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BACHELOR OF COMMERCE

BCOM 502

FINANCIAL MANAGEMENT

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CONTENTS

Subject: Financial Management	
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FINANCIAL MANAGEMENT: MEANING, OBJECTIVE, FUNCTION AND SCOPE

STRUCTURE

1.0 LEARNING OBJECTIVES

After reading this lesson, you should be able to:

(a) Explain the nature of finance and its interaction with other management functions.

(b) Review the changing role of the finance manager and his/her position in the management hierarchy.

(c) Focus on the shareholders' wealth maximisation principle as an operationally desirable finance decision criterion.

1.1 INTRODUCTION

Financial management is that managerial area which is concerned with the planning and controlling of the firm's financial resources. Though it was a branch of economics till 1890, as a separate managerial area or discipline it is of recent origin. Still, it has no unique body of knowledge of its own, and draws heavily on economics for its theoretical concepts even today. In the early years of its evaluation it was treated synonymously with the raising of funds. In the current literature pertaining to financial management, in addition to procurement of funds, efficient use of resources is universally recognised.

The subject of financial management is of great interest to academicians because the subject is still developing, and there are still certain areas where controversies exit for which no unanimous solutions have been reached as yet. Practising managers are interested in this subject because among the most crucial decisions of the firm are those which relate to finance, and an understanding of the theory of financial management provides them with conceptual and analytical in sights to make those decisions skillfully.

1.2 SCOPE OF FINANCE

What are a firm's financial activities? How are they related to the firm's other activities? The three most important activities of a business firm are: production, marketing and finance. A firm secures whatever capital it needs and employs it (finance activity) in activities which generate returns on invested capital (production and marketing activities).

A firm needs real assets to carry on its business. Real assets can be tangible or intangible. Plant, machinery, office, factory, furniture and building are examples of tangible real assets, while technical know-how, technological collaborations, patents and copyrights are intangible real assets. The firm sells financial assets or securities, such as shares and bonds or debentures, to investors in capital markets to raise necessary funds. Financial assets also include lease obligations and borrowing from banks, financial institutions and other sources. Funds applied to assets by the firm are called capital expenditures or investment. The firm expects to receive return on investment and distribute return as dividends to inventors.

The raising of capital funds and using them for generating returns and paying returns to the suppliers of funds are called the finance functions of the firm. There are two types of funds that a firm raises: equity funds and borrowed funds. A firm has to sell shares to acquire equity funds. *Shares* represent ownership rights of their holders. The buyers of shares are called *shareholders* and are the legal owners of the firm whose shares they hold. Shareholders invest their money in the shares of a company in the expectation of returns on their invested capital. The return on the shareholders' capital is called *dividend*. Shareholders can be of two types: common and preference. Preference shareholders receive dividends at a fixed rate and have a priority over common shareholders in receiving dividends. The dividends rate for common shareholders is not fixed and can vary from year to year depending on the decision of the board of directors. The payment of dividends to shareholders is not a legal obligation; it is an absolute discretion of the board of directors. Since common shareholders receive dividends (or re-payment of invested capital, if the company is wound up) in the end, they are generally called *owners of residue*. Dividends paid by a company are not deductible charges for calculating corporate income taxes.

Another important source of securing capital is *creditors* or *lenders*. Lenders are not owners of the company. They make money available to the firm on lending basis and retain title to the funds lent. The return on loans or borrowed funds is called *interest*. Loans are furnished for a specified period at a fixed rate of interest. Payment of interest is a legal obligation. The amount of interest is allowed to be treated as expense for computing corporate income taxes. A firm may borrow funds from banks, financial institutions, debenture holders and others.

A company can also secure funds by retaining a portion of the returns available for shareholders. This method of acquiring funds is called retained earnings. The retained earnings are undistributed returns on equity capital; they are, therefore, rightfully a part of equity capital. The retention of earnings can be considered as a form of raising new capital. If a company distributes all earnings to shareholders, then, it can require new capital from the same sources by issuing new shares.

The funds raised by a company will be invested in the available investment opportunities. Each investment opportunity available to a company is called investment project or simply a project. A project involves use of funds presently in the expectation of future benefits. The company may also have on-going projects. They (on-going projects) may also involve outlays of cash to maintain or to

increase their profitability. It would be realized that generation of revenue – a production activity – is possible only when funds are invested in projects.

1.2.1 RELATION OF FINANCE AND RELATED DISCIPLINES

1. Finance and Other Management Functions: Financial management, as an integral part of management, is not a totally independent area. It draws heavily on related disciplines and fields of study such as economics, marketing, production, accounting and quantitative models. Despite key differences among these fields, they are inter-related. Almost all kinds of business activities, directly or indirectly, involve the acquisition and use of funds. For example, recruitment and promotion of employees in production is clearly a responsibility of the production department' but it requires payment of wages and salaries and other benefits, and thus, involves finance. Similarly, buying a new machine or replacing an old machine for the purpose of increasing productive capacity affects the flow of funds.

Sales promotion policies come within the purview of marketing, but advertising and other sales promotion activities require outlays of cash and therefore, affect financial resources. Where, then, is the separation between production and marketing functions and the finance function of making money available to meet the costs of production and marketing operations? Where do the production and marketing functions end and the finance functions begin? There are no clear-cut answers to these questions. The finance function of raising and using money although has a significant effect on other functions, yet it need not necessarily limit or constraint the general running of the business. A company in a tight financial position will, of course, give more weight to financial considerations, and devise its marketing and production strategies in the light of the financial constraint. On the other hand, management of a company, which has a regular supply of funds, will be more flexible in formulating its production and marketing policies. In fact, financial policies will be devised to fit production and marketing decisions of a firm in practice.

Relationship to Economics

There are two important linkages between economics and finance. The macroeconomics environment defines the setting within which a firm operates and the micro-economic theory provides the conceptual foundation for the tools of financial decision making.

Key macro-economic factors such as growth rate of the economy, domestic savings rate, role of the government in economic affairs, tax environment, nature of external economic relationships,

availability of funds to the corporate sector, rate of inflation, real rate of interest, and terms on which the firm can raise finances define the environment in which the firm operates. No finance manager can afford to ignore the key developments in the macro-economic sphere and the impact of the same on the firm. Similarly, a firm grounding in micro-economic principles sharpens his analysis of decision alternatives. Finance, in essence, is applied micro-economics. For example, the principle of marginal analysis – a key principle of micro-economics according to which a decision should be guided by a comparison of incremental benefits and costs– is applicable to a number of managerial decisions in finance.

Relationship to Accounting

Finance and accounting functions are closely related. Finance and accounting are often considered indistinguishable or at least substantially overlapping. However, as a student of finance you should know how the two differ and how the two relate. The primary objective of accounting is to measure the performance of the firm, assess its financial condition, and determine the base for tax payment. The principal goal of financial management is to create shareholder value by investing in positive net present value projects and minimising the cost of financing. Of course, financial decision-making requires considerable inputs from accounting.

Further, the accountant prepares the accounting reports based on the accrual method which recognizes revenues when the sale occurs and matches expenses to sales. The focus of the finance manager, however, is on cash flows. He is concerned about the magnitude, timing, and risk of cash flows as these are the fundamental determinants of values.

Accounting deals primarily with the past. It records what has happened. Finance is concerned mainly with the future. It involves decision making under imperfect information and uncertainty. Hence it is characterised by a high degree of subjectivity.

1.2.2 APPROACHES TO THE FINANCE FUNCTIONS

The approach to the functions of financial management is divided into two broad categories: (a) Traditional Approach, and (b) The Modern Approach.

Traditional Approach

The traditional approach to the functions of financial management refers to its subject-matter, in

academic literature in the initial stages of its evolution, as a separate branch of academic study. The term 'corporation finance' was used to describe what is now known in the academic would as 'financial management'. The traditional phase of financial management lasted for about four decades (upto 1950).

Traditionally the concern of financial management was with the financing of corporate enterprises. In other words, the scope of the finance function was treated by the traditional approach in the narrow sense of procurement of funds by corporate enterprise to meet their financing needs. The term 'procurement' was used in a broad sense so as to include the whole gamut of raising funds externally. Thus defined, the field of study dealing with finance was treated as encompassing the following aspects of raising and administering resources from outside:

- The focus of financial management was mainly on certain episodic events like formation, issuance of capital, major expansion, merger, reorganisation, and liquidation in the life cycle of the firm.
- The approach was mainly descriptive and institutional. The instruments of financing, the institutions and procedures used in capital markets, and the legal aspects of financial events formed the core of financial management.
- The outsider's point of view was dominant. Financial management was viewed mainly from the point of view the investment bankers, lenders, and other outside interests.

The coverage of corporation finance was, this, conceived to describe the rapidly evolving complex of capital market institutions, instruments and practices. A related aspect was that firms require funds at certain episodic events such as merger, liquidation, reorganisation and so on. A detailed description of these major events contributed the second element of the scope of this field of academic study. Thus, the issues to which literature on finance addressed itself was how resources could best be raised from the combination of the available sources.

The traditional approach has now been discarded as it suffers from serious limitations. The first argument against the traditional approach was based on its emphasis on issues relating to the procurement of funds by corporate enterprises. Further, the traditional treatment of finance was criticised because the finance function was equated with the issues involved in raising and administering funds, the theme was woven around the viewpoint of the suppliers of funds such as investors, investment bankers and so on, that is, the outsiders. It implies that no consideration was given

to the viewpoint of those who had to take internal financial decisions. The traditional treatment was, in other words, the outsider-looking-in approach. The limitation was that internal decision making (i.e. insider-looking-out) was completely ignored.

The second criticism of the traditional treatment was that the focus was on financing problems of corporate enterprises. To that extent the scope of financial management was confined only to a segment of the industrial enterprises, as non-corporate organisations lay outside its scope.

The third ground of criticism of the traditional approach was that the treatment was built too closely around episodic events, such as promotion, incorporation, merger, consolidation, reorganisation and so on. Financial management was confined to a description of these infrequent happenings in the life of an enterprise, but the day-to-day financial problems of normal company did not receive much attention.

Lastly, the traditional approach was challenged because its focus was on a long-term financing. Its natural implication was that the issues involved in working capital management were not in the purview of the finance function.

The limitations of the traditional approach were more fundamental. The conceptual and analytical shortcoming of this approach arose from the fact that it confined financial management to issues involved in procurement of external funds; it did not consider the important dimension of allocation of capital. These issues are reflected in the following fundamental questions which a finance manager should address. Should an enterprise commit capital funds to certain purposes? Do the expected returns meet financial standards of performance? How should these standards be set and what is the cost of capital funds to the enterprise? How does the cost vary with the mixture of financing methods used? In the absence of the coverage of these crucial aspects, the traditional approach implied a very narrow scope for financial management. The modern approach provides a solution to these shortcomings.

Modern Approach: The traditional approach, with its emphasis on the episodic financing and lacking in sound theoretical background, lost its utility in the changed business situation since the mid 1950's A number of economic and environment factors, such as the increasing pace of industrialisation, technological innovations and inventions, intense competition, increasing intervention of government on account of management efficiency and failure, population growth and widened markets etc., during and after mid-1950's necessitated efficient and effective utilisation of the firm's resources, including financial resources. Fortunately, the development of a number of management skills and decision-

making techniques facilitated to implement a system of optimum allocation of the firm's resources. As a result, the approach to, and the scope of, financial management also changed. The emphasis shifted from episodic financing to the managerial financial problems, from raising of funds to efficient and effective use of funds. 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. In this broader view the central issue of 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 modern enterprise, the basic finance function is to decide about the expenditure decisions and to determine the demand for capital for these expenditures. In other words, the financial manager, in his new role, is concerned with the efficient allocation of funds. The allocation of funds is not a new problem, however. It did exist in the past, but it was not considered important in achieving the firm's long run objectives.

In his new role of using funds wisely, the financial manager must find a rational basis for answering the following three questions:

- How large should an enterprise be, and how fast should it grow?

  In what form should it hold its assets?

  What should be the composition of its liabilities?

The questions stated above relate to three broad decision areas of financial management: investment; financing and dividend decisions. The "modern" financial manager has to help making these decisions in the most rational way. These decisions have to be made in such a way that the funds of the firm are used optimally. We have referred to these decisions as managerial finance functions since they require special care and extraordinary administrative ability.

The financial decisions have a great impact on all other business activities. The concern of the financial manger, besides his traditional function of raising money, will be in determining the size and technology, in setting the pace and direction of growth and in shaping the profitability and risk complexion of the firm by selecting the best asset mix and by obtaining the optimum financing mix. The new approach to financial management may be broadened to include profit-planning function also. The term profit-planning refers to the operating decisions in the areas of pricing, volume of output and

the firm's selection of product lines. Profit-planning is therefore, a prerequisite for optimising investment and financing decisions.

1.2.3 FINANCIAL DECISIONS IN A FIRM

Finance functions or decisions include:

- Investment or long-term asset-mix decision
- Financing or capital-mix decision
- Dividend or profit allocation decision
- Liquidity or short-term asset-mix decision

A firm performs finance functions simultaneously and continuously in the normal course of the business. They do not necessarily occur in a sequence. Finance functions call for skilful planning, control and execution of a firm's activities. Let us note at the outset that shareholders are made better off by a financial decision that increases the value of their shares. Thus while performing the finance functions, the financial manager should strive to maximise the value of shares. Following is brief description of the financial decisions:

Investment Decision: The first and perhaps the most important decision that any firm has to make are to define the business or businesses that it wants to be in. This decision has a significant bearing on how capital is allocated in the firm.

Once the managers of a firm choose the business or businesses they want to be in, they have to develop a plan to invest in buildings, machineries, equipment, research and development, godowns, showrooms, distribution network, information infrastructure, brands, and other long-lived assets. This is the capital budgeting process.

The unit of analysis in capital budgeting is a investment project. Considerable managerial time, attention, and energy is devoted to identify, evaluate, and implement investment projects. When you look at an investment project from the financial point of view, you should focus on the magnitude, timing, and riskiness of cash flows associated with it. In addition, consider the options embedded in the investment projects.

Financing Decision: Financing decision is the second important function to be performed by the financial manager. Once a firm has decided the investment projects it wants to undertake, it has to figure out ways and means of financing them. The key issues in capital structure decisions are: What is

the optimal debt-equity ratio for the firm? Which specific instruments of equity and debt finance should the firm employ? Which capital markets should the firm access? When should the firm raise finances? At what price should the firm offer its securities?

Financing decisions should be guided by considerations of cost and flexibility, in the main. The objective should be to minimise the cost of financing without impairing the ability of the firm to raise finances required for value creating investment projects. The firm must decide whether it should buy back its own shares.

Dividend Decision: Dividend decision is the third major financial decision. The financial manager must decide whether the firm should distribute all profits, or retain them, or distribute a portion and retain the balance. Like the debt policy, the dividend policy should be determined in terms of its impact on the shareholders' value. The optimum dividend policy is one that maximises the market value of the firm's shares. Thus, if shareholders are not indifferent to the firm's dividend policy, the financial manager must determine the optimum dividend-payout ratio. The financial manager should also consider the questions of dividend stability, bonus shares and cash dividends in practice. Most profitable companies pay cash dividends regularly. Periodically, additional shares, called bonus shares (or stock dividend), are also issued to the existing shareholders in addition to the cash dividend.

Working Capital Management: Working capital management also referred to as short-term financial management refers to the day-to-day financial activities that deal with current assets (inventories, debtors, short-term holdings of marketable securities, and cash) and current liabilities (short-term debt, trade creditors, accruals, and provisions). Current assets should be managed efficiently for safeguarding the firm against the dangers of illiquidity and insolvency. Investment in current assets affects the firm's profitability, liquidity and risk.

A conflict exists between profitability and liquidity while managing current assets. If the firm does not invest sufficient funds in current assets, it may become illiquid. But it would lose profitability as idle current assets would not earn anything. Thus, a proper trade-off must be achieved between profitability and liquidity. In order to ensure that neither insufficient nor unnecessary funds are invested in current assets, the financial manager should develop sound techniques of managing current assets.

The key issues in working capital management are: What is the optimal level of inventory for the operations of the firm? Should the firm grant credit to its customers and, if so, on what terms? How

much cash should the firm carry on hand? Where should the firm invest its temporary cash surpluses? What sources of short-term finance are appropriate for the firm?

It would thus be clear that financial decisions directly concern the firm's decision to acquire or dispose off assets and require commitment or recommitment of funds on a continuous basis. It is in this context that finance functions are said to influence production, marketing and other functions of the firm. This, in consequence, finance functions may affect the size, growth, profitability and risk of the firm, and ultimately, the value of the firm. To quote Ezra Solomon:

The function of financial management is to review and control decisions to commit or recommit funds to new or ongoing 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 distribution of assets.

1.2.4 GOALS OF FINANCIAL MANAGEMENT

In order to make the firm's financial decisions rationally, the firm must have a goal. It is generally agreed in theory that the financial goals of the firm should be the maximisation of owners' economic welfare There are two widely-discussed alternative approaches which can be used a as decision criterion for the maximisation of owners' economic welfare: (i) Profit maximisation approach, and (ii) Wealth maximisation approach. In this section, we discuss that the shareholders. Wealth maximisation approach is theoretically logical and operationally small feasible normative goal of financial management for guiding the financial decision-making.

Profit Maximisation

According to this approach, actions that increase profits should be undertaken and those that decrease profits are to be avoided. In specific operational terms, as applicable to financial management, the profit maximisation criterion implies that the investment, financing and dividend policy decisions of a firm should be oriented to the maximisation of profits.

Profit maximisation means maximising the rupee (or any other currency such as dollar, pound or euro) income of firms. Firms produce goods and services. They may function in a market economy, or in a government-controlled economy. Price system is the most important organ of a market economy indicating what goods and services society wants. Goods and services in great demand command higher

prices. This results in higher profit for firms; more of such goods and services are produced. Higher profit opportunities attract other firms to produce such goods and services. Ultimately, with intensifying competition an equilibrium price is reached at which demand and supply match. In the case of goods and services which are not required by society, their prices and profits fall. Such goods and services are dropped out by producers in favour of more profitable opportunities. Price system directs managerial efforts towards more profitable goods or services. Prices are determined by the demand and supply conditions as well as the competitive forces, and they guide the allocation of resources for various productive activities.

However, regarding price system a question is generally raised: Would the price system in a free market economy serve in interests of the society? The answer has been given by Adam Smith many years ago. According to him:

(the businessman), by directing... industry in such a manner as its produce may be of greater value.. intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was not part of his intention..... pursuing his own interest he frequently promotes that of society more effectually than he really intends to promote it.

Thus the economists following Smith's logic held that under the conditions of free competition, businessmen pursuing their own self-interests also serve the interest of society. It is also assumed that when individual firms pursue the interest of maximising profits, society's resources are efficiently utilised.

The economic behaviour of a firm is analysed in terms of profit maximisation. While maximising profit, a firm either produces maximum output for a given amount of output, or uses minimum input for producing a given output. Thus, the underlying logic of profit maximisation is efficiency. It is assumed to cause the efficient allocation of resources under the competitive market conditions, and profit is considered as the most appropriate measure of a firm's performance.

Objections to Profit Maximisation: The profit maximisation criterion has, however, been questioned and criticised on several grounds. It is argued that profit maximisation assumes perfect competition, and in the face of imperfect modern markets, it cannot be a legitimate objective of the firm. It is also argued that profit maximisation, as a business objective, developed in the early 19th century when the characteristic features of the business structure were self-financing, private property and single

entrepreneurship. The only aim of the single owner then was to enhance his or her individual wealth and personal power, which could easily be satisfied by the profit maximisation objective. The modern business environment is characterised by limited liability and a divorce between management and ownership. The business firm today is financed by shareholders and lenders but it is controlled and directed by professional management. The other interested parties are customers, employees, government and society. In practice, the objectives of these constituents (or stakeholders) of a firm differ and may conflict with each other. The manager of the firm has the difficult task of reconciling and balancing these conflicting objectives. In the new business environment, profit maximisation is regarded as unrealistic, difficult, inappropriate and immoral.

There is also a suspension that profit maximisation behaviour in a market economy may tend to produce goods and services that are wasteful and unnecessary from the society's point of view. Also, it might lead to inequality of income and wealth. It is for this reason that governments tend to intervene in business. The price system and therefore, the profit maximisation principle may not work due to imperfections in practice. Oligopolies and monopolies are quite common phenomena of modern economies. Firms producing same goods and services differ substantially in terms of technology, costs and capital. In view of such conditions, it is difficult to have a truly competitive price system, and thus, it is doubtful if the profit maximising behaviour will lead to the optimum social welfare.

Is profit maximisation an operationally feasible criterion? Because of the aforesaid criticisms, profit maximisation fails to serve as an operational criterion for maximising the owners' economic welfare. The main technical flaws of this criterion are ambiguity, timing of benefits, and quality of benefits.

Ambiguity: The first operational difficulty with profit maximisation criterion for financial decision making is that the term profit is a vague and ambiguous concept. It has no precise connotation. It is amenable to different interpretations by different people. To illustrate, profit may be short term or long term; it may be total profit or rate of profit; it may be before-tax or after-tax; it may be return on total capital employed or total assets or shareholders' equity and so on. If profit maximisation is taken to be the objective, the question arises, which of these variants of profit should a firm try to maximise? Obviously, a loose expression like profit cannot form the basis of operational criterion for financial management.

Timing of Benefits: A more important technical objection to profit maximisation, as guide to financial decision making, is that it ignores the differences in the time pattern of the benefits received from investment proposals or courses of action. While working out profitability, '*the bigger the better*' principle is adopted, as the decision is based on the total benefits received over the working life of the asset, irrespective of when they were received. Consider Table 1.1

Table 1.1 Time-Pattern of Benefits (Profits)

	Alternative A (Rs. lakhs)	**Alternative B (Rs. lakhs)**
Period I	100	(–)
Period II	200	200
Period III	100	200
Total	400	400

Table 1.1 shows that the total profits associated with the alternatives, A and B, are identical. If the profit maximisation is the decision criterion, both the alternatives would be ranked equally. But the returns from both the alternatives differ in one important respect, while alternative A provides higher returns in earlier years, the returns from alternative B are larger in later years. As a result, the two alternative courses of action are not strictly identical. This is primarily because a basic dictum of financial planning is *the earlier the better* as benefits received sooner are more valuable than benefits received later. The reason for the superiority of benefits now over benefits later lies in the fact that the former can be reinvested to earn a return. This is referred to as time value of money. The profit maximisation criterion does not consider the distinction between returns received in different time periods and treats all benefits irrespective of the timing, as equally valuable. This is not true in actual practice as benefits in early years should be valued more highly than equivalent benefits in later years. The assumption of equal value is inconsistent with the real world situation.

Uncertainty of returns: Third important technical limitation of profit maximisation is that it ignores the quality aspect of benefits associated with a financial course of action. The term quality here refers to the degree of certainty with which benefits can be expected. As a rule, the more certain the expected return, the higher is the quality of the benefits. Against it, an uncertain and fluctuating return implies risk to the investors. It can be assumed that the investors want to avoid or at least minimise risk. They can therefore, be reasonably expected to have a preference for a return which is more certain in the

sense that it has smaller variance over the years.

Thus, the uncertainty of process renders profit maximisation unsuitable as an operational criterion for financial management as it considers only the size of benefits and gives no weight to the degree of uncertainty of the future benefits.

Maximising Profit After Taxes: One can easily prove that maximising profit after taxes will not maximise the economic welfare of the owners. It is possible for a firm to increase profit after taxes by selling additional equity shares and investing the proceeds in low-yielding assets, such as the governments bonds. Profit after taxes would go up but earnings per share would go down. To illustrate, let us assume that a company has 5,000 shares outstanding, profit after taxes of Rs. 50,000 and earnings per share of Rs. 10. If the company sells 5,000 additional shares at Rs. 100 per share and invests the proceeds (Rs. 5,00,000) at 5 per cent after taxes. The total profits after taxes will increase to Rs. 75,000. However, the earnings per share will fall to Rs. 7.5. This example clearly indicates that maximising profits after taxes does not necessarily serve the best interests of owners.

Maximising Earnings Per Share: The financial objective of maximising earnings per share will also not ensure the maximisation of owners' economic welfare. It also suffers from the flaws already mentioned, i.e. it ignores timing and risk of the expected benefits. Apart from these problems, maximisation of earnings per share has certain deficiencies as a financial objective. For example, if the market value is not a function of earnings per share, then maximisation of the latter will not necessarily result in the highest possible price for the company's shares. Maximisation of earnings per share further implies that the firm should make no dividend payments so long as funds can be invested internally at any positive rate of return, however small.

To conclude, maximising profits after taxes or earnings per share as the financial objective fails to maximise the economic welfare of owners. Both methods do not take account of the timing and objective of wealth-maximisation. This objective is also considered consistent with the survival goal and with the personal objectives of managers such as recognition, power, status and personal wealth.

Shareholders' Wealth Maximisation

It is also termed as value maximisation or net present worth maximisation. In current academic literature value maximisation is almost universally accepted as an appropriate operational decision criterion for financial management decisions. Its operational features satisfy all the three requirements

of a suitable operational objective of financial courses of action, namely, exactness, quality of benefits and the time value of money. This goal has been defended by distinguished finance scholars, economists, and practitioners. The following are some evidences of their views:

In a market-based economy which recognises the rights of private property, the only social responsibility of business is to create value and do so legally and with integrity. It is a profound error to view increases in a company's value as a concern just for its shareholders. Enlightened managers and public officials recognise that increases in stock prices reflect improvement in competitiveness – an issue which affects everyone who has a stake in the company or economy.

Should a firm maximise the welfare of employees or customers, or creditors? These are bogus questions. The real question is: What should a firm do to maximise its contribution to the society? The contribution to the society is maximised by maximising the value of the firm.

Those who regard shareholder wealth maximisation as irrelevant or immoral are forgetting that shareholders are not merely the beneficiary of a corporation's financial successes, but also the referee who determine management's financial power.

What is meant by Shareholders' Wealth Maximisation (SWM)? SWM means maximising the pet present value (or wealth) of a course of action to shareholders. The net present value (NPV) of a course of action is the difference between the present value of its benefits and the present value of its costs. The net present value of wealth can be defined more explicitly in the following way:

$$W = \frac{A_1}{(1+k)} + \frac{A_2}{(1+k)^2} + \ldots\ldots + \frac{A_n}{(1+k)^n} - C_0 = \sum_{t=1}^{n} \frac{A_t}{(1+k)^t} - C_0$$

where A_1, A_2.. represent the stream of benefits expected to occur if a course of action is adopted, C_0 is the cost of that action and k is the appropriate discount rate to measure the quality of A's; k reflects both timing and risk of benefits, and W is the Net present value or wealth which is the difference between the present value of the stream of benefits and the initial cost. The firm should adopt a course of action only when W is positive, i.e. when there is net increase in the wealth of the firm. This is a very simple model of expressing wealth maximisation principle. A complicated model can assume capital investments to occur over a period of time and k to change with time. A financial action that has a positive NPV creates wealth for shareholders and, therefore is desirable. A financial action resulting in negative NPV

should be rejected since it would destroy shareholders' wealth. Between a numbers of mutually exclusive projects the one with the highest NPV should be adopted. Therefore, the wealth will be maximised if this criterion is followed in making financial decisions.

The objective of shareholders' wealth maximisation takes care of the questions of the timing and risk of the expected benefits. These problems are handled by selecting an appropriate rate (the shareholders' opportunity cost of capital) for discounting the expected flow of future benefits. It is important to emphasize that benefits are measured in terms of cash flows. In investment and financing decisions, it is the flow of cash which is important, not the accounting profits.

Maximising the shareholders' economic welfare is equivalent to maximising the utility of their consumption over time. With their wealth maximised, shareholders can adjust their cash flows in such way as to optimise their consumption. From the shareholders' point of view, the wealth created by a company through its actions is reflected in the market value of the company's shares. Therefore, the wealth maximisation principle implies that the fundamental objective of a firm is to maximise the market value of its shares. The value of the company's shares is represented by their market price which, in turn, is a reflection of the firm's financial decisions. The market price serves as the firm's performance indicator. How is the market price of a firm's share determined?

