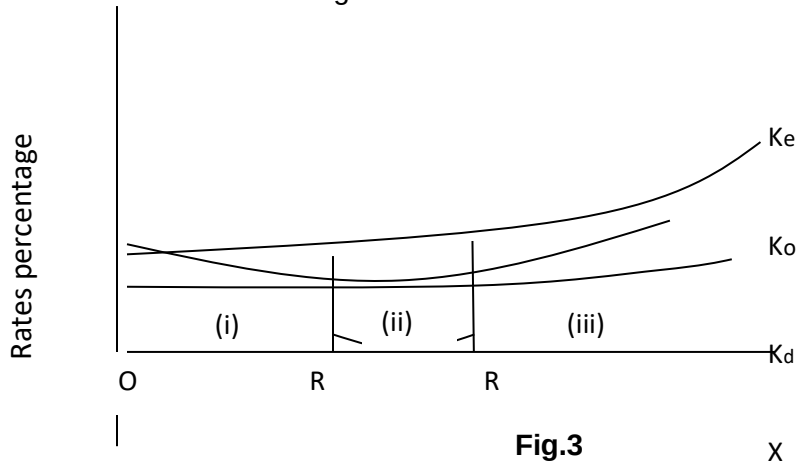


Fig.3

The overall cost of capital ko is a saucer shaped with a horizontal range RR. The optimal capital structure of the firm is represented by range RR, since the overall cost of capital ko is minimum and the value of firm is maximum.

ILLUSTRATION 3.

Compute the market value of the firm, value of share and the average cost of capital from the following information:

Net Operating Income		2, 00,000
Total investment		10, 00,000
Equity Capitalization Rate:		
(a)	If the firm use no debt	10%
(b)	If the firm uses Rs.4,00,000 debentures	11%
(c)	If the firm uses Rs.6,00,000 debentures	13%

Assume that Rs.4,00,00 debenture can be raised at 5% interest where as Rs. 6,00,000 debentures can be raised 6% rate of interest.

Solution:

computation of market value of firm, Values of shares & the Average cost of capital			
	(a) no debt	(b) Rs. 4,00,00 5% Debentures	(c) Rs. 6,00,000 6% debentures
Net Operating Income less interest i.e. cost of debt	Rs. 2,00,000	Rs. 2,00,000 20,000	Rs.2,00,000 36,000

Earnings available to equity shareholders	Rs.2,00,000	Rs. 1,80,000	1,64,000
Equity capitalization Rate	10%	11%	13%
Market value of shares	2,00,000 X 100/10	1,80,000 X 100/11	1,64,000 X 100/13
Market value of debt (debentures)	Rs. 20,00,000	Rs. 16,36,363 4,00,000	Rs,12,61,538 6,00,000
market value of firm	20,00,000	20,36,363	18,61,358
Average cost of capital earning/value of the firm or EBIT/V	$\frac{2,00,000}{20,00,000}x100$ $= 10\%$	$\frac{2,00,000}{20,36,363}x100$ $= 9.8\%$	$\frac{2,00,000}{18,61,558}x100$ $= 10.7\%$

Comments

It is clear from the above that if debt of Rs. 4, 00,000 is used the value of the firm increase and the overall cost of capital decrease. But if more debt is used to finance in place of equity, i.e., Rs. 6, 00,000 debentures, the value of the firm decrease and the overall of capital increases.

7.4.4 MODIGLANI-MILLERS (MM) APPROACH

The Modigliani-miller (MM) approach is akin to the Net Operating Income (NOI) approach. According to this approach, the value of a firm is independent of its capital structure, like NOI approach. The NOI approach is only definitional or conceptual and lacks behavioral significance. The significance of MM therefore total value of the firm. In other words, MM approach maintains that the weighted average cost of capital does not change with change in the debt equity mix or capital structure of the firm. It also gives operational justification for this and not merely states only a proposition.

Basic propositions

MM derived the following three propositions.

1. The total market value of a firm is equal to its expected operating income by the discount rate appropriate to its risk class. It is independent of the degree of leverage.

V = EBIT/K	EBIT expected before interest and tax K_o = Overall cost of capital/discount rate V = Market value of firm

2. The expected yield on equity, ke, is equal to capitulation rate (k) plus a premium. The premium is equal to the debt-equity ratio times the difference between k and they yield on debt, kd

In symbols, Ke=ko + (ko –kd) D/S	ke = cost of equity capital kd = cost of debt D = M.V of debt

S = M.V. of equity

3. The cut off rate for investment decision making for a firm in a given risk class is not affected by the manner in which the investment is financed. It means, cut-off for investment purpose is completely independence of the in which an investment is financed.

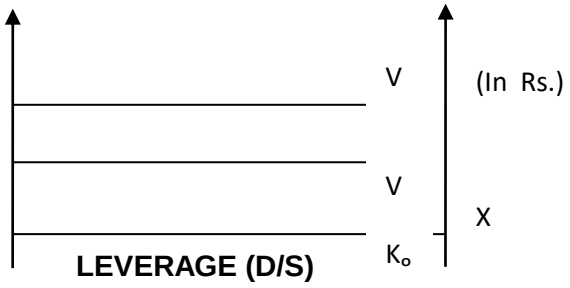
Assumptions

The MM approach is based on the some assumptions. Let us now took at those assumptions.

1. Investors are free to buy and sell securities.
2. The investors can borrow without restriction on the same terms on which the firm can borrow.
3. The investors are well informed.
4. The investors behave rationally.
5. There are no transaction costs.
6. There is no corporate income, taxes.
7. Firms can be grouped into 'equivalent risk' on the basis of their business risk.

MM approach maintains that the weighted average cost of capital does not change with a change in the proportion of debt to equity in the capital structure. Apart from this, market value of the firm which is not also affected with leverage ratio is shown in following :

figure no 4.



The MM hypothesis can, therefore, be put in the following words: MM hypothesis is based on the ideal that or matter how you divide up the capital structure of film among debt, equity and other claims, there is a underlying profitability and risk. The operational justification for the MM hypothesis is the arbitrage process, which is discussed under the following head.

Arbitrage Process:

The term 'Arbitrage refers to an act of buying an asset or securities in one market lowers price and selling it in another market at a higher price. As a result, equilibrium is restored in the market price of a security in different markets. This is because in case the market values of two firms which are equal in all respects expect their capital structures, are not equal, investors of the overvalued firm would sell their shares, borrow additional funds on personal account and invest in the undervalued firm in order to obtain the same return on smaller investment outlay. This will continue till the market prices

or the two identical firms become identical. Thus, the arbitrage operation derives the total value of two homogeneous firms in all respects; expect the debt equity ratio together. The ruse of debt by the investors for arbitrage is termed as 'home made' or personal leverage.

Illustration No. 4 the values for two firms X and Y in accordance with the traditional theory are given below:

	X	**Y**
Expected Operating Income	Rs. 1,50,000	1,50,000
Total cost of Debt (Kd. D=R)	0	10,000
Net Income	50,000	40,000
Cost of equity (Ke)	0.10	0.11
Market value of shares (s)	5,00,000	3,60,000
Market value of debt (D)	0	2,00,000
Market value of the firm (V=S+D)	5,00,000	5.60,000
Average cost of capital (Ke)	0.10	0.09
Data Equity Ratio	0	0.556

Compute the value of the firms X & Y as per MM assume that

(i) Corporate Taxes do not exist and
(ii) The equilibrium value of Ke is 12.5%

Solution:

Computation of the Values of the Firms

	Firm 'X'	**Firm 'Y'**
Expected Operating Income (x)	Rs. 50,000	50,000
Less: Cost of Debt (Kd x D=R)	----------	10,000
Net Income for Equity (x-R)	50,000	40,000
Equilibrium value of Ke (1.5%)	0.125	0.125
Market value of Firm	4,00,000	4,00,000
(V) = 50,000/0 0.125	-------	
Market value of the Debt (D)	----------	2,00,000
Market Value of Equity (S-VD)	4,00,000	2,00,000
Cost of Equity (Ke) = X-R/S	12.5%	20%

Limitations of M.M Hypothesis

The shortcoming of the M>M lies in the assumption of perfect capital structure in which arbitrage process, the behavioral foundation for the M>M hypothesis is expected to work. The arbitrage process would fail to bring equilibrium in the capital market for the following reasons.

1. **Rate of interest for the Firms and Individuals**: The assumption that firms and individuals can borrow and lend at the same rate of interest does not hold well in practice. As a result, they are able to borrow at lower rates of interest than individuals and firms on a different footing n the capital market. If a firm goes bankrupt, all investors stand to lose to the extent of the amount of the purchase price of their shares. But if an investor creates personal leverage, then in the event of the firm's insolvency, he would lose not only his principal investment in the shares of the company but also be liable to return the amount of his personal loan.
2. **Substitution for Corporate Leverage**: It is incorrect to assume the " personal (homemade) leverage" is a perfect substation for "corporate leverage" the existence of limited liability of firms in contrast with unlimited liability of individuals clearly places individuals and firms on a different footing in the capital market. If a firm goes bankrupt, all investors stand to lose to the extent of the amount of the purchase price of their shares. But if an investor creates personal leverage, then in the event of the firm's insolvency, he would lose not only his principal investment in the shares of the company but also be liable to return the amount of his personal loan.
3. **Transaction Cost**: The cost of transaction costs also interferes with the working of arbitrage. Because of the costs involved in the buying and selling securities, it would become necessary to invest a greater amount, in order to earn same return. As a result the firm will have a higher market value.
4. **Institutional Restriction**: Institutional restriction also impedes the working of arbitrage. Durand points out that 'home-made' leverage is not practically feasible as a number of institutional investors would not be able to substitute personal leverage for corporate leverage, simply because they are not allowed to engage in the "home-made" leverage.
5. **Corporate Income Tax**: The incorporation of the corporate income taxes also frustrate M.M's conclusion. Interest charges are tax deductible. This if fact, means that the cost of borrowing fund to the firm is less than the contractual rate of interest. The very existence of interest charges gives the firm a tax advantage which allows it to return its equity and debt holders a larger stream of income that it otherwise could have.

The corporate taxes and M.M Hypothesis

The M.M hypothesis that the value of a firm and its cost of capital will remain constant with leverage does not hold good when there are corporate taxes. Under income taxes, interest paid to debt holders is treated as deductible expenses. Dividends paid to share holders, on the other hand are not tax deductible. Thus, unlike dividends the return debt holders are but subject to the taxation at the corporate level. This makes debt financing advantageous. The effective cost of debt is, therefore, less than the contractual rate of interest. A leveraged firm should have, therefore, a greater market value as

compared to an unleveled firm. The value of the levered firm would exceed that of the unleveled firm by an amount equal to the levered firm's debt multiplied by the tax rate.

Formula for valuation of the firm

1. **For un-levered Firm**:

Vu= (I-T) EBT/Ke	EBT= earnings before tax T = Tax rate Vu = Value of an un-levered firm Ke = Equity capital Firm Rate

2. **For levered firm**

V1 = Vu + Bt	V1 = Value of levered Firm Vu = Value of un-levered B = Amt. of debt t = Tax rate

7.5 DETERMINATION OF OPTIMUM CAPITAL STRUCURE

At optimum capital structure, the value of an equity shares is the maximum while the average cost of capital is the minimum. A review of the major capital structure theories has reveled several methods of approaching the issue of the optimal capital structure of a firm. But any approach to an optimal capital structure must bring together three variables:

1. Favorable Financial Leverage: optimum capital structure occurs at the point where favorable financial leverage exists. This kind of leverage brings the maximum earring per share. So long the "Return on investment" (ROI) is more than cost of borrowing each rupee of extra borrowing pushes up the earning per equity shares. It means the company can borrow till the interest rate on borrowing is equal to or does not exceed the return from project.

2. Income Tax Leverage: In order to have the maximum tax advantage on the interest payable, the company may maintain debt equity ratio near the top of the range keeping in view other factors such as profitability, solvency, flexibility, control etc.

3. Market Conditions: the reaction of investor to change in the capital structure is an important part of any decision to use debt or equity financing. Market condition must be considered in any search for an optimal capital structure. But market factors are highly psychological, complex and do not follow always accepted theoretical principles since capital markets are never perfect. However, each extra rupee of borrowing increase the risk and therefore in spite of increase in the earning per equity investors taking, it as a more risky company of course, in some cases, in spite of increase in risk, the value of a company's equity shares may increase because of investor's speculation on future profits.

Thus, it is too rough to find out the exact debt-equity where the capital structure would be optimum. Empirical studies disclosed that the investors do not discount the value of the company's share so "appropriate or sound capital structure "in place of the term "optimum capital structure".

Capital structure decision is a highly individualistic decision. Every firm must design its capital structure having regard to the peculiar conditions faced by it. In theory one can speak of optimal capital structure but in actual practice designing of capital structure is a formidable task. There are significant differences among industries and among companies in the same industry in terms of qualitative and quantitative factors to be considered in designing of capital structure. Moreover personal judgment of the person designing the capital must design its capital structure capital structure is as follow:

(i) Profitability

Capital structure should help the firm in achieving its profitability targets. Maximum use of lower cost should be made to magnify profitability.

(ii) Safety and Solvency

Capital structure should ensure the solvency of the firm in the long run. Excessive use of debt threatens the solvency of the firm. Debt should be used to the extent it does not pose significant risk. Beyond this the use of debt in the capital structure should be avoided significant risk. Beyond this, the use of debt in the capital structure should be avoided significant risk. Beyond this, the use of debt in the capital should be avoided.

(iii) Attraction to investors

Various securities to be issued to raise capital for the firm should offer certain attractions to the investors either relating to return, risk control or liquidity.

(iv) Flexibility

Capital structure should be flexible. It should be such as can be changed having regard to changing

(v) Debt bearing

Capital structure of a firm should be designed having regard to its debt bearing capacity. A company with stable and growing cash flow from operations has more debt bearing capacity as compared to a company whose flows from operations are highly volatile.

(vi) Control

Capital structure should help the present management of the company to retain its control. For this purpose debt should be preferred to equity capital to raise further capital for the company. Debt holders do not have a right to elect the board of director of the company, where as equity shareholders possess voting rights. Thus issue of further equity leads to dilution in the control of present management over the company.

(vii) Avoidance of unnecessary restrictions

The capital structure of a firm should be such as imposes minimum possible restriction on the firm. Term loans from financial institutions should be avoided as these institutions impose a number of restrictions on the operations of the borrowing company.

(viii) Economy in the floatation costs

Securities should be issued in such a manner as to entail minimum possible cost of issue. Generally cost of issue is lower in case of debentures as compared to the issue of equity shares.

(ix) Balanced use of leverage

A firm must make balanced use of leverage. Necessary funds should be raised by an appropriate mix of borrowed funds and equity capital. Normally it is appropriate to issue debenture when the rates of interest are low. The firm should prefer issuing equity capital when the rates of interest are higher.

Self Assessment:

Fill in the blanks:

1. Capital structure is referred as mix of _____sources of finance.
2. At _____capital structure, the cost of capital is minimum and market price per share is maximum.
3. The most profitable capital structure is one that tends to minimize _____and maximize earning per equity share.
4. The Net Income (NI) approach is the relationship between leverage and _____and value of the firm.
5. The _____ is the operational justification of MM hypothesis.
6. The Net Operating Income (NOI) approach is the opposite of the _____approach.

7.6 Summary

- Leverage is the use of fixed-cost assets or sources of funds (e.g. debt preference share) to increase the returns to the equity shareholders.
- Financial leverage is the ability of the firm to use fixed financial costs to enhance the effects of changes in earnings before interest and taxes on earnings per share. The higher the interest and preference dividends, which are fixed costs, the greater is the financial leverage.
- The mix of long-term debt and equity it uses in financing its operations determines a firm's capital structure.
- The basic difference in debt (including preference shares) and equity capital is related to the voting rights, the claims on income and assets, and the tax treatment.
- The traditional approach to capital structure indicates the optimal capital structure for the firm is one in which the overall cost of capital is minimized and the share value is maximized.
- The cost of debt increase beyond a certain level of leverage.
- A firm's capital structure should be consistent with its business risk and results an acceptable financial risk.
- However, the optimal capital structure, which is selected from among alternative and not just (profits).
- The MM analysis suggests that the optimal capital structure does not matter and that as such debt as possible should be used, because the interest is tax-deductible. This MM hypothesis is attacked because of its unreal assumptions.

7.7 Glossary:

1. **Arbitrage:** It refers to an act of buying a security in one market having lower price and selling it in another market at higher price.
2. **Capital Structure** It is that part of financial structure, which represents long-term sources.
3. **MM Theory:** According to this theory the value of the firm is independent of its capital structure.
4. **Net Income Approach:** According to this approach, the cost of debt and the cost of equity do not change with a change in the leverage ratio.
5. **NOI Approach:** According to this approach, the market value of the firm is not affected by the capital structure changes.
6. **Optimum Capital Structure:** It is that capital structure where market value per share is maximum and the cost of capital is minimum.

7.8 Answers: Self Assessment:

1. Long-term
2. Optimum
3. Cost of financing
4. Cost of capital
5. Arbitrage process
6. Net Income (NI)

7.9 Terminal Questions:

1. Define capital structures. What should generally with features of an appropriate capital structure?
2. Give a critical appraisal of the Traditional Approach and the Modigliani-Miller Approach to the problems of Capital Structure.
3. Discuss Net Income, net operating income approach of capital structure.

7.10 Suggested Readings:

1. I.M. Pandey, Financial Management, Vikas Publishing New Delhi.
2. James C. Van Horne Financial Management and Policy Prentice Hall, New Delhi.
3. M.Y. Khan and P.K. Jain, Financial Management, Tata McGraw Hill, New Delhi.
4. Prasanna Chandra, Financial Management, Tata McGrew Hill, New Delhi.

LESSON 8

CAPITAL STRUCTURE=II

STRUCTURE:

8.0 Learning objectives:

After reading this lesson you should be able to:

- Explain the importance of decision regarding Capital Structure.
- Identify the factors that have a bearing on determining the Capital Structure.
- Explain the concept of an appropriate Capital Structure.
- Explain capitalization -: over capitalization and under capitalization.
- Choice of EPS under alternative financing plans.

8.1 INTRODUCTION

Capital structure planning is one of the key financial functions. Capital structure decision in a firm is made with the objectives of maximization of shareholder's wealth. It is concerned with the decision-making about various sources of long-term capital to be tapped for raising the necessary funds for the firm. The major sources of capital for a corporate organization include, equity capital preference capital, retained earnings and long term debt. These sources of capital are lesser costly but more risky whereas other are more costly but lesser risky. Therefore, a financial manager has to judiciously select the sources of capital. He has to determine how much will be the equity capital representing the funds owned by the equity shareholders? How much money would be raised through the issue of debt? Thus capital structure decision of a firm is concerned with the determination of appropriate of various sources

of capita n the total capital of the firm so as to minimize the cost of capital and the risk and maximize the value of the firm.