Need for a Valuation Approach

Wealth maximisation approach requires a valuation model. The financial manager must know or at least assume the factors that influence the market price of shares, otherwise he or she would find himself or herself unable to maximise the market value of the company's shares. What is the appropriate share valuation model? In practice, innumerable factors influence the price of a share, and also, these factors change very frequently. Moreover, these factors vary across shares of different companies. For the purpose of the financial management problem, we can phrase the crucial questions normatively: How much should a particular share be worth? Upon what factor or factors should its value depend? Although there is no simple answer to these questions, it is generally agreed that the value of an asset depends on its risk and return.

Criticism of Wealth Maximisation Objectives

Despite the forceful arguments in favour of the goal of maximising shareholders value, its supremacy has been challenged by many. The critics fall into four main categories: the capital market

skeptics, the strategic visionaries, the balancers, and the social responsibility advocates. The arguments of these critics and the rebuttal by the defendants of shareholder value maximisation principal are summarised as follows:

1. The capital market critics argue that the stock market displays myopic tendencies, often wrongly priced securities, and fails to reflect long-term values. Managers, on the other hand, are well-informed and make decisions based on more reliable and robust measures of value creation.

2. The strategists are of the opinion that the firm should pursue a product market goal like maximising the market share, or enhancing customer satisfaction, or minimising costs in relation to competitors, or achieving a zero defect level. If the firm succeeds in implementing its product market strategy, investors would be amply rewarded.

3. It is also argued that a firm should seek to balance the interest of various stakeholders, viz. customers, employees, shareholders, creditors, suppliers, community, and others.

Justification for Wealth Maximisation Objective

1. Financial economists argue that there are extensive empirical evidence of the fact that in developed capital markets, at least, share prices are the least biased estimates of intrinsic values and managers are not generally better than investors at assessing values.

2. Some financial experts advocate that shareholders wealth is created only through successful product market strategies. For example, satisfied and loyal customers are essential for value creation. However beyond a certain point customer satisfaction comes at the cost of shareholders value. When that happens, the conflict should be resolved in favour of shareholders to enhance the long-term viability and competitiveness of the firm.

3. Practically, there is no such mantra that can ensure balancing of the interest of various stakeholders. There is no formula for balancing the interests. When managers confront complex problems involving numerous trade-offs, they will have no clear guidelines on how to resolve the differences.

1.2.5 RISK RETURN TRADE OFF

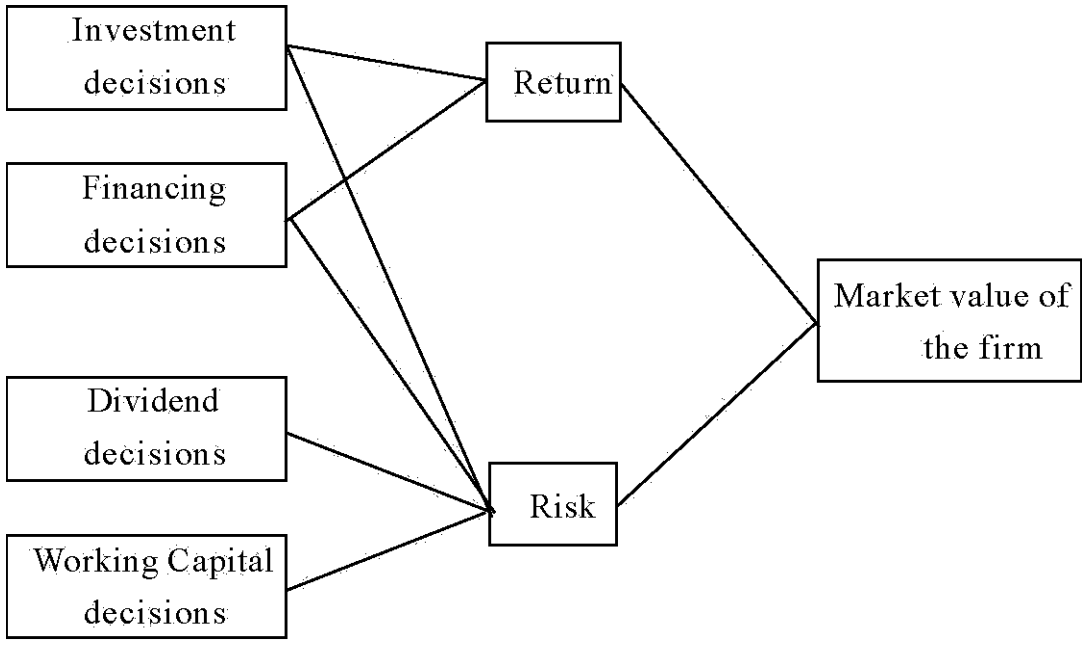
Financial decisions often involve alternative courses of action. Should the firm set up a plant which has a capacity of one million tonnes or two million tonnes? Should the debt-equity ratio of the firm be 2:1 or 1:1? Should the firm pursue a generous credit policy or a conservative one? Should the

firm carry a large inventory or a small one?

The alternative courses of action typically have different risk-return implications. A large plant may have a higher expected return and a higher risk exposure, whereas a small plant may have a lower expected return and a lower risk exposure. A higher debt-equity ratio compared to a lower debt-equity ratio may reduce the cost of capital but expose the firm to greater risk. A 'hot' stock compared to a defensive stock, may offer a higher expect return but also a greater possibility of loss.

In general, when you make a financial decision, you have to answer the following questions: What is the expected return? What is the risk exposure? Given the risk-return characteristics of the decision, how would it influence value? Exhibit 1.1 shows schematically the relationship between the key financial decisions, return, risk, and market value.

Exhibit 1.1: Risk-Return Trade-Off



1.2.6 ORGANISATION OF THE FINANCE FUNCTION

Financial management is in many ways an integral part of the jobs of managers who are involved in planning, allocation of resources, and control. The responsibilities for financial management are dispersed throughout the organisation. For example:

- The technocrat who proposes a new plant shapes the investment policy of the firm.

- The marketing analyst provides inputs in the process of forecasting and planning.
- The purchase manager influences the level of investment in inventories.
- The sales manager has a say in the determination of the receivables policy.
- Departmental managers, in general, are important links in the financial control system of the firm.

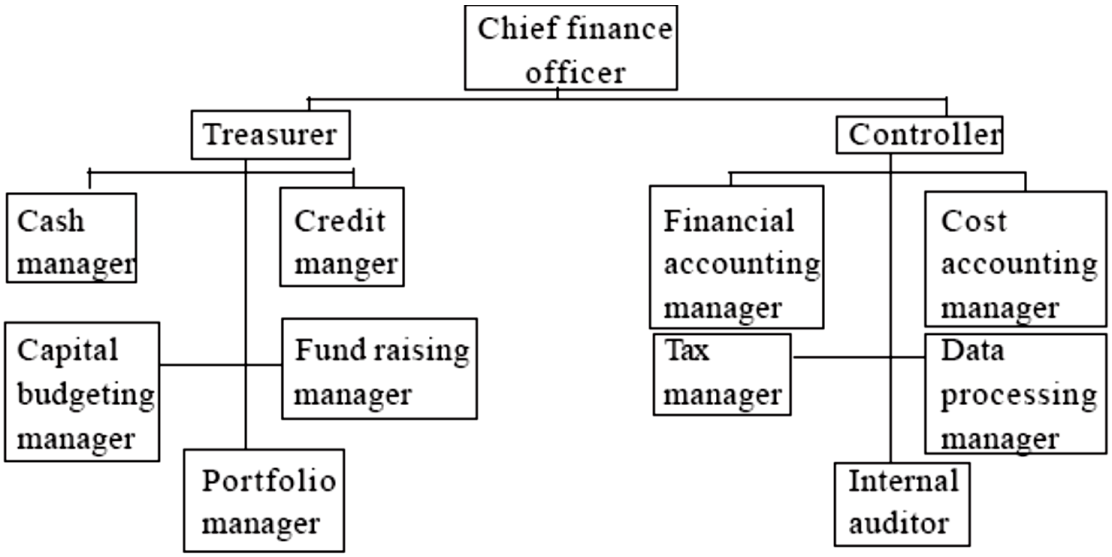
There are many tasks of financial management and allied areas (like accounting) which are specialised in nature and which are attended to by specialists. These tasks and their typical distribution between the two key financial officers of the firm, the treasurer and the controller, are shown in Exhibit 1.2. Note that the treasurer is responsible mainly for financing and investment activities and the controller is concerned primarily with accounting and control.

Exhibit 1.2: Functions of the Treasurer and the controller

Treasurer	Controller
Obtaining finance	Financial accounting
Banking relationship	Internal auditing
Cash management	Taxation
Credit administration	Management accounting and control
Capital budgeting	

The finance function in a large organisation may be organised as shown in Exhibit 1.3. Generally, the chief finance officer is overall incharge/head of the firm. The chief finance officer may be designated as Director (Finance) or vice President (Finance) and he supervises the work of the treasurer and the controller. In turn, these officers are assisted by several specialist managers working under them.

Exhibit 1.3: Organisation of Finance function



The finance officers, in addition to their specialised responsibility, have significant involvement in injecting financial discipline in corporate management processes. They are responsible for emphasising the need for rationality in the use of funds and the need for monitoring the operations of the firm to achieve desired financial results. In this respect the tasks of financial officers have assumed new dimensions. Instead of just looking after routine financing and accounting activities they guide and participate in the tasks of planning, funds allocation, and control so that the financial point of view is sufficiently emphasised in the process of corporate management.

Functions of Controller and Treasurer in the Indian Context

The two terms 'controller' and 'the treasurer' are not Indian terms. In fact these are American terms. Generally speaking, the American pattern of dividing the financial executive's functions into controllership and treasurership functions is not being widely followed in India. We do have a number of companies in India having officers with the designation of the controller, or the financial controller. The controller or the financial controller in India, by and large, performs the functions of a chief accountant or management accountant. The officer with the title of treasurer can also be found in a few companies in India.

Presently some of the controllership functions are performed by the company secretary in India. His or her duties, for example, include asset control and protection, maintaining records and preparing reports and government reporting. The economic appraisal function is generally performed at the top

level in India. Some companies do have separate economics and statistical departments for this purpose. Some other functions, such as internal audit, can be brought within the fold of the controllership functions, if this concept is developed in the Indian context.

It has been noted the financial controller does not control finances: he or she develops, uses and interprets information – some of which will be financial – for management control and planning. For this reason, the financial controller may simply be called as the controller. Management of finance or money is a separate and important activity. Traditionally, the accountants have been involved in managing money in India. But the difference in managing money resources and information resources should be appreciated.

As per as the American business is concerned, the management of finance is treated as a separate activity and is being performed by the treasurer. The title of the treasurer has not found favour in India to the extent the controller has. Some of the functions performed by the treasurer in the American context are again discharged by the company secretary in India. Insurance coverage is an example in this regard. The function of maintaining relations with investors (particularly shareholders) may now assume significance in India because of the development in the India capital markets and the increasing awareness among investors.

The designation, financial manager, seems to be more popular in India. This title is also better than the title of treasurer since it conveys the functions involved. The main function of the financial manager in India should be the management of the company's funds. He or she should ensure the optimum use of money under various constraints. He or she should therefore, be allowed to devote his or her full energy and time in managing the money resources only.

1.3 CHECK YOUR PROGRESS

1. The optimum …….is one that maximises the market value of the firm's shares.

2. ……..approach is theoretically logical and operationally small feasible normative goal of financial management for guiding the financial decision-making.

3. Duties of …….. include asset control and protection, maintaining records and preparing reports and government reporting.

4. A financial action that has a positive ……. creates wealth for shareholders and, therefore is desirable.

5. …….. functions call for skilful planning, control and execution of a firm's activities.

1.4 SUMMARY

Financial management, also referred to as corporate finance or managerial finance, emerged as a distinct field of study at the turn of the 20th century. Financial management is closely related to macro-economic, financial accounting, marketing, production and other related fields of management. The financial management function in the modern sense of the term covers decision making in three interrelated areas, namely, investment including working capital management, financing and dividend policy. The financial manager has to take these decisions with reference to the objectives of the firm. Wealth maximisation as measured by the market price of shares emerges as a superior normative objective of financial management as compared to profit maximisation mainly because the latter is inapplicable in real situations due to two technical limitations; it ignores timing of benefits and does not consider the quality (uncertainty) of benefits. Though managers are the agents of shareholders, they are likely to act in a way incompatible with the interest of the shareholders. To harmonise the conflict between them arising out of agency problems, shareholders have to bear agency costs.

Although, the importance of finance functions depends largely on the size of the firm, financial management is an integral part of the overall management of the firm. In small firms the finance functions are generally performed by the accounting departments. In large firms, there is a separate department of finance headed by a specialist known by different designations such as vice-president, director of finance and so on.

1.5 KEYWORDS

Financial Management: It refers to that part of the management activity which is concerned with planning and controlling of firm’s financial resources.

Financing Decision: These are decisions which are concerned with raising or procurement of funds to meet the project costs.

Wealth Maximisation: It means that the operation of business should be conducted in such a manner so as to provide the maximum net present worth or value to the owners of a corporate body.

1.6 SELF- ASSESSMENT TEST

1. Define the scope of financial management. What role should the financial manager play in a modern enterprise?
2. ".... the function of financial management is to review and control decisions to commit or recommit funds to new or ongoing 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" (Ezra Solomon). Elucidate.
3. What are the basic financial decisions? How do they involve risk-return trade-off?
4. "The profit maximisation is not an operationally feasible criterion". Do you agree? Illustrate your views.
5. What is the justification for the goal of maximising the wealth of shareholders?
6. What do the critics of the goal of maximising shareholder wealth say? What is the rebuttal provided by the advocates of maximising shareholder wealth?
7. Critically evaluate the goals of maximisation of profit and maximisation of return on equity.
8. Discuss the risk-return tradeoff in financial decisions.
9. How is the finance function typically organised in a large company?
10. Discuss the relationship of financial management to economics and accounting.
11. Comment on the emerging role of the finance manager in India.

1.7 ANSWERS TO CHECK YOUR PROGRESS

1. Dividend policy

2. Wealth maximization

3. Controller

4. NPV

5. Finance

1.8 REFERENCES/SUGGESTED READINGS

- Prasanna Chandra: Financial Management, Tata McGraw Hill.
- I.M. Pandey: Financial Management, Vikas Publishing House.
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Subject: Financial Management	
Course Code: BCOM-502	Updated By: Dr. Poonam
Lesson No.-2	
Time Value of Money	

STRUCTURE

2.0 LEARNING OBJECTIVES

After reading this lesson the learners will be able:

- To understand what gives money, its time value;
- To calculate present and compound values;
- To understand the use of present value technique (discounting) in financial decisions; and
- To explain the basic concept of internal rate of return.

2.1 INTRODUCTION

Most financial decisions involve cash flows occurring at different time periods. For example, if a firm borrows funds from a bank or from any other source, it receives cash now and commits an obligation to pay interest and repay principal in future periods. The firm may also raise funds by issuing equity shares. The firm's cash balance will increase at the time shares are issued, but, as the firm pays dividends in future, the outflow of cash will occur. Sound decision-making requires that the cash flows which a firm is expected to give up over period should be logically comparable. The absolute cash flows which differ in timing and risk are not directly comparable. Cash flows become logically comparable when they are appropriately adjusted for their differences in timing and risk. The understanding and recognising the time value of money and risk is extremely vital in financial decision-making to attain its objective of maximising the owners' welfare. The welfare of owners would be maximised when *net wealth* or *net present value* is created from making a financial decision. The net present value is a time value concept. Let us now understand the concept of time value of money.

2.2 MEANING OF TIME VALUE OF MONEY

Money has time value. A rupee today is more valuable than a rupee a year hence. In fact, if an individual behaves rationally, he would not value the opportunity to receive a specific amount of money now equally with the opportunity to have the same amount at some future date. Most individuals value the opportunity to receive money now higher than waiting for one or more years to receive the same amount. This phenomenon is referred to as an individual's time preference for money. Thus, an individual's preference for possession of a given amount of cash now, rather than the same amount at some future time, is called time value of money.

There are several reasons for time value of money :

1. Generally, individuals prefer current consumption to future consumption.
2. Capital can be employed productively to generate positive returns. An investment of one rupee today would grow to (1+r) a year hence (r is the rate of return earned on the investment).

3. In an inflationary period a rupee today represents a greater real purchasing power than a rupee a year hence.

As an individual is not certain about future cash receipts. He prefers receiving cash now. Most people have subjective preference for present consumption over future consumption of goods and services either because of the urgency of their present wants or because of the risk of not being in a position to enjoy future consumption that may be caused by illness or death, or because of inflation. As money is the means by which individuals acquire most goods and services, they may prefer to have money now. Further, most individuals prefer present cash to future cash because of the available investment opportunities to which they can put present cash to earn additional cash. For example, an individual who is offered Rs. 200 now or Rs. 200 one year from now would prefer Rs. 200 now if he could earn on it an interest of, say Rs. 10 by putting it in the savings account in a bank for one year. His total cash in one year from now will be Rs. 210. Thus, if he wishes to increase his cash resources, the opportunity to earn interest would lead him to prefer Rs. 200 now, not Rs. 200 after one year.

2.3 TIME PREFERENCE RATE AND REQUIRED RATE OF RETURN

The time value for money is generally expressed by an interest rate. This rate will be positive even in the absence of any risk. It may be therefore called the risk-free rate. For instance, if time preference rate is 4 per cent, it implies that an investor can forego the opportunity of receiving Rs. 100 if he is offered Rs. 104 after one year (i.e. Rs. 100 which he would have received now plus the interest which he could earn in a year by investing Rs. 100 at 4 per cent). Thus, the individual is indifferent between Rs. 100 and Rs. 104 a year from now as he considers these two amounts equivalent in value. In reality, an investor will be exposed to some degree of risk. Therefore, he would require a rate of return from the investment which compensates him for both time and risk. His required rate of return will be.

Required rate of return = Risk-free rate + risk premium

The *risk-free* rate compensates for time while *risk premium* compensates for risk. The required rate of return may also be called *the opportunity cost of capital* of comparable risk. It is called so because the investor could invest his money in assets or securities of equivalent risk. Like

individuals, firms also have required rates of return and use them in evaluating the desirability of alternative financial decisions. The interest rates account for the time value of money, irrespective of an individual's preferences and attitudes.

Let us understand the answer to the question : How does knowledge of the required rate of return or simply the interest rate help an individual or a firm in making investment decision? It helps the individual or the firm to convert different amounts offered at different times to amounts of equivalent value in the present, a common point of reference. For example, let us assume an individual with an interest rate of 10 per cent. If he is offered Rs. 115.50 one year from now in exchange for Rs. 100 which he should give up today, should he accept the offer? The answer in this particular case is that he should accept the offer. When his interest rate is 10 per cent, this implies that he is indifferent between any amount today and 100 per cent of that amount one year hence. He would obviously favour more than 110 per cent of the amount (i.e. more than Rs. 110 in the example) one year from now.

2.3.1 COMPOUND VALUE

Interest is compounded when the amount earned on an initial deposit (the initial principal) becomes part of the principal at the end of the first compounding period. The term principal refers to the amount of money on which interest is received. Consider Example 1

Example 1 : Suppose you invest Rs. 1,000 for three years in a savings account that pays 10 per cent interest per year. If you let your interest income be reinvested, your investment will grow as follows :

First year	:	Principal at the beginning	1,000
		Interest for the year (Rs. 1,000 × 0.10)	100
		Principal at the end	1,100
Second year	:	Principal at the beginning	1,100
		Interest for the year (Rs. 1,100×0.10)	110
		Principal at the end	1,210
Third year	:	Principal at the beginning	1,210

Interest for the year (Rs. 1,210×0.10)	121
Principal at the end	1,331

Formula

The process of investing money as well as reinvesting the interest earned thereon is called compounding. The future value or compounded value of an investment after n years when the interest rate is r per cent is :

$$FV_n = PV\ (1+r)^n \qquad \text{---------- (1)}$$

in which FV = The future or compound value

PV = Present value

r = rate of interest

n = number of years

$(1+r)^n$ = the future value interest factor

To solve future value problems you have to find the future value factors. You can do it in different ways. In the example given above, you can multiply

1. 10 by itself three times or more generally (1+r) by itself n times. This becomes tedious when the period of investment is long.

Fortunately, you have an easy way to get the future value factors. Most calculators have a key labelled "y^x". So all that you have to do is to enter 1.10, press the key labelled y^x, enter 3, and press the "=" key to obtain the answer.

Alternatively, you can consult a future value interest factor (FVIF) table. One such table showing the future value factor for certain combinations of periods and interest rates is given in Appendix A at the end of this book.

Example 2 : Suppose Mr. Ram deposits Rs. 1,000 today in a bank which pays 10 per cent interest compounded annually, how much will the deposit grow to after 8 years and 12 years?

The future value, 8 years hence, will be:

$$\text{Rs. } 1{,}000\ (1.10)^8 = \text{Rs. } 1{,}000\ (2.144)$$

$$= \text{Rs. } 2{,}144$$

The future value, 12 years hence, will be:

$$\text{Rs. } 1{,}000\ (1.10)^{12} = \text{Rs. } 1{,}000\ (3.138)$$

$$= \text{Rs. } 3{,}138$$

Graphic View of Compounding

Exhibit 4.1 shows graphically how one rupee would grow over time for different interest rates. Naturally the higher the interest rates, the faster the growth rate. We have plotted the growth curves for three interest rates : 0 per cent, 6 per cent, and 12 per cent. Growth curves can be readily plotted for other interest rates.

Compound and Simple Interest

So far we assumed that money is invested at compound interest which means that each interest payment is reinvested to earn further interest in future periods. By contrast, if no interest is earned on interest the investment earns only simple interest. In such a case the investment grows as follows :

Future value = Present value [1+Number of years × Interest rate]

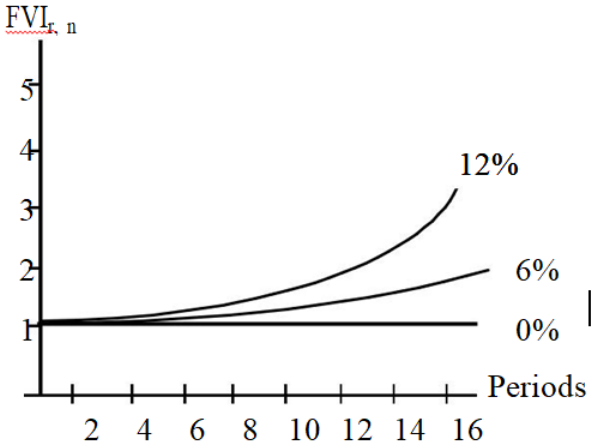

Exhibit 2.1 : Graphic View of Compounding

Example 3 : An investment of Rs. 2,000, if invested at 12 per cent simple interest rate will in 5 years time become :

$$2{,}000\ [1 + 5 \times 0.12] = \text{Rs. } 3{,}200$$

Semi-annual and Other Compounding Periods : In the foregoing discussion we have assumed annual compounding of interest at the end of the year. Very often the interest rates are compounded more than once in a year. Savings institutions, particularly, compound interests semi annually, quarterly and even monthly.

In case of Semi-annual Compounding there would be two compounding periods within the year. Interest is actually paid after every six months at a rate of one-half of the annual (stated) rate of interest.

Example 4 :

Assume Mr. Investor places his savings of Rs. 1,000 in a two-year time deposit scheme of a bank which yields 6 per cent interest compounded semi-annually. He will be paid 3 per cent interest compounded over four periods – each of six months' duration. Table presents the calculations of the amount Mr Investor will have from the time deposit after two year.

Table 2.1 : Semi-annual Compounding

Year	6 months	1 Year	18 months	2 years
Interest rate	0.03	0.03	0.03	0.03
Amount of interest	30.0	30.90	31.83	32.78
Beginning principal	1,000.00	1,030.00	1,060.90	1,092.73
Ending principal	1,030.00	1,060.90	1,092.73	1,125.51

Table 2.1 reveals that his savings will amount to Rs. 1,060.90 and Rs. 1,125.51 respectively at the end of the first and second years.

Quarterly Compounding means that there are four compounding periods within the year. Instead of paying the interest once a year, it is paid in four equal instalments after every three months. Using the above illustration, there will be eight compounding periods and the rate of interest for each compounding period will be 1.5 per cent, that is (1/4 of 6 per cent).

The effect of compounding more than once a year can also be expressed in the form of a formula, Equation 1 can be modified as Eq. 2.

$$A = P(1 + \frac{r}{n})^{nt} \quad (2)$$

Here, m is the number of times per year compounding is made. For semi-annual compounding, m would be 2, while for quarterly compounding it would equal 4 and if interest is compounded monthly, weekly and daily, it would equal 12, 52 and 365 respectively.

The general applicability of the formula can be shown as follows, assuming the same figures of Mr Investor's savings of Rs. 1,000 :

1. For semi-annual compounding,

$$\text{Rs. } 1{,}000 \left\{1 + \frac{0.06}{2}\right\}^{2\times 2} = \text{Rs.}1{,}000(1+0.03)^4 = \text{Rs. } 1{,}125.51$$

2. For quarterly compounding,

$$\text{Rs. } 1{,}000 \left\{1 + \frac{0.06}{4}\right\}^{4\times 2} = \text{Rs.}1{,}000(1+0.015)^8 = \text{Rs. } 1{,}126.49$$

The table of the sum of Re 1 (Table A) can also be used to simplify calculations when compounding occurs more than once a year. We are required simply to divide the interest rate by the number of times compounding occurs, that is (1 »m) and multiply the years by the number of compounding periods per year, that is, (m×n). In our example, we have to look at Table A for the sum of rupee one under the 3 per cent column and in the row for the fourth year when compounding is done semi-annually, the respective rate and year figures would be 1.5 per cent and the eighth year in quarterly compounding.

The compounding factor for 3 per cent and 4 years is 1.126 while the factor for 1.5 per cent and 8 year is 1.127. Multiplying each of the factors by the initial savings deposit for Rs. 1,000, we find Rs. 1.126 (Rs. 1,000×1.126) for semi-annual compounding and Rs. 1,127 (Rs. 1,000×1.127) for quarterly compounding. The corresponding values found by the long method are Rs. 1,125.51 and Rs. 1,126.49 respectively. The difference can be attributed to the rounding off of values in Table A.

Compounded Value of a Series of payments : So far we have considered only the future value of a single payment made at time zero. In many instances, we may be interested in the future value of a series of payments made at different time periods. For simplicity, we assume that the compounding time period is one year and payment is made at the end of each year. Suppose, Mr X deposits each year Rs. 1,000, Rs. 2,000, Rs. 3,000, Rs. 4,000 and Rs. 5,000 in his saving bank account for 5 years. The interest rate is 5 per cent. He wishes to find the future value of his deposits at the end of the 5th year. Since the deposits are made at the end of the year, the first

deposit will earn interest for four years, the second for three years and so on. The last payment of Rs. 5,000 comes at the end of the fifth year and, therefore, the future value remains Rs. 5,000. The future value of the entire stream of payments is the sum of the individual future values, that is Rs. 16,041. Table 2.2 presents the calculations required to determine the sum of money he will have.

Table 2.2 : Annual Compounding of a Series of Payments

End of year	Amount deposited	Number of years compounded	Compounded interest factor from Table A	Future value (2) × (4)
1	2	3	4	5
1	1000	4	1.216	1216.00
2.	2000	3	1.158	2316.00
3.	3000	2	1.103	3309.00
4.	4000	1	1.050	4200.00
5.	5000	0	1.000	5000.00
				16041.00

Compound Value of an Annuity

An annuity is a fixed payment (or receipt) each year for a specified number of years. If you rent a flat and promise to make a series of payments over an agreed period, you have created an annuity. The equal instalment loans from the house financing companies or employers are common examples of annuities. The compound value of an annuity cannot be computed directly from Equation (2). Let us illustrate the computation of the compound value of an annuity.

Example 5 :

Assume a constant sum of Re1 is deposited in a savings account at the end of each year for four years at 6 per cent interest. This implies that Re 1 deposited at the end of the first year will grow for 3 years, Re 1 at the end of second year for 2 years, Re 1 at the end of the third year for 1 year and Re 1 at the end of the fourth year will not yield any interest. Using the concept of the compound value of a lump sum, we can compute the value of annuity. The compound value of

Re 1 deposited in the first year will be : Re 1 $(1+0.06)^3$ = Rs. 1.191, that of Re 1 deposited in the second year will be : Re 1 $(1+0.06)^2$

= Rs. 1.124 and Re 1 deposited at the end of third year will grow to : Re 1 $(1+0.06)^1$ = Rs. 1.06 and Re 1 deposited at the end of fourth year will remain Re 1. The aggregate compound value of Re 1 deposited at the end of each year for four years would be : Rs. 1.191 + Rs. 1.124 + Rs. 1.060 + Re 1.00 = Rs. 4.375. This is the compound value of an annuity of Re 1 for four years at 6 per cent rate of interest.

The above computations can be expressed as follows :

$$FV_4 = A(1+r)^3 + A(1+r)^2 + A(1+r) + A$$

$$FV_4 A[(1+r)^3 + (1+r)^2 + (1+r) + 1] \quad (3)$$

where A is the annuity. We can extend Equation (3) for n periods and rewrite it as follows:

$$FV_n = A\left[\frac{(1+r)^n - 1}{r}\right] \quad (4)$$

The term within brackets is the compound value factor for an annuity of Re 1, which we shall refer as CVAF.

Suppose Rs. 1000 are deposited at the end of each of the next three years at 10 per cent interest rate. The compound value employing Equation (4) is :

$$FV = \frac{1000\,[(1.10)^{3-1}]}{0.10}$$

= Rs. 1000 × 3.31 = Rs. 3310

It would be quite difficult to solve Equation (4) manually if n is very large. Our calculations can be facilitated by either using a calculator or precalculated compound values of an annuity of Re.1 Table B at the end of the book gives compound value factors for an annuity of Re 1 for various combinations of time period (n) and rates of interest (r). This table is constructed under the assumption that the funds are deposited at the end of a period. The compound value factor of an annuity (CVAF) should be ascertained from the table to find out the future value of the annuity. We can also write Equation (4) as follows :

$$FV = A\,(CVAF_{n.i}) \quad (5)$$

where $CVAF_{n,i}$ is the compound value factor of an annuity for n periods at i rate of interest.

Example 6 : Suppose that a firm deposits Rs. 5,000 at the end of each year for four years at 6 per cent rate of interest. How much would this annuity accumulate at the end of the fourth year? From Table B, we find that fourth row and 6 per cent column give us a CVAF of 4.375. If we multiply 4.375 by Rs. 5,000, we obtain a compound value of Rs. 21,875.

$$FV = \text{Rs. } 5{,}000\ (CVAF_{4,0.06}) = \text{Rs. } 5{,}000 \times 4.375 = \text{Rs. } 21{,}875$$ **Sinking Fund**

Suppose that we want Rs. 21,875 at the end of four years from now. How much should we deposit each year at an interest rate of 6 per cent so that it grows to Rs. 21,875 at the end of fourth year? We know from the computations above that the answer is Rs. 5,000 each year. The problem posed is the reversal of the situation above; we are given the future amount and we have to calculate the annual payments. Sinking fund is a fund which is created out of fixed payments each period to accumulate to a future sum after a specified period. Companies generally create sinking funds to retire bonds on maturity.

The factor used to calculate the annuity for a given future sum is called the sinking fund factor (SFF). SFF ranges between zero and 1.0. It is equal to the reciprocal of the compound value annuity factor. In the example above, the reciprocal of CFAV of 4.375 is 0.2286. If the future sum of Rs. 21,875 is multiplied by SFF of 0.2286, we obtain an annuity of Rs. 5,000. The problem can be written as follows :

$$FV = A(CVAF_{n,i})$$

$$A = FV \left[\frac{1}{CVAF_{n,i}} \right]$$

or $$A = FV\ (SFF_{n,i})$$

or $$A = FV \left[\frac{i}{(1+i)^n - 1} \right] \qquad (6)$$

Applying Equation (6) to the above example, we obtain :

$$A = \text{Rs. } 21{,}875 \left[\frac{1}{4.375} \right] = \text{Rs. } 21{,}875 \times 0.2286 = \text{Rs. } 5{,}000$$

The sinking fund factor is useful in determining the annual amount to be put in a fund to repay bonds or debentures at the end of a specified period.

Doubling Period

Generally, a question is raised by the savers : How long would it take to double the amount at a given rate of interest? To answer this question we may look at the future value interest factor table. Looking at Table 4 we find that when the interest rate is 12 per cent it takes about 6 years to double the amount, when the interest is 6 per cent it takes about 12 years to double the amount, so on and so forth. Is there a rule of thumb which dispenses with the use of the future value interest factor table? Yes, there is one and it is called the rule of 72. According to this rule of thumb the doubling period is obtained by dividing 72 by the interest rate. For example if the interest rate is 8 per cent, the doubling period is about 9 years (72/8). Likewise, if the interest rate is 4 per cent the doubling period is about 18 years (72/4). Though somewhat crude, it is a handy and useful rule of thumb.

If you are inclined to do a slightly more involved calculation, a more accurate rule of thumb is the rule of 69. According to this rule of thumb, the doubling period is equal to :

$$0.35 + \frac{69}{\text{Interest Rate}}$$

As an illustration of this rule of thumb, the doubling period is calculated for two interest rates, 10 per cent and 15 per cent.

Interest Rate	Doubling Period
10%	0.35 + ÎÓÑÒ = 7.25 years
15%	0.35 + ÎÓÑÒ = 4.95 years

Finding the Growth Rate

The formula used to calculate future value can be applied to answer other type of questions related to growth. Suppose your company currently has 5,000 employees and this number is expected to grow by 5 per cent per year. How many employees will your company have in 10 years? The number of employees 10 years hence will be :

$5{,}000 \times (1.05)^{10} = 5000 \times 1.629 = 8{,}145$

Example 7 : Sumit Limited had revenues of Rs. 100 million in 1990 which increased to Rs. 1000 million in 2000. What was the compound growth rate in revenues? The compound growth rate may be calculated as follows :

$A = P (1+i)^n$ (7) $1000 = 100 (1+i)^{10}$

$^{1000}_{100} = (1+i)^{10}$

$10 = (1+r)^{10}$

10 ÉÓÒ= 1+r

10 ÉÓÒ – 1 = r

r = 1.26-1 = 0.26 or 26%

Applications of the Compound Value of Annuity

The future value annuity formula can be applied in a variety of context. Its important applications are illustrated below.

Calculating the future value

Example 8 : Suppose you have decided to deposit Rs. 30,000 per year in your Public Provident Fund Account for 30 years. What will be the accumulated amount in your Public Provident Fund Account at the end of 30 years if the interest rate is 11 per cent?

The accumulated sum will be

$$\frac{\text{Rs. } 30{,}000\ (\text{FVIFA}_{11\%,\ 30\ \text{yrs}})}{[\ (1.11)^{30} - 1]}$$

= Rs. 30,000 .11

= Rs. 30,000 [199.02]

= Rs. 5,970,600

Decoding the amount of Annual savings

Example 9 : You want to buy a house after 5 years when it is expected to cost Rs. 4 million. How much should your save annually if your savings earn a compound return of 12 per cent?

The future value interest factor for a 5 year annuity, given an interest rate of 12 per cent, is :

$^{FVIFA}_{n=5,\ r = 12\%} = \dfrac{(1+0.12)^5 - 1}{0.12} = 6.353$

The annual savings should be :

$$\frac{\text{Rs. } 4000{,}000}{6.353} = \text{Rs. } 6{,}29{,}624$$

Annual Deposit in a Sinking Fund : Example 10 : Modern Limited has an obligation to redeem Rs. 100 million bonds 6 years hence. How much should the company deposit annually in a sinking fund account wherein it earns 14 per cent interest to cumulate Rs. 100 million in 6 years time?

The future value interest factor for a 5 year annuity, given an interest rate of 14 per cent is :

$$FVIFA_{n=6,\ r=14\%} = \frac{(1+0.14)^6 - 1}{0.14} = 8.536$$

The annual sinking fund deposit should be :

$$\frac{\text{Rs. } 100 \text{ million}}{8.536} = \text{Rs. } 11.715 \text{ million}$$

Finding the Interest Rate : Example 11 : A finance company advertises that it will pay a lump sum of Rs. 16,000 at the end of 6 years to investors who deposit annually Rs. 2,000 for 6 years. What interest rate is implicit in this offer?

The interest rate may be calculated in two steps:

(ii) Find the $FVIFA_{r,6}$ for this contract as follows :

$$\text{Rs. } 16{,}000 = \text{Rs. } 2{,}000 \times FVIFA_{r,6}$$

$$FVIFA_{r,6} = \frac{\text{Rs. } 16{,}000}{\text{Rs. } 20{,}000} = 8{,}000$$

Look at the $FVIFA_{r,n}$ table and read the row corresponding to 6 years until you find a value close to 8,000. Doing so, we find that

$$FVIFA_{12\%,6} \text{ is } 8.115$$

Hence, the interest rate is slightly below 12 per cent.

Deciding waiting period : Example 12 : You want to take up a trip to the moon which costs Rs. 1,000,000 – the cost is expected to remain unchanged in nominal terms. You can save annually Rs. 50,000 to fulfil your desire. How long will you have to wait if your savings earn an interest of 12 per cent?

The future value of an annuity of Rs. 50,000 that earns 12 per cent is equated to Rs. 1,000,000.

$$50{,}000 \times FVIFA_{n=?,12\%} = 1{,}000{,}000$$

$$50{,}000 \times \left[\frac{1.12^n - 1}{0.12}\right] = 1{,}000{,}000$$

$$1.12^n - 1 = \frac{1{,}000{,}000}{\text{Rs. } 50{,}000} \times 0.12 = 2.4$$

$$1.12^n = 2.4 + 1 = 3.4$$

$$n \log 1.12 = \log 3.4$$

$$n \times 0.0492 = 0.5315$$

$$n = \frac{0.5315}{0.0492} = 10.8 \text{ years}$$

You will have to wait for 10.8 years.

2.3.2 PRESENT VALUE

The concept of the present value is the exact opposite of that of compound value. While in the latter approach money invested now appreciates in value because compound interest is added, in the former approach (present value approach) money is received at some future date and will be worth less because the corresponding interest is lost during the period. In other words, the present value of a rupee that will be received in the future will be less than the value of a rupee in hand today. Thus, in contrast to the compounding approach where we convert present sums into future sums, in present value approach future sums are converted into present sums. Given a positive rate of interest, the present value of future rupees will always be lower. It is for this reason, therefore, that the procedure of finding present values is commonly called discounting. It is concerned with determining the present value of a future amount, assuming that the decision maker has an opportunity to earn a certain return on his money. This return is designated in financial literature as the *discount* rate, the *cost of capital* or an *opportunity cost*.

Mathematical Formula: The process of discounting, used for calculating the present value, is simply the inverse of compounding. The present value formula can be readily obtained by manipulating the compounding formula:

$$FV_n = PV\,(1+r)^n \qquad (8)$$

Dividing both the sides of Eq. (8) by $(1+r)^n$, we get :

$$PV = FV_n\,[1/(1+r)^n] \qquad (9)$$

The factor $1/(1+r)^n$ in Eq. (9) is called the discounting factor or the present value interest factor ($PVIF_{r,n}$). Table C which is available in the end of this book gives the value of $PVIF_{r,n}$ for several combinations of r and n.

Example 13 : What is the present value of Rs. 2,000 receivable 6 years hence if the rate of discount is 10 per cent?

The present value is :

Rs 2,000 × $PVIF_{10\%,6}$= Rs. 2,000 (0.5645) = Rs. 1129.0

Present Value of an Uneven Series

In financial analysis we often come across uneven cash flow streams. For example, the cash flow stream associated with a capital investment project is typically uneven. Likewise, the dividend stream associated with an equity share is usually uneven and perhaps growing.

The present value of a cash flow stream – uneven or even – may be calculated with the help of the following formula :

$$PV_n = \frac{A_1}{(1+r)} + \frac{A_2}{(1+r)^2} + \ldots\ldots + \frac{A_n}{(1+r)^n} = \sum_{t=1}^{n} \frac{A_t}{(1+r)^t} \qquad (10)$$

where PVz_n = present value of a cash flow stream

A_t = cash flow occurring at the end of year t k = discount rate

n = duration of the cash flow stream

Show the calculation of the present value of an uneven cash flow stream given in the following table, using a discount rate of 12 per cent.

Year	Cash Flows
1	Rs. 500
2	1,000
3	1,500
4	2,000
5	2,500

In order to solve this problem, the present value of each individual cash flow discounted at 10 per cent for the appropriate number of years is to be determined. The sum of all these individual values is then calculated to get the present value of the total stream. The present value factors required for the purpose are obtained from Table C (see appendix). The results are summarised in Table.....

Table 2.3 : Present Value of a Mixed Stream of Cash Flows

Year end	Cash flows	Present value factor (2)×(3)	Present value
1	2	3	4
1	Rs. 500	0.909	Rs. 454.50
2	1,000	0.826	826.00
3	1,500	0.751	1,126.50
4	2,000	0.683	1,366.00
5	2,500	0.621	1,552.50
			5,325.50

Present Value of an Annuity

An investor may have an opportunity to receive a constant periodic amount (an annuity) for a certain number of years. The present value of an annuity cannot be found out by using Equation (8). We will have to find out the present value of the amount every year and will have to aggregate all the present values to get the total present value of the annuity. For example, An

investor, who has a required interest rate as 10 per cent, may have an opportunity to receive an annuity of Re 1 for four years. The present value of Re 1 received after one year is, P=1/(1.10) = Re0.909, after two years, P=1/ $(1.10)^2$ = Re 0.826, after three years, P=1/$(1.10)^3$ = Re 0.751 and after four years, P=1/$(1.10)^4$ = Re 0.683. Thus the total present value of annuity of Re 1 is Rs. 3.169 :

$$PV = \frac{1}{(1.10)} + \frac{1}{(1.10)\,2} + \frac{1}{(1.10)\,3} + \frac{1}{(1.10)4}$$

$$= 0.909 + 0.826 + 0.751 + 0.683 = \text{Rs. } 3.169$$

If Re 1 would have been received as a lump sum at the end of the fourth year, the present value would be only Re 0.683. Notice that the present value factors of Re 1 after one, two, three and four years and so on can be ascertained from Table D (at the end of the book), and when they are aggregated we obtain the present value of the annuity of Re 1. The present value of an annuity of Re 1 for four years at 10 per cent interest rate is shown in Figure 2.2. It can be noticed that the present value declines over period for a given discount rate.

The computation of the present value of an annuity can be written in the following general form :

$$P = \frac{A}{(1+r)} + \frac{A}{(1+r)^2} + \frac{A}{(1+r)^3} + \ldots\ldots \frac{A}{(1+r)^n}$$

$$= \left[\frac{1}{(1+r)} + \frac{1}{(1+r)^2} + \frac{1}{(1+r)^3} + \ldots\ldots + \frac{1}{(1+r)^n} \right] \qquad (11)$$

where A is a constant payment (or receipt) each year. Equation (10) can be solved and expressed as follows :

$$PV = A \left[\frac{1}{1-\frac{1}{(1+r)^n}} \right]$$

or $$PV = A \left[\frac{(i+r)^n - 1}{i\,(1+r)^n} \right]$$

or $$P = A \left[\frac{1}{r} - \frac{1}{i(1+r)^n} \right] \quad (12)$$

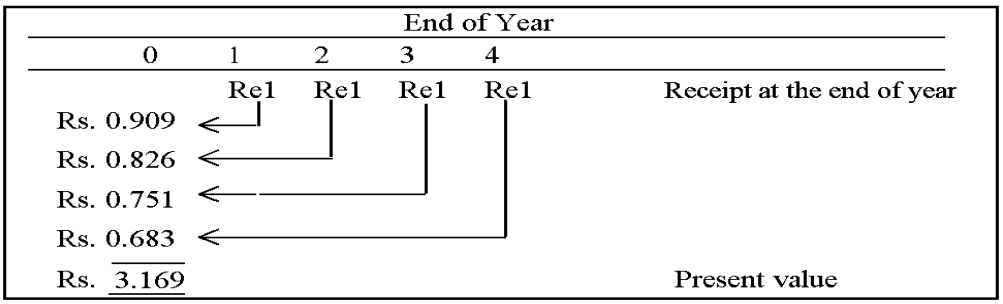

Figure 2.2 : Graphic representation of present value of an annuity of Re 1 at 10%

The term within parentheses of Equation (12) is the present value factor of an annuity of Re 1, which we will call PVAF, and it is a sum of single-payment present value factors.

To illustrate, let us suppose that a person receives an annuity of Rs. 5,000 for four years. If the rate of interest is 10 per cent, the present value of Rs.

5,000 annuity is :

$$PV = \text{Rs. } 5{,}000 \left[\frac{1}{\frac{1-\frac{1}{(1+10)_4}}{i}} \right] = \text{Rs. } 5{,}000 \times 3.170 = \text{Rs. } 15{,}850$$

It can be realised that the present value calculations of an annuity for a long period would be extremely cumbersome. Our calculations are, however, simplified when we use calculator or the precalculated present values of an annuity of Re 1 as given in Table D at the end of the book. Table D is constructed using Equation (12). To compute the present value of an annuity, we should simply find out the appropriate factor from Table D and multiply it by the annuity value. In our example, the value 3.170 solved using Equation (11) could be ascertained directly from Table D. Reading fourth row and 10 per cent column, the value is 3.170. Equation (12) can also be written as follows :

$$PV = A\,(PVAF_{n,r})$$

where $PVAF_{n,r}$ is present value factor of an annuity of Re 1 for n periods at r rate of interest. Applying the formula and using Table D, we get :

$$PV = Rs.\ 5,000\ (PVAF_{4,0.10}) = Rs.\ 5,000 \times 3.170 = Rs.\ 15,850$$

7. Applications of the Present Value of Annuity

The present value annuity formula can be applied in the following contexts :

How Much Can You Borrow for a Car : After reviewing your budget, you have determined that you can afford to pay Rs. 12,000 per month for 3 years towards a new car. You call a finance company and learn that the going rate of interest on car finance is 1.5 per cent per month for 36 months. How much can you borrow?

To determine how much you can borrow, we have to calculate the present value of Rs. 12,000 per month for 36 months at 1.5 per cent per month.

Since the loan payments are an ordinary annuity, the present value interest factor of annuity is :

$$PVIFA_{r,n} = \frac{(1+r)^n - 1}{r(1+r)^n} = \frac{(1+.015)^{36} - 1}{.015(1+.015)^{36}} = \frac{1.7091 - 1}{0.0256} = 27.70$$

Hence the present value of 36 payments of Rs. 12,000 each is :

Present Value = Rs. 12,000 × 27.70 = Rs. 332,400

You can, therefore, borrow Rs. 332,400 to buy the car.

Period of Loan Amortisation : Suppose you want to borrow Rs. 1,080,000 to buy a flat. You approach a housing finance company which charges 12.5 per cent interest. You can pay Rs. 180,000 per year toward loan amortisation. What should be the maturity period of the loan?

The present value of annuity of Rs. 180,000 is set equal to Rs. 1,080,000.

$180,000 \times PVIFA_{n,r} = 1,080,000$

$180,000 \times PVIFA_{n=?,\ r = 12.5\%} = 1,080,000$

$$180,000 \left[\frac{1.125^n - 1}{0.125 \times 1.125^n} \right] = 1,080,000$$

Given this equality the value of n is calculated as follows :

$$\frac{1.125^n - 1}{0.125 \times 1.125^n} = \frac{1,080,000}{180,000} = 6$$

$1.125^n - 1 = 6(0.125 \times 1.125^n) = 0.75 \times 1.125^n$

$0.25 \times 1.125^n = 1$

$1.125^n = 4$

$n \log 1.125 = \log 4$

$n \times 0.0512 = 0.6021$

$$n = \frac{0.6021}{0.0512} = 11.76 \text{ years}$$

You can perhaps request for a maturity of 12 years.

Determining the Loan Amortisation Schedule : Most loans are repaid in equal periodic instalments (monthly, quarterly, or annually), which cover interest as well as principal repayment. Such loans are referred to as amortised loans.

For an amortised loan we would like to know (a) the periodic instalment payment and (b) the loan amortisation schedule showing the break up of the periodic instalment payments between the interest component and the principal repayment component. To illustrate how these are calculated, let us look an example.

Suppose a firm borrows Rs. 1,000,000 at an interest rate of 15 per cent and the loan is to be repaid in 5 equal instalments payable at the end of each of the next 5 years. The annual instalment payment A is obtained by solving the following equation.

Loan amount = $A + PVIFa_{n=5, r=15\%}$

1,000,000 = A × 3.3532

Hence A = 298,223

The amortisation schedule is shown in Table 2.4. The interest component is the largest for year 1 and progressively declines as the outstanding loan amount decreases.

Table 2.4 : Loan Amortisation Schedule

Year	Beginning Amount (1)	Annual Instalment (2)	Interest (3)	Principal Repayment (2)-(3) = (4)	Remaining Balance (1)-(4)=(5)
1	1,000,000	298,329	150,000	148,329	851,671
2	851,671	298,329	127,751	170,578	681,093

3	681,093	298,329	102,164	196,165	484,928
4	484,928	298,329	72,739	225,590	259,338
5	259,338	298,329	38,901	259,428	– 90*

a. Interest is calculated by multiplying the beginning loan balance by the interest rate.

b. Principal repayment is equal to annual instalment minus interest * Due to rounding off error a small amount is shown.

Present Value of a Perpetuity

Perpetuity is an annuity that occurs indefinitely. Perpetuities are not very common in financial decision making. But one can find a few examples. For instance, in the case of irredeemable preference shares (i.e. preference shares without a maturity), the company is expected to pay preference dividend perpetually. By definition, in a perpetuity, time period, n, is so large (mathematically n approaches infinity) that the expression $(1+r)^n$ in Equation (12) tends to become zero, and the formula for a perpetuity simply becomes:

$$P = \frac{A}{r} \qquad (13)$$

Let us assume that an investor expects a perpetual sum of Rs. 500 annually from his investment. What is the present value of this perpetuity if his interest rate is 10 per cent? Applying Equation (13), we get :

$$P = \frac{\text{Rs. } 500}{0.10}$$

$$= \text{Rs. } 5{,}000$$

Present Value of a Growing Annuity

In financial decision-making there are number of situations where cash flows may grow at a compound rate. For example, in the case of companies dividends are expected to grow at a compound rate. Assume that to finance your studies in an evening college, you undertake a part-time job for 5 years. Your employer fixes an annual salary of Rs. 2000 with the provision that you will get annual increment at the rate of 10 per cent. It means that you shall get the following amounts from year 1 through year 5.

Year End	Amount of Salary (Rs.)		
1	2,000		= 1,000
2	2,000(1.10)	= 1,200	= 2,200
3	2,200(1.10)	= 2,000$(1.10)^2$	= 2,420
4	2,420(1.10)	= 1,000$(1.10)^3$	= 2,662
5	2,662(1.10)	= 1,000$(1.10)^4$	= 2,928

If your required rate of return is 12 per cent, the present value of your salary is calculated as follows :

Year End	Amount of Salary (Rs.)	PVF @ 12%	PV of Salary (Rs.)
1	2,000	0.893	1786
2	2,200	0.797	1754
3	2,410	0.712	1724
4	2,662	0.636	1694
5	2,928	0.567	1660
	12,210		8618

We can write the formula for calculating the present value as follows :

$$PV = \frac{A_1}{(1+i)} + \frac{A_2}{(1+i)^2} + \frac{A_3}{(1+i)^3} + \ldots\ldots \frac{A_n}{(1+i)^n}$$

$$= \left[\frac{A_1(1+g)^0}{(1+i)} + \frac{A_1(1+g)^1}{(1+i)^2} + \frac{A_1(1+g)^2}{(1+i)^3} + \ldots\ldots + \frac{A_1(1+g)^{n-}}{(1+i)^n} \right] \quad (14)$$

where g is the rate of growth of cash flows. We know that for calculating the present value of a non-growing annuity, we can use Equation (12) or Equation (13). With an adjustment in the discount rate for growth, we can use the same procedure for calculating the present value of cash flows growing at constant rate.

If Equation (12) is modified to incorporate growth in cash flows, it can be rewritten as follows :

$$PV = \frac{A}{1+g}\left[\frac{1-(1+i^*)^{-n}}{i^*}\right] \quad (15)$$

Note that i^* is the required rate of interest adjusted for growth. It can be found as follows :

$$\frac{i - g}{i^*} = 1 + g$$

If we use the data of the example above, the growth-adjusted rate of return would be :

$$i^* = \frac{0.12 - 0.10}{1.10} = 0.018$$

The present value factor for an annuity for 5 years at a rate 1.8 per cent is 4.740. Thus, the present value of your salaries would be :

$$P = \frac{\text{Rs. } 2{,}000}{1.10} \times 4.740 = \text{Rs. } 8618$$

Example 14 : A dividend stream commencing one year hence at Rs. 66 is expected to grow at 10 per cent per annum for 15 years and then ceases. If the discount rate is 21 per cent, what is the present value of the expected series?

$$P = \frac{A}{1+g}\left[\frac{1-(1+i^*)^{-n}}{i^*}\right] \quad \text{where } i^* = \frac{1 - g}{i + g}$$

hence

$$i^* = \frac{0.21 - 0.10}{1.10} = \frac{0.11}{1.10} = 0.10$$

and

$$\frac{A}{1+g} = \frac{\text{Rs. } 66}{\text{Rs. } 1.10} = \text{Rs. } 60$$

Referring to Table D at the end of the book, we find the present value of an annuity of Re 1 and 10 per cent for 15 years is 7.606, therefore :

$$P = Rs.\ 60 \times 7.606 = Rs.\ 456.36$$

In showing the calculation of the present value of constantly growing series of cash flows, we have assumed a finite time period. Cash flows may grow indefinitely. In mathematical term, we may say that n may extend to infinity (n) in Equation (14). Then the calculation of the present value of a constantly growing perpetuity becomes very simple ; it is given by the following equation:

$$P = \frac{A}{i - g} \qquad (16)$$

Thus, in the example above if the dividend is expected to grow perpetually, the present value would be :

$$P = \frac{66}{0.21 - 0.10} = \frac{Rs.\ 66}{0.11} = Rs.\ 600$$

Value of an Annuity Due

The concepts of compound value and present value of an annuity discussed earlier are based on the assumption that series of payments are made at the end of the year. In practice, payments could be made at the beginning of the year. When you buy a scooter on instalment sale, the dealer requires you to make the first payment immediately (viz. in the beginning of the first period) and subsequent instalments in the beginning of each period. Similarly it is common in lease or hire purchase contracts to require payments to be made in the beginning of each period. Lease is a contract to pay lease rentals (payments) for the use of an asset. Hire purchase contract involves regular payments (instalments) for acquiring (owning) an asset. A series of fixed payments starting at the beginning of each period for a specified number of periods is called an annuity due.

Present Value of an Annuity Due

Now a question arises : What is the present value of the annuity if each payment is made at the beginning of the year? Let us consider a 4-year annuity of Re 1 each year paid in the beginning of the year, the interest rate being 10 per cent. Note that the first payment is made immediately,

therefore its present value is equal to its absolute value. Other payments have been discounted at 10 per cent to compute their present values. Thus, the present value of the series of payments is :

$$PV = \frac{\text{Re } 1}{(1.10)^0} + \frac{\text{Re } 1}{(1.10)^1} + \frac{\text{Re } 1}{(1.10)^2} + \frac{\text{Re } 1}{(1.10)^3}$$

$$= \text{Re } 1 + \text{Re } 0.909 + \text{Re } 0.826 + \text{Re } 0.751 = \text{Rs. } 3.487$$

The formula for the present value of an annuity due is :

$$P = A\left[1 + \frac{1}{(1+r)} + \frac{1}{(1+r)^2} + \ldots + \frac{1}{(1+r)^{n-1}}\right] = A\left[\frac{1-(1+r)^{-n}}{r}\right](1+r) \quad (17)$$

$$P = A\,(PVAF_{n,r})\,(1+r) \quad (18)$$

Applying Equation (18), the present value of Re 1 paid at the beginning of each year for 4 years is :

$$\text{Re } 1(3.170)\,(1.10) = \text{Rs. } 3.487$$

The present value annuity factors in Table D should be multiplied by (1+r) to obtain relevant factors for an annuity due.