8.2 CAPITAL STRUCTURE PLANNING

Decision regarding what type of capital structure a company should have is of critical importance because of its potential impact on profitability and solvency. The small companies often do not plan their capital structure. The capital structure is allowed to develop without any formal planning. These companies may do well in the short-run; however, sooner or later they face considerable difficulties. The unplanned capital structure does not permit an economical use of funds for the company. A company should therefore plan its capital structure in such a way that it derives maximum advantages out of it and is able to adjust more easily to the changing conditions.

Instead of following any scientific procedure to find an appropriate proportion of different types of capital which will minimize the cost of capital and maximize the market value, a company may just either follow its advice.

Theoretically, a company should plan an optimum capital structure in which a way that the market value of its shares is maximum. The value will be maximized when the marginal real cost of each source of funds is the same. In general, the discussion on the issue of optimum capital structure is highly theoretical. The determination of an optimum capital structure in practice is a formidable task, and we have to go beyond the theory. That is why, perhaps, significant variations among industries and among different companies within the same industry regarding capital structure are found. A number of factors influence the capital structure decision of a company. The judgment of the person or group of persons making the capital decision plays a crucial role. Two similar companies can have deferent capital structures if the decision makers differ in their judgment about the significance of various factors. These factors are highly psychological, complex and qualitative and do not always follow the accepted theory. Capital markets are not perfect and the decision has to be taken with imperfect knowledge and consequent risk. You might have become interested in identifying some of the important factors which influence the planning of the capital structure some of the important factors which influence the planning of the capital structure in practice. However, before we discuss these factors let us examine the features of an appropriate capital structure.

8.3 DETERMINATION OF CAPITAL STRUCTURE

A company should aim at a capital structure, which allows it to take full advantages of the factors discussed here under:

A. Cost of capital

Capital in the form of shares of debentures has to be attracted and maintained. The interest payable in case of a loan can be met or an adequate return can be paid on the share capital invested. But the total cost of maintaining loan and results. Loan capital from alternative sources or for different time should be considered and the one, which results in minimum cost should be, the one selected. Care should be taken to ensure that the terms of the cheapest loan do not impose restrictions, which limit the activity of the company to extent. It cannot earn maximum profit. Borrowing by means of a long-term loan will generally be more expensive than the short-term loans give security to tenure. With the overdraft or shot term loan, there is always the danger that repayment will be demanded at very

notice. Interest on debentures and dividend on preference shares represent at charge, which a company must pay before it, pays divided to equity holders.

Cost of borrowing is an extremely important consideration but it is not the only one. The stern, cost of capital generally refers to the interest or dividend payable. However, the cost incurred in raising the capital is also important. They involve legal and publicity costs. Management decision often depends upon the size of this rate at particular time. When deciding whether to invest in fixed assets, the cost of capital serves a guide to the rate to be used for the appropriate capital expenditure decision techniques. In profit planning, the cost of capital should be the starting point. This also applies when establishing the target profit for the company and budgetary control.

B. Maximum Control

Certain shares will have voting right. Therefore, through term control can be exercised. The correct balance between the voting capital (equity) and the loan capital should be maintained but the ideal ratio is difficult to decide and maintained, it is difficult to formulate general rates on the maximum amount of loan capital, which should be employed by a business. This is a difficult task. Each business has different characteristics and what is good for one may be considered. The first time is the fixed assets owned. If money is borrowed for an important factors which should be considered. The first is the fixed is the assets owned. If money is borrowed for a long period it will be usual for the lender to require some form of security. Companies of high financial standing can borrow without giving security but this should not be taken that securities will not be required. Even when unsecured notes can be issued there will, be a limit to the amount that can be raised in this way. Fixed assets may be used a guide determine what is a reasonable amount of borrow. To ensure that a sound policy is being followed, the total amount borrowed should not exceed a reasonable proportion of a fixed assets figure. Between one-third and one half may be taken as an appropriate guide. This then leaves as margin of safety and allows for emergency borrowing that may be found necessary. It may also enable borrowing to be made at the lowest possible rates for the simple reason that the loan can be earned but some businesses are more stable than other. This matter is related to gearing of capital, which is discussed in the following paragraphs. The stable company may be able to have a high gearing, whereas companies who experience fluctuation in trade have relatively low gearing. Earning should be adequate to cover all type of payments whether interest of dividends. This safeguarding of any shareholders can be expected from all companies whose directors wish to have the continued support of the public and the stock exchange.

C. Elasticity Of Capital Structure :

The capital structure should be elastic. Elasticity means capital structure should be such as to enable the firm to change it as required under changing conditions. It should be capable of expansion or contraction as the case may be. Too much dependence on preference shares and debentures make the capital structure rigid, as this requires the payment of fixed charges. As a general practice, debentures are not issued in the initial +stages and resorted to in case of emergence or for the purpose of expansion. In that case too, a firm can prefer redeemable preference shares and convertible debentures. Instead of issuing debentures, preference shares are generally issued in the beginning.

D. Nature Of Business :

The nature of business is also imported in deciding the basic capital structure. Thus, a manufacturing company may have a different capital structure than that of a non manufacturing one. Therefore, one type of example, public utilities are financed through fixed interests securities as debentures because they have stability of income because of their monopoly. On the contrary, manufacturing concerns are usually subject to competitive conditions and, therefore, rely to a large extent on equity share capital.

E. Period for Which Funds are Required :

Funds needed for short periods are usually borrowed from bands as short-term loans or maybe received as public deposits for a year or two. Such loans can be paid back as soon as the company manages to have its own funds. The issue of shares and debentures can raise long-term finance.

F. Investors Need :

Investors have different thinking. In order to involve more investors, different types of securities are to be issued to meet their requirements. For this the security must be attractive to all type of investors. The amount invested in it should be safe; it must yield a fairly good return and provide a stable income. Moreover, it should command a ready market and value as collateral; it should be an acceptable denominations and duration. It should enjoy potential appreciation. However, to meet the need of different kinds of investors, it is necessary to issue different kinds of securities. The investors, who want the security of the principal and stability of income, will go in for debentures. Those who are for higher and stable income and safety of the money invested will take up preference shares. Those who are ready to take risk for higher income and capital appreciation will take up equity shares. They may also like t acquire control over the affairs of company. It is also desirable to issue securities with different face values in order to secure subscription from people from people in the different strata of society.

G. Growth And Stability of Sales :

Growth and stability sales play very important role in determining the capital structure of a firm. Degree of leverage depends tendency of sales. The greater stability in sales increase earning of a firm and enables it to adopt policy of using higher level of debt with low risk because it meets fixed interest obligations. When the sales are fluctuating business risk increase because it meet fixed interests obligations. When the sales are fluctuating business risk increase because the expected earning cannot be estimated accurately. The firm with fluctuating sales cannot employ a high degree or leverages buy issues equity capital to raise funds. So we can understand that use of debt financing is directly influenced by predictability and stability in the rate of growth in sales.

H. Risk :

Risk means fear of negative deviations in expected rate of return. A firm should opt for that capital structure which has minimum possibility of risk. Risks are of four types:

(1) Systematic risks or market risks or non-diversifiable risks are caused by factors like inflation money supply, and governmental spending level and industrial policy. Though rates of return of all firms get affected by these factors yet they hardly can do anything to avoid these risks.

(2) Other type of risks is unsystematic risks or diversifiable risks. These can e caused by shortage or non-availability or raw material, technological change, more competition, break down or plant etc. it does but influence rate of return or all firms but affects individual firm where it happens.

(3) Business risk represents the variability of earnings before interest and taxes (EBIT). The factors, which cause high business risks, are variability of demand, which affects sale of manufactured products, high degree of variability for prices or products and prices of inputs, higher proportion of fixed costs to total costs etc.

(4) Financial risk refers to the variability of shareholders earning per share (EPS) when it is caused by use of financial leverages. Financial leverage means use of debt and preference capital with equity. High degree of financial leads to high burden of fixed charges and more exposure to financial risk.

Capital structure of a firm should be such which minimizes business risk and financial risk. There is a combined effect of business risks and financial risk since combined effect = financial risk x business risk.

If business risk is high for a company, it is advisable to maintain low financial risk. On the other hand, if a company is facing low business risk it can afford to take higher degree of financial risk.

8.4 FACTORS INFLUENCING CAPITAL STRUCTURE

Every firm must design its capital structure having regard to the relevant factors affecting such capital structure. A large number of factor is differs have a bearing on the design of the capital structure of a firm. These factors differ in intensity from one industry to another industry and even from one firm to another firm within the same industry. While designing the capital structure of the firm, some of the important factors affecting the capital structure decision are discussed as below:

1. Growths and stability of Sales

The nature and pattern of sales of a firm has a significant effect on its capital structure. A firm whose sales are stable or rising steadily can generate more cash to discharge fixed interest obligation and pay preference dividends. On the hands, those firms whose sales are fluctuating and cannot be predicted accurately cannot assume fixed interest obligations. Therefore those firm whose sales are stable or rising steadily, can raise their capital through the issue of debt. On the other hand, those firms whose sales re fluctuating should prefer issuing equity capital for raising funds.

2. Risk

Capital structure of firm should pose minimum possible risk. From risk point of view debt is the most risky sources of capital due to (i) a firm has to pay fixed amount of interest irrespective of its net operating income and (ii) in case of default the creditors can ask for the winding up of the business. Equity capital on the other hand is the least risky source of capital. There is no fixed commitment to pay equity dividend. Equity capital has not to be returned to the equity shareholders during the lifetime of the company preference capital involves moderate degree of risk. It is more risky than equity buy lesser risky than debt. Form risk point of view the issue of equity is preferable to the issue of debt or preference capital.

3. Ability to serve debt

The ability to serve debt depends upon the pattern and magnitude of cash flows of a firm. If a firm can generate sufficient cash to discharge the fixed interest obligations and loan repayments. It can have more debt in its capital structure. On the other hand a firm with meager cash flows from operation should not raise debt capital. Generally two ratios (i) interest coverage ratio and (ii) cash to debt service ration are computed to assess the debt service ability of a firm. These rations have been discussed in the chapter on ratio analysis.

4. Operational Characteristics

Operational characteristics of a firm influence its capital structure in a significant manner. Different firms may employ different technologies to manufacture their products. Some firms employ labour intensive technologies of production whereas other may adopt capital-intensive technologies. Those firms, which employ capital-intensive technologies of production, have large investment in fixed assets. Fixed costs constitute a major portion of total costs in such firm and thus these firms have more operating risk. Therefore, these firms should prefer equity capital to debt. On the other hand firms with labour intensive technologies of production and trading firms do not have to invest much in fixed assets. Fixed costs of these firms are lower as compared to fixed costs of those firms employing capital-intensive technologies. These firms are subject to lesser operating risk and therefore they can afford to use more of debt capital.

5. Purpose of Financing

The purpose for which funds are to be raised has a distinct bearing on the capital structure of a firm. If the funds are needed for a productive purpose like expansion or diversification, which is expected to generate sufficient cash inflows, the firm may consider the issue of debentures for raising capital for such purpose. On the other hand, if the funds are needed for an unproductive purpose like meeting some legal or social responsibilities, the issue of equity capital should be preferred.

6. Age and Size of Firm

The age and size of the firm considerably affect design of its capital structure. New and small firms have to depend upon outside equity and debt capital. As a firm grows in size, retained earnings start replacing outside debt and equity. Large and reputed companies have access to the capital market and therefore they have to depend more on owned capital.

7. Corporate tax rate

Presence of corporate taxes has a significant influence on the costs of various sources of capital and hence on the capital structure of firm. As stated earlier interest on debt is tax deduction where as dividend on preference capital or equity capital has to pay out of post tax profits. Consequently cost of debt is significantly lower than the cost of equity or cost of preference capital. Therefore, it can be said that higher the tax rate, greater is the advantage of using debt capital as compared to equity capital or preference capital.

8. Floatation costs

Floatation costs of raising funds from various sources of capital should be given due consideration while designing the capital structure of a firm. Floatation costs consist of expenses of printing promotional material and publicity and brokerage and commission payable to intermediaries like brokers and bankers. Generally, floatation costs of debentures are lower than that of equity capital. From the floatation costs point of view debt is preferable to equity shares.

9. **Nature of Investors**

Investors can be divided into different categories on the basis of their risk return preferences. Some investors are prepared to assume higher risk to earn higher return. On the other hand, some other investors prefer playing safe. They do not want to assume higher risk and are satisfied with lower return. While designing its capital structure the firm should take care of the requirement of its investors. For those investors who do not want higher risk, the firm should consider issuing debentures or preference shares. For risk assuming investors the equity shares should be issued.

10. Capital Market Conditions

Conditions prevailing in the capital market not only determines the types of securities to the issued but also the rate of interest on debentures, rate of dividend on preference capital and the issue prices of various securities. In case of favorable market conditions the company can issue various types of securities to raise capital for its expansion and other purpose. On the other hand, if the conditions in the capital market are depressed, the firm cannot think of raising capital through the issue of equity capital and other securities. In such a situation it has to approach financial institutions for term loans to fulfill its requirement of funds.

11. Attitude of management

Management of different firms differs in skills, judgment, experience, temperament and motivation. Some management is aggressive. They are prepared to assume higher risk to reduce the cost of capital and increase the market values of their firms. Such managements are conservative. They do not want to assume more risk. Such management prefers equity capital as sources of funds for the firm. The conservatism or the aggressiveness of the management depends upon the age experience, ambition and confidence of the persons constituting the management team. Therefore, these factors also affect the capital structure of a firm.

12. Legal and other conditions

Lastly while designing its capital the firm should also care of the relevant provisions of various laws framed by the government from time to time. It should also take care of the norms set by the financial institutions, securities and Exchange Board of India and stock exchange.

8.5 Capitalization

Capitalization comprises of share capital, debentures, loans, free reserves, etc. capitalization represents permanent investment in companies excluding long-term loans. Capitalization can be distinguished from capital structure. Capital structure is a boras term and it deals with qualitative aspect of finance. While capitalization is a narrow term and it deals with the quantitative aspect.

Capitalization is generally found to be of following types-

- Normal
- Over
- Under

Overcapitalization

Overcapitalization is a situation in which actual profits of a company are not sufficient enough to pay interest on debentures. On loans and pay dividends on shares over a period of time. This situation arises when the company raises more capital than requires. A part of capital always remains idle. With a result, the rate of return shows a declining trend. The causes can be-

1. **High promotion cost**- When a company goes for high promotional expenditure, i.e., making contracts, canvassing, underwriting commission, drafting of document, etc. and the actual returns are not adequate in proportion to high expenses, the company is over-capitalized such cases.
2. **Purchase of assets at higher prices**- When a company purchases assets at an inflated rate, the result is that the book value of assets is more than the actual returns. This situation gives to over-capitalization of company.

3. **A company's floatation n boom period**- At times company has to secure it's solvency and thereby float in boom periods. That is the time when rate of returns are less as compared to capital employed. This results in actual earnings lowering down and earnings per share declining.

4. **Inadequate provision for depreciation**- If the finance manager is unable to provide an adequate rate of depreciation, the result is that inadequate funds are available when the assets have to be replaced or when they become obsolete. New assets have to be purchased at high prices which prove to be expensive.

5. **Liberal dividend policy**- When the directors of a company liberally divide the dividends into the shareholders, the result is inadequate retained profits which are very essential for high earnings of the company. The results are deficiency in company. To fill up the deficiency, fresh capital is raised which proves to be a costlier affair and leaves the company to be over-capitalized.

6. **Over-estimation of earnings**- When the promoters of the company overestimate the earnings due to inadequate financial planning, the result is that company goes for borrowings which cannot be easily met and capital is not profitable invested. This results in consequent decrease in earnings per share.

Effects of Overcapitalization

1. On Shareholders- The over capitalized companies have following disadvantages to shareholders:-

a. Since the profitability decreases, the rate of earning of shareholders also decreases.

b. The market price of shares goes down because of low profitability,
c. The profitability going down has an effect on the shareholders. Their earnings become uncertain.
d. With the decline in goodwill of the company, share prices decline. As a result shares cannot be marketed in capital market.

2. On Company-

a. Because of low profitability, reputation of company is lowered.
b. The company's shares cannot be easily marketed.
c. With the decline of earning of company, goodwill of the company declines and the result is fresh borrowings are difficult to be made because of loss of credibility.
d. In order to retain the company's image, the company indulges in malpractices like manipulation of accounts to show high earnings.
e. The company cuts down it's expenditure on maintenance, replacement of assets, adequate depreciation, etc.

3. On Public- An overcapitalized company has got many adverse effects on the public:

a. In order to cover up their earning capacity, the management indulges in tactics like increase in prices or decrease in quality.
b. Return on capital employed is low. This gives an impression to the public that their financial resources are not utilized properly.
c. Low earnings of the company affects the credibility of the company as the company is not able to pay its creditors on time.
d. It also has an effect on working conditions and payment of wages and salaries also lessen.

Undercapitalization

An undercapitalization company is one which incurs exceptionally high profits as compared to industry. An undercapitalized company situation arises when the estimated earnings are very low as compared to actual profits. This gives rise to additional funds, additional profits, high goodwill, high earnings and thus the return on capital shows an increasing trend. The causes can be-

1. Low promotion costs
2. Purchase of assets at deflated rates
3. Conservative dividend policy
4. Floatation of company in depression stage
5. High efficiency of directors
6. Adequate provision of depreciation
7. Large secret reserves are maintained.

Effects of under capitalization

1. On shareholders

a. Company's profitability increases. As a result, rate of earning go up.
b. Market value of share rises.
c. Financial reputation also increases.
d. Shareholders can expect a high dividend.

2. On company

a. With greater earning, reputation becomes strong.
b. Higher rate of earnings attract competition in market.
c. Demand of workers may rise because of high profits.
d. The high profitability situation affects consumer interest as they think that the company is overcharging on products.

3. On Society.

a. With high earning, high profitability, high market price of shares, there can be unhealthy speculation in stock market.
b. Restlessness in general public is developed as they link high profits with high prices of product.
c. Secret reserves are maintained by the company which can result in paying lower taxes to government.
d. The general public inculcates high expectations of these companies as these companies can import innovations, high technology and thereby best quality of product.

8.6 EBIT/EPS ANALYSIS

(a) Effect on EPS

The exercise involved in deciding capital structure capital structure of business is to select a financing plant is in the best interest of the owner. To select a plan different techniques are available. One is evaluating earnings per share (EPS) for given plans to select the best. The best is obviously plant, which grants highest EPS. You by now must be aware of the fact that wealth of the owners i.e., shareholders depends upon the market value of the share of the company and market price is lined to EPS. Thus impact of financing plant on EPS id significant. To compute EPS EBIT is taken from which interest charges are deducted to determine taxable profits i.e. earnings before tax can then adjust this value for tax liability giving EAT. Divide EAT by number of shares to get EPS. This can be explained with help of the following example.