Effective versus Stated Rate

If the stated rate of interest is 12 per cent, a sum of Rs. 1000, will grow to Rs. 1,123.6 at the end of a year if compounding is done semi-annually. This means that Rs. 1,000 grows at the rate of 12.36 per cent per annum. The figure of 12.36 per cent is called the effective interest rate –the rate of interest under annual compounding which produces the same result as that produced by an interest rate of 12 per cent under semi-annual compounding.

The general relationship between the effective interest rate and the stated annual interest rate is as follows :

$$\text{Effective interest rate} = \left[1 + \frac{\text{Stated annual interest rate}}{m}\right]^m - 1$$

where m is the frequency of compounding per year.

Suppose a bank offer 12 per cent stated annual interest rate. What will be the effective interest rate when compounding is done annually, semiannually, and quarterly?

$$\text{Effective interest rate with annual compounding} = \left[1 + \frac{0.12}{1}\right] - 1 = 0.12$$

$$\text{Effective interest rate with semi-annual compounding} = \left[1 + \frac{0.12}{2}\right]^{4} - 1 = 0.1236$$

$$\text{Effective interest rate with quarterly compounding} = \left[1 + \frac{0.12}{4}\right] - 1 = 0.1255$$

When compounding becomes continuous, the effective interest rate is expressed as follows :

$$\text{Effective interest rate} = e^{r} - 1 \qquad (19)$$

Where e = base of natural logarithm

r = stated interest rate

2.3.3 NET PRESENT VALUE

We have stated in lesson 1 that the firm's financial objective should be to maximise the shareholder's wealth. Wealth is defined as net present value (NPV). NPV of a financial decision is the difference between the present value of cash inflows and the present value of cash outflows. Suppose you have Rs. 2,00,000. You want to invest this money in land which can fetch you Rs. 2,45,000 after one year when you sell it. You should undertake this investment if the present value of the expected Rs. 2,45,000 after a year is greater than the investment outlay of Rs. 2,00,000 today. You can put your money to alternate uses. For example, you can invest Rs. 2,00,000 in units (Unit Trust of India sells 'units' and invest money in securities of companies on behalf of investors) and earn, say, 15 per cent divided a year. How much should you invest in units to obtain Rs. 2,45,000 after a year? In other words, if your opportunity cost of capital is 15 per cent, what is the present value of Rs. 2,45,000 if you invest in land? The present value is :

$$PV = \text{Rs. } 2,45,000\ (PVF_{1.0,15}) = \text{Rs. } 2,45,000 \times 0.870 = \text{Rs. } 2,13,150$$

The land is worth Rs. 2,13,150 today, but that does not mean that your wealth will increase by Rs. 2,13,150. You will have to commit Rs. 2,00,000, and therefore, the net increase in your wealth or net present value is : Rs. 2,13,150-Rs. 2,00,000 = Rs. 13,150. It is worth investing in land. The general formula for calculating NPV can be written as follows :

$$NPV = \frac{A_1}{(1+r)} + \frac{A_2}{(1+r)^2} + ...+ \frac{A_n}{(1+r)^n} - C_0$$

$$NPV = \sum_{t=1}^{n} \frac{A_t}{(1+r)^t} - C_0 \qquad (20)$$

where A_t is cash inflow in period t, C_0 cash outflow today, r the opportunity cost of capital and t the time period. Note that the opportunity cost of capital is 15 per cent because it is the return foregone by investing in land rather than investing in securities (units). The opportunity cost of capital is used as a discount rate.

2.4 SOLVED PROBLEMS

1. If the interest rate is 12 per cent, what are the doubling periods as per the rule of 72 and the rule of 69 respectively?

   Solution : As per the rule of 72 the doubling period will be 72/12 = 6 years

   As per the rule of 69, the doubling period will be

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

2. A borrower offers 16 per cent nominal rate of interest with quarterly compounding. What is the effective rate of interest?

   Solution : The effective rate of interest is

   $$\left[1 + \frac{0.16}{4}\right]^4 - 1 = (1.04)^4 - 1$$
   $$= 1.17 - 1$$
   $$= 0.17 = 17 \text{ per cent}$$

3. A finance company advertises that it will pay a lumpsum of Rs. 44,650 at the end of five years to investors who deposit annually Rs. 6,000 for 5 years. What is the interest rate implicit in this offer?

   Solution : The interest rate may be calculated in two steps

(a) Find the FVIFA for this contract as follows :

Rs. 6,000 (FVIFA) = Rs. 44,650

$$\text{FVIFA} = \frac{\text{Rs. 44,650}}{\text{Rs. 6,000}} = 7.442$$

(b) Look at the FVIFA table and read the row corresponding to 5 years until 7.442 or a value close to it is reached. Doing so we find that

$FVIFA_{20\%,\ 5yrs.}$ is 7.442

So, we conclude that the interest rate is 20 per cent

4. What is the present value of the following cash stream if the discount rate is 14 per cent ?

Year	0	1	2	3	4
Cash flow	5,000	6,000	8,000	9,000	8,000

Solution : The present value of the above cash flow stream is :

Year	Cash Flow	($PVIFA_{14\%,n}$)	Present Value
0	Rs. 5,000	1.000	Rs. 5,000
1	6,000	0.877	5,262
2	8,000	0.769	6,152
3	9,000	0.675	6,075
4	8,000	0.592	4,736
			Rs. 27,225

5. Shyam borrows Rs. 80,000 for a musical system at a monthly interest of 1.25 per cent. The loan is to be repaid in 12 equal monthly instalments, payable at the end of each month. Prepare the loan amortisation schedule.

Solution : The monthly instalment A is obtained by solving the equation:

$$80{,}000 = A \times PVIFA_{n=12,\, r=1.25\%}$$

$$80{,}000 = A \times \frac{(1+r)^{12} - 1}{r\,(1+r)^{12}}$$

$$80{,}000 = A \times \frac{(1.0125)^{12} - 1}{(0.0125)(1.0125)^{12}}$$

$$= A \times \frac{1.16075 - 1}{0.0125 \times 1.16075}$$

$$= A \times 11.0786$$

Hence A = 80,000/11.0786 = Rs. 7221

The loan amortisation schedule is shown below :

Loan Amortisation Schedule

Month	Beginning Amount	Monthly Instalment	Interest Repayment	Principal Balance	Remaining
	(1)	(2)	(3)	(2)-(3)=(4)	(1)-(4)=(5)
1	80,000	7221	1000	6221	73779
2	73,779	7221	922.2	6298.8	67480.2
3	67,480.2	7221	843.5	6377.5	61102.7
4	61102.7	7221	763.8	6457.2	54645.5
5	54645.5	7221	683.1	6537.9	48107.6
6	48107.6	7221	601.3	6619.7	41487.9
7	41487.9	7221	518.6	6702.4	34785.5
8	34785.5	7221	434.8	6786.2	27999.3
9	27999.3	7221	350.0	6871.0	21128.3
10	21128.3	7221	264.1	6956.9	14171.4
11	14171.4	7221	177.1	7043.9	7127.1
12	7127.1	7221	89.1	7131.9	- 4.8[@]

@ Rounding off error

2.5 CHECK YOUR PROGRESS

1. The ……. for money is generally expressed by an interest rate.

2. The term ……...refers to the amount of money on which interest is received.

3. …….Compounding means that there are four compounding periods within the year.

4. An ……. is a fixed payment (or receipt) each year for a specified number of years.

5. The concept of the ……is the exact opposite of that of compound value.

2.6 SUMMARY

Money has time value. A rupee today is more valuable than a rupee a year hence. The time value of money are future value and present value.

Future value depends on compounding of interest to measure the value of future amounts. When interest is compounded, the initial principal/deposit in one period, along with the interest earned on it, becomes the principal of the following period and so on. Interest can be compounded annually, six monthly, quarterly, monthly, weekly, daily or even continuously. The more frequently interest is compounded, the larger is the future amount that will be accumulated. Table A in the appendix presents the future value interest factors used in the annual compounding of interest at various rates for a number of years. This table can also be used to evaluate the benefits of compounding interest more frequently than annually. Table B provides a short cut for finding the future value if the amount is annuity.

Present value represents the opposite (inverse) of compound value. In finding the present value of a future sum, we determine what amount of money today would be equivalent to the given future amount, considering the fact that we can earn certain return on this money. The sum is discounted using a discount rate. Table C and D in the Appendix contain present value interest factor for various discount rates and periods for mixed streams of cash flows and annuity cash flows respectively.

The future values and present values can be used to determine (i) the deposit needed to accumulate a future sum, (ii) loan amortisation payments (iii) interest and growth rates and so on. The present value of perpetuity can also be calculated.

2.7 KEYWORDS

Compound Interest: If interest for one period is added to the principal to get the principal for the next period, it is called compounded interest.

Present Value: It is a method of assessing the worth of an investment by inverting the compounding process to give present value of future cash flows.

Annuity: An annuity is a cashflow, either income or outgoings, involving the same sum in each period.

Perpetuity: A perpetuity is a financial instrument that promises to pay the equal cash flow per period.

2.8 SELF- ASSESSMENT TEST

1. 'Cash flows of two years in absolute terms are incomparable'. Give reasons in support of your answer.
2. Define the following terms and phrases :
   (a) Compound sum of an annuity
   (b) Present value of a future sum
   (c) Present value of an annuity
   (d) Perpetuity
   (e) Annuity
   (f) Discount rate
3. 'Generally individuals show a time preference for money'. Give reasons for such a preference.
4. Is the adjustment of time relatively more important for financial decisions with short-range implications or for decisions with long-range implications? Explain.
5. Explain the mechanics of calculating the present value of cash flows.
6. What happens to the present value of an annuity when the interest rate rises?
7. What is multi-period compounding? How does it affect the annual rate of interest? Give an example.

8. How does discounting and compounding help in determining the sinking fund and capital recovery?
9. Calculate the present value of Rs. 600 (a) received one year from now; (b) received at the end of five years; (c) received at the end of fifteen years. Assume a 5 per cent time preference rate.
10. Determine the present value of Rs. 700 each paid at the end of each of the next six years. Assume a 8 per cent rate of interest.
11. Assume a 10 per cent discount rate. Compute the present value of Rs. 1,100; Rs. 900; Rs. 1,500 and Rs. 700 received at the end of one through four years. For calculations, use the tables given at the end of the book.
12. Exactly ten years from now Shri Chand will start receiving a pension of Rs. 3,000 a year. The payment will continue for sixteen years. How much is the pension worth now, if Sri Chand's interest rate is 10 per cent?
13. How long will it take to double your money if it grows at 12 per cent annually?
14. Mohan bought a share 15 years ago for Rs. 10. It is now selling for Rs. 27.60. What is the compound growth rate in the price of the share?
15. Sadhulal Bhai is borrowing Rs. 50,000 to buy a low-income group house. If he pays equal instalments for 25 years and 4 per cent interest on outstanding balance, what is the amount of instalment? What shall be amount of instalment if quarterly payments are required to be made?

2.9 ANSWERS TO CHECK YOUR PROGRESS

1. Time value
2. Principal
3. Quarterly
4. Annuity
5. Present value

2.10 SUGGESTED READINGS

- Prasanna Chandra: Financial Management, Tata McGraw Hill.
- I.M. Pandey: Financial Management, Vikas Publishing House.
- John J. Hampton: Financial Decision Making, PHI.
- Ravi M. Kishore: Financial Management.
- Khan and Jain: Financial Management, Tata McGraw Hill.

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Lesson No.-03	**Updated By**: Dr. Poonam

CAPITAL BUDGETING DECISIONS

STRUCTURE

3.0 LEARNING OBJECTIVES

After reading this lesson, you should be able:

(a) to understand meaning and significance of capital budgeting decisions;

(b) to explain the process of evaluation of capital budgeting decisions; and

(c) to apply various methods of evaluating and ranking capital expenditure projects.

3.1 INTRODUCTION

Capital budgeting is one of the most important areas of financial decision making. It involves the selection of that assortment of investment opportunities which will make the optimum contribution to corporate objectives, and, of course, one of the most important corporate objectives is long-term profitability of the enterprises. Capital budgeting or investment decisions commit the company's resources far into the future, and thus vitally affect its future growth and profitability. Strictly speaking, investment decisions refer to those financial decisions which have relatively long-term financial consequences for the company. Capital budgeting is a broader term. It includes not only investment decisions but also the exploration of profitable investment opportunities, marketing and engineering

investigation of these opportunities and financial analysis as to their future profitability. However, the terms investment decisions and capital budgeting are generally used interchangeably.

Investment decisions may involve capital expenditure on: (i) cost reduction through modernization, rationalization, automation, etc., (ii) increasing production through expansion of capacity, creation of balancing facilities, replacement of semiautomatic plants with automatic ones etc., (iii) product improvement, addition to the existing product line, diversification, etc., and (iv) larger market share through establishment of new distribution outlets, creation of additional warehousing and transportation facilities, etc. Decisions involving capital outlays which fructify within a year are of a revenue nature and constitute part of short-range planning. Investment or capital budgeting decisions have long-term consequences. They usually have a gestation period and bring cash inflows to the company over a period of time. As such investment decisions constitute a part of long-range corporate planning.

Significance of Capital Budgeting

Capital expenditure decision is a single most important financial decision in as much as it affects the financial health of the enterprise for a long period of time. The very fact that this kind of decision deals with capital expenditure projects involving considerably large volume of capital, return on which will be flowing in the enterprise over a number of years bears testimony to its significance.

It should be noted at this juncture that capital expenditure decision involving the acquisition of major assets is not a routine process and whatever decision is taken can be reversed only at considerable cost to the company. This necessitates a careful job of planning and evaluation. This fact becomes more important particularly when the management is faced with problem of allocation of scarce resources among competing alternatives. A finance manager is required to choose the best alternative in order to maximise the wealth of the owners.

Another factor contributing to the significance of the capital expenditure decision is the risk exposure of burgeoning funds committed in capital expenditure projects, effect of which will be felt by the company over extended period of time. Once a multimillion investment is made in acquiring a sophisticated machine, the company cannot easily withdraw from continuing the construction. The long-term commitment of funds reduces the flexibility of the manager. The decision-maker is bound by the decision whether it is good or bad. Once he has committed the funds, he is at the mercy of future development.

Capital expenditure decision is also important because of its effects on operating expenditures and the patterns of cash flows for a longer period. For example, capital expenditure decision determines where and how the company's products will be manufactured which in turn shapes the basic character of the organisation, operations, cash flows, and the financial structure of the company.

Where a company is contemplating to diversify its operations or expand its activity the management is required to make a series of investment decisions. A company to grow and prosper has to make investment decision, otherwise the company's growth will be accompanied by financial strains.

Finally, sentient investment decision based on sophisticated techniques and managerial skill and experience will usually improve the timing and quality of asset acquisition. If done poorly, it will cost the company large sums of money because of over capacity or under capacity — sometimes at the same time. The company may have idle assets to produce a product that is not in demand while it has a shortage of the machinery and facilities to produce a much demanded high-profit product.

Planning Capital Expenditure

Since capital investment decisions involve long-term commitment of the company's financial resources and vitally affect its future growth and profitability, they are top management decisions. Such investment projects may, of course, originate from the shop-floor level, or the middle management level in the production division, or initiated by marketing or quality control division, head of the research and development division, or the personnel division. All the investment proposals, irrespective of their source of origin, are investigated for their technological feasibility, marketing implications, compatibility with overall corporate objectives, strategy and policies, and financial soundness. The most important criterion before the top management is the relative impact of various investment proposals on the future growth and profit making capability of the company.

Criterion for Investment

The investment projects are evaluated at various stages—the departmental and divisional level, the financial controller level, the project committee level, the chief executive level and finally the board level. As the capital projects are evaluated at multiple levels, it is imperative that an uniform evaluation criterion is used consistently and objectively at each level. The most widely accepted criterion of evaluating capital budgeting or investment decisions is estimated networth of the capital project. Every capital project involves one or a series of cash outflows and cash inflows. If the present value of

estimated cash inflows of a project exceeds the present value of cash outlays it has net cash benefits or net worth. If, on the other hand, present value of cash outflows on the project exceeds the present value of its cash inflows over its estimated life, it has net expenditure or net cash losses. Obviously, projects having net cash benefits are candidates for further consideration, while those involving net cash expenditure are out of the race. Among projects which have net cash benefits, the one having the maximum net cash benefit is selected for investment.

Net Investment and Net Cash Inflows

In matching cash outlays with cash inflows, we take into account net investment and net cash inflows.

Net Investment: Net investment is the incremental or marginal investment involved in an investment project at a point of time or over a period of time. It represents the net amount which is to be expended in executing the project. The net investment outlay of a capital project includes not only the expenditure on the new physical equipment and facilities, installation cost, etc., but also the value of the existing physical facilities that are to be used as part of the new project. The value of the existing facilities is not their book value but the amount of money that would have to be spent in acquiring facilities in comparative condition had they not been available, their opportunity cost or the amount of money that could be realised on their sale, whichever may happen to be the realistic alternative in the existing situation.

When a capital project replaces any existing physical facilities (for example, a new lathe machine replaces an old one), its book value shown in the books of accounts is of no relevance in estimating the outlay of the capital project. It is to be regarded as sunk cost resulting from a past decision. Perhaps its operational life had been overestimated and it had not been depreciated fully over its real operational life. The loss on the old facility is a book loss and involves no cash outflows. As such it is not to be included in estimating the cash outflows associated with the investment project under consideration.

However, if the existing physical facility is disposed of and fetches some price, that is to say, it has a salvage value, it should be deducted from the capital outlay of the new project in order to arrive at the net investment outlay.

Cash Inflows: Net cash inflows of a project are based on an estimate of future streams of cash generated as a result of the fructification of the investment project. These estimates are based on a number of forecasts. These forecasts relate to production, plant performance, market share, sales

revenues, profit margin , tax laws, state of the economy, etc. Cash inflows at various points of time have to be estimated on the basis of these and other forecasts. These estimates are more than mere guesses as they are based on systematic forecasts and past experience of the company and industry. Nevertheless, projections of future cash inflows are not more than estimates and must contain an element of variance.

Net Cash Benefits: Net cash benefits are net cash inflows over a period of time resulting from the capital project. Net cash inflows are incremental cash inflows, and are estimates of cash revenues minus all cash outflows including maintenance costs, corporate taxes, etc. Depreciation, being noncash expense, is excluded but tax benefit resulting from depreciation appropriation is included in cash inflows. Another component of cash inflow is the salvage value, if any, of the physical facility at the end of its operational life. Removal expenses and capital gains taxes, if any, are to be deducted from it. Lastly, working capital representing the value of current assets released at the end of the operational period of the physical facility, are to be taken into account. Thus net cash inflows are equal to cash revenues minus cash expenses plus tax benefit from depreciation appropriation plus salvage value of physical facility net of removal charges and capital gains tax value of current assets released.

Illustration: Novex Manufacturing company bought a machine 5 years ago at a cost of Rs. 15,000. The machine had an expected life of 15 years at the time of purchase and a zero estimated salvage value at the end of 15 years. It is being depreciated on a straight line basis and has a book value of Rs. 10,000 at present. The purchase manager reports that he can buy a new machine for Rs. 20,000 which over its 10 years life will expand sales annually from Rs. 20,000 to Rs. 22,000. Further, it will reduce operating cost from Rs. 14,000 to Rs. 10,000. The old machine's current market value is Rs. 2,000. Taxes are at present 50 per cent and the company's cost of capital is 10 per cent. Calculate cash outflow of the project and net cash inflows.

Solution

(i)	Estimating Net Investment Outlay	Rs.
	Invoice Price of New Machine	20,000
	Less: Tax Savings	4,000
	Less: Salvage value of old machine	2,000
	Net Cash Outlay	14,000

(ii) Estimating Net Cash Benefits

	Without New Investment	With New Investment
Sales	20,000	22,000
Operating cost	14,000	10,000
Depreciation (D)	1,000	2,000
Taxable Profit	5,000	10,000
Less: Income Tax	2,500	5,000
Profit after Tax (P)	2,500	5,000
Cash Benefits (P + D)	3,500	7,000

Incremental cash benefits Rs. 3,500 (7,000 - 3,500)

Present Value of Future Cash Flows: Before we start discussing investment evaluation methods, it will be useful to understand the concept of Present Value of Money or Discounted Cash Flows. It is generally agreed that a rupee received tomorrow does not have the same value to us as a rupee received today. This is so for several reasons.

1. Tomorrow is hidden in the mysteries of the unknown and is attendant with risks and uncertainties. One may fairly accurately peep into the tomorrow yet never be sure about it. There is often a slip between the cup and the lips. One is sceptical even about the money in the bank payable tomorrow because he may have left this mortal world before tomorrow comes.
2. Money invested in securities, deposited in bank, lent to a private party or invested in business generally grows in value. A rupee invested today is likely to be more than a rupee tomorrow. Therefore, a rupee to be received tomorrow is worth less than a rupee today.
3. Often people have subjective time preference for money. Many of us will like to consume their rupee worth of comforts today rather than wait for tomorrow which may never come.

It is because of one or more of these factors that if a businessman expects that he will receive a certain sum of money after a year, or a series of future payments, he wants to know suitable rate of interest. This rate of interest is usually the cost of capital or the required rate of return, and sometimes even an

arbitrary cut-off point. The present value or *PV* of future cash flow of Re. 1 to be received in *n* years is computed by the following formula:

$$PV = \frac{1}{(1 + K)^n}$$

where *PV* = present value

K = the discount rate.

If rate of interest is 10 per cent and money is to be received after one year, Re. 1 one year later will be worth:

$$PV = \frac{1}{(1 + 10)^1} = \text{Re. } 0.90909$$

If rate of interest or discount rate is 10 per cent and Re. 1 is to be received after 5 years, its present value will be as follows:

$$PV = \frac{1}{(1 + 10)^5} = \text{Re. } 0.6209$$

3.2 INVESTMENT DECISION CRITERIA

The most important basis of making an investment or capital budgeting decision is to determine whether the particular capital project will earn the desired rate of return. In case a management has a number of alternative capital projects for consideration, it will be necessary to determine which of them is the most profitable, and also whether the most profitable one earns to determine which of them is the most profitable, and also whether the most profitable one earns at least the desired rate of return. A number of methods for evaluating capital investment projects are available. Before discussing the various investment methods and their relative merits and demerits, it is necessary to make it clear that most of these methods evaluate investment projects on one criterion only and that is profitability. The management may have a number of other criteria besides profitability such as its public image, market share, future growth, excellence in quality, price leadership, etc. In making the final investment decision a management may find that some or all of these latter criteria are not wholly compatible with the profitability criterion and it may try to strike a balance between them. In doing this, it exercises judgement. In fact, there is no investment decision, or for that matter any decision in which

management does not have to exercise its judgement. Project evaluation on profitability criterion helps this judgement.

The commonly used methods of decision making for selecting capital projects are:

1. Ranking by inspection
2. The payback period
3. Accounting rate of return
4. Average rate of return
5. Net present value method
6. Profitability index
7. Internal rate of return or the yield of investment method

3.2.1 Ranking by Inspection

In some cases, it is possible to evaluate investment projects on profitability criterion by merely looking at them and without using any other complicated technique.

This is possible in two situations:

1. When competing investment projects have: (i) identical cash outlays, and (ii) identical cash inflows over a period of time, but in one case inflows continue for a longer time than in others. On this basis, capital project B in Table 1 is obviously more profitable than project A.
2. When two investment projects have equal aggregate inflows but in one case inflows are larger in the earlier years than those in the later years. In Table 1, C and D are projects of this type, and project D is distinctly and obviously superior than project C.

Table 1: Ranking by Inspection Method

Capital project	Net Investment outlay (Rs.)	Net Cash inflows (Rs.)	
		Year 1	Year 2
A	25,000	25,000	-
B	25,000	25,000	5,000
C	25,000	15,000	20,000
D	25,000	20,000	15,000

E	25,000	20,000	10,000
F	25,000	15,000	20,000

But the simple ranking method of capital project evaluation cannot be used when the alternate projects have unequal aggregate cash inflows, and at the same time, inflows at various time periods are also unequal. In case of capital projects E and F, it is not possible to make investment decision only on the basis of inspection. This method is all the more unsuitable in cases where the above conditions are combined with unequal investment outlays. Moreover, this method also does not take into account the time value of money. All the outflows and inflows are considered on their nominal value even though various installments of cash flows may occur at different time periods. The advantage of this method is that it is simple and does not require an expert to evaluate the capital projects.

3.2.2 Payback Period Criterion

Payback period is the time period during which net cash outlays on capital project are equal to the net cash inflows. Simply put, it is the time period during which capital investment pays off its full value. It is relatively a simple method of evaluation, and it is widely used. Its computation is simple and can be done by the following formula in cases where inflows are in the nature of a series of uniform amounts.

$$\text{Payback period} = \frac{\text{total cash outlay}}{\text{annual cash inflows}}$$

For example, an investment project involves a net cash outlay of Rs. 20,000 and annual cash inflows are in the amount of Rs. 10,000 for five years. Payback period in this case is:

$$\frac{\text{Rs. } 20{,}000}{\text{Rs. } 10{,}000} = 2 \text{ years}$$

In case of projects A and B, shown in Table 1, payback period is one year.

If net cash inflows are of an uneven nature, as in the following example, payback will be computed as shown in Table 2.

Table 2: Computation of Payback Period

Year	Net cash outlays (Rs.)	Annual net cash inflows (Rs.)	Cumulative net cash inflows (Rs.)
1	10,000	5,000	5,000

2	-	4,000	9,000
3	-	3,000	12,000

Payback period in this case is more than two years but less than three years. In the whole of the third year, net cash inflow is Rs. 3,000. Assuming that cash inflows are in an even amount from month to month it will take (Rs. 1,000)/(Rs. 3,000) = 1/3 year to get cash inflow of Rs. 1,000.

Payback period = 2 + 1/3 years. Companies using payback criterion for accepting or rejecting the proposed investment projects predetermine a maximum or required payback period which acts as a decision rule for investment decisions. Projects which have a payback period equal to or less than this predetermined payback period are accepted, and projects with playbacks greater than this period are rejected.

Payback period method of capital project evaluation recommends itself in companies which are subject to rapid technological changes such as pharmaceutical, electronics and space industries, or to rapid consumer taste changes such as clothing industry. Such companies have to make huge investments in research and development, production facilities and marketing, and they are keen to recover it before their products become obsolete. It is also used by companies when money market is tight, or when they have surplus cash resources available for a short period of time. It is simple to calculate and management can know in relatively definite terms how long it will take to get its money back. It, of course, tells nothing about relative merits of alternate investment projects in terms of surplus generation.

Its most obvious limitation, as in case of ranking by inspection method, is that it does not take into account time value of money. All streams of cash inflows whether received now or a year or ten years after have the same value in the computation of payback period.

The payback method of investment evaluation does not take into account the post-payback surplus generating capacity of alternate investment projects. In case of projects illustrated in Table 1, payback period for both projects E and F is the same $1\frac{1}{2}$ years and it is a matter of indifference to management as to which project is accepted. But a glance at net cash inflows shows that project F is to be preferred over project E as net cash inflow of the former after one year is larger than of the latter. Thus the payback period method of investment analysis has the same weakness as the ranking by inspection

method: it does not take into account the time value of money. These weaknesses of the payback period criterion make it unsuitable as a tool of investment decisions.

3.2.3 Average Rate of Return

The average rate of return method of investment decisions is very similar to the accounting rate of return method except that in place of aggregate of additional net income, we use its average as numerator. Thus, average rate of return for the investment project in the preceding example, will be as follows:

$$\text{Average Rate of Return} = \frac{\text{Average income}}{\text{Average investment}}$$

Illustration: Management of Raj Electricals is contemplating to buy a machine for manufacturing purpose. There are presently two machines available in the market which could serve the purpose. Details about these two machines are set out below:

	Machine A (Rs.)	**Machine B (Rs.)**
Cost	30,000	30,000
Annual income estimated after depreciation and tax Ist year	5,500	6,700
IInd year	8,000	7,200
IIIrd year	8,400	8,500
IVth year	8,800	7,000
Vth year	9,000	8,800
Estimated life in years	5	5
Average income Tax Rate	55%	55%

Depreciation on straight-line basis

Which machine should the management buy? Assume that the management uses accounting rate of return for the project.

Solution

$$\text{Average Income} = \frac{\text{Total Income during the life of the project}}{\text{Life of the Project}}$$

$$\text{Average Income of Machine A} = \frac{\text{Rs. } 39{,}700}{5 \text{ years}} = \text{Rs. } 7{,}940$$

$$\text{Average Income of Machine B} = \frac{\text{Rs. } 38{,}200}{5 \text{ years}} = \text{Rs. } 7{,}640$$

Average investment = Original Investment ÷ 2

$$\text{Average Investment of Machine A} = \frac{\text{Rs. } 30{,}000}{2} = \text{Rs. } 15{,}000$$

$$\text{Average Investment of Machine B} = \frac{\text{Rs. } 30{,}000}{2} = \text{Rs. } 15{,}000$$

$$\text{ARR of Machine A} = \frac{\text{Rs. } 7{,}940}{\text{Rs. } 15{,}000} \times 100 = 52.93\%$$

$$\text{ARR of Machine B} = \frac{\text{Rs. } 7{,}640}{\text{Rs. } 15{,}000} \times 100 = 50.93\%$$

Since rate of return on machine A is higher as compared to machine B, the management should acquire machine A.

It should be noted at this juncture that income figure is not based on cash flows but upon the reported accounting profits.

The average rate of return also ignores time value of money and it is based on book income instead of cash flows. This shortcoming can, however, be removed by using the data of cash inflows instead of accounting data.

We have seen that one of the serious limitations of all the methods of investment decisions discussed above is that none of them takes into account the present value of the future streams of cash inflows and capital outlays. The next three methods, viz., the net present value method, the internal rate of return or the yield of investment method, and the profitability index method take account of the timings of cash

flows. As a group these methods are called discounted cash flow methods. These methods overcome the shortcomings of all other methods of project evaluation by taking into account (i) cash flows over the entire operational life of the capital project, as well as (ii) present values of future streams of cash flows.

3.2.4 Net Present Value (NPV) Method

The net present value (*NPV*) method, also called the discounted benefit-cost ratio method, of capital budgeting is based on a comparison of the present values of the investment outlays and that of cash inflows.

1. The first step in computing the present values of investment outlays and cash inflows is to determine the rate of discount. This discount rate is the cost of capital of the firm or the rate of return desired by the firm on its investments.

2. Once this discount rate is determined, the financial manager has to compute the present values of cash outlays of the capital project by discounting future cash outlays at the predetermined discount rate. If the capital assets acquired for the capital project have any salvage value, its present value has to be set off against the present value of the cash outlays. To illustrate, a capital project involves a cash outlay of Rs. 50,000 in the present and future outlays of Rs. 10,000 in the first year, Rs. 8,000 in the second year and Rs. 5,000 in the third year. The salvage value of the plant after 5 years is Rs. 10,000. Rate of discount is 10 per cent. The computation of present value of investment in this capital project is given in Table 3.

Table 3: Computation of Present Value of Investment Outlays

Table 3 : Computation of Present Value of Investment Outlays

Time period	*Investment outlay (Rs.)*	*Present value factor*	*Present value of investment (Rs.)*	*Salvage value at the end of 5 yrs. (Rs.)*	*Present value factor*	*Present value of salvage (Rs.)*	*Present value of net investment (Rs.)*
Present 1	50,000	-	50,000				
end of 2	10,000	0.909	9,090				
year 3	8,000	0.826	6,608				
4	5,000	0.751	3,755				
5				10,000	0.621	6,210	
Total	Rs. 73,000		Rs. 69,453			Rs. 6,210	Rs. 63,243

As mentioned in an earlier section, these present values can be computed by the formula:

$$PV = \frac{1}{(1 + K)^n}$$

where *PV* is present value and *K* is the discount rate. Let us remember that these present value computations are based on the assumptions that each outlay has been made in one instalment, and also that it has been made at the year end.

As shown in Table 3 the present value of investment outlays discounted at 10 per cent compound rate is Rs. 63,243. This is the minimum amount which the firm must get back in the form of cash inflows from the capital project in order to leave its present value unaffected.

3. The third step in analysis for investment decisions is to determine the present value of the cash inflows expected to be generated by the investment outlays. In estimating the cash inflows, depreciation is disregarded as it represents only a book entry and does not involve any cash outflow. All other direct and indirect expenses including operational and maintenance costs are deducted from the total cash receipts in order to arrive at the cash inflows. Thus cash inflows are total revenue receipts minus all cash expenses.

Cash inflows are to be discounted at a predetermined discount rate which is equal to the cost of capital or the required rate of return. The discount rate for determining the present values of cash inflows is the same as that for discounting investment outlays, and is computed by the same formula:

$$PV = \frac{CF_1}{(1+k)} + \frac{CF_2}{(1+k)^2} + \ldots + \frac{CF_n}{(1+k)^n}$$

Let us assume that the investment project illustrated earlier will generate Rs. 30,000, 40,000, 50,000, 30,000 and 20,000 at the end of the first, second, third, fourth and fifth year. What is the present value of these streams of cash inflows at 10 per cent discount rate.

Time period	Cash inflows (Rs.)	Present value factor	Present value of cash inflows (Rs.)
1	30,000	0.909	27,270
2	40,000	0.862	34,480

3	50,000	0.751	37,550
4	30,000	0.683	20.490
5	20,000	0.621	12,420

Total present value of cash inflows = Rs. 1,32,210

4. The fourth and the final step in capital project evaluation is to compare the present value of cash outlays with the present values of cash inflows. The difference is the net present value (NPV). If the net present value is negative, the project results into a financial loss to the company; if it is positive, it results into a financial gain, and if it is zero, it is no profit no loss situation. In case of the above investment project, present value of investment outlays is Rs. 63,243 and present value of cash inflows is Rs. 1,32,210. It has positive net cash flows, or what may be called net present value to the extent of Rs. 68,967. Hence the capital project is acceptable from the financial criterion.

3.2.5 Profitability Index

A firm can also use the net present value method to select the best out of a number of investment projects. This can be done by computing profitability index of each project on the basis of the present value of its investment outlays and cash inflows.

$$\text{Profitability index} = \frac{\text{Present value of cash inflows}}{\text{Present value of investment outlays}}$$

The hypothetical present values of investment outlays and cash inflows of three capital projects are given in Table 4, and they have been ranked on the criterion of profitability. The most profitable and therefore the most acceptable project from profitability criterion is project *C*. Profitability index is thus an effective tool of ranking the alternate investment projects and provides a sound basis for the selection of the most profitable one.

Table 4: Selection of investment Project by Profitability Index

Investment project	*Present value of investment outlays (Rs.)*	*Present value of cash inflows (Rs.)*	*Profitability index (3 ÷ 2)*	*Ranking*
1	*2*	*3*	*4*	*5*
A	50.000	70.000	1.400	2
B	90.000	100.000	1.111	3
C	40.000	60.000	1.500	1

The shortcoming of *NPV* method is that it does not tell us the rate of return on a single or alternate investment projects. It merely tells whether net present value generated by a capital project is equal to, more or less than the required rate of return. It does not tell us how much. Profitability index provides a basis of comparability and serves as a tool for selecting the most profitable project; it does not tell us how much better one project is as compared to others.

3.2.6 Internal Rate of Return Method

The internal rate of return (*IRR*) method of project evaluation is also called, 'yield of investment', 'marginal efficiency of capital' and 'discounted cash flow rate of return'. It removes the shortcomings of the present value method as it tells us the rate of return expected to be yielded by various investment projects.

The yield of investment or the internal rate of return is the discount rate at which present values of investment outlays and of future streams of cash inflows are equal. This discount rate is the true rate of return or yield on investment. In the present value method, the discounting rate is determined in advance and it is either the cost of capital or the desired rate of return. In case of the yield method, the discount rate at which present values of investment outlays and inflows are equal is found by trial and error. It can be computed by using the following formula:

$$\sum_{t=0}^{n} \frac{A_t}{(1+r)^t} = 0$$

where r = rate of discount = internal rate of return

A = net cash flow for period *t*

n = total period during which cash flow is expected.

If investment outlay occurs only once and that too at time 0, then the above equation can be expressed as follows:

$$A_0 = \frac{A_1}{(1+r)^1} + \frac{A_2}{(1+r)^2} + \frac{A_3}{(1+r)^3} + \ldots + \frac{A_n}{(1+r)^n}$$

$$A_0 = \sum_{t=1}^{n} \frac{A_t}{(1+r)^t}$$

Here *r* is that rate of discount at which present value of A_1 through A_n (future stream of cash inflows) is equal to A_0 (investment outlay at time 0).

As mentioned earlier, the discount rate can be ascertained only through a process of trial and error. First, we arbitrarily select a discount rate (*r*) and compute present values of future streams of investment outlays, i.e., costs (*C*), and also present values of future streams of cash inflows, i.e., benefits (B). If $B = C$, *r* is the correct rate of discount as also the yield rate or the internal rate of return (*IRR*). If $B > C$, it means that a higher rate should be tried to equate *B* and *C*; in case $C > B$ it means that a lower discount rate should be tried. This process of trial and error goes on until we hit at a discount rate at which $B = C$.

Problem

Let us suppose that investment on a capital project is Rs. 45,000. Cash inflows for five years are Rs. 15,000, Rs. 20,000, Rs. 20,000, Rs 10,000. What is the yield of investment?

Let us now compute *PV* of cash inflows at 20 per cent discount rate. This is done in Table 5.

Table 5: Computation of Yield of Investment

Time period	Cash inflows (Rs.)	PV factor at 20 per cent	PV of cash inflows at 20 per cent (Rs.)	PV factor at 22 per cent	PV of cash inflows at 22 per cent (Rs.)
1	15,000	0.833	12,495	0.820	12,300
2	20,000	0.694	13,880	0.672	13,440
3	20,000	0.579	11,580	0.551	11,020
4	10,000	0.482	4,820	0.451	4,510
5	10,000	0.402	4,020	0.370	3,700
			46,795		**44,970**

Present value of investment (it is the same as investment outlay because the investment is to be made at the beginning of the time period) is Rs. 45,000. *PV* of cash inflows at 20 per cent discount rate is Rs. 46,795. Since in this case $B > C$, the actual yield of investment should be more than 20 per cent. Therefore, we calculated *PV* of cash inflows at 22 per cent discount rate and found that it is Rs. 44,970. Now $C > B$. Therefore, the yield of investment is less than 22 per cent.

We come to the conclusion that the actual yield of investment lies between 22 per cent and 20 per cent. Let us find the actual yield of investment by using the formula:

$$\text{Actual IRR} = D + \frac{\text{PV of inflows at lower D - PV of Investment Outlays}}{\text{PV of investment at lower D - PV of inflows at higher D}} \times \Delta D$$

where, IRR = Internal Rate of Return or yield on investment

D = lower discount rate

ΔD = Difference between the two discount rates

$$20 + \frac{\text{Rs. } 46.795 - 45.000}{\text{Rs. } 46.795 - 44.970} \times 2 = 21.97 \text{ per cent}$$

Actual yield of investment or *IRR* = 21.97 per cent.

In case yield of investment or *IRR* is equal to or more than the desired rate of return, the project is accepted; otherwise it is rejected. *IRR* is also used to rank the projects in order of their profitability.

The yield of investment method is more complicated than the present value method as it is to be computed by the trial and error method. It becomes even more complex if investment outlays are made over a period of time rather than in one block at the beginning of the time period, and the capital assets have a salvage value. However, in such cases the yield of investment method can be used with the help of computer.

Net Present Value Method Vs. Internal Rate of Return— Which is Better ?

These two methods sometimes give contradictory results when used for the selection of the most profitable investment project from among mutually exclusive projects, i.e. if one is selected, the others have to be rejected. This can be seen from the following example.

Problem

Two alternative capital projects *X* and *Y* involve an investment outlay of Rs. 36,000 each. The streams of cash inflows are as follows:

Year	Cash inflows (Rs.)	
	Project X	Project Y
1	25,000	5,000

2	20,000	10,000
3	5,000	10,000
4	5,000	10,000
5	5,000	45,000

The required rate of earnings is 10 per cent. Which of the two projects should be accepted?

Solution

Year	PV factor at 10 per cent	Cash inflows of Project X (Rs.)	PV of cash inflows of Project X (Rs.)	Cash inflows of Project Y (Rs.)	PV of cash inflows of Project Y (Rs.)
1	0.909	25,000	22,725	5,000	4,545
2	0.826	20,000	16,520	10,000	8,260
3	0.751	5,000	3,755	10,000	7,510
4	0.683	5,000	3,415	10,000	6,830
5	0.621	5,000	3,105	45,000	27,945
	PV of total cash inflows 49,520				55,090

NPV of Project *X* = Rs. 49,520 - Rs. 36,000 = Rs. 13,520

NPV of Project *Y* = Rs. 55,090 - Rs. 36,000 = Rs. 19,090

Since Project *Y* has larger *NPV* than Project *X*, it is to be accepted and Project *X* rejected.

Project	Net Present Value	Decision
Y	Rs. 19,090	Accept
X	Rs. 13,520	Reject

Selection of Project by Yield of Investment Method

Table 7: Selection of Capital Projects by the Yield of Investment Method Project X

Year	Cash inflows (Rs.)	PV factor at 20 per cent	PV of cash inflows at 20 per cent (Rs.)	PV factor at 32 per cent	PV of cash inflows at 32 per cent (Rs.)

1	25,000	0.833	20,825	0.758	18,950
2	20,000	0.694	13,880	0.574	11,480
3	5,000	0.579	2,895	0.435	2,175
4	5,000	0.482	2,410	0.329	1,645
5	5,000	0.402	2,010	0.249	1,245
			Rs. 42,020		Rs. 35,495

Project Y

Year	*Cash inflows (Rs.)*	*PV factor at 34 per cent*	*PV of cash inflows at 34 per cent (Rs.)*	*PV factor at 20 per cent*	*PV of cash inflows at 20 per cent (Rs.)*
1.	5.000	0.746	3.730	0.833	4.165
2.	10.000	0.557	5,570	0.694	6,940
3	10.000	0.416	4,160	0.579	5,790
4	10.000	0.310	3,100	0.482	4,820
5	45.000	0.231	10,395	0.402	18,090
			Rs. 26,955		**Rs. 39,805**

In case of Project *X*, *PV* of cash inflows at 20 per cent rate of discount is higher than the *PV* of investment outlay. Therefore, the actual yield of investment must be higher than 20 per cent. We next tried 32 per cent rate of discount. At this rate *PV* of cash inflows is lower than the *PV* of investment outlay. Therefore, actual yield of investment must lie between 20 per cent and 32 per cent.

In case of Project *Y*, *PV* of cash inflows at 34 per cent rate of discount is lower than the *PV* of investment outlay. Therefore, the actual yield of investment must be lower than 34 per cent. We next tried 20 per cent discount rate and found that at this rate *PV* of cash inflows is higher than the *PV* of investment outlay. Therefore, actual investment yield of Project *Y* must lie between 34 per cent and 20 per cent.

Let us now compute the actual investment yields of Projects *X* and *Y* by using the formula given earlier.

Actual yield of investment of Project *X*

$$= 20 + \frac{\text{Rs. } 42{,}020 - \text{Rs. } 36{,}000}{\text{Rs. } 42{,}020 - \text{Rs. } 35{,}495} \times 12 = 31.07 \text{ per cent}$$

Actual yield of Investment of Project *Y*

$$= 20 + \frac{39.805 - 36.000}{39.805 - 26{,}955} \times 14 = 24.14 \text{ per cent}$$

Since yield of investment of Project *X* is higher than that of Project *Y*, it should be accepted against Project *Y*.

Project *X* Yield = 31.07 per cent Accept

Project *Y* Yield = 24.14 per cent Reject

In this illustration, according to the *NPV* method, Project *Y* is to be accepted in preference to Project *X* as it has larger net present value; and according to yield of investment method, Project *X* has higher yield than Project *Y*. Hence Project *X* is to be selected and *Y* is to be rejected. These contradictory results are obtained because of the different assumptions underlying the two methods. The yield of investment method assumes that all future streams of cash inflows are reinvested at the yield rate over the life of the project. The net present value method assumes that the cash inflows generated during the operational life of the project are reinvested at the discount rate.

Since the management's objective is to maximize the shareholder's wealth, and, therefore, the value of the firm, the net present value method provides the correct criterion of investment decisions. A company should select the project which has the maximum *NPV* out of the mutually exclusive projects under its consideration. The project with the maximum *NPV* makes maximum contribution to the present value of the firm.

3.3 RISK IN INVESTMENT DECISIONS

Risk involves situations in which the probabilities of an event occurring are known and these probabilities are objectively or subjectively determinable. The main attribute of risk situation is that the event is repetitive in nature and possesses a frequency distribution. It is the inability to predict with perfect knowledge the course of future events that introduces risk. As events become more predictable, risk is reduced. Conversely, as events become less predictable, risk is increased. Thus, if Rs. 10 lakhs is

invested in stock of a company organised to extract coal from a mine, then the probable return cannot be predicted with 100 per cent certainty. The rate of return on the above investment could vary from minus 100 per cent to some extremely high figure and because of this high variability, the project is regarded as relatively risky. Risk is then associated with project variability — the more variable the expected future returns from the project, the riskier the investment.

Sources of Risk

The first step in risk analysis is to uncover the major factors that contribute to the risk of the investment. Four main factors that contribute to the variability of results of a particular investment are size of the investment in the project, reinvestment of cash flows, variability of cash flows and life of the project.

1. **Size of the Investment:** A large project involving greater investments entails more risk than the small project because in case of failure of the large project, the company will have to suffer considerably greater loss and it may be forced to liquidation. Furthermore, cost of a project in many cases is known in advance. There is always the chance that the actual cost will vary from the original estimate. One can never foresee exactly what the construction, debugging, design and developmental costs will be. Rather than being satisfied with a single estimate, it seems more realistic to specify a range of costs and the probability of occurrence of each value within the range. The less confidence the decision-maker has in his estimate, the wider will be the range.
2. **Reinvestment of Cash Flows**: Whether a company should accept a project that offers a 20 per cent return for two years or one that offers a 16 per cent return for three years would depend upon the rate of return available for reinvesting the proceeds from the 20 per cent, two-year period. The danger that the company will not be able to reinvest funds as they become available is a continuing risk in managing fixed assets and cash flows.
3. **Variability of Cash Flows:** It may not be an easy job to forecast the likely returns from a project. Instead of basing investment decision on a single estimate of cash flow it would be desirable to have range of estimates.
4. **Life of the Project:** Life of a project can never be determined precisely. The production manager should base the investment decision on the range of life of the project.

Measurement of Risk

1. Probability Distribution: As stated above, a risky proposition in a business enterprise is presumed to be one with a wide range of possible outcomes. If a range of possible outcomes for cash flow in each year is arranged in the form of a frequency distribution, it is known as a probability distribution. The probability that a particular event will occur is a measure of its likelihood of occurrence. Probabilities normally are stated as decimal fractions to 1.0.

In capital budgeting usually the forecast of annual cash flow in one single figure is made. This is the most likely or most probable outcome perceived by the forecaster for the proposal. The question that arises in this connection is how much the forecaster is confident about this outcome. Is he very certain, very uncertain or somewhere in between? This degree of uncertainty can be defined and measured in terms of the forecaster's probability distribution. Thus, a probability distribution consists of just a few potential outcomes, viz., on optimistic estimate, a pessimistic estimate and a most likely estimate or alternatively one could make high, low and best guess estimates. An analysis is not limited to these three alternatives. Any number may be used to express the future conditions applicable to the project.

Normally, the most likely estimate represents the expected value of the variable. This is in the middle of the other possibilities and has the highest probability of occurrence. Weighted arithmetic mean provides expected value. This value is constructed by multiplying each possible outcome by its associated probability and summing the products. The following formula is used to compute the expected value of the distribution:

$$\text{Expected Value} = R = \sum_{i=1}^{n} (R_i P_i)$$

Where, R_i = the return associated with each outcome

P_i = the probability of occurrence of each outcome

R=the expected value

2. Standard Deviation as a Measure of Risk: Probability distribution provides the basis for measuring the risk of a project. The rule set down in this connection is "the higher the probability distribution of expected future return, the smaller the risk of a given project and the vice versa". To measure the rightness or dispersion of the probability distribution the most widely used statistical

technique of standard deviation is employed. The following steps are used to calculate the standard deviation:

1. Calculate the mean of expected value of the distribution.
2. Calculate the deviation from each possible outcome.

   Deviation = $R_i - \overline{R}$
3. Square each deviation.
4. Multiply the squared deviations by the probability of occurrence for its related outcome.
5. Sum all the products. This is called variance.

$$\text{Variance} = \sigma^2 = \sum_{i=1}^{n} (R_i - \overline{R})^2 P_i$$

6. The standard deviation is determined by taking the square root of the variance

$$\sigma = \sqrt{\sum_{i=1}^{n} (R_i - \overline{R})^2 P_i}$$

The smaller the standard deviation, accordingly the lower the riskiness of the project.

3. Coefficient of Variation as a Relative Measure of Risk

The size difficulty can be eliminated by developing a third measure, the coefficient of variation. It measures the relative variability of returns. It calls for nothing more difficult than dividing the standard deviation from an investment by the expected value:

$$\text{Coefficient of variation (v)} = \frac{\sigma}{R}$$

Utility Theory and Risk Analysis in Investment Decisions

Even after the determination of the various outcomes and their respective probabilities objectively, it may be difficult to know whether or not the company would accept the risk. It is because of the fact that the decision is ultimately based on the management's subjective evaluation of risk. Utility theory has been developed by Milton Friedman to measure an individual's attitude toward varying amounts of

gains and losses. The utility function spelt out in this theory is different from the ordinary concept of utility discussed in the principles of economics.

The core of the utility theory is the concept of diminishing marginal utility for money. According to this concept, marginal utility of a unit of money goes on declining successively in correspondence with increasing money income. Thus, increase in income will mean lower utility from additional income. As one proceeds from necessities to comforts and then luxuries the intensity of desire will go on decreasing and therefore, the successive increments of income necessary to satisfy these categories of wants will necessarily give less and less utility.

The investors with a diminishing marginal utility of money will get more pain from a rupee lost than pleasure from a rupee gained. They cannot, therefore, be apathetic to risk and will require a higher return as a compensation for bearing risk.

The above discussion leads us to an unmistakable conclusion that business managers are predominantly risk averters who cannot remain indifferent between risk free and riskier projects. This is why a prudent finance manager considers both risk factor and utility function together while choosing worth-while capital investment projects.

Risk Analysis Approaches

There are two major approaches which may be adopted for handling the risk dimension within the investment decisions process. These are simulation approach and sensitivity analysis. We shall now discuss each of these approaches.

1. Simulation Approach: Simulation approach has, of late, come to be used by the business executives who are interested to gauge the effects of the uncertainty surrounding of the significant factors that enter into the valuation of a specific decision on the expected returns. This approach combines the variabilities in all the relevant factors so as to provide a clear picture of the relative risk and the probable odds of coming out ahead or behind it in the light of uncertain foreknowledge.

This model considers the following variables which are subject to random variation.

Market Related Factors

1. Market Size
2. Market growth rate
3. Selling price of product

4. Market share captured by the firm

Investment Related Factors

5. Investment outlay
6. Useful life of investment
7. Residual value of the investment

Cost Related Factors

8. Variable operating unit cost
9. Fixed costs

Risk analysis based on simulation approach involves the following steps:

1. List all the basic economic variables that will affect the outcome of the decision.
2. Estimate the range of variables for each of these variables that are subject to uncertainty.
3. State in equation form the economic or accounting relationships that connect the basic variables to the final outcome on which the decision will be based.
4. With the aid of a computer randomly select a specific value for each basic variable according to the chances this value has of actually turning up in the future. Given these specific values, use the equation in step III to calculate the resulting outcome.
5. Repeat this process to define and evaluate the probability of the occurrence of each possible rate of return. Since there are literally millions of possible combinations of values, we need to test the likelihood that various specific returns on the investment will occur.

The simulation approach has several advantages. In the first instance, the simulation enables the analyst to handle more complicated problems. Secondly, compared with the single valued estimate approach, simulation allows the experts providing input data to indicate the probable accuracy of their estimates as well as expected values. Thirdly, this approach enables the analyst to make a sensitivity analysis of any stochastic variable merely by holding all other variables constant (presumably at their expected values). Finally, since the output is probability of NPV or IRR, decision-maker have substantial information about the reward-risk profile of the project.

The main limiting factor of this approach is scarcity of appropriate inputs data, incorporating interdependence among the variables, correct modelling of the project variables and correct specification of independence or correlation of cost flows over this time.

2. Sensitivity Analysis: Sensitivity analysis is a meaningful technique used to locate and assess the potential impact of risk on a project's profitability. It does not attempt to quantify risk, but rather provides insight into how the final outcome of an investment decision is likely to be affected by possible variations in the underlying factors. For instance, it attempts to answer what is the NPV if selling price falls by 10 per cent, what is the IRR if the project's life is only three years, not five years as expected, what is the level of sales revenue required to break-even in the net present value terms.

Sensitivity analysis helps the management to improve decision-making in a number of ways. In the first instance, it identifies the critical factors which have greatest impact on a project's profitability. Secondly, it encourages consideration of uncertainties and risks by managers at different levels. Finally, it isolates areas on which the management is required to concentrate during implementation of the project. However, it does not actually evaluate risk; the decision maker must still assess the probability of occurrence for these deviations from expected values.

Methods of Adjusting Risk

A finance manager being risk averter when given choice between two projects promising the same rate of return but different in risk would prefer the one with the least perceived risk. He will require compensation for bearing risk so that overall value of the company remains unaffected by assumption of the risky project. There are several methods of adjusting risk in investment decisions which can be classified broadly in two groups, viz., informal and formal methods.

1. Informal Method: This is the most common method of adjusting risk. The finance manager recognizes that some projects are more riskier than others. He also finds that riskier projects would yield more than what risk free or less risky projects promise. To choose a project carrying greater risk as against the less risky one, the finance manager decides on subjective basis (by using his discretion), the margin of difference in rate of return of both types of projects. The manner of fixing the standard is strictly internal known to the finance manager himself and is not specified.

2. Formal Methods: Among the formal methods of adjusting risk in capital budgeting decisions, the most popular one is Risk adjusted discount rate method.

Risk Adjusted Discount Rate: A popular approach to adjusting for risk is the use of different discount rates for proposals with different risk levels. A project that carries a normal amount of risk and does not change the overall risk complexion of the company should be discounted at the cost of capital. Projects involving more than normal risks will be discounted at a higher rate and so on.

Illustration: Modern Steel Company is considering two mutually exclusive projects. The expected investment outlay of these projects is Rs. 1,500: net cash flow information for both projects are as under:

Year	Project A (Rs.)	Project B (Rs.)
1	575	450
2	510	450
3	430	450
4	278	450
5	278	450

Which project should modern Steel Company select and why?

Solution: The cash flow information shows that Project A is more risky than Project B because the distribution of the cash flows of the latter is normal while the distribution of cash flows of the former is negatively skewed. In view of the risk differential the management decides to evaluate Project A with 14 per cent discount rate and Project B with 10 per cent discount rate as follows:

The risk adjusted NPVA = - 1500 + (.877 x 575 + .769 x 510 + .675 x 430 + .592 x 278 + .519 x 278)

= - 1,500 + 1,495

NPV = - Rs. 5

The risk adjusted NPVB = -1500 + (.909 x 450 + .826 x 450 + .751 x 450 + .683 x 450 + .621 x 450)

= -1,500 + 1750.5

NPV = Rs. 250.50

Since Project B has higher NPV in comparison to Project A the management should choose the former. Adjusting discount rate in consonance with variation in risk yields useful results. However, the problem that arises in the approach is in respect of variation in discount rate exactly in relation to the variation

the degree of risk. No generally accepted scale has thus far been evolved that could guide in allowing additional percentage amount for a project carrying a specified amount of risk in comparison to a perfectly riskless project.

Illustration 1: Consider the following investment opportunity:

A machine is available for purchase at a cost of Rs. 80,000. We expect it to have a life of five years and to have a scrap value of Rs. 10,000 at the end of the five year period. We have estimated that it will generate additional profits over its life as follows:

Year	Amount (Rs.)
1	20,000
2	40,000
3	30,000
4	15,000
5	5,000

These estimates are of profits before depreciation. You are required to calculate the return on capital employed.