Illustration No. 1

A growing company is confirmed with a choice between 15% debt issues and equity issues to finance its new investments. The firm's pre-expansion income statement is as follow:

	Rs.
Sales (production capacity of Rs. 60,000 at current sales price)	45, 00,000
Fixed cost	5, 00,000
Variable cost (66 2/3%)	30, 00,000

EBIT	10, 00,000
Interest at 12.5%	1, 00,000
Earnings before taxes	9, 00,000
Income tax (at 50%)	4, 50,000
Earnings per share (EPS)	4,50,000

The expansion program is estimated to cost Rs. 5, 00,000. If this is financed through debt, the rate on new debt will be 15%. If expansion program is financed through equity, new shares can be sold at Rs. 100 per share. Expansion will generate additional sales of Rs. 12, 75,000. No additional fixed costs would be needed to meet the expansion operation. If the company is to follow a policy of maximizing the EPS, which form of financing, should be employed by the company?

Solution:

Market value of shares under different financing alternatives

Particular	*15%*	*Equity Shares*
Sales revenue	Rs.57,75,000	Rs.57,75,000
Less fixed costs	5,00,000	5,00,000
Less variable (2/3 of sales)	38,50,000	38,50,000
EBIT	14,25,000	14,25,000
Less interest	1,75,000	1,00,000
Earnings before taxes (EBT	12,50,000	12,25,000
Less income taxes	6,25,000	6,62,500
Earnings after taxes (EAT)	6,25,000	6,62,500
Number of equity taxes (EAT)	50,000	55,000
EPS (EAT ÷ N)	12.50	12.05

Dept financing should be adapted to company, as it maximizes the EPS of its shares.

(b) EBIT-EPS Analysis

The magnitude and pattern of EBIT, as mentioned earlier, helps deciding the debt component in capital structure. Higher EBIT, other remaining the same, permits high debt proportion. Whereas a company with uncertain EBIT should not find a high debt proportion advisable. This exercise can be illustrated by means of an exercise called as EBIT-EPS analysis where the impact of change in EBIT on EPS is studied for different alternatives. Taking two mutually exclusive alternatives a point of indifference is computed.

- If EBIT is less than indifference point shares have a favorable affection EPS
- If EBIT is more than indifference point, debt funds influence EPS favorably

This situation can be illustrated with the help of a graph.

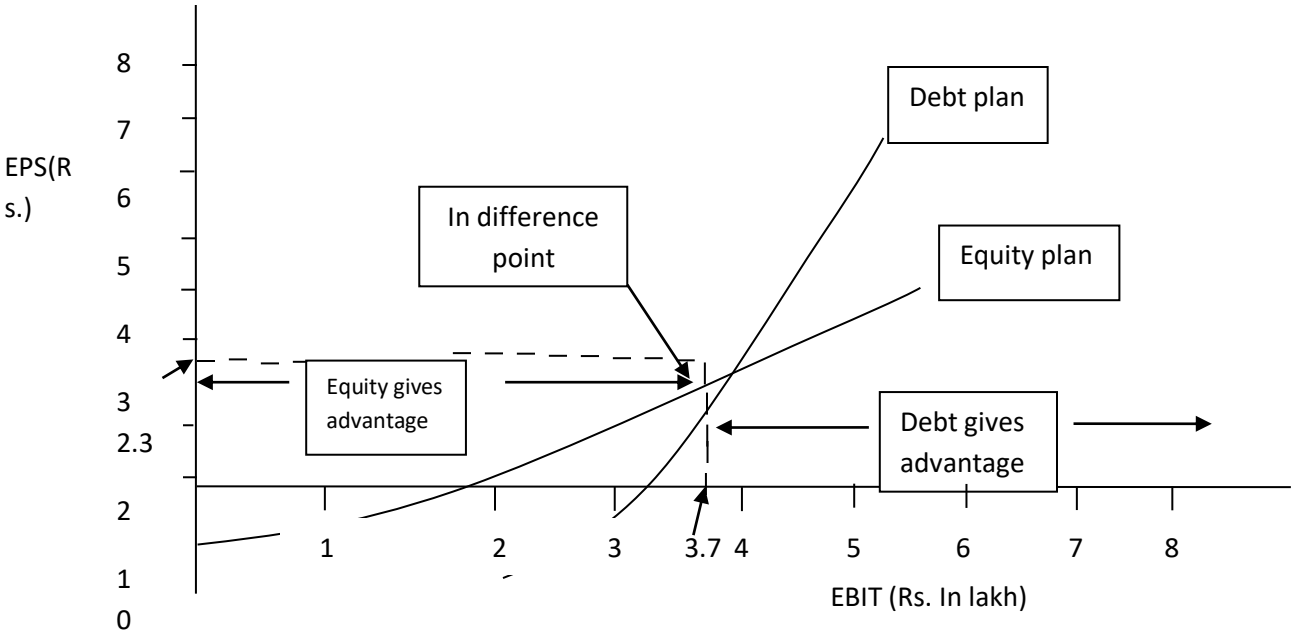


Illustration No. 2.

A firm is considering methods to fiancé its investment proposal. It is estimated that initially Rs. 4,00,000 will be needed. Two alternative methods of raising funds are available to the firm:

(a) Issue of 15% loan amounting to Rs. 2,00,000 and issue of 2,000 equity shares of Rs. 100 each: and (b) issue of 4,000 equity shares of Rs. 100 each. The appropriate tax rate is 50%

(i) Assuming operating profits (EBIT) of (a) Rs. 70,000 and (b) Rs. 80,000 which financing proposal would you recommend, and why?

(ii) Compute the indifference point of the two financial plans.

Solution

(i) Determination of EPS at various levels of EBIT under alternative financial plans.

	Financial plans			
	15% Loan And equity Plan	Equity plant (Rs.)	15% loan and equity plant	Equity plan (Rs.)
EBIT	70,000	70,000	80,000	80,000
Less interest at 15 %	30,000	-	30,000	-
Earnings before taxes	40,000	70,000	50,000	80,000

Less taxes at 15%	20,000	35,000	25,000	40,000
Earnings after taxes	20,000	35,000	25,000	40,000
Number of share (N)	2,000	4,000	2,000	4,000
EPS	10	8.75	12.50	10.00

Financial plan, having loan and equity is recommended.

(ii) $\frac{(\mathrm{X}-1)\,(1-\mathrm{t})}{N_2} = \frac{X\,(1-t)}{N_2}$

$= \frac{(\mathrm{X}-\mathrm{Rs}.30{,}000)}{2{,}000} = \frac{X\,(0.5)}{4{,}000}$

$= \frac{(0.5\,\mathrm{X}-\mathrm{Rs}.15{,}000)}{2{,}000} = \frac{0.5X}{4{,}000}$

= 2 (0.5X – Rs. 15,000) = 0.5X

= Rs. 30,000 = 0.5 X,

X = Rs. 60,000

Rs. 60,000 is the indifference point. At this point, EPS under both the financial plans would be the same.

8.7 Practical

Illustration No. 3

Good shape company Ltd has currently an ordinary share capital of Rs 25 lakh, consisting of 25,000 shares of Rs 100 each- The management is planning to raise another Rs 20 lakh to finance a major programmed of expansion through one of four possible financing plans. The options are as under:

(A) Entirely through ordinary shares.

(B) Rs 10 lakh through ordinary shares and Rs 10 lakh through long-term borrowings at 15 per cent interest per annum.

(C) Rs 5 lakh through ordinary shares and Rs 15 lakh through long-term borrowing is 16 percent interest per annum.

(D) Rs 10 lakh through ordinary shares and Rs 10 lakh through preference shares with 14 percent dividend. The company's expected EBIT is Rs 8 lakh. Assuming a tax rate of 35 percent. Determine the EPS in each alternative, and comment on the implications of financial leverage.

Solution:

Determination of EPS under financing alternatives

Financing plans

	A	B	C	D
EBIT	Rs. 8,00,000	Rs. 8,00,000	Rs. 8,00,000	Rs. 8,00,000
Less interest	----------	1,50,000	2,40,000	----------
EAT				
	8,00,000	**6,50,000**	**5,60,000**	**8,00,000**
Less taxes (0.35	2,80,000	2,27,500	1,96,000	2,80,000
EAT	5,20,000	4,22,500	3,64,000	5,20,000
Less dividends on preference shares (E)	----------	----------	----------	1,40,000 ----------
Earning available to equity	5,20,000 ----------	4,22,500 ----------	3,64,000 ----------	3,80,000 ----------
Number of equity shares (N)	45,000	35,000	30,000	35,000
	11.56	12.07	12.13	10.86
EPS (E÷N)				

The EPS is maximum in financing plan C, having maximum amount of debt (Rs.15 lakh out of total required amount of Rs. 20 lakh)

The use of debt will have a favorable impact on the EPS, which in turn will enhance prudent, as debt is the cheapest source of raising funds since interest is deductible item of expense in arriving at taxable income. The use debt of Rs. 15 lakh will raise the debt-equity ratio to 1:2, which is very satisfactory. Interest coverage is also very high. Moreover, there is no dilution of control with the debt. Thus from all points of view, the implication of financial leverage appear to be favorable.

Self Assessment:

Fill in the blanks:

1. In the context of capital structure planning, ……..risk is relevant.
2. Along with cost and risk factors, the ……..aspect is also important consideration in planning the capital structure.
3. In case a firm has higher debt content in capital structure, the risk of variations in ……..available to equity shareholders will be higher.
4. Investment decisions of the firm determine the size of the ……pool
5. The EBIT is shared among three main claimants which are debt holders, government and ……..who receive the balance.
6. The total value of the firm is the sum of the value to the ……..and its shareholders.

7. _____.denote what has been earned by the company during a particular period in each of the ordinary shares.
8. A major cause of EPS volatility would be the fluctuations in the sales volume and the _____leverage.
9. EPS volatility shows whether a company enjoys a _____or not.

8.8 SUMMARY

Capital structure is the composition of various sources of long-term finance in the total capitalization of the company. The two main sources are ownership and creditor ship securities. Both types of securities as well as the long-term loans from financial institutions are used most of the large industrial companies.

Capital structure planning, initially and on continuing basis, is of great importance to any company as it has a considerable bearing on its profitability. A wrong decision in this respect may prove quite costly for the company.

While taking a decision about capital structure, due attention should be paid to objectives like profitability, solvency and flexibility. The Choice of the amount of debt and other fixed securities on the hand and variable income securities namely equity on the other, is made after a comparison of the characteristics of each kind of securities and after careful consideration of internal and external factors related to the firm's operations. In real life situations compromises have to be made somewhere on the line between the expectations of companies seeking funds and the expectations of those supply them. These compromised do not change the basic distinctions between debts and equity. Generally, the decision about financing is not of choosing between equity and debt but is of selecting the ideal combination of the two. The decision on debt-equity mix is affected by considerations of suitability, risk, income, control and timing. The weight assigned to these factors will vary from company to company depending on the characteristics of the industry and the particular situation of the company. There cannot perhaps be a plays an important role in analyzing the conflicting forces before a decision on appropriate capital structure is reached.

8.9 Glossary

Capital structure : (also known as Financial Structure) is the mix of various types of long- term source of funds, namely debentures, bonds, loans from financial institutions, preference shares and equity shares (including retained earnings).

Cost of Capital: is the (weighted) average cost of various sources of finance used by a company.

Financial Leverage : (or trading on equity) is an aspect or financial planning which enable the company to enhance the return on equity shares by using debt with lower fixed cost which is less than the overall return on investment. Financial leverage magnifies the effect of changes in EBIT (earnings before interest and taxes) on EPS (earning per share).

8.10 Answers: Self Assessment:

1. financial 2. control 3. expected earnings 4. debt holders 5. shareholders 6. EBIT 7. Earnings Per Share (EPS) 8. operating 9. stable income

8.11 Terminal Questions:

1. What is capital structure? Explain the importance of capital structure and planning?
2. What are the features of an appropriate capital structure?
3. What are the determinants of capital structure? Explain briefly.
4. Do you think that different companies will view different factors affecting capital structure decision differently? Support your answer with suitable examples.
5. Make a comparative assessment of different types of securities from the point of view capital structuring. Under what conditions different types of securities would be considered more suitable.

8.12 Suggested Readings:

1. I.M. Pandey, Financial Management, Vikas Publishing New Delhi.
2. James C. Van Horne Financial Management and Policy Prentice Hall, New Delhi.
3. M.Y. Khan and P.K. Jain, Financial Management, Tata McGraw Hill, New Delhi.
4. Prasanna Chandra, Financial Management, Tata McGrew Hill, New Delhi.

LESSON-9

LEVERAGES

STRUCTURE

9.0 Learning Objectives:

After studying this lesson, you will be able to:

- define leverage,
- explain different types of leverage, and
- explain the concept of EBIT-EPS analysis

9.1 Introduction:

Every business firm tries to conduct its affairs in such a way as increases the amount of profit that reaches the bottom line or the line showing net profit after taxes. This is based on the premise that the financial strength i.e. ability to grow, remain solvent, remain liquid of a firm is dependent upon its profit earning capacity.

To meet this objective of increasing profit the financial manager has to select the most advantageous level of investment in fixed assets i.e. the investment made to create productive capacity and means of financing such investment among the alternative choices available.

The risk of the shareholders increases in case there are high total capital structures of the company, in any situation ,where the percentage of the shareholders funds is more than the fraction of the borrowed funds, the return as well as the risk of the shareholders will be much less.

Leverage helps us in lifting heavy material or object ,which may not be otherwise possible .however in area of finance, the term 'leverage 'refers to the ability of a firm in employing long term fund having a fixed cost, to enhance returns to the owners. In other words, 'leverage' is the employment of fixed costs or fixed rate of interest obligation irrespective of the level of activities attained or the level of operating profit earned. James Home has defined leverage as "the employment of an asset or sources of funds for which he firm has to pay a fixed cost or fixed return." The fixed cost (also called fixed operating cost) and fixed return (called financial cost) remains constant irrespective of the change in volume of output

or sales. Thus, the employment of an asset or source of funds for which the firm has to pay a fixed cost/return acts as the fulcrum and the leverage magnifies the influence .It must, however, be noted that higher is the degree of leverage, higher is the risk as well as return to the owners .it should also be remembered that leverage can have negative or reversible effect also. It may be favourable or unfavourable.

9.2 Types of leverage

There are three types of leverages:

(a) Operative leverage

(b) Financial leverage

(c) Combined or composite leverage

Operative leverage:

It refers to the use of fixed costs in the operation of the firm. A firm has a high degree of operating leverage if it employs a greater amount of fixed cost. The fixed cost is treated as fulcrum of leverage. The changes in sales are related to changes in revenue.

The operating leverage may be defined as the tendency of the operating profit to vary disproportionately with sales. The firm is said to have a high degree of operating leverage if it employs a great amount of fixed cost and a small amount of variable costs. Similarly, a firm will have allowed operating leverage when it employs a greater amount of variable costs and a smaller amount of fixed costs. For example, convenience stores are significantly less leveraged than high end car dealerships.

A firm employs assets with fixed cost in the hope that its operations will produce revenues more than sufficient to cover both fixed as well as variable costs. The production processes which are accompanied by high fixed costs are highly mechanized and automated process. In these processes the per unit production cost is lower as compared to labour intensive processes. With fixed costs the percentage change in profits accompanying a change in the sales is greater that the percentage change in sales.

"Soloman ezra" defmed operating leverage as; "The tendency of the operating profit to vary disproportionately with sales "operating leverage in a firm is a function of three factors:

(i) The amount of fixed costs

(ii) The contribution margin

(iii) The volume of sales

Computation of operating leverage

The formulae for calculating the operating leverage and financial leverage are:

$$\text{Operating leverage} = \frac{\text{Contribution}}{\text{EBIT}} \quad \text{or} \quad \frac{\text{Contribution}}{\text{Operating profit}}$$

Contribution = Sales - Variable Cost

Operating Profit = Sales - Variable Cost - Fixed cost

Degree of operating leverage:

The degree of operating leverage may be defined as the percentage change in profits resulting from a percentage change in sales. The same may be expressed in equation form:

$$\text{Degree of operating leverage} = \frac{\%\text{ change in profits}}{\%\text{ change in sales}}$$

A high DOL means exceptionally large net operating profits if sales are great and exceptionally large loses if sales are depressed and the firm has to operate below break even point. The degree of operating leverage has implications for a number of business and financial policy decisions.

The breakeven point can be calculated by dividing the fixed cost by percentage of contribution to sales or P/V ratio.

$$\text{Breakeven point} = \frac{\text{Fixed cost}}{\text{P/V ratio}}$$

$$\text{P/V ratio} = \frac{\text{contribution}}{\text{Sales}}$$

When production and sales move above the breakeven point, the firm enters highly profitable range of activities. At breakeven point the fixed costs are fully recovered any increase in sales of leverage and above breakeven point earns good amount of profits.

If a firm does not have fixed costs then there will be no operating leverage. The percentage change in sales will be equal to the percentage change in profit. When fixed costs are there, the percentage change in profits will be more than the percentage in sales volume.

Example: 1 following is the cost information of a firm.

Fixed cost = Rs. 50,000

Variable cost = 70% of sales

Sales = Rs 2, 00,000 in 2000 and Rs 250,000 in 2001

Find out the percentage change in sales and operating profits when :

Fixed costs are not there (no leverage)

Fixed costs are there (leveraged situation)

(i) Statements	2000	2001	Percentage change(Rs.)
Sales Less: variable cost(70% of sales)	2,00,000 1,40000	2,50,000 1,75,000	25% 25%
Profit from operations	60,000	75,000	25%

(ii)Statements	2000	2001	% change(Rs)
Sales	2,00,000	2,50,000	25%
Less: variable cost(70% of sales)	1,40000	1,75,000	25%
Contribution	60,000	75,000	25%
Fixed cost	50,000	50,000	25%
Profit from operations	10,000	25,000	150%

Example: 2 The installed capacity of a factory is 6000 units per annum. Actual capacity used is 4,000 units per annum. Selling price per unit is Rs. 10. Variable cost is Rs. 6 per unit. Calculate the operating leverage in each of the following three situations:

When fixed cost are Rs. 4000 per annum. When fixed cost are Rs. 10000 per annum. When fixed cost are Rs. 12000 per annum.