Solution:

Total profit before depreciation over the life of the machine = Rs. 1,10,000

$$\text{Average profit p.a.} = \frac{\text{Rs. } 1,10,000}{5 \text{ years}} = \text{Rs. } 22,000$$

Total depreciation over the life of the machine = Rs. 80,000 - Rs. 10,000 = Rs. 70,000

$$\text{Average depreciation p.a.} = \frac{\text{Rs. } 70,000}{5 \text{ years}} = \text{Rs. } 14,000$$

Average annual profit after depreciation = Rs. 22,000 - Rs. 14,000

= Rs. 8,000

Return on original Investment:

Original investment required = Rs. 80,000

$$\text{Accounting rate of return} = \frac{\text{Rs. } 8.000}{\text{Rs. } 80,000} \times 100 = 10\%$$

Return on average investment:

$$\text{Average investment} = \frac{80.000 + 10,000}{2} = \text{Rs. } 45.000$$

$$\text{Therefore accounting rate of return} = \frac{8.000}{45,000} \times 100 = 17.78\%$$

Illustration 2: XYZ Ltd. has decided to diversify its production and wants to invest its surplus funds on the most profitable project. It has under consideration only two projects - "A" and "B". The cost of project "A" is Rs. 100 lakhs and that of "B" is Rs. 150 lakhs. Both projects are expected to have a life of 8 years only and at the end of this period. "A" will have a salvage value of Rs. 4 lakhs and "B" Rs. 14 lakhs. The running expenses of "A" will be Rs. 35 lakhs per year and that of "B" Rs. 20 lakhs per year. In either case the company expects a rate of return of 10%. The company's tax rate is 50%. Depreciation is charged on straight line basis. Which project should the company take up?

Note: Present value of annuity of Rs. 1 for eight years at 10% is 5.335 and present value of Rs. 1 received at the end of the eighth year is 0.467.

Solution: Statement showing NPV of Projects

		(Rs. lakhs)
Particulars	*Project A*	*Project B*
Profit after tax (10% on cost of project)	10.00	15.00
Depreciation	12.00	17.00
Net cash inflow every year	22.00	32.00
P.V. of cash flow in eight year period @ 5.335	117.370	170.720
P.V. of salvage at the end of 8th year	1.868	6.538
Total inflow	119.238	177.258
*Less:*Initial investment	100.000	150.000

Net present value (NPV)	19.238	27.258

Project B is more profitable than Project A, the increase in profit being Rs. 8.020 lakhs. Hence, Project B should be taken up.

Illustration 3: The project cash flows from two mutually exclusive projects A and B are as under:

Period	***Project A***	***Project B***
0 (outflow)	Rs. 22,000	Rs. 27,000
1 to 7 (inflow)	Rs. 6,000 each year	Rs. 7,000 each year
Project life	7 years	7 years

(i) Advise on project selection with reference to internal rate of return.

(ii) Will it make any difference in project selection, if the cash flow from *Project B* is for 8 years instead of 7 years @ Rs. 7,000 each year?

Relevant P.V.	***For 7 years factor at***	***For 8 years***
15%	4.16	4.49
16%	4.04	4.34
17%	3.92	4.21
18%	3.81	4.08
19%	3.71	3.95
20%	3.60	3.84

Solution

(i) Project selection based on internal rate of return.

The present values of *Project A* and *Project B* is calculated as follows:

Discount Rate	P.V. Factor for 7 yrs	Project A		Project B	
		Cash inflow p.a. (Rs.)	P.V. (Rs.)	Cash inflow p.a. (Rs.)	P.V. (Rs.)
15%	4.16	6,000	24,960	7,000	29,120
16%	4.04	6,000	24,240	7,000	28,280
17%	3.92	6,000	23,520	7,000	27,440
18%	3.81	6,000	22,860	7,000	26,670
19%	3.71	6,000	22,260	7,000	25,970
20%	3.60	6,000	21,600	7,000	25,200

(a) Project A

Since the original investment in Project A is Rs. 22,000, its IRR will fall between 19% and 20%.

	(Rs.)
P.V. of cash inflows at 19%	22,260
P.V. of cash inflows at 20%	21,600
Difference	660

Now, IRR of Project A is calculated as follows, by applying formula for interpretation:

$$\text{IRR} = 19 + \frac{22,260 - 22,000}{660} \times 1 = 19.4\% \text{ (approx.)}$$

(b) Project B

Since the original investment in Project B is Rs. 27,000, its IRR will fall between 17% and 18%.

	(Rs.)
P.V. of cash inflows at 17%	27,440
P.V. of cash inflows at 18%	26,670
Difference	770

Now, IRR of Project B is ascertained as below:

$$\text{IRR} = 17 + \frac{27,440 - 27,000}{770} \times 1 = 17.6\% \text{ (approximately)}$$

Selection of project: The IRR of Project A and Project B are 19.4% and 17.6% respectively. A project can be selected based on its higher IRR over the other Projects. Hence Project A is preferred to which is having a higher IRR of 19.4%.

(i) Calculation of IRR of Project B whose cash flow from the project is for 8 years instead of 7 years.

Discount factor	*P.V. factor for 8 years*	*Cash inflow each year (Rs.)*	*P.V. of cash inflows (Rs.)*
15%	4.49	7.000	31.430
16%	4.34	7.000	30.380
17%	4.21	7.000	29.470
18%	4.08	7.000	28.560
19%	3.95	7.000	27.650
20%	3.84	7.000	26.880

Since the original investment in Project B is Rs. 27,000, its IRR will fall between 19% to 20%.

	(Rs.)
P.V. of cash inflows at 19%	27,650
P.V. of cash inflows at 20%	26,880
Difference	770

Now, IRR of Project B is ascertained as below:

$$\text{IRR} = 19 + \frac{27,650 - 27.000}{770} \times 1 = 19.8\% \text{ (approximately)}$$

Selection of project: With the change in cash inflow of Project B from 7 years to 8 years its IRR is also improved from 17.6% to 19.8 and it is also higher than the IRR of Project A (i.e. 19.4%). Hence, Project B can be selected (based on its 8 years of cash inflows).

3.4 CHECK YOUR PROGRESS

Fill In the Blanks

1. --------- is the discount rate at which present values of investment outlays and of future streams of cash inflows are equal.

2. ---------- is the time period during which net cash outlays on capital project are equal to the net cash inflows.
3. ---------- is a process of planning capital expenditure which is to be made to maximise the long-term profitability of the organisation.
4. ---------- is the different between the present value of cash inflows and cash outflows.
5. The capital investment decisions are ----------.

3.5 SUMMARY

Capital budgeting involves the selection of projects which will make the optimum contribution to corporate objectives, and one of the most important corporate objectives is to maximize the profitability of the enterprise. Capital budgeting is broader in scope than investment decisions. It includes not only investment decisions but also the exploration of profitable investment opportunities, and investigation of potential opportunities. Capital budgeting decision is top management decisions. Capital investment projects may be initiated at any level of management, but they are processed through various levels including the head of the operating division concerned, financial controller, investment or finance committee, general manager and the board. The most widely accepted criterion of investment decision is the estimated net worth or present value of the project. Major investment decision methods are: (i) ranking by inspection method

(ii) payback period (iii) average rate of return method (iv) net present value (v) profitability index, and (vi) internal rate of return.

3.6 KEYWORDS

Capital Budgeting: It is a process of planning capital expenditure which is to be made to maximise the long-term profitability of the organisation.

Payback Period: It is the time period during which net cash outlays on a capital project are equal to the net cash inflows.

Net Present Value: It is the different between the present value of cash inflows and cash outflows.

Internal Rate of Return: It is that rate of return which equates the present value of cash inflows and cash outflows.

3.7 SELF- ASSESSMENT TEST

1. What is capital budgeting? What is the most acceptable criterion for making capital budgeting decisions?
2. Discuss the payback criterion of investment decisions. What are its strengths and weaknesses?
3. Discuss and distinguish between net present value and yield of investment methods of making investment decisions. Illustrate your answer with the help of an example. Which of the two is better? Why?
4. Your bank pays you Rs. 12,000 at the end of seven years of your deposit of Rs. 1200 a year for seven years in a recurring deposit account. What is the net present value of your investment if your required rate of return is 10 per cent? What is the internal rate of return?
5. XYZ Ltd. has a target accounting rate of return of 20% and is now considering the following project.

Capital cost of asset Rs. 80,000

Estimated Life 4 years

Estimated profit before depreciation	*Rs.*
Year 1	20,000
Year 2	25,000
Year 3	35,000
Year 4	25,000

The capital asset would be depreciated by 25% of its cost each year, and would have no residual value. Should the project be undertaken?

6. A company proposes to undertake one of the two mutually exclusive projects namely, AXE and BXE. The initial capital outlay and annual cash inflows are as under:

	AXE	***BXE***
Initial capital outlay (Rs.)	22,50.000	30.00.000
Salvage value at the end of the life	0	0
Economic life (years)	4	7

Year	***Rs. lakhs***	***After tax annual cash inflows Rs. lakhs***
1	6.00	5.00
2	12.50	7.50
3	10.00	7.50
4	7.50	12.50
5	-	12.50
6	-	10.00
7	-	8.00

The company's cost of capital is 16%.

Required:

(i) Calculate for each project

(a) Net present value of cash flows

(b) Internal rate of return

7. Precision Instruments is considering two mutually exclusive Projects X and Y: following details are made available to you:

(Rs. lakhs)

		Project X	Project Y
	Project Cost	700	700
		-	-
Cash inflows :	Year 1	100	500
	Year 2	200	400
	Year 3	300	200
	Year 4	450	100
	Year 5	600	100
Total		**1,650**	**1,300**

Assume no residual values at the end of the fifth year. The firm's cost of capital is 10%. Required, in respect of each of the two Project:

(i) Net Present Value, using 10% discounting;

(ii) Internal rate of return;

(iii) Profitability Index.

8. A company is considering taking up of one of two Projects, 'X' and 'Y'. Both projects have the same life, require equal investment of Rs. 80 lakhs each and both are estimated to have almost the same yield. As the company is new to this type of busienss, the cash flows arising from the projects cannot be estimated with certainty. An attempt was therefore, made to use probability to analyse the pattern of cash flow from either project during the first year of operation. This pattern is likely to continue during the life of these projects. The results of the analysis are as follows:

Project X		Project Y	
Cash flow (Rs. lakhs)	Probability	Cash flow (Rs. lakhs)	Probability
12	0.1	8	0.10
14	0.2	12	0.25
16	0.4	16	0.30
18	0.2	20	0.25
20	0.1	24	0.10

Which project should the Company take up?

3.8 ANSWERS TO CHECK YOUR PROGRESS

1. Internal Rate of Return
2. Payback Period
3. Capital Budgeting
4. Net Present Value
5. Irreversible.

3.9 SUGGESTED READINGS

- Financial Management by Prasanna Chandra.
- Financial Management by I.M. Pandey.
- Financial Management by Khan & Jain.
- Organisation & Management by R.D. Aggarwal.
- Financial Management and Policy by R.M. Srivastava.

Subject: Financial Management	
Subject Code: BCOM-502	
Lesson No.:04	**Updated By:** Dr. Poonam

WORKING CAPITAL MANAGEMENT

STRUCTURE

4.0 LEARNING OBJECTIVES

After reading this lesson, your will be conversant with:

- The nature and types of working capital
- Estimation of a firm's working capital needs using the operating cycle
- Determinants of working capital
- Trade-off between liquidity and profitability

- Determination of financing mix

4.1 INTRODUCTION

The working capital management is a delicate area in the field of financial management. A firm's working capital consists of its investment in current assets which include short term assets such as cash and bank balance, inventories, receivables (including debtors and bills), and marketable securities. So, the working capital management refers to the management of the level of all these individual current assets. The need for working capital management arises from two considerations. *First*, existence of working capital is imperative in any firm. The fixed assets which usually partake a large chunk of total funds can be used at an optimum level only if supported by sufficient working capital, and *second*, the working capital involves investment of funds of the firm. If the working capital level is not properly maintained and managed, then it may result in unnecessary blocking of scarce resources of the firm. The insufficient working capital, on the other hand, put different hindrances in smooth working of the firm. Therefore, the working capital management needs attention of all the financial managers.

4.2 TYPES, DETERMINANTS AND IMPORTANCE OF WORKING CAPITAL

4.2.1 NATURE AND TYPES OF WORKING CAPITAL

The term working capital refers to current assets which may be defined as (i) those which are convertible into cash or equivalents within a period of one year, and (ii) those which are required to meet day to day operations. The fixed assets as well as the current assets, both require investment of funds. So, the management of working capital and of fixed assets, apparently, seem to involve same type of considerations but it is not so. The management of working capital involves different concepts and methodology than the techniques used in fixed assets management. The reason for this difference is obvious. The very basics of fixed assets decision process (i.e., the capital budgeting) and the working capital decision process are different. The fixed assets involve long period perspective and therefore, the concept of time value of money is applied in order to discount the future cash flows; whereas in working capital the time horizon is limited, in general, to one year only and the time value of money concept is not considered. The fixed assets affect the long term profitability of

the firm while the current asses affect the short term liquidity position. The fixed assets decisions are irreversible and affect the growth of the firm, whereas the working capital decisions can be changed and modified without much implication.

Managing current assets may require more attention than managing fixed assets. The financial manager cannot simply decide the level of the current assets and stop there. The level of investment in each of the current assets varies from day to day, and the financial manager must therefore, continuously monitor these assets to ensure that the desired levels are being maintained. Since, the amount of money invested in current assets can change rapidly, so does the financing required. Mis-management of current assets can be costly. Too large an investment in current assets means tying up capital that can be productively used elsewhere (or it means added interest cost if the firm has borrowed funds to finance the investment in current assets). Excess investment may also expose the firm to undue risk e.g., in case, the inventory cannot be sold or the receivables cannot be collected.

On the other hand, too little investment also can be expensive. For example, insufficient inventory may mean that sales are lost as the goods which a customer wants are not available. The result is that the financial managers spend a large chunk of their time managing the current asses because these assets vary quickly and a lack of attention paid to them may result in appreciably lower profits for the firms. So, in the working capital management, a financial manager is faced with decisions involving some of the considerations as follows:

1. What should be the total investment in working capital of the firm?
2. What should be the level of individual current assets?
3. What should be the relative proportion of different sources to finance the working capital requirements?

Thus, the working capital management may be defined as the management of firm's sources and uses of working capital in order to maximize the wealth of the shareholders. The proper working capital management requires both the medium term planning (say up to three years) and also the immediate adoptions to changes arising due to fluctuations in operating levels of the firm.

The term working capital may be used in two different ways:

1. Gross Working Capital

2. Net Working Capital

In the broad sense, the term working capital refers to the gross working capital and represents the amount of funds invested in current assets. Thus, the gross working capital is the capital invested in total current assets of the enterprise. Current assets are those assets which in the ordinary course of business can be converted into cash within a short period of normally one accounting year. Examples of current assets are : cash in hand and bank balances receivables, inventory, short-term loans and advances, temporary investments of surplus funds and prepaid expenses.

In a narrow sense, the term working capital refers to the net working capital. Net working capital is the excess of current assets over current liabilities. Net working capital may be positive or negative. When the current assets exceed the current liabilities the working capital is positive and the negative working capital results when the current liabilities are more than current assets. Current liabilities are those liabilities which are intended to be paid in the ordinary course of business within a short period of normally one accounting year out of the current assets or the income of the business. Examples of the current liabilities are: bills payable, sundry creditors, short-term loans, advances and deposits, bank overdraft.

Those authors who hold that working capital represents current assets give various arguments to support their view. *First*, they say that gross concept of working capital takes into account the fact that with every increase in the borrowings, the working capital will increase, while according to the net concept there will be no increase. *Secondly*, profit is the result of interaction of both fixed and current assets. Since the fixed assets constitute the fixed capital of a firm, logic demands that current assets should be taken to mean the working capital. *Thirdly*, the management is primarily concerned with the total of current assets as they constitute the total funds available for operating purposes.

The other school considers that working capital represents current assets minus current liabilities. They argue that this concept helps the investors and creditors to weigh the financial soundness and margin of protection and is of special significance to suppliers of short-term loans and advances. It creates confidence among the creditors about the security of their amounts. Secondly,

the surplus of current assets over current liabilities can always be relied upon to meet contingencies since the enterprise is under no obligation to return the amount invested in surplus current assets.

The gross working capital concept is useful for an analytical insight into profitability with reference to the management of current assets. The net working capital concept emphasises the aspect of liquidity, drawing attention to the equity and long-term financing portion of current assets which is supposed serve as a cushion of safety and security to current liabilities. Also, the gross working capital concept emphasises the use and the 'net' concept the source; the interaction of both these concepts is necessary in order to understand the working capital management from the point of view of risk, return and uncertainty. Working capital viewed according to net concept is qualitative in character. It is the amount of current assets that has been supplied by the shareholders and/or long-term creditors. The gross concept of working capital is quantitative in character because it represents the total amount of funds used for current operating purposes.

This distinction between gross working capital and net working capital does not in any way undermine the relevance of the concepts of either gross or net working capital. A financial manager must consider both of them because they provide different interpretations. The gross working capital denotes the total working capital or the total investment in current assets. A firm should maintain an optimum level of gross working capital. This will help avoiding (i) the unnecessarily stoppage of work or chance of liquidation due to insufficient working capital, and (ii) effect on profitability (because over flowing working capital implies cost). Therefore, a firm should have just adequate level of total current assets. The gross working capital also gives an idea of total funds required for maintaining current assets.

On the other hand, net working capital refers to the amount of funds that must be invested by the firm, more or less, regularly in current assets. The remaining portion of current assets being financed by the current liabilities. The net working capital also denotes the net liquidity being maintained by the firm. This also gives an idea of buffer available to the current liabilities. Thus, both concepts of working capital i.e., the gross working capital and the net working capital have their own relevance and a financial manager should give due attention to both of these.

4.2.2 OPERATING CYCLE

The working capital requirements of a firm depend, to a great extent upon the operating cycle of the firm. The operating cycle may be defined as the time duration starting from the procurement of goods or raw materials and ending with the sales realization. The length and nature of the operating cycle may differ from one firm to another depending upon the size and nature of the firm.

In a trading concern, there is a series of activities starting from procurement of goods (saleable goods) and ending with the realization of sales revenue (at the time of sale itself in case of cash sales and at the time of debtors' realizations in case of credit sales). Similarly, in case of manufacturing concern, this series starts from procurement of raw materials and ending with the sales realization of finished goods (after going through the different stages of production). In both the cases, however, there is a time gap between the happening of the first event and the happening of the last event. This time gap is called the operating cycle.

Thus, the operating cycle of a firm consists of the time required for the completion of the chronological sequence of some or all of the following:

(a) Procurement of raw materials and services.

(b) Conversion of raw materials into work-in-progress.

(c) Conversion of work-in-progress into finished goods.

(d) Sale of finished goods (cash or credit).

(e) Conversion of receivables into cash.

These activities create and necessitate cash flows which are neither synchronized nor certain. The relevant cash flows are not synchronized because the cash disbursements (i.e., payment for purchases) take place before the cash inflows (from sales realizations). These cash flows are uncertain because these depend upon the future costs and sales. Of course, the cash outflows relating to payment for purchases and payment for wages and other expenses are less uncertain with respect to time as well as quantum. What is required on the part of a firm is to make adjustments and arrangements so that the uncertainty and unsynchronization of these cash flows can be taken care of. The firm is often required to extend credit facilities to customers. The finished goods must be kept in store to take care of the orders and a minimum cash balance must be maintained. It must also have a minimum of raw materials to have smooth and uninterrupted production process. So, in order to have a proper and smooth running of the business activities, the firm must make investments in all these

current assets. This requirement of funds depends upon the operating cycle period of the firm and is also denoted as the working capital needs of the firm.

The duration of the operating cycle for the purpose of estimating working capital requirements is equivalent to the sum of the durations of (a) raw materials and stores storage stage (b) work-in-process stage (c) finished goods stage and (d) receivables collection stage less the credit period allowed by the suppliers of the firm.

Symbolically, the duration of the working capital cycle can be put as follows :

O = R + W + F + D – C

O = Duration of operating cycle

R = Raw materials and stores storage period;

23. = Working-in-process period;

F = Finished stock storage period;

D = Debtors' collection period;

C = Creditors' payment period.

Each of the component of the operating cycle can be calculated as follows :

$$R = \frac{\text{Average stock of raw materials and stores}}{\text{Average Raw Materials and stores consumption per day}}$$

$$W = \frac{\text{Average work-in-process inventory}}{\text{Average cost of production per day}}$$

$$F = \frac{\text{Average finished stock inventory}}{\text{Average cost of goods sold per day}}$$

$$D = \frac{\text{Average books debts}}{\text{Average credit sales per day}}$$

$$c = \frac{\text{Average trade creditors}}{\text{Average credit purchases per day}}$$

After computing the period of one operating cycle, the total number of operating cycles that can be completed during a year can be computed by dividing 365 days with the number of operating days in a cycle. The total operating expenditure in the year when divided by the number of operating cycles in a year will give the average amount of the working capital requirements.

Illustration 1 : From the following information, extracted from the books of a manufacturing company, compute the operating cycle in days and the amount of working capital required :

Period covered	365 days
Average period of credit allowed by suppliers	16 days
	(Rs. in '000)
Average Total of Debtors outstanding	480
Raw Material Consumption	4,440
Total Production Cost	10,000
Total Cost of Sales	10,500
Sales for the year	16,000
Value of Average Stock maintained :	
Raw Material	320
Work-in-progress	350
Finished Goods	260

Solution :

COMPUTATION OF OPERATIONAL CYCLE

(i) *Raw materials held in stock*

$$\frac{\text{Average stocks of raw materials held}}{\text{Average consumption per day}} = \frac{320}{4{,}400/365} = \frac{320\times365}{400} = 27 \text{ days}$$

Less : Average credit period granted by suppliers — 16 days

11 days

(ii) *Work-in-progress :*

$$\frac{\text{Average WIP maintained}}{\text{Average cost of production per day}} = \frac{350}{10{,}000/365} = \frac{350\times365}{10{,}000} = 13 \text{ days}$$

(iii) *Finished Goods held in stock :*

$$\frac{\text{Average finished goods maintained}}{\text{Average cost of goods sold per day}} = \frac{260}{10{,}500/365} = \frac{260\times365}{10{,}500} = 9 \text{ days}$$

(iv) *Credit period allowed to debtors :*

$$\frac{\text{Average total of outstanding debtors}}{\text{Average credit sales per day}} = \frac{480}{16{,}000/365} = \frac{365\times480}{16{,}000} = 11 \text{ days}$$

= 44 days

Total Operating Cycle Period : (i) + (ii) + (iii) + (iv) Number of Operating cycles in a year = 365/44

= 8.30

$$\text{Amount of Working Capital required} = \frac{\text{Total Operating Cost}}{\text{Number of Operating cycles in a year}}$$

= 10,500/8.3

= Rs. 1,265

4.2.3 DETERMINANTS OF WORKING CAPITAL

The working capital needs of a company are influenced by a large number of factors and all the factors are of different importance. Again the importance of these factors also changes for the company over a period of time. As such it is necessary that an analysis is made into these factors to

determine the total investment in the working capital of the company. Following are the factors that determine the working capital needs of an enterprise:

1. **Business size and its Nature:** Nature of business greatly influences the working capital requirements of an enterprise. Thus financial and trading enterprises require less of fixed assets but require huge working capital investments. For example a retailer has to carry large stocks of a variety of goods to satisfy the varied and continuous needs and requirements of his customers. Almost same is the case with some manufacturing enterprises like bidi manufacturers who have to invest a nominal amount in fixed assets but a substantial amount in their working capital. Contrary to this, public utility undertakings like electricity and water works etc. have very little of working capital requirements with huge investments in fixed assets. Such undertakings supply services and not goods and resort to cash sales. With the result no funds will be stuck as debtors and there will be no inventories. At the same time most of the manufacturing enterprises fall in between the two extremes of public utilities and trading enterprises. These manufacturing enterprises maintain their working capital position as per their total assets structure and other variables. Along with the nature, the size of business also has a great bearing upon the working capital requirements of an enterprise. The size of the enterprise may be measured in terms of the scale of operations of the company. Obviously an enterprise with greater scale of operations shall need greater amount of investments in working capital. Similarly an enterprise with small size of operations shall need small amount of investments in its working capital.

II. **Manufacturing Cycle:** Working capital requirements of an enterprise are affected by its manufacturing cycle as well. The cycle starts with the purchase and use of raw material and ends when finished goods are produced. Thus the longer the cycle the greater the company's working capital needs. To avoid this an alternative manufacturing cycle should be adopted if it calls for shortest time span. Also the company should always try to complete the manufacturing process as per the schedule so that inventories do not unnecessarily get accumulated. Some enterprises call for advances from their customers and thereby minimise their investment in working capital.

III. **Fluctuations of Business:** Fluctuations in business are of several types, namely, short-period fluctuations, seasonal fluctuations and cyclical fluctuations etc. These fluctuations result in change in the demand of products of the enterprise. This is turn results in change in working capital

requirements of the business. In the event of upswing in the economy there will be increase in demand and correspondingly increase in sales. With the result there will be more investment in inventories and debtors will also increase. As against this with a decline in the economy, sales will go down and with this investments in inventories and debtors will also fall. Both these situations have a bearing on the working capital requirements of the company. Again the enterprises that are affected by seasonal fluctuations face production problems also. When demand is at its peak, increased production will be expensive. It will be again very expensive during slack period when the company has to sustain its work force and the necessary infrastructure when the production and sales are not adequate. Under these circumstances the company may adopt a steady policy of production, unmindful of seasonal variations, to enable it to utilize fully its available resources. This will mean accumulation of inventories during off seasons and their quick disposal during peak season. Thus during slack season the working capital will be more and during peak period it may be less.

4. Policy of Production: An enterprise, as stated above, may adopt a constant policy of production to suit its ends. But such a policy will expose the company to greater risks and inventory costs. Therefore the company may prefer to follow the policy of varying its production schedules in accordance with the changes in its demand. Some concerns may utilise their production capacities for producing varies products and thus have the advantage of diversified activities and with this solve their working capital problems. Thus the original product will be produced during peak season and during slack season the work force and other infrastructure will be used to produce other products. As such the policy of production will vary from enterprise to enterprise with its impact upon the working capital requirements of the business.

5. **Credit Policy of the Company:** The working capital of an enterprise is also determined by its credit policy as it affects the company's level of book debts. An enterprise formulates the terms of credit followed by it towards its customers, which of course, is influenced by the norms set in the similar business around. However, it is advisable if the enterprise follows the credit policy on the merit of each individual case and thus it should have a discretionary practice. As otherwise a liberal credit policy may land the enterprise into trouble as it may face difficulty in collections if a credit policy is formulated ignoring the credit worthiness of the parties. The collections should be made promptly as a high collection period will mean tie-up of funds in book debts and it may result in

increase in bad debts.Thus the enterprise should follow such a credit policy, whereby funds do not unnecessarily get tied up. Such a policy should be based on the credit standing of the customers besides other things. The credit worthiness of the exiting customers should periodically be reviewed and that of the new customers should be evaluated first. In the event of delayed payments the matter should be thoroughly investigated to reshape the credit policy for future.

6. Credit Availability: Credit terms granted to an enterprise by its customers also affect the requirements of working capital. If liberal credit terms are available to the company it will require less investment in its working capital. The availability of bank creditors also affects the level of working capital needs of an enterprise. It will operate on less working capital if bank credits are available to it's easily and on favourable conditions.

7. **Activities of Growth and Expansion:** With the growth of a firm by way of increase in its sales and fixed assets the working capital needs of it also increase. In fact the increased working capital needs precede the growth in business activities. Thus the increased working capital need not follow the growth of the firm rather the growth follows it. As such for a growing firm there is every need to make advance planning on continuous basis for working capital needs. Again, in order to sustain its growing production and sales a growing enterprise may need to invest funds in fixed assets. With this, investment in current assets will increase in order to support enlarged scale of operations. A growing enterprise needs funds continuously and it obtains the same both from internal as well as external sources. Under these circumstances if the enterprise retains its profits it will result in more problems as it shall not be paying dividends to its shareholders. Therefore, a growing enterprise should formulate an appropriate planning and policy to fund its increased needs of working capital.