S.No	Item	Situation- I (Rs.)	Situation-2(Rs.)	Situation-3 (Rs.)
(i)	Sales (4000 units @Rs. 10 per unit)	40,000	40,000	40,000
(ii)	Less : variable cost	24000	24000	24000
(iii)	Contribution(i-ii)	16,000	16000	16000
(iv)	Fixed cost	4,000	10,000	12,000
(v)	Operating profit or	12,000	6,000	4,000

	EBIT(iii-iv)			
(vi)	Operating leverage=C / EBIT	16,000 / 12,000 / = 1.33	16,000 / 6,000 / = 2.67	16,000 / 4,000 / = 4.00

It can be observed that above analysis that with the increasing proportion of fixed costs in total costs the value of operating leverage increases. In first situation operating leverage is 1.33 and it has increased to 2.67 in second situations and 4.00 in third situations.

(b) Financial leverage or Trading on Equity:

Trading on equity is an arrangement under which the company raises funds by issuing securities which carry a fixed rate of interest or dividend, which is less than average earning of the company, to increase the return on equity shares.

Financial leverage is the degree to which a company uses fixed-income securities such as debt and preferred equity. The more debt financing a company uses, the higher its financial leverage. A high degree of financial leverage means high interest payments, which negatively affect the company's bottom-line earnings per share. It is also known as trading on equity.

The use of financial leverage increases the responsiveness of firm is financed entirely with share capital, a given percentage change in EBIT results in the same percentage change in EPS. However with the use of debt or preference share capital the percentage change in EPS is comparatively more than percentage change in EBIT.

Financial leverage is used to magnify the earnings of equity shareholders, this is based on the assumption that the firm is capable of earning more on the assets that are acquired by the use of funds on which a fixed rate of interest/dividend is paid. The companies that are highly leveraged may be at risk of bankruptcy, if they are unable to make payments on their debt : they may also be unable to find new lenders in the future. It is not always bad, however, it can increase the shareholder's return on their investment and often there are tax advantages associated with borrowing also called leverage.

Financial leverage:

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

EBT = Earnings before interest and taxes

EBIT = Earnings before interest

Degree of Financial Leverage:

The formula for calculating a company's degree of financial leverage (DFL) measures the percentage change in earnings per share over the percentage change in EBIT. DFL is the measure of the sensitivity of EPS to changes in EBIT as a result of changes in debt.

Formula:

$$DFL = \frac{\text{\% change in EPS}}{\text{\% change in EBIT}} \quad \text{or} \quad \frac{\text{EBIT}}{\text{EBIT-Interest}}$$

Example: 3 A company has the following capital structure:

1, 00,000 equity shares of Rs 10 each Rs 10, 00,000

20,000 10% preference shares of Rs 100 each Rs 20, 00,000

20,000 10% debentures of Rs. 100 each

20, 00,000 Calculate EPS for each of the following levels of EBIT:

Rs 10,00,000 (ii) 6,00,000 (iii) 14,00,000

The rate of income tax for the company is 50%.

In the above case, also calculate the financial leverage taking EBIT Rs 10, 00,000 as base.

Items	(i)	(ii)	(iii)
EBIT less : interest on debentures	10,00,000 2,00,000	6,00,000 2,00,000	14,00,000 2,00,000
EBT Less : income tax(50%)	8,00,000 4,00,000	4,00,000 2,00,000	12,00,000 6,00,000
EAT	4,00,000	2,00,000	6,00,000
Less: preference dividend	2,00,000	2,00,000	2,00,000
Earnings available to equity shareholders(EAS) Earnings per share= EAS EPS	2,00,000 2,00,000 1,00,000 =2 per share	Nil	4,00,000 4,00,000 1,00,000 =4 per share

In above situation (ii) from situation (i) EBIT has declined by 40% from Rs 10,00,000 to Rs 6,00,000 whereas EPS has declined 100% (from Rs 2 to Rs 4)

In situation (iii) in comparison to situation (i) the EBIT increased by 40% (from Rs 10,00,000 to Rs 14,00,000) and EPS increased 100%(from Rs 2 to Rs 4)

Calculation of degree of financial leverage

Degree of financial leverage can be computed as under:

$$\text{Degree of financial leverage} = \frac{\%\text{ change in EPS.}}{\%\text{ change in EBIT}}$$

Thus from situation (i) and (ii) the financial leverage = $\frac{-100}{-40} = 2.5$

From situation (i) and (iii) the financial leverage = $\frac{100}{40} = 2.5$

The leverage will be considered to be favourable if the firm earns more on assets purchased with the funds than the fixed costs of their use. Unfavourable or negative leverage occurs when the firm does not earn as much as the funds cost.

Two ratios i.e. debt equity and debt-assets ratios both computed from balance sheet data are commonly used to describe the presence of financial leverage. The two ratios are interrelated:

$$\text{Debt equity ratio (D/E)} = \frac{\text{Debt}}{\text{Equity}}$$

$$\text{Debt assets ratio (D/A)} = \frac{\text{Debt}}{\text{Assets}}$$

(c) Combined leverage:

If a firm uses a considerable amount of both operating and financial leverage, even small changes in the level of sales will produce wide fluctuations in PBT. The effect of the superimposition of financial leverage on operating leverage is obtained by multiplying the two leverages. The product is called the combined leverage factor or the leverage multiplier.

Combined leverage factor = Operating leverage x Financial leverage

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

$$= \frac{\text{Contribution}}{\text{EBT}}$$

Composite leverage their expresses the relationship between revenue on account of sales (i.e. contribution or sales less variable cost) and the taxable income. It helps in finding out the resulting percentage change in taxable income on account of percentage change in sales/

Combined leverage is the measure of total leverage due to the presence of both operating and financial fixed costs. The degree of combined leverage (DCL) establishes a relationship between percentage change in earnings per share (EPS) and percentage change in sales.

$$\text{Degree of combined leverage (DCL)} = \frac{\text{percentage change in EPS}}{\text{percentage change in sales}}$$

There is a functional relationship between degree of operating leverage, degree of financial leverage and degree of combined leverage. The degree of combined leverage is the product of degree of operating leverage and degree of financial leverage.

DCL = DOL * DFL

DCL= Degree of combined leverage

DOL= Degree of operating leverage

DFL= Degree of financial leverage

9.3 EBIT-EPS Analysis:

While deciding on the appropriate capital structure for an organization, the first thing is to understand the effect on earnings per share (EPS) due to the changes in earnings before interest and taxes (EDIT) under different financing alternatives.

For example, the relationship between EBIT and EPS is as follows:

$$EPS = \frac{(EBIT-t)(l-t)}{n}$$

Where,

EBIT = Earnings before interest & taxes

EPS = Earnings per share

I = Interest

t = tax rate

n = number of equity shares

One widely used approach to select an appropriate financing plan is to analyze the relationship between EBIT and E.P.S. Essentially this method involves the comparison of alternative methods of financing under various assumptions of EBIT. At one level of EBIT one plan may be advantageous while at another level of EBIT a different plan may look attractive. Thus, a plan is selected having regard to expected level of EBIT in future.

To decide which one out of two financing plan is advantageous, the indifference point/level of EBIT is that level of EBIT is determined. Indifference point/level of EBIT is that level of EBIT at which EPS s same for two alternative financial plans. It can be defined as the level of EBIT beyond which the financial leverage start according in terms of increase in EPS.

In other words, if the expected EBIT is more than the indifference level of EBIT, the use of fixed charge sources of funds (debt and preference capital) is advantageous from the point of view of EPS. On the other hand, if expected EBIT is lower than the indifference level of EBIT, the use of equity capital is preferred.

Self Assessment:

Fill in the blanks:

1. Operating leverage results from the existence of the fixed operating expenses in the firm's _____stream.
2. _____is used by the firm to determine the level of operations necessary to cost all operating costs.
3. Changes in _____.costs affect operating leverage.
4. High operating leverage is good when _____are rising and bad when they are falling.
5. The firms operating break-even point are the level of sale necessary to give all _____costs.
6. The financial leverage is favourable when the firm earns more on the investments/assets financed by the sources having _____charges.
7. As the _____component in capital structure increases, the financial leverage increased.
8. A high financial leverage means high fixed financial cost and high financial_____.
9. Combined leverage is equals to _____leverage multiplied by financial leverage.
10. A high operating leverage and a high financial leverage combination is_____.

9.4 Summary:

Financial leverage is related to the financing activities of a firm. It results from the presence of fixed financial charges (such as interest on debt and dividend on preference shares). Since such financial expenses do not vary with the operating profits, financial leverage is concerned with the effect of changes in EBIT on the earnings available to equity shareholders. It is defined as the ability of a firm to use fixed financial charges to magnify the effect of changes in EBIT on the earnings per share (EPS). The operating leverage (DOL) is favourable when increase in sales volume has a positive magnifying effect on EBIT. Therefore, high DOL is good when sales revenues are rising and bad when they are falling.

To devise an appropriate capital structure, the amount of EBIT under various financing plans should be related to EPS. The EBIT -EPS analysis is a widely used method of examining the effect of financial leverage/use of debt. A financial alternative that ensures the largest EPS is preferred, given the level of EBIT.

9.5 Glossary

1. **Debt:** It is that which is owed; usually referencing assets owed.

2. **Degree of Operating Leverage**: It is the change in the percentage of operating income (EBIT) for the change in percentage of sales revenue.
3. **Financial Leverage:** It is the payment of fixed rate of interest for the use for the fixed interest bearing securities, to magnify the rate of return as equity shares.
4. **Leverage:** It allows accomplishing certain things that are otherwise not possible.
5. **Operating Leverage:**It results from the present fixed operating expenses within firm's income stream.
6. **Operating Risk**: It is the risk of the firm not being able to cover its fixed operating costs.
7. **Return on Assets**: This percentage shows how profitable a company's assets are in generating revenue.
8. **Operating Income**: It is a measure of a firm's profitability that excludes interest and income tax expenses.

9.6 Answers: Self Assessment:

1. Income
2. Break-even analysis
3. fixed operating
4. Revenues
5. Operating
6. Fixed
7. Debt
8. Risks
9. Operating
10. Very risky

9.7 Terminal Questions:

- What is mean by the term leverage?
- What is financial leverage and operating leverage?
- What is an indifference point' in EBIT-EPS analysis? How would you compute it?
- With what type of risk is leverage generally associated?
- What do you mean by EBIT-EPS analysis ?

9.8 Suggested Readings:

I.M. Pandey, "Financial Management", Vikas Publishing House Pvt. Ltd., Ninth Edition.

Maheshwari,S.N and Maheshwari S.K, Elements of Corporate laws, Himalaya publishing house Pvt. Ltd, Mumbai.

M Y Khan, Financial Management, Fifth Edition ,New Delhi.

Sashi K Gupta, R.K.Sharma, Financial Management, kalyani Publishers, New Delhi.

N.K.Sahni,Meenu Gupta, Financial Management, Kalyani Publishers, New Delhi

LESSON-10

DIVIDEND

STRUCTURE

10.0 Learning Objectives:

After studying this lesson, you will be able to:

- understand the determinants of dividend,
- know about the various models of dividend,
- explore different types of dividend policy, and
- explain the corporate dividend practices in India.

10.1 Introduction:

The dividend is not defined in the act. According to institute of chartered accountants of India, the term dividend means a distribution to shareholders out of profits or reserves available for this purpose .it is that part of the profit of the company which is distributed amongst its shareholders. It differs from interest in the sense that it not arises out of contractual obligations. It is that part of the company which is distributed amongst its shareholders. It differs from interest in the sense that it does not arises out of contractual obligations. It also differs from the definition of dividend as given by the income tax act. Dividend, rightly speaking, implies two things payment out of profits and actual release of some assets, issue of bonus shares or right shares to the existing members is not considered as dividend because the former does not involve release of any assets and the latter has no relation with the profits of the company. Articles of association regulate the dividend is to be paid. Dividend once approved and declared by the shareholders becomes a debt due upon the company. Companies are bound to provide for proposed dividends in their profit and loss account and show the same under the head 'current liabilities and provisions' in the balance sheet.

Dividend refers to that portion of a firm's net earnings which are paid out to the shareholders. Our focus here is on dividends paid to the ordinary shareholders because holders of preference shares are entitled to a stipulated rate of dividend .moreover, the discussion is relevant to widely held public limited companies as the dividend issue does not pose a major problem for closely held private limited companies. Since dividends are distributed out of the profits, the alternative to the payment of dividends is the retention of earnings/profits. The retained earnings constitute an easily accessible important source of financing the investment requirements of firms. There is, thus, a type of inverse relationship between retained earnings and cash dividends: uses of the net earnings-dividends and retained earnings-are competitive and conflicting.

10.2 Types of dividend policy

(i)Conservative dividend policy:

In this policy managers plough back profit in the business and distribute very low dividend amongst members this policy is known as conservative or hard dividend policy agree payout ratio is known as conservative or hard dividend policy; Here payout ratio is kept either very low or zero.

(ii)Liberal dividend policy

This is opposite to the conservative dividend policy .this is a liberal policy because most of the profits are distributed amongst shareholders and a very small part is kept in the company as retained earnings. The application of this policy results either in shortage of funds for expansion and development or speculation in the share prices. It is very essential that this policy should e such which can keep interest of shareholders and company protected.

(iii) Stable dividend policy

Stable dividend policy is a long term policy which is not affected by the changes in earnings from year to year. Stable dividend policy may be divided into three categories.

(a) Stable dividend policy : Under this policy management of the company keeps dividend rate stable or fixed. Some companies follow a policy of paying fixed dividend per share irrespective of the level of earnings year after year. Such firms, usually, create a reserve for dividend equalization to enable them pays the fixed dividend even in the year when the earnings are not sufficient or when there are losses.

(b) Stable payout ratio: under this policy company management does not fix a stable payout ratio is fixed. In this policy dividend per share and retained earnings will change from year to year with the change in earnings of the company but the dividend payout ratio remain stable.

(c) Regular plus extra dividend: This is another way of stable dividend policy in which company pays a regular dividend as a moderate fixed rate but during periods of prosperity some extra dividend is paid to the shareholders.

(3) *Irregular dividend Policy:* Some companies follow irregular dividend payments on account of the following:-uncertainty of earnings, unsuccessful business operations, lack of liquid resources, fear of adverse effects of regular dividends on the financial standing of the company.

(4) *No dividend policy:* A company may follow a policy of paying no dividends presently because of its unfavourable working capital position or on account of requirement s of funds for future expansion and growth.

10.3 Determinants of dividend policy

1. Magnitude and trend of earnings : The amount and trend of earning is an important aspect of dividend policy. It is rather the starting point of the dividend policy. As dividend can be paid only out of present or past year's profits, earnings of a company fix the upper limits on dividends. The dividend should, generally, be paid out of current year's earnings only, as the retained earnings of the previous years become more or less a part of permanent investment in the business to earn current profits.
2. *Liquidity of funds:* Availability of cash and sound financial position is also an important factor in dividend decision. A dividend represents a cash outflow, the greater the funds and the liquidity of the firm, the better the ability to pay dividend. The liquidity of a firm depends very much on the investment and financial decisions of the firm which in turn determines the rate of expansion and the manner of financing.
3. *Trade cycles:* Business cycles also exercise influence upon dividend policy. During boom, prudent management creates good reserves for contingencies. Higher rates of dividend can be used as a tool for marketing the securities in an otherwise depressed market.
4. *Taxation policy:* High taxation reduces the earnings of the companies and consequently the rare of dividend is lowered down. Sometimes government levies dividend tax on distribution of dividend beyond a certain limit .it also affects the rate of capital formation.
5. *Regularity and stability in dividend payment:* Dividends should be paid regularly because search investor is interested in the regular payment of dividend. The management should, in spite of regular payment of dividend, consider that the rare of dividend should be all the most constant.
6. *Control objectives:* when a company pays high dividends out of its earnings, it may result in dilution of both control and earnings for the existing shareholders. As in case of a high dividend payout ratio, the retained earnings are insignificant and the company will have to issue new shares to raise funds to finance its future requirements.

10.4 Dividend Models: (Dividend decision and valuation of firms)

The value of the firm can be maximized if the shareholders wealth is maximized. There is a conflicting view regarding the impact of dividend decision on the valuation of the firm. According to one school of thought, dividend decision materially affects the shareholders wealth and also the valuation of firm.

A. The irrelevance concept of dividend or the theory of irrelevance

B. The relevance concept of dividend or the theory of relevance

A. The irrelevance concept of dividend or the theory of irrelevance: Residual Approach

According to this theory, dividend decision has no effect on the wealth of the shareholders or the prices of the shares and hence it is irrelevant so far as the valuation of the firm is concerned. This theory regards dividend decision merely as a part of financing decision because the earnings available may be retained in the business for reinvestment. But if the funds are not required in the business they may be distributed as dividends. Thus it is a residual decision to pay dividends or retain the earnings.

Modigliani and Miller Approach (MM Model)

Modigliani and Miller, two professors in the 1950s, studied capital-structure theory intensely. From their analysis, they developed the capital-structure irrelevance proposition. Essentially, they hypothesized that in perfect markets, it does not matter what capital structure a company uses to finance its operations. They theorized that the market value of a firm is determined by its earning power and by the risk of its underlying assets, and that its value is independent of the way it chooses to finance its investments or distribute dividends. The basic M&M proposition is based on the following key assumptions:

- No taxes
- No transaction costs
- No bankruptcy costs
- Equivalence in borrowing costs for both companies and investors
- Symmetry of market information, meaning companies and investors have the same information
- No effect of debt on a company's earnings before interest and taxes

Of course, in the real world, there are taxes, transaction costs, and bankruptcy costs, differences in borrowing costs, information asymmetries and effects of debt on earnings. To understand how the M&M proposition works after factoring in corporate taxes, however, we must first understand the basics of M&M propositions I and II without taxes. Modigliani and Miller's Capital-Structure Irrelevance Proposition:- The M&M capital-structure irrelevance proposition assumes no taxes and no bankruptcy costs. In this simplified view, the weighted average cost of capital (WACC) should remain constant with changes in the company's capital structure. For example, no matter how the firm borrows, there will be no tax benefit from interest payments and thus no changes or benefits to the WACC. Additionally, since there are no changes or benefits from increases in debt, the capital structure does not influence a company's stock price, and the capital structure is therefore irrelevant to a company's stock price. However, as we have stated, taxes and bankruptcy costs do significantly affect a company's stock price. In additional papers, Modigliani and Miller included both the effect of taxes and bankruptcy costs.

B. The relevance concept of dividend or the theory of relevance:

The other school of thought on dividend decision holds that the dividend decisions considerably affect the value of the firm. According to this concept dividends communicate information to the investors about the firm's profitability and hence dividend decision becomes relevant .Those firms which pay higher dividends will have greater value as compared to those which do not pay dividends or have lower dividend payout ratio. The two models explained below.

(i) Walter's Model

(ii) Gordon's Model

(i) Walter's Model: According to Walter's Approach, dividend policy of the company plays and active role in influencing share price and value of the firm. Both dividend policy and investment policy are inseparable management decision. In determining the value of the firm internal rate of return (r) and the cost of capital (k) is very significant. if the r > k the firm should retain the earnings. Such firm are termed

as growth firms and the optimum pay-out would be zero in their case. This would maximize the value of shares. The firm should distribute more of its earnings if r < k so that the shareholders can make higher earnings by investing elsewhere. For such firm, the optimum pay out would be 100% and the firms should distribute the entire earnings as dividends. In case of normal firms where r=k ,the dividend policy will not affect the market value of shares as the shareholders will get the same return from the firm as expected by them . For such firms, there is no optimum dividend payout and the value of the firm would not change with the change in dividend rate.

Assumptions of Walter's Model:

- Retained earnings constitute exclusive source of finance. The firm does not resort to equity or debt financing.
- The firm's internal rate of return (r) and cost of capital (k) are constant.
- The firm retains its entire earnings for reinvestment immediately or distributes its entire earnings among shareholders.
- There is no change in values of earnings per share (E) and the dividend per share (D).
- The firm has perpetual life.

Walter's formula for determining the value of a share:-

$$P = \frac{D + r(E-D)/K_e}{K_e}$$

P = Market price per share

D = Dividend per share

r = Internal rate of return

E = Earnings per share

K_e = cost of equity capital

Example: 1 the par value of ordinary shares of X Y Z limited is Rs 100 per share. The company's earnings per share (E) is Rs 15. The productivity of retained earnings in the market (Ra) is

20 percent while the rate of capitalization in the market (Rs) 15 percent. The following are the alternatives before the management regarding the distribution of dividend.

To have a payout ratio of 60 %.

To have a payout ratio of 40%.

To have a payout ratio of 20% and

To have a payout ratio of 0%

In the above circumstances which alternative you consider the best?

$$Ve = \frac{D + r(E-D)}{Ke} = \frac{9 + .20(15-9)}{.15} 7.15 = \text{Rs } 113.33$$

$$Ve = \frac{D + r(E-D)}{Ke} = \frac{6 + .20Q\ 5-6)}{.15} 7.15 = \text{Rs } 120.00$$

$$Ve = \frac{D+r(E-D)/Ke}{Ke} = \frac{3+.20(15-3)7.15}{.15} = Rs\ 126.67$$

$$Ve = \frac{D-r(E-D)/Ke}{Ke} = \frac{0+.20(15-0)7.15}{.15} = Rs\ 113.33$$

Conclusion: alternative (iii) is the best because it maximizes the value of equity shares. It is Rs. 126.67 highest in all four alternatives; therefore, the company should follow a payout ratio of 20%

(ii) Gordon's Model-

Myron j. Gordon's has developed a model for determination of a firm's dividend policy. Dividend policy is relevant for affecting valuation of the firm. The Gordon model is based on the following assumptions:

- The firm is an all equity firm.
- No external financing is available or used. Retained earnings represent the only source of financing investment programmes.
- The rate of return on the firm's investment r is constant.
- The retention ratio b, once decided upon is constant. Thus, the growth rate of the firm g=br , is also constant
- The cost of capital for the firm remains constant and it is greater than the growth rate i.e K > br.
- The firm has perpetual life.
- Corporate taxes do not exist.

10.5 Dividend practices in India

Legal rules governing payment of dividends:

The following are the rules regarding declaration and payment of dividends:

1. Board of directors determines and recommends to the shareholders the portion of net profits to be utilized for the purposes of distribution and also the rate of dividend to be declared. Dividend always declared on account of one financial year of the working of the company.
2. Regulations 85 of table A provides: "The Company in general meeting may declare dividends but no dividend shall exceed, the amount recommended by the board".
3. Dividends are to be paid only in cash. Payment of dividends in the shape of scrip’s is not allowed. However, a company, if so authorized by the articles of association, may decide to pay dividends in the shape of bonus shares or paying up any unpaid amount on the shares already issued. In such a case, company shall have to satisfy all the legal conditions required for increasing of the capital by issuing more shares
4. Dividend shall be paid only to those persons whose names appear in the register of members on the dare when dividend is declared or to the holders of share warrants. If issued by the company.

5. Every company shall pay dividend on the nominal amount of the shares. Paid up value of the shares shall not be taken into account .But articles of association may provide for the payment of dividends in proportion to the amounts paid upon each share. Calls paid in advance shall not rank for dividend (sec.93)
6. All dividends must be paid within 30 days of their declaration (sec 207). if dividends are not so paid, every director of the company, who is knowingly a party to the default, shall be liable to simple imprisonment which may extend to three years besides a fine of Rs. 1,000 for every day the default continues. The company shall also be liable to pay simple interest at 18% per annum during the period such default continues.
7. However, no offence shall be deemed to have been committed in respect of above, in each of the following cases:
   (i) when dividend could not be paid due to the operation of any law.
   (ii) When dividend could not be paid in order to comply with the directions of the shareholders
   (iii) When any dispute regarding the right to receive dividend is pending:
   (iv) When non payment of dividend is not due to the default of the company: and
   (v) When the company has lawfully adjusted the amount of dividend against any sum due by the company from the shareholder.
8. After a dividend has been declared, it becomes a debt due on the company and the shareholder who is entitled to it, can enforce its payments through court within three years of its declaration.
9. Dividend is usually declared at the annual general meeting (expect the interim dividend). But a company may declare dividend at the general meeting other than the annual general meeting unless articles otherwise provide table A declaration.
10. The company cannot declare a further dividend after declaration of dividend at the annual general meeting. Dividend once declared cannot also be revoked expect with the consent of shareholders.

Bonus shares:-

If the articles of association permit, a company may capitalize its surplus profits instead of paying them off as cash dividends. The shares allotted by capitalization of reserves or surplus profit are known as bonus shares. Such a source is adopted by the company in those areas where it wants to distribute large reserves accumulated out of profits unrepresented by liquid assets.

Bonus shares can be issued only when the following conditions are satisfied: The articles of association (AOA) permit the issue of bonus shares. Company has sufficient undistributed profits.

The proposal of the board regarding issue of bonus shares has been approved by the members in the general meeting.

The bonus issue is to be as per the guidelines issued by the securities and exchange board of India. (SEBI).

The company shall file, within 30 days of the allotment of the bonus shares, a return stating the number and nominal amount of bonus shares issued together with the name and address of the allotters and a copy of the resolution authorizing issue of such shares.(sec 75)

A stock dividend is a distribution of additional shares of stock to existing shareholders on a pro-rata basis i.e. so much stock for each share of stock held. Thus, a 10% stock dividend would give a holder of ICQ shares, as additional 10 shares, whereas a 250% stock dividend would give him 250 additional shares. A stock dividend has no immediate effect upon assets.

It results in a transfer of an amount from the accumulated earnings or surplus account to the share capital account. In other words, the reserves are capitalized and their ownership is formally transferred to the shareholders.

The equity of the shareholders in the corporation increases. Stock dividends do not alter the cash position of the company. They serve to commit the retained earnings to the business as a part of its fixed capitalization.

Reasons for declaring a stock dividend /Bonus Shares:

Two principal reasons which usually actuate the directors to declare a stock dividend are:

(1) They consider it advisable to reduce the market value of the stock and thereby facilitate a broader distribution of ownership.

(2) The corporation may have earnings but may find it inadvisable to pay cash dividends. The declaration of a stock dividend will give the stock holders evidence of the increase in their investment without interfering with the company's cash position. If the stock holders prefer cash to additional stock in the company, they can sell the stock received as dividend.

Sometimes, a stock dividend is declared to protect the interests of old stock holders when a company is about to sell a new issue of stock (so that new shareholders should not share the accumulated surplus).

Limitations of stock dividends/bonus shares:

The bonus shares entail an increase in the capitalization of the corporation and this can only be justified by a proportionate increase in the earning capacity of the corporation. Young companies with uncertain earnings or companies with fluctuating income are likely to take great risk by distribution stock dividends.

Every stock dividend carries an implied promise that future cash dividends will be maintained at a steady level because of the permanent capitalization of reserves. Unless the corporate management has reasonable grounds of entertaining this hope, the wisdom of large stock dividend is always subject to grave suspicion.

The existence of legal sanction for distributing the accumulated earnings or reserves does not warrant the issue of stock dividends from the point of view of sound financial practice. There should be other conditioning factors also for the issue of stock dividend.

(a) Bonus shares bring about a capitalization of undistributed profits in the companies where the profits originate and this lead to a linear development of corporate enterprise and greater concentration of economic power.

(b) By issuing stock dividends the corporations deprive the capital market of 'secondary' funds which would otherwise have flowed into more widely dispersed investments.

(c) Bonus shares enable companies to appropriate to their own use undistributed profits which, otherwise, would have led either to an increase in the share of labour or a reduction in prices for the consumer.

Self Assessment:

Fill in the blanks:

1. _____is the amount of profit remaining after tax and distribution to stockholders that is retained in a business.
2. _____mean net earnings available to equity shareholders from where a firm actually declares dividends.
3. The regular dividend policy is based on the concept of a _____dividend in each period.
4. A _____ratio implies that the percentage of earnings paid out each year is fixed.
5. When a firm pays regular dividend it is considered as a sign of continued _____ operations.
6. Walter's Model supports the doctrine that dividends are _____.
7. Gordon Model assumes that future dividends are the sole determinant of the _____value of the common shares.
8. The _____shares allows the firms to declare a dividend without using up cash that may be needed for operations or expansion.
9. The amount of dividend that can be legally distributed is governed by the _____law.
10. With _____approach, the firm recognizes that the payment of dividends has a strong influence on the market price of the common shares.

10.6 Summary:

The D/P ratio indicates the percentage share of the net earnings distributed to the shareholders as dividends. Given the objective of wealth maximization, the D/P ratio should be such as can maximize the wealth of its owners in the "long run". In practice, investors, in general have a clear cut preference for dividends because of uncertainty and imperfect capital markets. Therefore, a low D/P ratio should may cause a decline in share prices, while a high ratio may lead to a rise in the market price of the shares. A part from cash dividend, a firm can also reward its investors by paying bonus shares. The bonus shares/share splits do not have any economic impact on the firm in that its assets, earnings and investors proportionate ownership remain unchanged. As a result, the number of shares outstanding increases. The increased number of shares outstanding tends to brings the market shares within more popular range and promote more active trading in shares. Moreover, bonus /split announcements have

informational content to the investors. It will also enable the conversion of corporate cash and further enable a firm to raise additional funds particularly through the issue of convertible securities.

10.7 Glossary:

1. **Dividends:** It refers to that portion of company's net earnings that is paid out to the equity shareholders.
2. **Dividend Policy:** It decides the portion of earnings to be paid as dividends to ordinary shareholders and what portion is ploughed back in the firm for investment purpose.
3. **Payout Ratio:** The ratio of dividend to earnings is known as payout ratio.
4. **Profit:** It is the excess of the revenue over the expenses on conducting the operations.
5. **Stability:** It refers to the consistency or lack of variability in the stream of dividend payments

10.8 Answers: Self Assessment:

1. Surplus
2. Earnings
3. Fixed rupee
4. Stable dividend payout
5. Normal
6. Relevant.
7. Intrinsic
8. Bonus
9. Company
10. Maximization of wealth

10.9 Terminal Questions:

- What are the factors that determine the dividend policy of a company?
- What is stable dividend policy?
- What do you mean by bonus share?
- Explain any one dividend model with example?

10.10 Suggested Readings:

Maheshwari, S.N and Maheshwari S.K, Elements of Corporate laws, Himalaya publishing house Pvt. Ltd, Mumbai.

M Y Khan, Financial Management, Fifth Edition, New Delhi.

Sashi K Gupta, R.K. Sharma, Financial Management, Kalyani Publishers, New Delhi.

LESSON-11

WORKING CAPITAL MANAGEMENT

Structure:-

11.0 Learning Objectives

After Studying the lesson you should be able to:-

1. Understand the concept of working capital
2. Discuss the objectives of working capital Management
3. Discuss the Objectives of working capital
4. Assess working capital requirements.

11.1 Introduction:

So far we have learned about capital budgeting decisions which relate to the creation and management of fixed assets. Managing fixed assets and current assets is similar when it comes to devotion of efficient manpower and estimating the risk- return trade off.

However, they differ in many ways. Unlike fixed assets, current assets can be managed in a shorter span of time. Managing current assets directly affects the liquidity of the firm. Unlike fixed assets, current assets can be easily adjusted to the demand and supply variations of the product and in accordance with the variance in estimated sales.

11.2 Working Capital Management:

Management of the current assets held by a firm is known as working capital management. It involves the administration, control, procurement and financing of current assets. Current assets include cash marketable securities, short-terms investments, accounts receivable inventory, and so on and financing of current assets include current liabilities and bank borrowing. Thus working capital management deals with funds involved in the day-to-day operations of the firm. Hence, management of working capital becomes increasingly important in order to protect the firm from liquidity problems.

11.3 The Objectives of Working Capital Management

The objectives of working capital management by all the firms are to provide enough liquidity so that production process continues smoothly during the normal course of the business. Further, the focus is to maintain an optimum level of current assets so that funds of the firm do not remain unnecessarily idle. The finance manager aims at efficiently managing the current assets and liabilities to meet the firm's working capital requirement.

The basic objective of working capital management for a given firm is to provide itself adequate liquidity so that the firm is able to carry on its normal operations smoothly. Every firm, thus, has to decide for itself the optimum level of ''working capital'' which is to be maintained by it.

11.4 Concepts of Working Capital

There are two concepts of working capital- gross and net.

- Gross Working Capital: refers to the-firm's investment in current assets. Current assets are the assets which can be converted into cash within an accounting year and include cash, short-term securities, debtors, accounts receivable or book debts) bill receivable and stock (inventory)

- Net working capital: refers to the difference between current assets and current liabilities. Current abilities are those claims of outsiders which are expected to mature for payment within an accounting year and include creditors (account payable), bills payable, and outstanding expenses. Net working capital can be positive or negative. A positive net working capital will arise when current assets exceed current liabilities. A negative net working capital occurs when current liabilities are in excess of current assets.

The two concepts of working capital—gross and net—are not excl8usive rather, they have equal significance from the management viewpoint.

The gross working capital concepts forces attention-on two aspects of currents assets management

(1) How to optimize investment in current assets?

(2) How to should current assets be financed?

Net working capital is a qualitative concept. It indicates the liquidity positions of the firm and suggests the extent to which working capital needs may be financed by permanent sources of funds. Current assets should be sufficiently in excess of current liabilities to constitute a margin or buffer for maturing obligations within the ordinary operating cycle of a business. It is a conventional rule to

maintain the level of current assets twice the level of current liabilities. However, the quality of current assets should be considered in determining the level of current assets vis-à-vis current liabilities.

Net working capital concepts also cover the question of judicious mix of long-term and short-term funds for financing current assets. For every firm, there is a minimum amount of net working capital which is permanent. Therefore, a portion of the working capital should be financed with the permanent sources of funds such as equity share capital, debentures, long-term debt, preference share capital or retained earnings. Management must, therefore, decide the extent to which current assets should be financed with equity capital and/or borrowed capital.

It may be emphasized that both gross and net concepts of working capital are equally important for the efficient management of working capital.

11.5 Operating Cycle:

Working capital is also called a circulating capital or revolving capital. That is the money/capital which circulates in various forms of current assets in a continued manner. For example, at a point of time, funds may be tied up in raw materials and then later converted into semi-finished products, then into finished/ final products and when these finished products are sold, it is converted either into account receivables or cash.

This cash is reinvested in current assets. Thus, the amount always keeps on circulating or revolving from cash to current assets and back again to cash. That is why some people prefer to use the term liquidity management instead of working capital management. Although this circulation takes place at short intervals the money is required and again.

The American institute of certified public Accountants defined the operating cycle as: “the average time intervening between the acquisition of material or services entering the process and the final cash realization”

According to I.M Pandey. “Operating cycle is the time duration involved in the acquisition of resources. Conversion of raw materials into work in process into finished goods. Conversion of finished goods into sales and collection of sales.”

Thus, operating cycle of a manufacturing enterprise involves three phases:

1. Acquisition of resources such as raw material labor power and fuel etc.
2. Manufacture of the product which includes conversion of raw material into work-in-progress into finished goods.
3. Sale of the product either for cash or on credit. Credit sales create account receivable for collection.

The operating cycle or circulation flow of money can best be projected in the following manner:

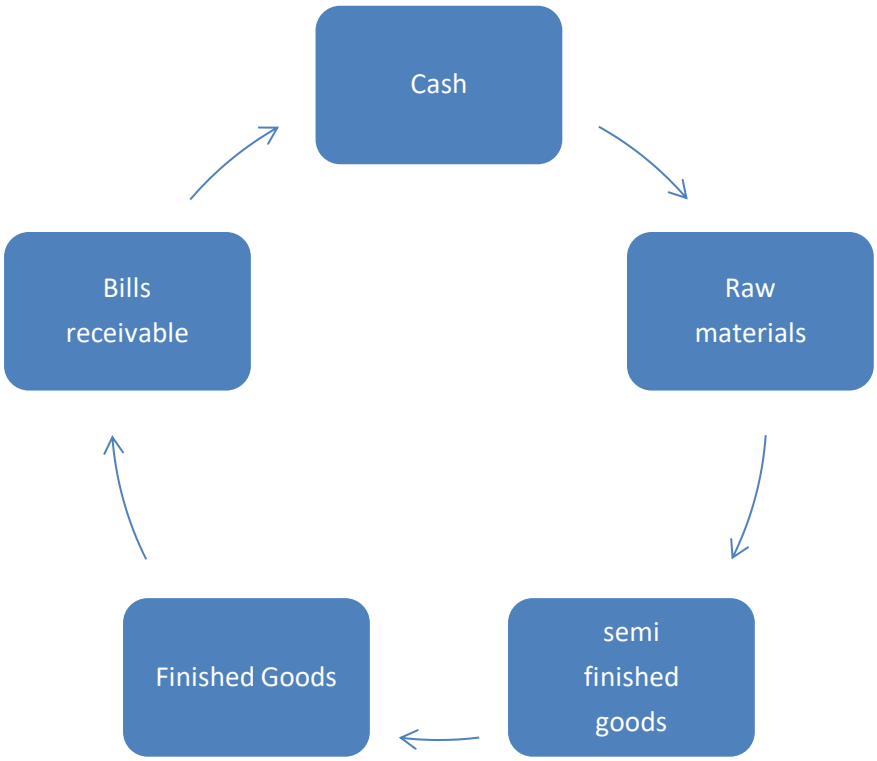


Figure-: Working Capital Operating Cycle

Capital/finance is regarded as life-blood of any enterprise. Therefore, the significant of working capital in and enterprise lies in the fact that its circulation has to be properly regulated in the business. Because, and over-circulation or under-circulation may create problems just as improper blood circulation called high or low blood pressure, in the human body may create problems.