8. **Margin of Profit and Profit Appropriation:** Profit earning capacity of business enterprises vary from one another. This of course depends much upon the quality of the product, pricing, marketing strategies and monopoly power or otherwise enjoyed by the enterprise. Different organisations enjoy these factors differently and thus their margin of profit differs, some earning high and others low profit margin. The volume of net profit earned is a source of working capital, of course to the extent it comprises of cash. However, whole of the profit earned in cash is not available for working capital purposes. Such a contribution towards the working capital would be affected by

the way in which profits are appropriated in the business. As such the availability of cash for working capital depends upon taxation, dividend, retention policy and depreciation policy followed by the company.

9. Changes in Price Level: There is direct impact of changes in price level on the working capital requirements of an enterprise. This makes the job of the financial manager very important as he is required to anticipate correctly this impact. Generally a company will have to maintain higher volume of working capital as a result of rise in price line. This is because investments in current assets will increase because of price rise. But such enterprises that can immediately enhance the price of their product will not face severe working capital problems. Also the impact of price level increase will affect the business enterprises differently as individual prices may move differently. Likewise some companies may be badly hit whereas others may not be affected at all. As such the change in price level may affect the working capital of some enterprises whereas others may not be affected at all.

10. Operating Efficiency: With optimum utilization of its resources a company can improve its operational efficiency. This will result in minimisation of costs and maximisation of returns. When the company is able to control its operational costs, it can effectively contribute towards its working capital. The operational efficiency of an enterprise improves the use of its working capital and the pace of the cash cycle will be accelerated. Pressure on working capital will get released when there is optimum utilization of resources resulting in improved profitability.

4.2.4 CLASSIFICATION OR KINDS OF WORKING CAPITAL

Working capital may be classified in two ways:

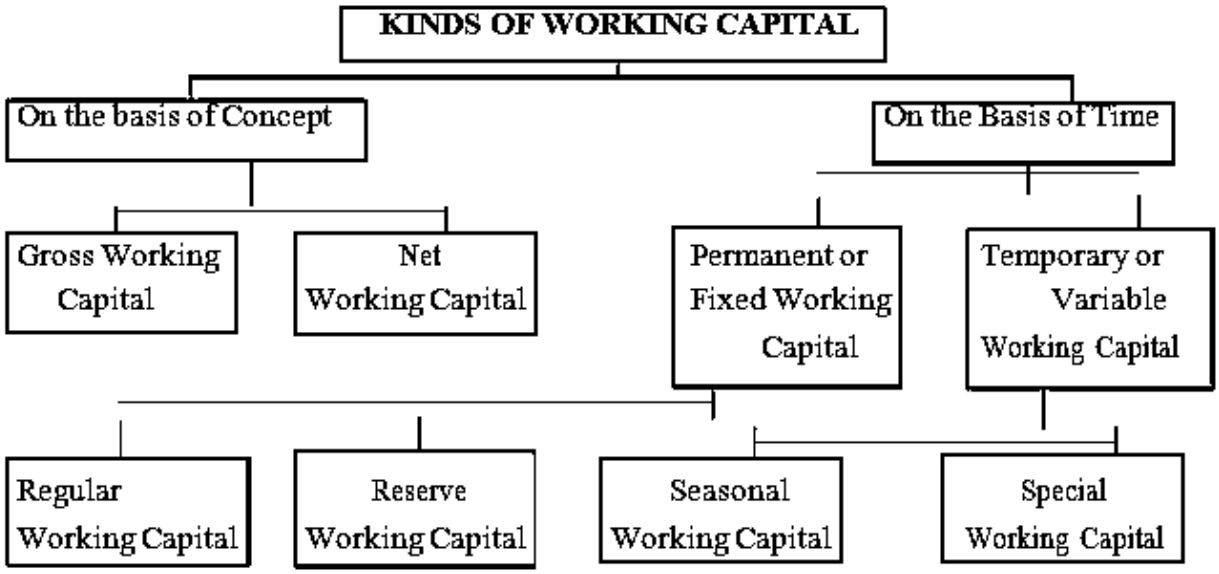
(a) On the basis of concept.

(b) On the basis of time

On the basis of concept, working capital is classified as gross working capital and net working capital as discussed earlier. This classification is important from the point of view of the financial manager. On the basis of time, working capital may be classified as:

1. Permanent or fixed working capital.
2. Temporary or variable working capital

1. Permanent or Fixed Working Capital: Permanent or fixed working capital is the minimum amount which is required to ensure effective utilisation of fixed facilities and for maintaining the circulation of current assets. There is always a minimum level of current assets which is continuously required by the enterprise to carry out its normal business operations. For example, every firm has to maintain a minimum level raw materials, work-in-process, finished goods and cash balance. This minimum level of current assets is called permanent or fixed working capital as this part of capital is permanently blocked in current assets. As the business grows the requirements of permanent working capital also increase due to the increase in current assets. The permanent working capital can further be classified as regular working capital and reserve working capital required ensuring circulation of current assets from cash to inventories, from inventories to receivables and from receivables to cash and so on. Reserve working capital is the excess amount over the requirement for regular working capital which may be provided for contingencies that may arise at unstated periods such as strikes, rise in prices, depression, etc.



KINDS OF WORKING CAPITAL

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3. **Temporary or Variable Working Capital :** Temporary or variable working capital is the amount of working capital which is require to meet the seasonal demands and some special exigencies. Variable working capital can be further classified as seasonal working capital and special working capital. Most of the enterprises have to provide additional working capital to meet the seasonal and special needs. The capital required to meet the seasonal needs of the enterprise is called seasonal working capital. Special working capital is that part of working capital which is required to meet special exigencies such as launching of extensive marketing campaigns for conducting research, etc. Temporary working capital differs from permanent working capital in the sense that it is required for short periods and cannot be permanently employed gainfully in the business. Figures given below illustrate the difference between permanent and temporary working capital:

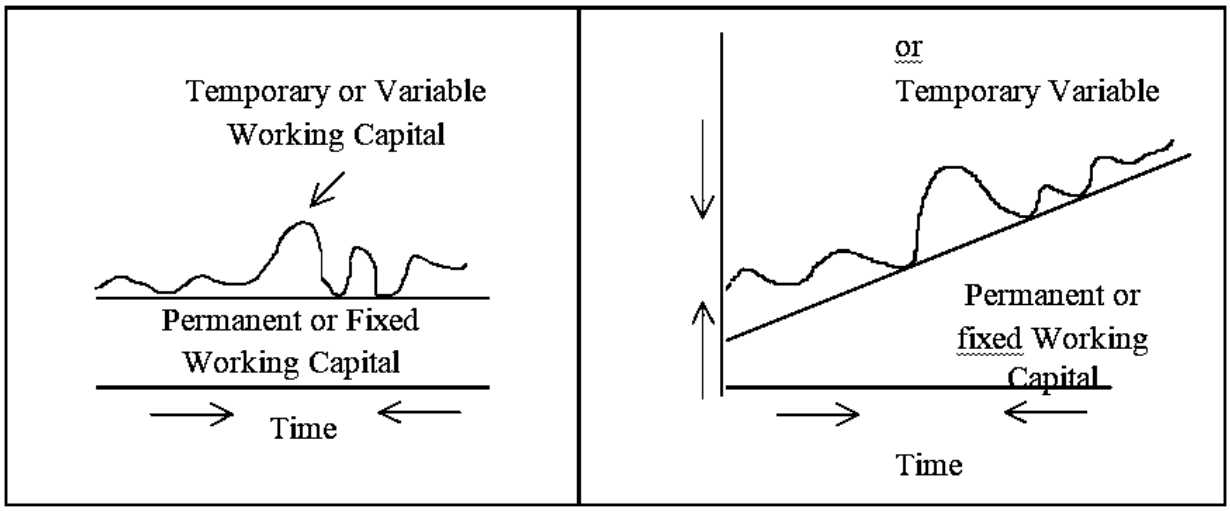


Fig. 1 Fig. 2

In Fig. 1, permanent working capital is stable or fixed over time while the temporary or variable working capital fluctuates. In Fig. 2, permanent working capital is also increasing with the passage of time due to expansion of business but even then it does not fluctuate as variable working capital which sometimes increases and sometimes decreases.

4.2.5 NEED AND IMPORTANCE OF WORKING CAPITAL

Working capital is the lifeline of every concern, whether it is a manufacturing or non-manufacturing one. Without adequate working capital there can be no progress in the industry. Inadequate working capital means shortage of raw materials, labour etc., resulting in partial utilisation of available machinery. Moreover, research and development in the industry is at low ebb and essential innovations fail to appear. Inadequate working capital frustrates the objectives of the enterprise through lack of funds and contributes towards the failure of a business. On the other hand, more working capital may lead to less control over workers' performances, inefficient store-keeping, excessive stocks of raw materials and finished goods, delay in the flow of work-in-progress and lack of co-ordination in the enterprise. So the amount of working capital in every concern should be neither more nor less than what is required. The management is to see that funds invested as working capital earn at least as much as they would have earned if invested elsewhere. In times of rising capital costs and scarce funds, the area of working capital management assumes added importance. A firm's profitability and liquidity are deeply influenced by the way its working capital is being managed. The main objective of working capital management is to arrange the needed funds adequately from the best sources and for the time period involved, so that trade-off between liquidity and profitability may be realised. The volume of working capital required is determined by the level of production unlike fixed asset investment which is determined by the scale of production. The precise level of working capital investment depends upon the management's attitude towards risk and the factors that influence the levels of cash, inventories and receivables required to support a given volume of output. However, the working capital requirements vary from industry to industry, from one undertaking to another in the same industry and even from time to time in the same undertaking. Actually, the size of current assets in a concern depends upon the extent to which the three basic activities – production, distribution (sales), and collection – are synchronised. The main advantages of maintaining adequate amount of working capital are as follows:

1. **Solvency of the business:** Adequate working capital helps in maintaining solvency of the business by providing uninterrupted flow of production.
2. **Goodwill:** Sufficient working capital enables a business concern to make prompt payments and hence helps in creating and maintaining goodwill.
3. **Easy Loans:** A concern having adequate working capital, high solvency and good credit standing can arrange loans from banks and others on easy and favourable terms.
4. **Cash Discounts:** Adequate working capital also enables a concern to avail cash discounts on the purchases and hence it reduces costs.
5. **Regular supply of raw materials:** Sufficient working capital ensures regular supply of raw materials and continuous production.
6. **Regular payment of salaries, wages and other day-to-day commitments:** A company which has ample working capital can make regular payment of salaries, wages and other day-to-day commitments which raises the morale of its employees, increases their efficiency reduces wastages and costs and enhances production and profits.
7. **Exploitation of favourable market conditions:** Only concerns with adequate working capital can exploit favourable market conditions such as purchasing its requirements in bulk when the prices are lower and by holding its inventories for higher prices.
8. **Ability to face Crisis:** Adequate working capital enables a concern to face business crisis in emergencies such as depression because during such periods, generally, there is much pressure on working capital.
9. **Quick and Regular return on Investments:** Every investor wants a quick and regular return on his investments. Sufficiency of working capital enables a concern to pay quick and regular dividends to its investors as there may not be much pressure to plough back profits. This gains the confidence of its investors and creates a favourable market to raise additional funds in the future.
10. **High morale:** Adequacy of working capital creates an environment of security, confidence, high morale and creates overall efficiency in a business.

4.2.6 LIQUIDITY VS. PROFITABILITY: RISK-RETURN TRADE-OFF

The firm would make just enough investment in current assets if it were possible to estimate working capital needs exactly. Under perfect certainty, current assets holdings would be at

the minimum level. A larger investment in current assets under certainty would mean a low rate of return on investment for the firm, as excess investment in current assets will not earn enough return. A smaller investment in current assets, on the other hand, would mean interrupted production and sales, because of frequent stock-outs and inability to pay to creditors in time due to restrictive policy. As it is not possible to estimate working capital needs accurately, the firm must decide about levels of current assets to be carried. Given a firm's technology and production policy, sales and demand conditions, operating efficiency etc., its current assets holdings will depend upon its working capital policy. It may follow a conservative or an aggressive policy. These policies involve risk-return trade off. A conservative policy means lower return and risk, while an aggressive policy produces higher return and risk. The two important aims of the working capital management are: profitability and solvency. Solvency, used in the technical sense, refers to the firm's continuous ability to meet maturing obligations. Lenders and creditors expect prompt settlements of their claims as and when due. To ensure solvency, the firm should be very liquid, which means larger current assets holdings. If the firm maintains a relatively large investment in current assets, it will have no difficulty in paying claims of creditors when they become due and will be able to fill all sales orders and ensure smooth production. Thus, a liquid firm has less risk of insolvency; that is, it will hardly experience a cash shortage or a stock-out situation. However, there is a cost associated with maintaining a sound liquidity position. A considerable amount of the firm's funds will be tied up in current assets, and to extent this investment is idle, the firm's profitability will suffer. To have higher profitability, the firm may sacrifice solvency and maintain a relatively low level of current assets. When the firm does so, its profitability will improve as less funds are tied up in idle current assets, but its solvency would be threatened and would be exposed to greater risk of cash shortage and stockouts. So, there exists a trade-off between profitability and liquidity or a trade-off between risk (liquidity) and return (profitability) with reference to working capital. The risk in this context is measured by the probability that the firm will become technically insolvent by not paying current liabilities as they occur; and profitability here means the reduction of cost of maintaining of current assets. The greater the amount of liquid assets a firm has, the less risky the firm is. In other words, the more liquid is the firm, the less likely it is to become insolvent. Conversely, lower levels of liquidity and risk of the firm is that the liquidity and risk move in opposite direction. So, every firm, in order to reduce the

risk will tend to increase the liquidity. But, increased liquidity has a cost. If a firm wants to increase profits by reducing the cost of maintaining liquidity, then it must also increase the risk. If it wants to decrease risk, the profitability is also decreased. So, a trade-off between risk and return is required. The risk-return trade-off of the working capital management is illustrated in Illustration 2.

Illustration 2 : Suppose, a firm has the following data for some future year :

	Rs.
Sales (1,00,000 units)	15,00,000
Earnings before interest and taxes	1,50,000
Fixed assets	5,00,000

The three possible current assets holdings of the firm are : Rs. 5,00,000, Rs. 4,00,000 and Rs. 3,00,0000. It is assumed that fixed assets level is constant and profits do not vary with current assets levels. The effect of the three alternative current policies is as follows:

Effect of Alternative Working Capital policies:

	Policies		
	A	B	C
	Rs.	Rs.	Rs.
Sales	15,00,000	15,00,000	15,00,000
Earnings before interest & taxes(EBIT)	1,50,000	1,50,000	1,50,000
Current assets	5,00,000	4,00,000	3,00,000
Fixed assets	5,00,000	5,00,000	5,00,000
Total assets	10,00,000	9,00,000	8,00,000
Return on total assets (EBIT/Total assets)	15%	16.67%	18.75%
Current assets/Fixed assets	1.00	0.80	0.60

The calculations indicate that alternative A the most conservative policy, provides greatest liquidity (solvency) to the firm, but also the lowest return on total assets. On the other hand, alternative c, the most aggressive policy, yields highest return but provides lowest liquidity and thus, is very risky to the firm. Alternative B demonstrates a moderate policy and generates a return higher than alternative A but lower than alternative C and is less risky than alternative C but more risky than alternative A.

4.2.7 FINANCING CURRENT ASSETS

A firm can adopt different financing policies vis-a-vis current assets. Three types of financing may be distinguished :

(a) Long-term financing: The sources of long-term financing include equity share capital, preference share capital, debentures, long-term borrowings from financial institutions and reserves and surplus (retained earnings).

(b) 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 receivables etc.

(c) **Spontaneous financing:** Spontaneous financing refers to the automatic source of short-term funds arising the normal course of a business. Trade (suppliers') credit and outstanding expenses are examples of spontaneous financing. There is no explicit cost of spontaneous financing. A firm is expected to utilise these sources of finances to the fullest extent. The real choice of financing current assets, once the spontaneous sources of financing have been fully utilised, is between the long-term and short-term sources of finances.

What should be the mix of short-and long-term sources in financing current assets? Depending on the mix of short and long-term financing, the approach followed by a company may be referred to as:

(i) matching approach

(ii) conservative approach

(iii) aggressive approach

(i) Hedging Approach

According to this approach, actual pattern of financing of the firm is decided keeping in view life of assets and maturity of the sources of funds. Thus, each asset would be offset with a financing instrument of the same approximate maturity. Short-term loans would be send to finance acquisition of short-term assets and long-term assets or permanent part of current assets would be purchased by long term debt or equity. In hedging approach (also known as matching approach), finance manager has to endeavour to match the life of assets with the term of sources of funds. For instance, if a firm has to buy a machine having expected life of 10 years, according to hedging approach, long-term loans for 10 years should be borrowed. Likewise, if inventory bought is expected to be sold in 60 days, the firm would resort to short-term loans for 60 days. However, it should be realised that exact matching is not possible because of uncertainty about the expected lives of assets. Fig. 3 depicts pattern of working capital financing as per the hedging approach

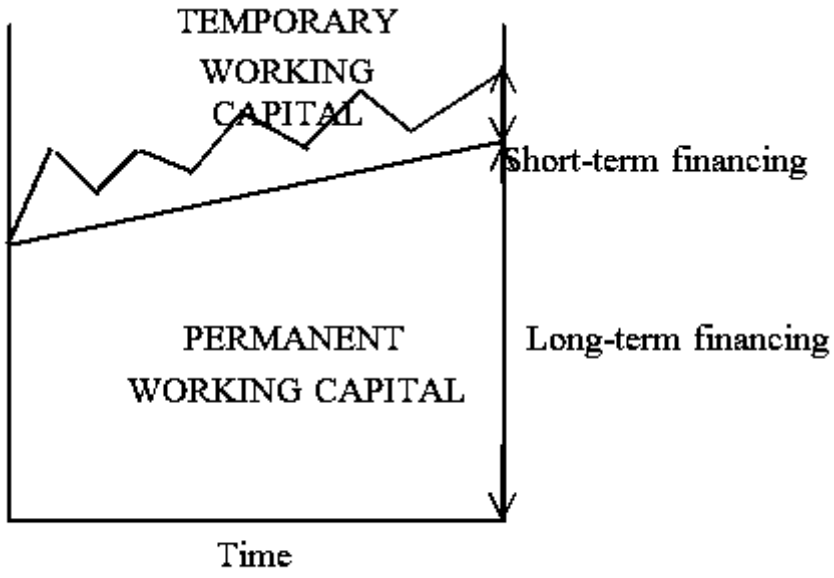


Fig. 3 : Financing under hedging approach

This approach tends to reduce risk in as much as it saves the firm from heavy cost of long-term funds lying idle during times when they were not needed. The borrowing and payment schedule, under hedging approach, would be arranged so as to correspond to the expected savings in current assets, less payables and accruals. Fixed assets and permanent component of current assets would be financed with long-term debt, equity and permanent component of current liabilities. Under the hedging approach, no

short-term financing will be used if the firm has a fixed current assets need only. During the seasonal upswings, funds will be borrowed for short-term i.e., for the period of season. Short-term borrowings would be liquidated with surplus cash in the off season.

(b) **Conservative Approach**

According to this approach, long-term sources of funds are used to finance current asset requirements. Only in times of emergency when current asset needs surge suddenly, the firm should use short-term sources. This implies that the predictable variable investment in current assets should also be financed by long-term funds. The financing plan based on the conservative approach minimizes risk of technical insolvency because it gives the firm the greatest liquidity cushion to meet unexpected needs for funds. However, cost of financing would be relatively high with the result that the rate of return would be low. So, under the conservation approach, the working capital is primarily financed by long term sources. The larger the portion of long term sources used for financing the working capital, the more conservative is said to be the working capital policy of the firm. In case, the firm has no temporary working capital need then the idle long term funds can be invested in marketable securities. This will help the firm to earn some income.

(iii) Aggressive Approach

In this approach of working capital financing short-term funds are used to finance a major part of the firm's permanent current assets and a part of fixed assets. Thus, larger the ratio of short-term funds to total assets, the more aggressive approach to financing. The following illustration will explain this approach:

Illustration 3

Aggressive Approach

Liabilities	Policy A	Policy B	Policy C
Current Liabilities	25,000	30,000	35,000
Long-term Liabilities	25,000	20,000	15,000
Total Liabilities	50,000	50,000	50,000
Current Assets	15,000	15,000	15,000
Long-term Assets	35,000	35,000	35,000
Total Assets			

50,000 50,000 50,000

\Ratio of Short-term funds to Total Investments

Policy A = 25,000 / 50,000 = 0.5:1

Policy B = 30,000 / 50,000 = 0.6:1

Policy C = 35,000 / 50,000 = 0.7:1

The firm has aggressive approach when it adopts policy A, the degree of aggressiveness increases when the firm moves from policy A to policy B, and further to Policy C. The financing plan based on aggressive approach increases the risk exposure of the firm but reduces the cost of capital and increases the profitability. An analysis of the above approaches leads us to the following conclusions:

(a) In conservative approach, cost is high, risk is low and return is low.

(b) In aggressive approach, cost is low, risk is high and return is high.

(c) In hedging approach, cost, risk and return are moderate. It aims at trade-off between profitability and risk.

Choice of particular financing plan would depend on a host of factors such as the approval of creditors, state of money and capital markets, composition of current assets, recent use of a source and risk preferences of the management.

4.3 CHECK YOUR PROGRESS

Fill in the Blanks

1. Gross working capital refers to the firm's investment in ----------.
2. ---------- means the difference between current assets and current liabilities.
3. ---------- is a low-profit and low-risk combination financing mix.

4. ---------- are those claims of outsiders which are expected to mature for payment within an accounting year.
5. ---------- are those assets which are convertible into cash within a period of one yearand are those which are required to meet the day-to-day operations of the business.

4.4 SUMMARY

The concept of working capital is used in two ways. Gross working capital refers to the firm's investment in current assets. Net working capital means the difference between current assets and current liabilities, and therefore, represents that position of current assets which the firm has to finance either from long-term funds or bank borrowings.

A firm is required to invest in current assets for a smooth uninterrupted production and sale. However much a firm will invest in current assets will depend on its operating cycle. Operating cycle is defined as the time duration which the firm requires to manufacture and sell the product and collect cash. Thus operating cycle refers to the acquisition of resources, conversion of raw materials into work-in-process into finished goods, conversion of finished gods into sales and collection of sales. Larger the operating cycle, larger the investment in current assets. The firm's decision about the level of investment in current assets involves a trade-off between risk and return. When the firm invested more in current assets it reduces the work of illiquidity but losses in terms of profitability since the opportunity of earning from the excess investment in current assets is lost. The firm therefore is required to strike a right balance. The determination of financing mix is the another ingredient of the theory of working capital management. The financing-mix refers to the proportion of current assets to be financed by current liabilities and long-term sources. One approach to determine the financing mix is the hedging approach, according to which the long-term funds should be used to finance the fixed/core portion of the current assets and the temporary/seasonal requirements should be met out of short-term funds. This approach is a high-profit, high-risk financing mix. According to second approach namely the conservative approach, the estimated total requirements of the current assets should be financed from long-term sources and short-term funds should be used only in emergency situations. The conservative approach is a low-profit, low-risk

combination financing mix. If the firm uses more of short-term funds for financing both current and fixed assets, its financing policy is considered aggressive and risky. Theoretically, short-term debt is considered to be risky and costly to finance permanent current assets.

4.5 KEYWORDS

Working Capital: It is the excess of current assets over current liabilities.

Current Assets: There are those assets which are convertible into cash within a period of one year and are those which are required to meet the day-to-day operations of the business.

Current Liabilities: Current liabilities are those claims of outsiders which are expected to mature for payment within an accounting year.

Operating Cycle: The operating cycle of a company consists of time period between the procurement of inventory and the collection of cash flow receivables.

4.6 SELF ASSESSMENT TEST

(a) Define the term working capital. What factors would you take into consideration in estimating the working capital needs of a concern?

(b) What do you understand by working capital? Explain the concepts of working capital?

(c) Discuss the importance of working capital for a manufacturing concern.

(d) How are net working capital, liquidity, technical insolvency and risk related?

(e) Discuss the various approaches to determine an appropriate financing mix of working capital.

4.7 ANSWERS TO CHECK YOUR PROGRESS

1. Current assets
2. Net working capital
3. Conservative approach
4. Current liabilities
5. Current assets

4.8 REFERENCES/ SUGGESTED READINGS

- Financial Management and Policy by James C. Van Horne.
- Financial Management by Prasana Chandra.
- Financial Management by Ravi M. Kishore.
- Financial Management by I.M. Pandey.

Subject: Financial Management	
Subject code: BCOM-502	
Lesson No.: 05	Updated By: Dr. Poonam

RECEIVABLES AND CASH MANAGEMENT

STRUCTURE

5.0 LEARNING OBJECTIVES

After going through this lesson, you would be able to understand:

1. Concept of Receivables Management,
2. Costs and benefits of maintaining receivables,
3. Dimensions of receivables management,
4. Motives for holding cash,

5. Functions and objectives of cash management,
6. Facets of cash management.

5.1 INTRODUCTION TO RECEIVABLES MANAGEMENT

Receivables are almost certain and inevitable to arise in the ordinary course of business. They represent extension of credit and investment of funds and need to be carefully managed. Every firm needs to develop a credit policy that includes setting credit standard, defining credit terms and employing methods for timely collection of receivables. The receivable (including the debtors and the bills) constitute a significant portion of the working capital and is an important element of it. The receivables are created when a firm sells goods or services to its customers and accepts, instead of the spot cash payment, the promise to pay within specified period. Thus, receivable is a time of loan extended by the seller to the buyer to facilitate the purchase process. As against the ordinary type of loan, the trade credit in the form of receivables is not a profit making service but an inducement or facility to the buyer-customer of the firm. The receivable is an asset as it represents a claim of the firm against its customers, expected to be realized in near future. Since credit sales assume a sizable proportion of total sales in any firm, the receivable management becomes an area of attention. Every firm has a set of credit terms and policies under which goods are sold on credit, and every policy has a cost and benefit associated with it. This lesson attempts as to how to balance the cost and benefit of a credit policy and the measures, which may be taken into consideration in this reference. The receivables represent credit allowed to customers and thereby allowing them to defer the payment. In a competitive environment, sometimes the firms are compelled and sometimes the firms desire to adopt liberal credit policies for pushing up the sales. Higher credit sales at more liberal terms will no doubt increase the profit of the firm, but simultaneously also increases the risk of and debts as well as result in more and more funds blocking in the receivables. So, a careful analysis of various aspects of the credit policy is required. This is what is known as receivables management. The term 'receivables management' may be defined as collection of steps and procedure required to properly weigh the costs and benefits attached with the credit policies. Receivable management consists of matching the cost of increasing sales (particularly credit sales) with the benefits arising out of increased sales with the objective of maximizing the return on investment of the firm.

5.1.1 COST AND BENEFITS OF MAINTAINING RECEIVABLES

There are various costs and benefits attached with a credit policy.

These are as follows:

COSTS OF RECEIVABLES

I. Collection costs;
II. Capital costs/Cost of financing;
III. Delinquency costs; and
IV. Default cost

I. Collection Costs: These costs are those which are to be incurred by a firm in order to collect the amount on account of credit sales, i.e. these expenses would not be incurred if the firm does not sell goods on credit, e.g., additional expenses incurred for the maintenance of credit and collection department, expenses incurred for obtaining information about credit-worthiness of potential customers.

II. Capital Costs/Cost of Financing: When a firm maintains receivables, some of the firm's resources remain blocked in them because there is a time lag between the credit sale to customer and receipt of cash from them as payment. To the extent that the firm's resources are blocked in its receivables, it has to arrange additional finance to meet its own obligations towards its creditors and employees, like payments for purchases, salaries and other production and administrative expenses. Whether this additional finance is met from its own resources or from outside, it involves a cost to the firm in terms of interest (if financed from outside) or opportunity costs (if internal resources which could have been put to some other use are taken).

III. Delinquency Costs: When the period of payment becomes due (i.e., after the expiry of the credit period) but is not received from the customers, the same is known as delinquency costs. It includes:

1. blocking up of funds/cost of financing for an extended period; and
2. cost of extra steps to be taken to collect the overdues, e.g., reminders, legal charges, etc.

IV. Default Costs: Sometimes the firms may not collect the overdues from the customers since they are unable to pay. These debts are treated as bad debts and are to be written off accordingly since the amounts will not be realized in future. Such costs are termed as 'Default Costs'.