It is also noteworthy that the total working capitals composed of two parts are known as (i) regular or fixed and (ii) variable. The amount which is needed, of course, at short intervals to invest again and again in current assets is called Regular or Fixed Working Capital.

In fact, this investment is irreducible minimum and remains permanently sunk in the enterprise. The other part of the working capital may vary due to the fluctuations (i.e. rise or fall) in the volume of business. Hence, it is called as the 'Variable Working Capital.'

Minimum level of current assets which is continuously required by a firm to carry on its business operations. Permanent or fixed, working capital is the minimum level of current assets. It is permanent in the same way as the firm's fixed assets. Depending upon the changes in production and sales, the need for working capital, over and above permanent working capital, will fluctuate. For example, extra inventory of finished goods will have to be maintained to support the peak periods of sale and investment in debtors (receivable) may also increase during such periods. On the other hand, investment in raw material, work-in-progress and finished goods will fall if the market is slack.

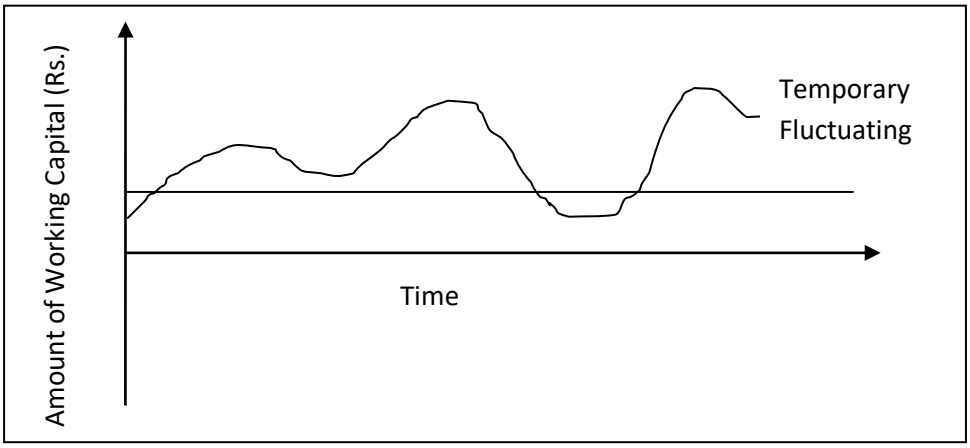
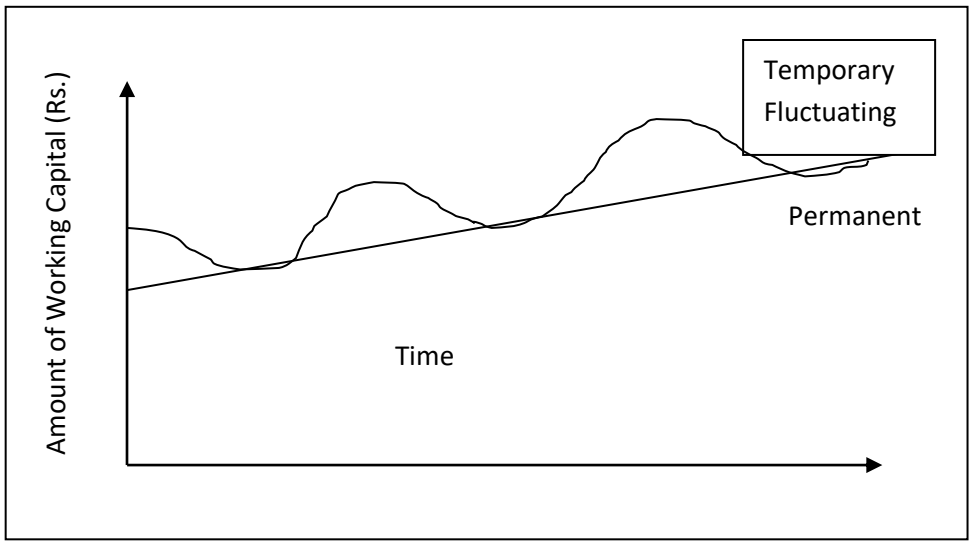


Figure1. Permanent and temporary working capital.

Fluctuating or variable working capital is the extra working capital needed to support the changing production and sales activities of the firm. Both kinds of working capital, permanent and fluctuation (temporary) – are necessary to facilitate production and sale through the operating cycle. But the firm to meet liquidity requirements that will, last only temporarily creates the temporary working capital.

Figure.1 illustrates differences between, permanent and temporary working capital. It is shown that permanent working capital is stable over time, while temporary working capital is fluctuating-sometimes increasing and sometime decreasing. However, the permanent working capital line need not be horizontal if the firm's requirement for permanent capital is increasing (or decreasing) over a period. For a growing firm, the difference between permanent and temporary working capital can be depicted through figure 2.



Balanced Working Capital Position

The firm should maintain a sound working capital position. It should have adequate working capital to run its business operations. Both excessive as well inadequate working capital positions are dangerous from the firm's point of view. Excessive working capital means holding costs and idle funds

which earn no profits for the firm. Paucity of working capital not only impairs the firm's profitability but also results in production interruption and inefficiencies and sales disruption.

The dangers of excessive working capital are as follows:

- It results in unnecessary accumulation of inventories. Thus chances of inventory mishandling, waste, theft and losses increase.
- It is an indication of defective credit policy and slack collection period. Consequently, higher incidence of bad debts results, which adversely affects profits.
- Excessive working capital makes management co placement which degenerates into managerial inefficiency.
- Tendencies of accumulating inventories tend to make speculative profits grow. This may tend to make dividend policy liberal and difficult to cope with in future when the firm is unable to make speculative profits.

Inadequate working capital is also bad and has the following dangers:

- It stagnates growth. It becomes difficult for the firm to undertake profitable projects for non-availability of working capital funds.
- it becomes difficult to implement operating plans and achieve the firm's profit target.
- Operating inefficiencies creep in when it becomes difficult even to meet day-to-day commitments.
- Fixed assets are not efficiently utilized for the lack of working capital funds. Thus, the firm profitability would deteriorate.
- Paucity of working capital funds render the firm unable to avail attractive credit opportunities etc.
- The firm loses its reputation when it is not in a position to honour its short-term obligations. As a result, the firm faces tight credit terms.

An enlightened management should, therefore, maintain the right amount of working capital on a continuous basis. Only then a proper functioning of business operations will be ensured. Sound financial and statistical techniques, supported by judgment, should be used to predict the quantum of working capital needed at different time periods.

A firm's net working capital position is not only important as an index of liquidity but if is also used as a measure of the firm's risk. Risk in this regard means chances of the firm being unable to meet its obligations on the due date. The lender considers a positive net working as a measure of safety. All other things being equal, the ,more the net working capital a firm has, the less likely that it will default in meeting its current financial obligations. Lenders such as commercial banks insist that the firm should maintain a minimum net working capital position.

11.6 Factors affecting working capital

The following factors determine the amount of working capital:

- Nature of Business
- Nature of Raw Material

- Process Technology used
- Nature of finished goods
- Degree of Competition in the market
- Inflation
- Business Cycles
- Paying habits of customers
- Profit planning and control
- Synchronization among cash inflows and cash outflows
- Easy availability of working capital
- Firm's policy

1. **Nature of Business:** Capital goods manufacturing and trading companies require high proportion of current assets in the form of inventory and working capital.
2. **Nature of Raw material used:** The nature of raw material used influences quantum of raw material inventory. When the company requires raw material that is seasonal in nature, then huge investment has to be made in the inventory.
3. **Process Technology used:** Technologies developments related to the production process have a sharp impact on the need for working capital.
4. **Nature of finished goods:** In case where finished goods have a small life, the inventory of finished goods is quite low; for example cigarettes. For seasonal industries, the finished goods inventory is high.
5. **Degree of competition in the market:** More competition means more credit sales. More credit sales imply more receivables and more demand of product. Thus, higher demand leads to higher inventory of finished goods and receivables.
6. **Inflation:** As a result of inflation, size of the working capital is increased in order to make it easier for a firm to achieve a better cash inflow.
7. **Business cycle:** Business expands during period of prosperity and declines during the period of depression. More working capital is required during periods of prosperity and less during the period of depression. Thus business cycle affects the working capital need of the firm.
8. **Paying habits of customers:** more receivables imply that the customers are in the habit of paying rate. In such case, the company has more receivables than from sales. Where customers are confident of paying rate, they buy more and, hence, more inventories arise.
9. **Profit Planning and control:** The level of working capital is decided by the management in accordance with its policy of profit planning and control.
10. **Synchronization among cash inflows and cash outflows:** with more synchronization between cash inflows and cash outflows, the firm has to keep less cash and bank balance as the money takes care of itself whereas in case of high level lf mismatch in cash inflows and

cash outflows of the firm, the firm has to keep more and more cash balance and bank balance to meet its demand.

11. **Easy availability of working capital:** when working capital is easily available to the firm, investments in current assets is not a problem for the firm. This enables the firm to invest a good amount in current assets for smooth running of the business.
12. **Firm's policy:** The amount of current assets also depends on the management policy of the firm if the management follows an aggressive policy of working capital, the firm has low current assets while when the firm follows conservative policy, it maintains high proportion of current assets.

11.7 Issues in Wording capital Management

Working capital management refers to the administration of all components of working capital-cash, marketable securities, debtors (receivable) and stock (inventories) and creditors (payables). The financial manager must determine levels and composition of current assets. He must see that right sources are tapped to finance current assets, and that current liabilities are paid in time.

There are many aspects of working capital management which make it an important function of the financial manager.

- *Time*: working capital management requires much of the financial manager's time.
- *Investment*: Working capital represents a large portion of the total investment in assets.
- *Critically*: Working capital management has great significant for all firms but it is very critical for small firms.
- *Growth*: The need for working capital is directly related to the firm's growth.

11.8 Assessment of Working Capital Requirement:

The most appropriate method of calculating the working capital lf a firm is the concept of operating cycle. However, a number of other methods-may be used to determine working capital needs in practice:

- **Current assets holding period:** To estimate working capital requirements on the basis of average holding period of current assets and relating them to costs based on the company's experience in the previous years. This method is essentially based on the operating cycle concept.
- **Ratio of sales:** To estimate working capital requirement as a ratio of sales on the assumption that current assets change with sales.
- **Ratio of fixed investment:** To estimate working capital requirement as a percentage of fixed investment. To illustrate the above methods of estimating working capital requirements and their impact on rate of return we shall take example of two hypothetical firms (as given in Table.1)

Table 1 Data for Two firms

	Firm A Rs.	***Firm B Rs.***
Material cost:		
Raw material consumed	248.000	248.000
Less: By- product	68.800	68.800
Net material cost	179,200	179,200
Manufacturing cost		
Labour	171.200	171.200
Maintained	160.000	160.000
Power and fuel	57.600	57.600
Factory overheads	240.000	240.000
Depreciation	160.000	320.000
Total manufacturing cost	788.800	948.800
Total product cost	968.000	1,128,000
Annual sales	1,448,000	1,448,000
PBIT	480.000	320.000
Investment	1,600.000	3,200.000
Period	1 year	1 year
Plant life	10 year	10 year
PBDIT	640.000	640.000
'ROI (PBIT/ (Investment – depreciation))	33.3%	11.1%

The calculation is based on the following assumptions regarding each of the three methods:

Method 1: inventory: one month's supply of each of raw material, semi-finished goods and finished material. Debtors: one month's sales. Operating cash: one month's total cost.

Method 2: 25-35% of annual sales.

Method 3: 10-20% of fixed capital investment.

The following calculations based on data of firm A are made to show how three methods work. You may complete calculations for firm B.

Method 1: Current assts holding period.

Let us first computer inventory requirements as shown below:

Raw material: one month's supply**:**

Rs.248,000 ÷12=Rs. 20,667

***Semi finished material*:** one month's supply (based on raw material plus assume one-half of normal conversion cost):

Rs20, 667+{(Rs.171,200)+Rs 1,60,000+Rs 57,600)} 1/2÷12 = Rs. 20,667+16200=Rs.36,867

***Finished material*:** one month's supply:

Rs. 968,000 ÷ 12 = Rs 80,666

The total inventory needs are: Rs 20,667 + Rs 36,867 + Rs 80,666 = Rs 138,200

After determining the inventory requirement projection for debtors and operating cash should be made.

***Debtors*:** one month's sales

Rs. 1,448,000 ÷ 12 = Rs.120,667

***Operating cash*:** One month's total cost:

Rs. 968,000 ÷ 12 = Rs. 80.667

Thus the total working capital required is:

Rs 138,200 + Rs 120,667 + 80, 6666 = Rs 339,533

Method 2: Ratio of sales

The average ratio is 30 percent of annual sales Rs. 1,448,000 is Rs 434,400

Method 3: Ratio of Fixed Investment

The ratio of current assets of fixed investment ranges between 10 to 20 percent. We shall use the average rate of15 percentages. The 15 percent of fixed investment Rs. 1, 6000,000 is Rs. 240,000

The first method gives details of the working capital items. This approach is subject to error that markets are seasonal. As per the first method the working capital requirement is Rs. 339,533. If from A method the working capital requirement is Rs. 339,533. If this figure is considered, in calculating the rate of return, it is lowered from 33.3 percent to 28.6 percent. On the other hand, the return of firm be drops from 11.1 percent to 9.9 percent, the estimated working capital for firm B as per the first method is Rs. 366,200. Rates of return are calculated as follow:

$$\text{Rate of Return} = \frac{PBIT}{\text{Net fixed investment} + \text{working capital}}$$

$$\text{Firm A} = \frac{480{,}000}{\{(1{,}600{,}000 - 160{,}000) + 339{,}553)\}} = 27\%$$

$$\text{Firm B} = \frac{320.000}{\{(3{,}200{,}000 - 320{,}000) = 366{,}200\}} = 9.9\%$$

You may notice that investment have been taken net of depreciation.

The second method has a limited reliability. Its accuracy is dependent upon the accuracy of sales estimates. The rate of return of Firm A drops to 25.6 percent and that of Firm B to 9.7 percent when the working capital computed by this method incorporated.

Third method relates working capital to investment. If estimate of investment is inaccurate, this method cannot be relied upon. This method is not generally, used in practice to estimate working

capital needs. The rates of return from firms A and B are respectively 28.6 percent and 9.5 percent when the working capital computed by this method is considered.

A number of factors will govern the choice of methods of estimating working capital. Factors such as seasonal variations in operation, accuracy of sales forecasts, investment cost and variability in sales price would generally be considered. The production cycle and credit and collection policy of the firm would have an impact on working capital requirements. Therefore they should be given due weight age in projecting working capital requirements.

11.9 Policies for Financing Current Assets:

A firm can adopt different financing policies vis-à-vis current assets. Three types of financing may be distinguished.

- Long-term financing- The sources of long-term financing include ordinary share capital, preference share capital debentures, long-term borrowing from financial institutions
- Short-term financing – The short-term financing is obtained for a period less than one/year. It is arranged in advance from banks and other suppliers of short-term finance in the money market. Short-term finances include working capital funds from banks, public deposits, commercial paper, factoring of receivable etc.
- Spontaneous financing- Spontaneous financing refers to the automatic sources of short-term funds arising in the normal course of a business. Trade (suppliers) credit and outstanding expenses are examples of spontaneous financing. A firm is expected to utilize these sources of finance to the fullest extent. The real choice of financing current assets, once the spontaneous sources, of financing have been fully utilized, is between the long-term and short-term sources of finances.

What should be the mix of short and long-term financing the approach following by a company may be referred to as:

- Matching approach
- Conservative approach
- Aggressive approach

Matching Approach

The firm can adopt a financial plan which matches the expected life of assets with the expected life of the source of funds raised to finance assets. Thus a ten-year loan may be raised to finance a plant with an expected life of ten years; stock of goods to be sold in thirty days may be financed with a thirty day commercial paper or a band loan. The justification for the exact matching is that, since the purpose of financing is to pay for assets, the source of financing and the asset should be relinquished simultaneously. Using long-term financing for short-term assets is expensive as funds will not be utilized for the full period. Similarly, financing long term assets with short term financing is costly as well s inconvenient as arrangement for the new short-term financing will have to be made on a continuing basis.

When the firm following matching approach (also known as hedging approach), long-term financing will be used to finance fixed assets and permanent current assets and short-term financing temporary or variable current assets. However, it should be realized that exact matching is not possible because of the uncertainty about the expected lives of assets.

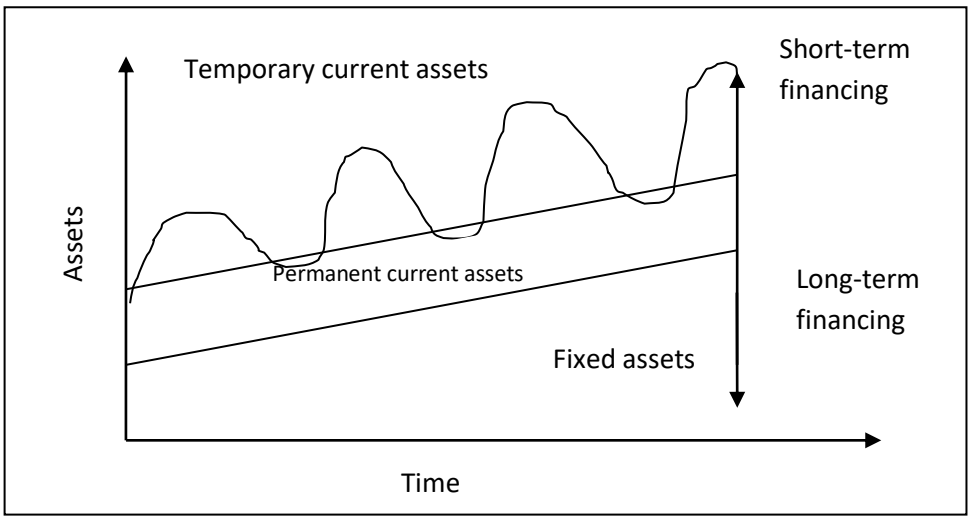


Figure 3. Financing under matching plan

Conservative Approach

A firm in practice may adopt a conservative approach in financing its current and fixed assets. The financing policy of the firm is said to be conservative when it depends more on long-term funds for financing needs under a conservative plan, the firm finances its permanent assets and also as part of temporary current assets with long-term financing. In the periods when the firm has no need for temporary current assets, the idle long-term funds can be invested in the tradable securities to conserve liquidity. The conservative plan relies heavily on long-term financing and, therefore, there firm has less risk of facing the problem of shortage of funds. The conservative financing policy is shown in figure 4. Note that when the firm has no temporary current assets [e.g., at (a) and (b)]; the long-term funds released can be invested in marketable securities to build up the liquidity position of the firm.

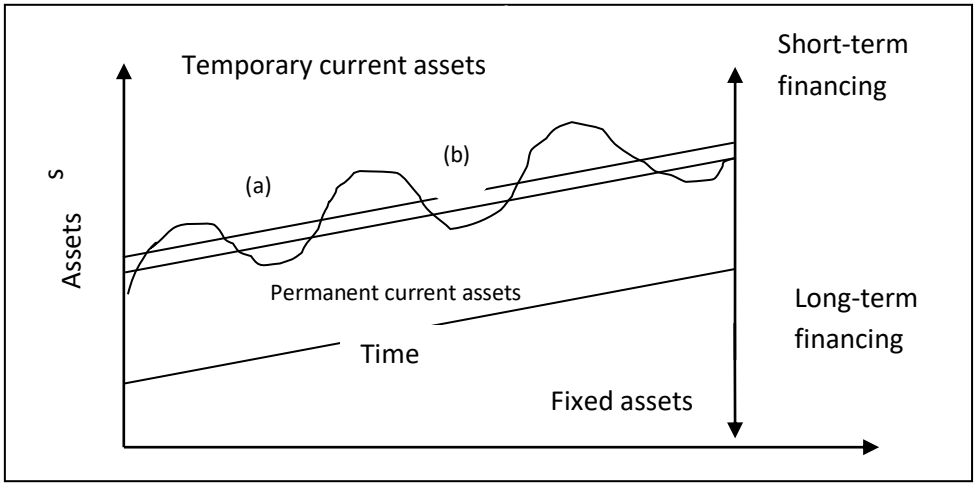
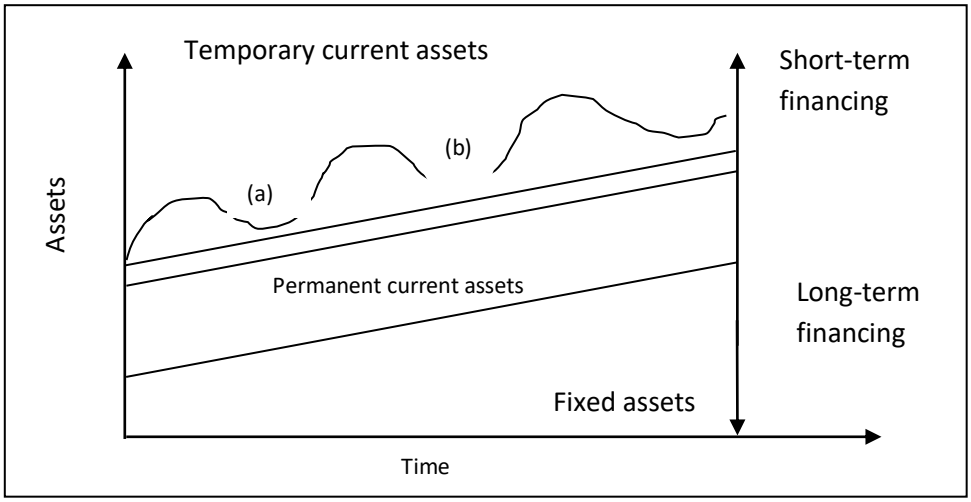


Figure 4: Conservative financing

Aggressive Approach

A firm may be aggressive in financing its assets. An aggressive policy is said to be followed by the firm when it uses more short-term financing than warranted by the matching plan. Under an aggressive policy, the firm finances a part of its permanent current assets with short-term financing. Some extremely aggressive firm may even finance a part of their fixed assets with short-term financing. The relatively more use of short-term financing makes the firm more risky. The aggressive financing is illustrated in Figure 5.



Short-Term vs. Long-term financing:

A Risk-Return Trade-off

A firm should decide whether or not it should use short-term financing. If short-term financing has to be used, the firm must determine its portion in total financing. This decision of the firm will be guided b the risk return trade off. Short-term financing may be preferred over long-term financing for two reasons: (i) the cost advantage and (ii) flexibility. But short-term financing is more risky than long-term financing.

Self Assessment:

Fill in the blanks:

1. If the firm has inadequate working capital, it is said to be_____.
2. _____implies that the company has too large funds for its requirements, resulting in a low rate of return a situation.
3. The greater the amount of working capital particularly cash and marketable securities the lower the risk of _____problems.
4. A firm with readily available credit from banks will be able to plan for _____working capital.
5. The various constituents of current assets and current liabilities have a direct bearing on the computation of working capital and the_____.

6. _____the operating cycle period, lower will be the requirement of working capital.
7. A _____current asset policy tends to reduce risk.
8. The _____component depends on how conservative or aggressive is the current asset policy of the firm.
9. _____.represents credit granted by suppliers of goods.
10. _____is an arrangement under which a customer is allowed to draw advance up to a certain limit against credit granted by bank.

11.10 Summary

Profitability of firms depends on how well their working capital is managed. When working capital is affected elative to sales without a corresponding change in production, the profitability of the firm is seriously influenced. Management of working capital is critical for every firm. There are two basic concepts of working capital. Net working capital and temporary working capital. The amount of working capital required b the firm depends on size, activities of the firm, availability of credit, attitude towards profits and risk.

11.11 Glossary:

1. **Gross Working Capital:** The total current assets are termed as the gross working capital.
2. **Net Working Capital:** The excess of current assets over current liabilities represents net working capital.
3. **Permanent Working Capital:** It is the minimum investment kept in the form of inventory of raw materials, work in progress, finished goods, stores and spares, and book debts to facilitate uninterrupted operation in a firm.
4. **Temporary Working Capital:** Any additional working capital apart from permanent working capital required to support the changing production and sales activities is referred to as temporary working capital.
5. **Working Capital:** It refers to short-term funds to meet operating expenses.

11.12 Answers: Self Assessment:

1. Under-capitalized
2. Over-capitalization
3. Liquidity
4. Less
5. Operating cycle
6. Shorter
7. Conservative
8. Safety
9. Trade credit

10. Cash credit

11.13 Terminal Questions:

1. State the concept of working capital.
2. Discuss different types of working capital.
3. What are the different factors determining working capital?

11.14 Suggested Readings:

I.M.Pandey, Financial management, Vikas Publishing Pvt,Ltd. New Delhi.

M.Y.Khan & P.K.Jain , Financial Management, Tata McGraw Hill Publishing Co.

Ltd,New Delhi Sheeba Kapil, Financial Management, pearson, New Delhi.

P.V Kulkarni & B.G. Satyaprasad, Financial Management, Himalaya Publishing House, Mumbai.

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LESSON -12

MANAGEMENT OF CASH, RECEIVABLES AND INVENTORY

Structure

12.0 Learning Objectives

After studying the lesson, you should be able to:

1. Understand the concept of cash management
2. Discuss the different motives for holding cash.
3. Understand the functions of cash management.
4. Understand the concept of credit sales and receivables arising from it.
5. Understand the concept of inventory management.

12.1 Introduction:

In the previous lesson, we study the management of current assets of the firm. We discussed how efficiently the firm's current assets should be managed. In this lesson we will discuss the management of cash, receivables and inventory.

Cash is the lifeblood of every business. Efficient cash management helps the company to remain healthy and strong.

A large number of companies are practicing credit sales. Hence, accounts receivable is among the largest and most liquid assets of the total assets the companies hold. Efficiently managed accounts receivable enhances the firm's cash inflow and thus creates large cash support to firm's cash requirements.

Inventories are assets held by the firm for management various productions for sales to realize revenue for the firm. The objective of inventory management is to minimize the total cost associated with holding inventories.

12.2 Management of Cash

Cash management is one of the key areas of working capital management. Apart from the fact that it is the most liquid current asset, cash is the common denominator to which all current assets can be reduced because the other major liquid assets; i.e. receivable and inventory get eventually converted into cash. This underlines the significance of cash management.

Motives for Holding Cash

The term, cash with, reference to cash management is used in two senses. In a narrow sense it is used broadly to cover currency and generally accepted equivalents of cash such as cheques, drafts and demand deposits in banks. The broader view of cash also includes near-cash assets, such as marketable securities and time deposits in banks. The main characteristics of these are that they can be readily sold and converted into cash. They serve as a reserve pool of liquidity that provides cash quickly when needed. They also provide a short-term investment outlet of excess cash and are also useful for meeting planned outflow of funds. We employ the term cash management in the broader sense. Irrespective of the form in which it is held, a distinguishing feature of cash,, as an asset, is that it has no earning power. If cash does not earn any return, why is it held by firms? There are four primary motives for maintaining, cash balance (i) Transaction motive; (ii) precautionary motive; (iii) Speculative motive and (iv)Compensating motive.

Goals or Cash Management

Precisely speaking, the primary goal of cash management in a firm is to trade-off between liquidity and profitability in order to maximize long-term profit. This is possible only when the firm aims at optimizing the use of funds in the working capital pool. This overall objective can be translated into the following operational goals:

(i) To satisfy day-to-day business requirements;
(ii) To provide for scheduled payments;
(iii) To face unexpected cash drains;
(iv) To seize potential opportunities long-term investments;
(v) To meet requirements of bank relationship;
(vi) To build image of credit worthiness;
(vii) To earn on cash balance;
(viii) To build reservoir for net cash inflows till the availability of better uses of funds by conscious planning;
(ix) To minimize the operating costs of cash management.

Function of Cash management

So as to achieve the stated objectives, a finance manager has to ensure that investment in cash is efficiently utilized, for that matter, he has to manage cash collections and disbursements efficiently, determine the appropriate working cash balance and invest surplus cash management function calls for cash planning evaluation of benefits and costs of policies, procedures and practices and synchronization of cash inflows and outflows. It is significant to note that cash management ‘functions

as depicted below are intimately interrelated and intertwined. Linkage among different cash management functions have led to the adoption of the following methods for efficient cash management:

(1) Use of techniques of cash mobilization to reduce operating requirements of cash;
(2) Major efforts to increase the precision and reliability of cash-forecasting;
(3) Maximum efforts to define and quantity the liquidity reserve needs of the firm;
(4) Development of explicit alternative sources of liquidity;
(5) Aggressive search for relatively more productive uses for surplus money assets.

The above approaches involve the following actions which a finance manager has to perform:

(1) To forecast cash, inflows and- outflows;
(2) To plan cash requirement
(3) To determine the safety level for cash
(4) To monitor safety level of cash
(5) To locate the needed funds;
(6) To regulate cash inflows.
(7) To regulate cash-outflows;
(8) To determine criteria for investment of excess cash;
(9) To avail banking facilities and management a finance manager has to first of all plan cash need of the firm.

This is followed by management of cash flows. Determination of optimum level of cash and finally, investment surplus cash.

Determining Optimum Level of Cash Balance

A prudent finance manager desires to maintain only that much amount of cash balance as is just sufficient to satisfy transaction requirements as well as to meet precautionary and speculative motives.

This task is so important that carrying of excess cash balance entails loss of interest earnings to the firm and thus causes low profitability and maintaining a small, cash balance renders the firm's liquidity position weak, although a higher profitability is ensured. Thus, determination of suitable level of cash holding involves risk return trade-off, determination "of appropriate level of cash balance is not only necessary to optimize cash utilization but also to decide the level of investment in marketable securities. It is worth stressing that the optimal level cash should be larger of (i) the transactions balances required when cash management is efficient and(ii) the compensatory-balance requirements of commercial banks with which the firm has deposit accounts]

A number of cash management models, have been developed to decide the optimal level of cash balance. We shall examine here two of the more widely used models. These models are based on such major considerations as the demand for cash, the interest rate on marketable securities and the cost of transfers between marketable securities and cash.

Inventory Model

The economic-order quantity (EQQ) formula, basically used in inventory decision, has now come to be popularly employed to determine the optimal level of cash holding for the firm. William Baumol was the first man who applied the inventory model to the problem of cash management.

According to the EOQ model, optimum level of cash should be determined by balancing the carrying cost of holding cash, (the interest foregone on marketable securities) against the fixed cost of transferring marketable securities to cash or vice-versa so as to minimize total costs. The level of cash at which the sum of inventory carrying costs and the fixed costs associated with transferring marketable securities is minimum, will be the optimum cash balance of the firm. The following formula is used to determine the optimum level:

$$Q = \sqrt{\frac{2CB}{K}}$$

Where

Q = stands for optimum size of cash inventory.

C = Stands for average fixed cost of securing cash from market.

B = Stands for the total amount of transaction demand for cash over the period of time involved.

K = Stands for the cash of carrying the inventory of cash. I.e. interest rate on marketable securities for the period.

This model assumes that an individual of a firm has to pay out cash in a steady transaction stream over a period of time. This model makes the following assumptions:

- The firm is able to forecast its cash needs with certainly.
- The firm's cash payment occurs uniformly over a period of time.
- The opportunity cost of holding cash is known and it does not change over time.
- The firm will incur the same transaction cost whenever it converts securities to cash.

Stochastic Model:

The model is based on the basis assumption that cash balances change randomly over a period of time both in size and direction and form normal distribution as the number of periods observed increases. The model prescribes two control limits-upper limit and lower limit. When cash balance reaches the upper limit a transfer of cash to investment account should be made and when cash balances reach the lower point, a portion of securities constituting investment account of the firm should be liquidated to return the cash balances to its return point.

The upper and lower limits of control are set after taking into account fixed cost associated with converting securities into cash and the vice versa, and the cost of carrying stock of cash.

Miller and Orr have provided the simplest model to determine the optimal behavior in a stochastic situation the model is essentially a control-limit model designed to determine the time and size o transfers between an investment account and cash account.

The miller and Orr model when cash balances of the firm reach the upper limit, cash equal to h-z should be invested –in marketable securities (i.e. investment account) so that new cash balance touches Z point. If the cash balances touch 0 points, the finance manager should immediately liquidate that much portion of the investment portfolio which could return the cash balance to Z Point.

It may be interesting to note that cash balances are allowed to wander in h-z balance and no control is called for so long as the cash balance stay there. The model sets Z as the target cash balance level.

Z and h, therefore, become levels determined to maximum profits. The optimal value of Z is determined by the following formula:

$$Z = \sqrt{\frac{3b\sigma^2}{4K}}$$

Where

b = fixed cost associated with a security transaction.

σ^2 = variance of daily net cash flows.

K = interest rate per day on marketable securities.

The optimal value of 'h' is simply times of z.

Self Assessment

Fill in the blanks:

1. Cash held in order to take advantage of profitable opportunities comes under the motive of ……needs.
2. The exact nature of a cash management system would depend upon the …….. of an enterprise.
3. ……...is the plan of receipts and payments of cash during the budget period.
4. To estimate the requirements of cash, …… statements and cash budgets are required to be prepared.
5. The ……..costs refer to the cost of holding cash.

12.3 Management of Receivables:

Problem of management of receivable arises only when merchandise is sold on credits. If a company makes all sales for cash, it would have no accounts receivables and therefore, the question of management of such assets does not arise at all. Although concessions like price discount are granted induce customers to make immediate cash payment, practice of extending credit to the customers is very popular. If other concerns engaged in the same line of business activity are selling goods on liberal credit terms, the firm will have to pursue liberal lending policy to maintain and increase volume of sales. Since trade credit device is used to stimulate sales. There is a greater possibility of business profits to expand. But is should be remembered that flow of funds from cash back to cash does not cycle as rapidly in credit sales as if credit were not offered. The funds tied in inventory are converted into receivables rather than in cash and it will take some time for collection of the receivables.

1. Dimensions of Receivables, Management

The following aspects must receive attention of a finance manager desirous of improving efficiency of receivables management:

(1) Formulation of credit policies;

(2) Execution of credit policies ; and

(3) Formulation of collection policy and its execution

(1) Formulation or Credit policies:

This aspect of receivables management is concerned, with deciding about

(i) The quality of the trade accounts to be accepted i.e. Credit standards.

(ii) The length of the credit period,

(iii) Cash discount

(iv) Discount period

(v) Seasonal dating

We shall now discuss the above facets of credit policies and strive to find ways and means of reducing the volume of receivables without impeding the firm's sales potential.

(a) Quality or Trade accounts to be accepted:

A firm's credit terms influence, in the main, its volume of sales. By liberalizing credit policy, the firm can stimulate sales and so also its gross earning. But the increased sales may be accompanied by added costs. One such cost is the enlarged credit department and clerical expenses involved in investigating additional accounts and servicing added volume of receivables. The most important cost which a firm incurs in relaxing credit terms is increased bad debt losses resulting from extension of credit facilities to less credit-worthy customers. Finally, owing to acceptance of more marginal accounts there is a grater possibility that less credit-worthy customers will delay payment longer than stronger customers and it this is so, the firm will have to incur higher costs for capital tied in receivable. Thus, the expected increase in gross profits is likely to be offset by the costs associated with the more liberal credit policy, leaving the firm's earning position unchanged. If on the other hand, the firm decides to provide credit facilities to stronger customers the firm will save many costs, such as bad debt losses; and additional investigation and collection costs but it will be deprived of profits resulting from lost sales. Thus, the major problem facing the finance manager in managing receivables in a firm is to decide as to what extent credit terms of the firm should be liberalizes.

(b) Length or the credit period

Credit terms specify the length of the credit period and size of the cash discount offered for quick payment. There is no legal restriction on a firm to set terms of sale. The firm can fashion its own terms and use them as a dynamic instrument in its bid to stimulate sales. But the freedom to determine the terms of credit is constrained by the customs of an industry. Each trade has its customary terms of credit which frequently dictate the nature of the credit terms to be offered by a firm. The competitive

pressures also compel a firm to have uniformity in respect of cash discount and period of credit extension. New firms are forced to offer as liberal terms of credit as are being already given.

(c) Cash Discount:

Cash discount is a powerful device to speed up collections of receivables. This would result in reduction of investment in receivables. But offering cash discount involves cost. The finance manager should match the earnings resulting from investment of funds released by reducing the level of receivables with the cost of the discount to decide whether or not cash discount should be offered.

(d) **Discount Period**:

Period of discount also influences average collection period of receivables. Thus, by lengthening discount period many customers who were not taking advantage lf cash discount may be tempted to avail of these benefits. This would, therefore, shorten the collection period. However, there may be some customers who were availing of discount facility and making payment within discount period, will bow postpone the payment until the expiry of lengthened discount period. Consequently, the firm's average collection period would increase. Which of these forces will actually exercise influence on collection period of receivables would depend essentially upon the admixture of paying habits of the firm's customers. In any case decision to extend discount period involves, matching of the effect on collection period with the increased cost associated with more customers taking the discount.

(e) Seasonal Dating:

By means of seasonal dating firms particularly those dealing in seasonal product can boost sales. In season dating customers are sold goods without being required to pay until sometimes to come/seasonal dating is usually tailored to the cash flow of the customer. Decision of offer seasonal dating facility involves balancing to the profitability of additional sales with the cost of carrying additional receivable.

II. Execution of Credit Policies

Once credit policies have been formulated, the finance manager should execute these policies properly. Execution of credit policies call for evaluation of credit applicants and financing of investment in receivables.

(a) Evaluation of Credit applicants

Mere determination of appropriate credit policy for the firm will not help accomplish the overall objective of minimizing investment in receivables and reducing bad debt losses unless creditworthiness of applicants is evaluated to ensure that they conform to the credit standards prescribed by the firm. Credit evaluation process involves three steps, namely, gathering credit information about the credit applicants, determining the credit worthiness of the applicants on the basis of information so collected and finally taking decision to grant credit facilities.

III. Formulation or collection policy and its execution

Proper management of receivable calls for designing of suitable collection policy of the firm and laying down collection procedures. Basic objective while formulating Collection policy is to ensure the earliest possible payment on receivable- without any customer losses through will prompt collection of accounts tends to reduce investment required to carry receivables and the costs associated with it.

Percentage of bad debts is very likely to decrease. A firm with a long due accounts will be exposed to greater amount of risk of non-payment. It is also possible that customers who have not cleared the payment long due may be hesitant to place order on the firm for further supplies causing loss of some sale to the firm.

The most important variable of, credit policy is the amount extended on collection of accounts. Other things being the same, greater the amount spent on collection efforts, the lower the percentage of bad debt losses and the-shorter is the average collection period and the vice-versa. Usually it is observed that initial expenditures on collection may have a little effect on bad debt losses. However, bad debt losses 'may significantly decrease as a result of additional collection expenditures. After reaching certain point further expenditures on collection work may not prove as effective as earlier in reducing bad debt losses.

In designing policy for the firm-the finance manager faces-problem of 'determining appropriate - amount of collection expenditure to minimize -bad debt losses and to shorter collection period. By matching the level of collection expenditures with the opportunity saving on reduced, investment in receivables and bad debt losses, and the finance manager should strive for the determination of an appropriate level of collection expenditure.

Self Assessment:

Fill in the blanks:

6. …….are administrative costs incurred in collecting the receivables from the customers to whom credit sales are made.
7. While determining the optimum level of receivables, the costs and benefits to be compared are ……..costs and benefits.
8. Efficient and timely collection of debtors ensures that …….losses are reduced to the minimum and the average collection period is shorter.
9. Credit terms have three components which are……; Cash discount and Cash discount period.
10. If the demand for the products is elastic, reduction in prices will result in ……....sales volume.

12.4 Inventory Management

The term inventory refers to the stock to the product a firm is offering for sale and the components that make up the product. In other words, inventory is composed of assets that will be sold in future in the normal course of business operations. The assets which firms store as inventory in anticipation of need are (1) raw materials, (2) work-in process (Semi finished goods) and (3) Finished goods.

Inventory, as a current asset, differs from other current assets because only financial managers are not involved. Rather, all the functional areas, i.e. finance, marketing, production, and purchasing are involved.

The views concerning the appropriate level of inventory would differ among the different functional areas.

The job-of the financial manager is to reconcile the conflicting viewpoints of the various functional areas regarding the appropriate inventory levels in order to fulfill the overall objective of maximizing the owner's wealth. Thus, inventory management, like the management of other current assets, should be related to the overall objective of the firm.

For accomplishment of the goal of efficient management of inventories, the finance manager must aim at resolving the above conflicts. This he can do by matching benefits and costs of carrying inventories and determining the optimum level of inventory determining when the order, deciding acceptability of stock out probabilities and levels and determining degree of inventory control.

(1) BENEFITS AND COSTS OF CARRING INVENTORIES

Piling of sufficiently large quantities of stock of raw material, work-in progress and finished goods is considered desirable to provide flexibility I business operations of a firm. If a firm is assured of regular supply of raw material at a rate 'identical with the rate of production, there would be no need to hold inventory of materials at all. In real world, supply of material is uncertain and source of supply of some materials may be seasonal. Procuring material is also time-consuming process. Thus to ensure uninterrupted production and to avoid catastrophe of breakdown of whole operation, the firm must carry an inventory of raw materials. Furthermore, purchase materials in huge quantity will be economical, resulting in substantial savings in the cost of goods sold. A firm with sufficient stock of materials in hand is also relieved of the dangers of breakdowns in the productions process. This further minimizes cost of production.

There would also have been no need for a hold finished goods inventory if the firm could sell its finished goods at the same rate at which production was taking place. Since the production runs cannot be synchronized with vagaries of customer's demand, the firm must stockpile sufficiently large quantities of finished goods so as to avoid risks of losing customers who cannot wait for delivery and hence the opportunity cost of not being able to till and order on a timely basis. Furthermore, firm with big stock of finished goods in hand can take advantage of sudden pickup in demand of the firm's product which would otherwise be lost. Inventories of finished goods are also needed when production schedule must be geared to the supply of materials. Above all, long production runs have been found economical since they reduce the number of times the set-up costs must be incurred. Cost of depreciation is also spread over a large number of units.

The above discussion point out that it would be advantageous to order a large rate, produce at another and sell at a third rate so that each function is performed as independently as possible and at the optimal level of efficiency.

But carrying inventories is not free from cost. A firm has to incur a host of costs to hold stocks, such as capital costs, service costs and storage costs. Some of these costs are fixed while others are variable. Cost of capital tied up and inventory service costs such as handling, taxes, insurance, record keeping, obsolescence and spoilage are variable costs which tend to increase in correspondence with rise in the size of inventory holding. As against this, storage costs such as cost of heat and light, ware house, labour, and depreciation are fixed costs in the short run and do not change in response to variation in size of inventory holdings. There are also certain risks cost associated with different kinds of inventory, for example, the risk resulting from price fluctuation and the risk o obsolescence. Besides, the firm has to incur acquisition cost to affect delivery of inventory items to the firm. Such costs include

order costs which comprise costs of preparing and processing requisition purchase orders and other kinds of administrative paper work. Acquisition costs per order are generally independent of the size of the order. For example the administrative work relating to placement of order to supplier will be the same regardless of size of orders. However, larger orders will mean that the firm will have to acquire inventory less frequently and hence reduce its total acquisition costs. The same is true of production runs also.

(II) DETERMINING THE OPTIMAL LEVEL OF INVENTORY

In his attempt to prevent cost of stock out and to minimize cost of carrying inventories skilful finance manager aims towards a policy of holding the appropriate level of inventory necessitates the resolution of the conflicting goals. As observed earlier, a larger inventory ensures uninterrupted production and minimizes costs of production interruptions of caused by inadequate inventories and risks of loss of profits owing to loss of sales and possible purchase discounts and so on but it accompanies higher carrying costs and the risk of obsolescence. A low inventory, on the other hand, means lower carrying, costs and risk of obsolescence but increase cost of production due to frequent production interruption and also cost of being out of stock. Determination of the right amount of inventory calls for matching of gains derived from carrying additional inventory with the costs involved in carrying such amount of inventory.

It must also be remembered in this regard that as order increase in size, additional savings per unit of added purchase because saving due to fixed cost is spread over a larger number of units even if quantity discounts are availed of whereas the additional variables costs tend to move up constantly with an increase in size of orders. Therefore, the carrying costs of inventory may tend to rise in proportion to the amount of inventory but the same may not hold true in respect of savings from purchasing or producing in large lots. To determine the appropriate level of inventory and for that matter to balance costs of carrying inventory against the benefits of holding this amount of inventory, the finance manager must consider a number of different levels of inventory for a particular item, and select that level which yields the lowest total cost.

One of the most widely used a technique which provides a fool proof solution to the problem of determining optimal size of inventory in a firm is 'Economic Order Quantity' (EOQ). We shall now discuss as to how optimal size of inventory is determined under 'EOQ approach.

According to EOQ approach, optimal level of investment in inventory is one where total costs of inventory comprising carrying and acquisition costs will be the minimum. This is also known as economic order quantity. The approach begins with analysis of behavioral relationship between carrying cost and acquisition cost and total cost at different levels of ordering inventories. Thus, the cost of carrying raw materials inventories cost of capital tied in inventories, storage costs of ordering inventories-cost of placing orders, quantity discounts lost and so on declines with an increase in size of inventory. The net effect of these rises and falls on total costs will depend on magnitude of the changes in those related costs.

The optimum quantity of ordering can be found by the following equation:

$$EOQ = \sqrt{\frac{2KD}{P1}}$$

Where

D = Annual usage rate

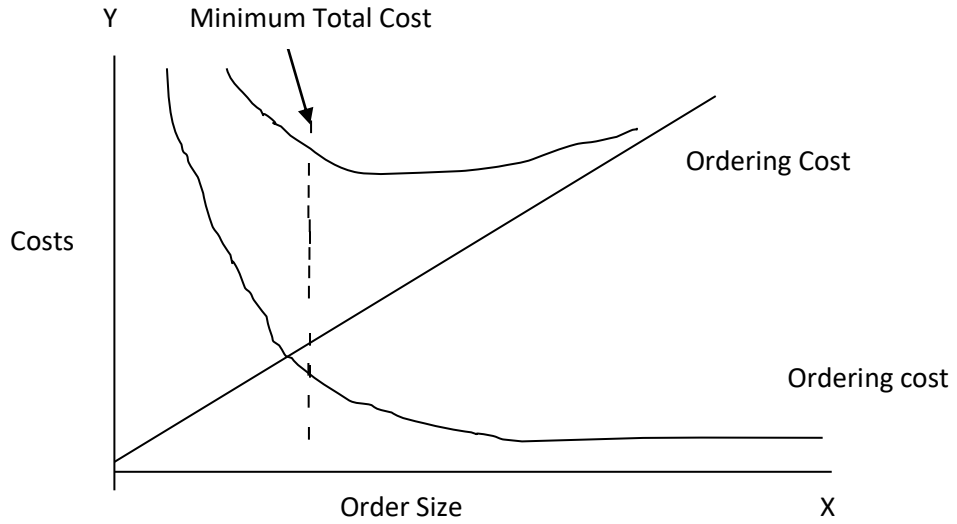
P = Unit purchase price of inventory item

I = Annual inventory carrying charge as a percent of inventory value.

K= Acquisition cost per order.

Another method of determining the economic order quantity is graphic method. Figure 1 demonstrates the results of plotting the total inventory costs for various order quantities. The acquisition costs which tend to decline, with an increase in quantum of order are designated by curve 'D' carrying costs which rise constantly are represented by curve 'R' Curve "T represents total inventory costs. The point where curves D and R intersect each other is the lowest inventory cost per order.

The EOQ model of inventory management is a very useful technique of controlling inventories. Thus, it tells us how much quantity of raw materials the firm should order to ensure uninterrupted production at minimum cost. It also enables the firm to exercise suitable control over. The size of production runs.



(iii) Determining Order Point Problem

The EOQ technique determines the size of an order to acquire inventory so as to minimize the carrying as well as the ordering costs. In other words, the EOQ provides an answer to the question: how much inventory should be ordered in one lot? Another important question pertaining to efficient inventory management is: when should the order to procure inventory be placed? This aspect of inventory management is covered under the order point problem.

The re-order point is started in terms of the level of inventory at which an order should be placed for replenishing the current stock of inventory. In other words, re-order point may be defined as that level of inventory when fresh order should be placed with the supplies for procuring additional inventory equal to the economic order quantity. We can use the following formulae to calculate the re-order point.

The re-order point – Lead time in day's average daily usage of inventory

It is based on the following assumptions

1. Constant daily usage of inventory.
2. Fixed lead time.

The term lead time refers to the normally taken in receiving the delivery of inventory after placing orders with the suppliers. It covers the time span from the point when a decision to placing order for the procurement of inventory is made to the actual receipt of the inventory by the firm. Another way of saying it is that the lead time consists of the number of days required by the suppliers to receive and process the order as well as the number of days during which the goods will be in transit from the supplier. The lead time also be called as the procurement time of inventory.

The average usage means the quantity of inventory, consumed daily. We can, therefore define re-order point as that inventory level which should be equal to the consumption during the lead time.

(iv)Determination of the Safety Stock

The demand for inventory is likely to fluctuate from time to time. In particular, at certain points of time the demand may exceed the anticipated level. In other words, a discrepancy between (anticipated/expected) and the actual usage rate of inventory is likely to occur in practice. Similarly, the receipt of inventory from the suppliers may be delayed beyond the expected lead time. The delay may arise from strike, floods, transportation and other bottlenecks, and so on. Thus, a firm would come across situation in which the actual usage of inventory is higher than the anticipated level and/or the delivery of the inventory from the suppliers is delayed.

The effect of increased usage and/or slower delivery would be a shortage of inventory. That is, the firm would face a stock-out situation. Thus, would disrupt the production schedule and alienate the customers the firm would, therefore, be well advised to keep a sufficient safety margin by having additional inventory to guard against stock-out situations. Such stocks are called safety stocks. This would act as a buffer or cushion against a possible shortage of inventory caused either by increased usage or delayed delivery of inventory. The safety stock may, then, be defined as the minimum additional inventory to serve as a safety margin or buffer or cushion to meet an unanticipated increase in usage resulting from an unusually high demand and or an uncontrollable late receipt of incoming inventory.

The safety stock two types of costs: (i) Stock out, and (ii) carrying costs. The job of the financial manager is to determine the appropriate level of safety stock on the basis of a trade-off between these two types of conflicting costs.

The term stock-out costs refers to the cost associated, with the shortage (stock-out) of inventory. It is, fact, an opportunity cost in the sense that due to the shortage of inventory the firm would be deprived of certain benefits. The denial of those benefits which would otherwise be available to the firm is the stock out costs. The first, and the most obvious, of these costs is the loss of profits which the firm could have earned from increased sales if there was no shortage of inventory. Another category of stock-out costs is the damage to the relationship with the customers owing to shortage of inventory, the firm would not be able to meet the customer's requirements and the latter may turn the firm's competitors. It should, of course, be clearly under stood that this type of cost cannot be easily and precisely quantified. Last, the shortage of inventory may disrupt the production schedule of the firm; the production process would grind to a halt involving idle time.

The carrying costs are the costs associated with the maintenance of inventory. Since the firm is required to maintain additional inventory, in excess of the normal usage, additional carrying costs are involved. The stock-out and vice-versa. Conversely, the larger the safety stock-out costs are likely to rise; on the other hand, an attempt to minimize the stock-out costs implies increased carrying costs. The object of the financial managers should be to have the lowest total cost (i.e. carrying costs. The object of the financial managers should be to have the lowest total cost (i.e. carrying cost plus stock-out cost). The safety stock with the minimum carrying and stock-out costs is the economic-(appropriate) level which financial managers should aim at: in brief, the appropriate level of safety stock is determined by the trade-off between the stock-out and the carrying costs.

Self Assessment:

Fill in the blanks:

11. Inventory ordering costs and inventory carrying costs are used to compute the …… inventory.
12. Inventory consists of stock of materials, components, work-in-progress, finished products and……..
13. The objective of inventory management is to achieve maximum efficiency in production and sales with the ……investment in inventory.
14. ……..indicates the lowest figure of inventory balance which must be maintained in hand at all times.
15. ……is the ratio of the quantity of input of material to production and the standard material content of the actual output.

12.5 Summary:

Efficient cash management required efficient cash forecasting. All firms need cash to meet their transactions, speculative and precautionary needs. For efficient cash management, the firm needs to speed up its collections and discourage early payment of liabilities and expenses. Thus cash inflows become faster and cash outflow occur slowly.

Credit sales result in accounts receivables. Credit sales are done to enhance sales demand of the firm's product/service. Efficient receivables management can be done by ascertaining the tradeoff between the cost of receivable investments and profitability of additional sales due to credit period.

Inventory forms a major portion of total current assets. Inventories form link between production process and sale of finished goods.

12.6 Glossary:

1. **Cash:** It is one of the components of current assets and a medium of exchange for the purpose of transactions.
2. **Cash Budget:** It is a statement showing the estimated cash inflows and cash outflows over a planning period.
3. **Conversion Costs:** It is the costs that are associated with the sales of marketable security.

4. **Float:** It is the amount of the money tied up in cheques that have been written but not yet collected.
5. **Optimal Cash Balance:** It is that cash balance where the firm's opportunity cost equals transactions cost and the total cost is minimum.
6. **Collection Policy**: It is the procedures passed to collect amount receivables, when they become due.
7. **Credit Standards:** It refers to the minimum criteria for the extension of credit to a customer.
8. **Credit Terms:** It means the stipulations under which goods or services are sold on credit.
9. **Receivables:** It is defined as debt owed to the firm by customers arising from sale of goods or services in the ordinary course of business.
10. **Receivables Management:** It involves decision areas: credit standards, credit period, cash discounts and collection procedures.
11. **Economic Order Quantity (EOQ):**It refers to that level of inventory at which the total cost of inventory is minimum
12. **Inventory:** The stockpile of the products a firm is offering for sales and the components that make up the product.
13. **Optimum Level of Inventory:** It is the level where the total costs of inventory is less.
14. **Raw materials:** It is the input that is converted into finished goods through a manufacturing or conversion process.
15. **Work-in-progress:** It is the stage of stocks between raw materials & finished goods

12.7 Answers: Self Assessment:

1. Speculative
2. Organizational structure
3. Cash budget
4. Cash flow
5. Carrying
6. Collection cost
7. Marginal
8. Bad debt
9. Credit period
10. Higher
11. Optimum size
12. Stores and spares
13. Minimum
14. Minimum level

15. Input Output ratio

12.8 Terminal Questions:

1. What are the basic motives for holding cash?
2. What do you understand by credit period, cash discount, cash discount period?
3. What is efficient inventory management?

12.9 Suggested Readings:

Pandey, I.M: Financial management, vikas publishing House, Delhi.

Chandra, Prasanna, Financial management, Tata Mc Graw Hill,Delhi.

Kapil sheeba, financial management, Pearson, Delhi.

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ASSIGNMENTS

Attempt any four Assignments. Assignments are compulsory.

1. State the objectives of Financial Management.
2. Define financial Planning. State the steps involved in financial planning.
3. What are the various kinds of capital budgeting decisions? Discuss the capital budgeting process?
4. Examine the importance of cost of capital and also discuss what are the problems involved in determination of cost of capital?
5. Give a critical appraisal of the Traditional Approach and the Modigliani-Miller Approach to the problems of Capital Structure.
6. What is an indifference point' in EBIT-EPS analysis? How would you compute it?
7. Explain any one dividend model with example?
8. What are the different factors determining working capital?