BENEFITS

Apart from the costs, another factor that has a bearing on accounts receivable management is the benefit emanating from credit sales. The benefits are the increased sales and anticipated profits because of a more liberal policy. When firms extended trade credit, that is, invest in receivables, they intend to increase the sales. The impact of a liberal trade credit policy is likely to take two forms. *First*, it is oriented to sales expansion. In other words, a firm may grant trade credit either to increase sales to existing customers or attract new customers. This motive for investment in receivables is growth-oriented.

Secondly, the firm may extend credit to protect its current sales against emerging competition. Here, the motive is sales-retention. As a result of increased sales, the profits of the firm will increase. From the above discussion, it becomes clear that investments in receivables involve both benefits and costs. The extension of trade credit has a major impact on sales, costs and profitability. Other things being equal, a relatively liberal policy and, therefore, higher investments in receivables, will produce larger sales. However, costs will be higher with liberal policies than with more stringent measures. Therefore, accounts receivable management should aim at a trade-off between profit (benefit) and risk (cost). That is to say, the decision to commit funds to receivables (or the decision to grant credit) will be based on a comparison of the benefits and costs involved, while determining the optimum level of receivables. The costs and benefits to be compared are marginal costs and benefits. The firm should only consider the incremental (additional) benefits and costs that result from a change in the receivables or trade credit policy.

5.1.2 OBJECTIVES OF RECEIVABLES MANAGEMENT

Receivables management is the process of making decisions relating to investment in trade debtors. It is clear that certain investment in receivables is necessary to increase the sales and the profits of a firm. But at the same time investment in this asset involves cost considerations also. Further, there is always a risk of bad debts too. Thus, the objective of receivables management is to promote sales and profits until that point is reached where the returns that the company gets from funding of receivables is less than the cost that the company has to incur in order to fund these receivables. Hence, the purpose of receivables is directly connected with the company's objectives of making credit sales which are:

= Increasing total sales as, if a company sells goods on credit, it will be in a position to sell more goods than if it insists on immediate cash payment.

= Increasing profits as a result of increase in sales not only in volume, but also because companies charge a higher margin of profit on credit sales as compared to cash sales.

5.1.3 DIMENSIONS OF RECEIVABLES MANAGEMENT

The size of receivables or investment in receivables is determined by the firm's credit policy and the level of its sales. Receivables management involves the careful consideration of the following aspects:

Formulation of credit policy.

Executing the credit policy.

Formulating and executing collection policy.

- **Credit Policy**

A firm makes significant investment by extending credit to its customers and thus requires a suitable and effective credit policy to control the level of total investment in the receivables. The basic decision to be made regarding receivables is to decide how much credit be extended to a customer and on what terms. This is what is known as the credit policy. The credit policy may be defined as the set of parameters and principles that govern the extension of credit to the customers. This requires the determination of (i) the credit standard i.e., the conditions that the customer must meet before being granted credit, and (ii) the credit terms i.e., the terms and conditions on which the credit is extended to the customers. These are discussed as follows:

The credit standards: When a firm sells on credit, it takes a risk about the paying capacity of the customers. Therefore, to be on a safer side, it need to set credit standard which may be applied in selecting customers for credit sales. The initial tendency may be to set rigorous standards which may hamper the sales growth. At the other extreme, if the standards are set loosely, it may make the firm to bear losses as many customers may turn out to be bad debts. Therefore, the problem is to balance the benefits of additional sales against the cost of increasing bad debts. The following points are worth noting while setting the credit standard for a firm :

a Effect of a particular standard on the sales volume.

b Effect of a particular standard on the total bad debts of the firm, and

c Effects of a particular standard on the total collection cost.

Further, the above considerations are also relevant if there is proposal to change the credit standard from the present level. The credit standard will help setting the level which must be satisfied by a customer before being selected for making credit sales. However, even after selecting the customers, all of them need not necessarily be offered same terms and conditions. The credit policy should also set out clearly the terms of credit being offered to different types of customers.

Credit Terms

When sales on credit are made to customers there are certain basis upon which sales are advanced. These basis are called terms of credit. There are two important aspects of these credit terms. They are regarding (a) period of credit and (b) the terms of cash discount. An explanation of these two terms is given hereunder.

I. **Period of Credit.** Period of credit is the time duration for which the credit is extended to the customers. Credit period is generally given as a net date. For instance when the terms of credit period allowed by an enterprise indicate "net 40" it specifies that the payment is expected to be made 40 days from the date of credit sale undertaken by the parties. Normally there are industry norms which govern the credit period but individual undertakings can extend credit for longer duration than provided in the industry norms so that sales are extended. Similarly, if the bad debts build up such an enterprise may tighten the credit period policy in relation with the provisions of the norms provided by the industry.

II. **Cash Discount.** The other aspect of credit terms in cash discount. Such a discount is offered by business undertakings to motivate customers to make early payment of their bills. The rate of discount and the period for which it is granted is indicated in the terms of cash discount. In the event of a customer not availing this opportunity of cash discount he is required to make the payment by the net date specified as credit period. The terms credit period and cash discount reflect a combination of the credit terms. The terms of credit besides giving the credit period, also indicate the rate of cash discount and the period of discount. When credit terms are given as "3/15, net 45", it implies that if payment is made within 15 days cash discount at the rate of 3 per cent will be granted, as otherwise the payment is to be made by 45th day if the offer of discount is not availed. An enterprise can use credit terms as an

instrument to expand sales. The customers should in this case be offered most favourable terms of credit, which at the same time increase the profitability of the company. Such favourable terms can be determined by financial manager by referring to the costs involved and the benefits resulting thereupon. At the same time before taking into hand particular terms of credit the reaction of the business competitors should be thoroughly studied. Thus if the competitors also relax their credit terms at the same pace there will be no accrual of any benefits. Rather credit relaxation may result in trade losses and the policy should therefore not be relaxed.

The following illustration will explain the impact of credit relaxation in case of manufacturing enterprise.

Illustration 1: The credit terms provided currently by an enterprise are "net 35". The company is considering to resort to credit terms "3/21, net 63" so that the sales are boosted. With this the enterprise expects to have the following results :

Sales at present Additional	Rs.10,00,000
estimated sales Total Sales	Rs.1,00,000
	Rs.11,00,000
Estimated Total Sales that will	
avail discount offers	Rs.3,00,000
Estimated increased Receivables	Rs.80,000
Increased Cost Estimated :	
Losses by way of bad debts	1 per cent of increased sales
Production and selling costs	80 per cent of increased sales
Administrative expenses	2 per cent of increased sales
Opportunity cost	10 per cent of increased investment in receivables
Cash discount	3 percent of total sales that avail discount

Do you think that the proposed change in the credit terms is desirable?

Solution :

If the changed terms of credit result in greater profits as compared with the enhanced costs, it will be desirable to change the terms. We can find out the same with the help of the following :

Costs and Benefits of Liberal Credit Terms

Increased sales	Rs. 1,00,000	
Increased costs :		
Bad debt losses	Rs. 1,000	
Production and Selling Costs	80,000	
Administrative expenses	2,000	
Opportunity Cost (10% of increased receivables times the sum of production, selling and administrative costs as a % age of sales		
i.e. (0.10) (Rs. 80,000) (0.80+0.02)	6,560	
Cash discount	9,000	98560
Increased profits		Rs. 1,440

Thus, in this case when the terms of credit sales are relaxed by the company the profit generated thereupon will be higher than the additional costs involved. As such the company can resort to the proposed relaxation.

Execution of Credit Policies

Once credit policies have been formulated, the finance manager should execute these policies properly. Execution of credit policies calls for evaluation of credit applicants and financing of investment in receivables.

I. Evaluation of Credit Applicants: Mere determination of appropriate credit policy for the firm will not help to 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, viz, 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. The following paragraphs will deal with these aspects :

II. Gathering Credit Information: The finance manager gathers requisite information from different sources on which customers' evaluation must necessarily be based. Two important factors that should be kept in mind while searching for credit information are: cost and time. A firm cannot afford to spend a lot of money in investigation of some credit applicants' particularly smaller ones and in such case the finance manager should take decision on the basis of limited information about the applicant. It is true that with larger expenditure on gathering information, there is greater possibility for the firm to reach better judgement on the credit worthiness of the applicant causing reduction in bad debt losses. But beyond a certain point additional costs on investigation outweigh the expected gains caused by reduction in bad debt losses. This again is a matter of matching incremental costs and revenues. Further, how much time credit department of the firm will spend on analysis of credit applicant must also be considered by the finance manager. Spending lot of time in investigation may be justified in case of new credit customers. It must, however, be remembered that the customer may not wait for long pending detailed credit investigation and turnover elsewhere for his requirements. There are number of sources of credit information that lend insight into credit worthiness of the potential borrowers. Their use will depend upon the nature of business of the applicant and the economical limit of credit investigation costs. We may discuss these sources one by one as follows:

A. Financial Statement: The financial position of an individual prospective customer can be scrutinized very easily by going through his Profit and Loss Account and Balance Sheet. In case of joint stock companies these financial statements can be very easily collected as these are statutorily published. There is difficulty in obtaining the same from individual proprietorship and partnership firms. The enterprise having seasonal business and sales should be asked to supply additional information if they can provide the same. It should be insisted that the financial statements supplied are duly audited.

B. Bank References: This is the other source available to an enterprise through which credit information can be collected from the bank in which the prospective customer is maintaining his account. These banks do not generally provide such information directly but it can be collected through the company's own bank. Sometimes the customer is himself asked to direct his bank to provide the needed information and in this case the information can be had directly from the said

bank. It is true that such information may not be a guarantee to believe that the customer will be able to settle his account in due time, but it at least gives some idea about his working behaviour. Thus, some information is better than no information. This information can be supplemented by more information from other sources.

C. Trade references: The prospective customer may be asked to give the names of some of the businessmen with whom he is having dealings currently. Thus credit information is collected without involving any cost. After obtaining the names, these references can be immediately contacted for providing the relevant credit information. It is not a mere formality and it should be taken very seriously. If required the referees should be personally contacted for the desired information. The honesty and the seriousness of the referees should also be examined as the customer can sometimes furnish misleading references. The customers should be asked to provide as references persons or enterprises of good reputation and standing.

D. Credit Agency Report: There are certain credit rating agencies which provide independent information on the credit worthiness of different parties. These agencies gather information on the credit history of different businessmen and sell it to the firms which want to extend credit. Obviously, people who have failed to pay their bills in the past are viewed as greater credit risk than those who have an un-blemished credit record. From these agencies, a special report in respect of a particular customer may also be obtained. In India, however, the credit agency system is not popular and there is a need to develop such a network which can provide reliable information.

E. Other sources: Other sources of credit information on business firms, especially the large ones, might be trade journals, periodicals, newspapers, trade directories, public records such as income tax statements, wealth tax returns, sales tax returns, reports about actions and decrees in Government gazettee, registration, revenue and municipal records.

III. Credit Analysis

After collecting credit information about the potential customer, the finance manager analysis these information to evaluate creditworthiness of the customer and to determine whether he satisfies the standard of acceptability or not. Such an analysis is known as credit analysis. Thus, credit analysis involves the credit investigation of potential customer to determine the degree of risk associated with the account. For that matter, capacity of the applicant to borrow and his ability and willingness to

repay the debt in accordance with the terms of the agreement must be studied. Analysis of credit worthiness of the applicant, therefore, calls for detailed study of five Cs, viz., character, capacity, capital, collateral and conditions.

'*Credit*' refers to the willingness of the customer to honour his obligations. It reflects integrity, a moral attribute considered very important by finance managers.

'Capacity' measures the ability of the potential customer to utilize the loan effectively and profitably. This is very important variable of credit analysis as the customer's ability to repay is essentially dependent upon his earning capacity.

'*Capital*' represents the general financial position of the customer's firm with special emphasis on tangible net worth and profitability (which indicates ability to generate funds for debt repayment). The net worth figure in the business enterprise is the key factor that governs the amount of credit that would be made available to the customer.

'Collateral' is represented by assets which may be offered as pledge against credit extension.

Collateral, thus, serves as a cushion or shock absorber if one or several of the first three 'Cs' are insufficient to give reasonable assurance of repayment of the loan on maturity. Collateral in the form of a pledged asset serves to compensate for a deficiency in one or several of the first three 'Cs'. Finally, *'condition'* includes the present status of the business cycle and general credit and business conditions throughout the country and also intensity of competition. These together effect a potential customer's ability to earn income and repay the debt.

IV. Credit Decision

After determining credit worthiness of the applicant, the finance manager has to decide whether or not credit facilities should be provided to him. For that matter, the creditworthiness of the applicant should be matched against established credit standards. If the applicant is above or upto the standard, naturally credit facilities would be provided otherwise not. The difficulty in taking credit decision arises where the applicant is marginally credit worthy at best. In such cases, decision should be taken only after matching potential profitability against cost of bad debt losses. Customer not satisfying the standard of acceptability may, instead of outright refusing to grant credit facilities, be offered cash on delivery (C.O.D.) terms. However, here also risk is involved when the customer refuses to accept goods on some pretext or the other in order to compel the firm to cut down price. If the finance manger feels that

there is a great possibility of the customer refusing goods on delivery, payment in advance must be insisted. There is another possibility that the firm may insist on strong and reliable third party guarantee against risky applicant. This will provide protection to firm against risk of any loss caused by the customer's default to make payment.

- **Formulating and Executing collection Policy**

The collection of amounts due to the customer is very important. The business concern should devise procedures to be followed when accounts become due after the expiry of credit period. The collection policy is termed as strict and lenient. A strict policy of collection will involve more efforts on collection. Such a policy has both plus and negative effects. This policy will enable early collection of dues and will reduce bad debt losses. The money collected will be used for other purposes and the profits of the concern will go up. On the other hand a rigorous collection policy will involve increased collection costs. It may also reduce the volume of sales. Some customers may not appreciate the efforts of the concern and may shift to another concern thus causing reduced sales and profits. A lenient policy may increase the debt collection period and more bad debt losses. A customer not clearing the dues for long may not repeat his order because he will have to pay earlier dues first, thus causing loss of customers. The collection policy should weigh various aspects associated with it, the benefits and losses of such policy and its effect on the finances of the concern. The collection policy should also devise the steps to the followed in collecting overdue amounts. The objective is to collect the dues and not to annoy the customer. The steps should be like

(i) Sending a reminder for payments

b Personal request through telephone etc. (iii) Personal visits to the customers

(d) Taking help of collecting agencies and lastly (v) Taking legal action. The last step should be taken only after exhausting all other means because it will have a bad impact on relations with customers. The genuine problems of customers should never be ignored while making collections. The aim should be make collections and keep amiable relations with customers. The collection of book debts can be monitored with the use of average collection period and aging schedule. The actual average collection period may compared with the stated collection period to evaluate the efficiency of collection that necessary corrective action can be taken if the need be. The aging schedule rather highlights the debtors according to the age or length of time of the outstanding debtors.

Illustration 2: A firm sells 40,000 units of its product per annum @ Rs. 35 per unit. The average cost per unit is Rs. 31 and the variable cost per unit is Rs. 28. The average collection period is 60 days. Bad debt losses are 3% of sales and the collection charges amount to Rs. 15,000. The firm is considering a proposal to follow a stricter collection policy which would reduce bad debt losses to 1% of sales and the average collection period to 45 days. It would, however, reduce sales volumes by 1000 units and increase the collections expenses to Rs. 25,000. The firm's required rate of return is 20%. Would you recommend the adoption of the new collection policy? Assume 360 days in a year for the purpose of your calculation.

Solution :

(A) Calculation of Savings/Benefits of the New Policy

(i) Savings in Losses due to bad debts :

Present Sales (40,000 ×35) =	Rs. 14,00,000	
Proposed Sales (39,000×35) =	Rs. 13,65,000	
Present Bad Debts (3% of 14,00,000) =	Rs. 42,000	
Proposed Bad Debts (1% of 13,65,000) =	Rs. 13,650	
Savings in Losses due to bad debts (a)		Rs. 28,350

(ii) Savings in Cost of Receivables Investments

Present level of Receivables ($14,00,000 \times \frac{60}{360}$) = Rs.2,33,333 Proposed level of Receivables($13,65,000 \times \frac{45}{360}$)= Rs.1,70,625

Reduction in the level of Receivables = Rs. 62,708

Total Savings in cost of Receivables Investment(b)

(20% of 62,708) = Rs. 12,547

Total Savings/Benefits of New Policy (a+b) Rs. 40,892

Calculation of Increase in Cost and Reduction of Profit under New Policy Rs.

(i) Increase in collection charges (25,000–15,000) = 10,000

(ii) Reduction in Profit due to decrease in Sales of 1000 units = 7,000

[1000 × (35-28)]

Total Increase in cost and Reduction of Profit (i+ii)	= 17,000
Net Gain arising from adopting New Policy (A-B)	
[40,892 – 17,000]	= 23,892

Hence, the firm is advised to adopt the new collection policy.

5.2 BACKGROUND TO CASH MANAGEMENT

Cash is a vital component of working capital because it is the cash which keeps a business going. It is the hub around which all other financial matters centre. There is no denying the fact that cash is the very life-blood of a business enterprise. Study and healthy circulation of cash in the entire business operation is the basis of business solvency. Cash is the basic input needed to keep the business running on a continuous basis; it is also the ultimate output expected to be realised by selling the service or product manufactured by the firm. Ultimately, every transaction in a business results in either in inflow or an outflow of cash. Therefore, effective management of cash is the key determinant of efficient working capital management. There should be sufficient cash with a firm all the time to meet the needs of the business. Both excess and inadequate cash situations are undesirable from the pint of view of profitability and liquidity. Inadequate cash may degenerate a firm into a state of technical insolvency and even lead to its liquidation. It will eventually disrupt the firm's Manufacturing operation. On the other hand, excessive cash remains idle, without contributing anything towards the firm's profitability. Moreover, holding of cash balance has an implicit cost in the form of its opportunity cost. The larger the idle cash, the greater will be its opportunity cost in the form of loss of interest which could have been earned either by investing it in some interest-bearing securities or by reducing the burden of interest charges by paying off the past loans. The carrying of cash and near cash reserves beyond the irreducible operating needs costs asset turnover and rate of return. If the cash balances with a firm at any time are surplus or deficit, it is obvious that the finances are mismanaged. Today when cash, like any other asset of the company, is a tool for profits the emphasis is on right amount of cash at the right time, at the right place and at the right cost. The term cash is used in two senses, i.e., narrow and broad. In the narrow sense, it includes coins, currency and cheques in hand and balances in bank accounts. However, in its borader sense, cash and near-cash items such as marketable securities and bank time deposits are also included in cash. The

basic characteristic of near-cash assets is that they can readily be converted into cash. Second, in a broader sense, it also includes near cash assets such as marketable securities and short term deposits with banks. For cash management purposes, the term cash is used in this broader sense i.e., it covers cash, cash equivalents and those assets which are immediately convertible into cash.

A financial manager is required to manage the cash flows (both inflows and outflows) arising out of the operations of the firm. For this he will have to forecast the cash inflows from sales and outflows for costs etc. This will enable the financial manager to identify the timings as well as amount of future cash flows. Cash management does not end here and the financial manager may also be required to identify the sources from where cash may be procured on a short term basis or the outlets where excess cash may be invested for a short term.

In most of the firms, the financial manager who is responsible for cash management also controls the transactions that affect the firm's investment in marketable securities. In case of excess cash, marketable securities are purchased; and in case of shortage of cash, a part of the marketable securities is liquidated to procure enough cash. All these issues are important to the financial manager for several reasons. For example, a judicious management of cash, near cash assets and marketable securities allows the firm to hold the minimum amount of cash necessary to meet the firm's obligations as and when they arise. As a result, the firm is not only able to meet its obligations, but also is in a position to take advantage of the opportunity of earning a return and thereby increasing the profitability of the firm.

5.2.1 Motives for Holding Cash

Though cash is the most liquid asset, but it does not earn any substantial return for the business. Nobody earns any income on the cash balance or currency being maintained, however, some interest income may be earned on short term deposits. But still everybody and every firm maintain some cash balance. What is the reason? Why the firm still keep some cash balance? It has been suggested that there are three primary motives for holding cash. These are as follows:

(a) The transactions motive: This motive refers to the holding of cash in order to meet the day-to-day transactions which a firm carries on in the ordinary course of the business. Primarily, these transactions include purchase of raw materials, wages, operating expenses, taxes, dividends etc. We all know that a firm may enter into a variety of transactions to accomplish its objectives. Similarly,

there is a regular inflow of cash from revenues. Thus, the receipts and payments constitute a continuous two-way flow of cash. Since the inflows and outflows of cash do not perfectly synchronize, an adequate or a minimum cash balance is required to uphold the operations if outflows exceed the inflows. Therefore, in order to meet the day-to-day transactions, the requirement of cash in known as transaction motive. So, it refers to the holding of cash to meet anticipated obligations when timing is not perfectly synchronised with the inflows of cash. Although, a major part of transactions balances is held in cash, a part may also be held in the form of marketable securities whose maturity conforms to the timing of the anticipated payments, such as, payment of taxes, dividends etc.

(ii) The Precautionary Motive: This motive for holding cash has to do with maintaining a cushion or buffer to meet unexpected contingencies. The unexpected cash needs at short notice may be the result of :

I. uncontrollable circumstances, such as, floods, strikes, droughts etc.;
II. bills which may be presented for settlement earlier than expected;
III. unexpected delay in collection of trade dues;
IV. cancellation of some order for goods due to inferior quality; and
V. increase in the cost of material, labour etc.

Precautionary balances are the cash balances which are held as reserve for random and unforeseen fluctuations in cash flows, i.e., this motive implies the need to hold cash to meet unpredictable obligations. The more predictable the cash flows, the less precautionary balances that are needed and vice-versa. Moreover, the need for these types of cash balance may be reduced if there is a ready borrowing power in order to meet the emergency cash outflows. Sometimes a portion of such cash balances may be held in marketable securities, i.e., near-money assets.

(iii) The Speculative Motive: This motive refers to the holding of cash for taking advantages of expected changes in security price. In other words, when the rates of interest are expected to fall, cash may be invested in different securities so that the firm will benefit by any subsequent fall in interest rates and rise in security prices. On the other hand, when the rate of interest is expected to rise the firm should hold cash until the rise in interest rates ceases. The precautionary motive is

defensive in nature while speculative notice represents a positive and aggressive approach. The speculative motive helps to take advantages of :

(i) in opportunity to purchase raw material at a reduced price against immediate payment, i.e., benefit of cash discounts;

(ii) a change to speculate of interest rate movements by purchasing securities when rates of interest are expected to decline;

(iii) the purchase at favourable prices.

5.2.2 FUNCTIONS OF CASH MANAGEMENT

If during a year, the cash inflows of a firm balance its cash outflows exactly, the job of the financial manger would be greatly simplified. Unfortunately, this does not often happen. What is more, there are time during the course of a year when the cash outflow may exceed the inflows by an amount sufficient to prevent the financial manager form meeting his firm's regular financial obligations, unless he takes steps to secure addition cash funds. These imbalances may result from external causes over which the management has little or no control; or they may be the result of changes made in the firm's manufacturing, purchasing or selling policies. Since it is the responsibility of the financial manager to provide sufficient cash funds to pay all liabilities as and when they arise, he must correct such imbalances by pumping additional cash into the firm. Alternatively, in situations where the imbalance lies in the other direction i.e., when too much cash has become available, he must make sure that the excess cash (but no more or no loss) is removed and put to some income earning asset. A firm may not face any problem in undertaking various activity and entering into various transactions if it is having adequate and sufficient cash balance. For this purpose, the financial manager should ensure that the firm is having right quantity and right quality of liquidity from right source at right price and at right time. Cash management, thus deals with optimization of cash as an asset and for this purpose the financial manager has to take various decisions from time to time. Even if a firm is highly profitable, its cash inflows may not exactly match the cash outflows. He has to manipulate and synchronize the two for the advantage of the firm by investing excess cash, if any, as well as arranging funds to cover the deficiency. Thus, an executive who manage cash of an enterprise has to look after the functions like

(i) collection and upkeeping of cash and securities;

(ii) control of payments, i.e., providing requisite cash at the proper time and place to meet financial obligations;

(iii) maintenance of adequate supply of cash to meet projected cash requirements, cash budgets and day-to-day demands;

(iv) investment of surplus cash in suitable marketable securities to keep it fully utilised and working towards greater profits; and

(v) maintenance of sound banking relations. Some of the important aspects of cash management have been dealt with below.

5.2.3 OBJECTIVES OF CASH MANAGEMENT

The financial manager must know as to why the cash management is a necessity. The cash management strategies are generally built around two goals: (a) to provide cash needed to meet the obligations, and (b) to minimize the idle cash held by the firm. The financial manager has to strike an acceptable balance between holding too much cash and too little cash. This is the focal point of the cash risk-return trade-off. A large cash investment minimizes the chances of default but penalizes the profitability of the firm. A small cash balance target may free the excess cash balance for investment in marketable securities and thereby enhancing the profitability as well as value of the firm, but increases simultaneously the chances of running out of cash. The risk-return trade-off of any firm can be reduced to two prime objectives for the firm's cash management system, as follows:

(i) **Meeting the cash outflows:** The primary objective of cash management is to ensure the cash outflows as and when required. Enough cash must be on hand to meet the dispersal needs that arise in the normal course of business. The firm should be able to make the payments at different point of time without any liquidity problem. It means that the firm should have sufficient cash to meet the payment schedules and disbursement needs. It will help the firm in (a) avoiding the chance of default in meeting financial obligations, otherwise the goodwill of the firm is adversely affected, (b) availing the opportunities of getting cash discounts by making early or prompt payments, and (c) meeting unexpected cash outflows without much problem.

(ii) **Minimizing the Cash Balance:** Investment in idle cash balance must be reduced to a minimum. This objective of cash management is based on the idea that unused asset earns no income

for the firm. The funds locked up in cash balance are a dead investment and has no earnings. Therefore, whatever cash balance is maintained, the firm is foregoing interest income on that balance. The objective of the cash management therefore, should be to keep minimum cash balance. However, the objective of cash management i.e., maintaining the minimum cash balance must be looked into together with the other objective i.e., maintaining the payment schedule etc., which require that a firm must have sufficient liquidity (even at the cost of reducing profitability). But the objective of minimum cash balance affects the liquidity and thereby increasing the profitability. Thus, these objectives seem to be contradictory in nature and hence the financial manager has to achieve a trade-off between them. He has to ensure that the minimum cash balance being maintained by the firm is not affecting the payment schedule and meting all disbursement needs. The cash management strategies are needed to reconcile these two goals wherever possible. However, meeting payment commitments takes higher priority than minimizing the cash balance.

5.2.4 FACETS OF CASH MANAGEMENT

Cash management is concerned with the managing of: (i) cash flows into and out of the firm, (ii) cash flows within the firm, and (iii) cash balances held by the firm at a point of time by financing deficit or investing surplus cash. Unlike fixed assets or inventories, cash does not provide goods for sale. The management of cash is important because it is difficult to predict cash flows accurately, particularly the inflows, and there is no perfect coincidence between the inflows and outflows of cash. During some periods, cash outflows will exceed cash inflows, because payments for taxes, dividends, or seasonal inventory buildup. At other times, cash inflow will be more than cash payments because there may be large cash sales and debtors may be realized in large sums promptly. Cash management is also important because cash constitutes the smallest portion of the total current assets, yet management's considerable time is devoted in managing it. In recent past, a number of innovations have been done in cash management techniques. An obvious aim of the firm now-a-days is the manage its cash affairs in such a way as to keep cash balance at a minimum level and to invest the surplus cash in profitable investment opportunities. In order to resolve the uncertainty about cash flow prediction and lack of synchronisation between cash receipts and payments, the firm should develop appropriate strategies for cash management. The firm should evolve strategies regarding the following four facets of cash management:

I. **Cash planning:** Cash inflows and outflows should be planned to project cash surplus or deficit for each period of the planning period. Cash budget should be prepared for this purpose.

II. **Managing the cash flows:** The flow of cash should be properly managed. The cash inflows should be accelerated while, as far as possible, the cash outflows should be decelerated.

III. **Optimum cash level:** The firm should decide about the appropriate level of cash balances. The cost of excess cash and danger of cash deficiency should be matched to determine the optimum level of cash balances.

IV. **Investing surplus cash:** The surplus cash balances should be properly invested to earn profits. The firm should decide about the division of such cash balance between alternative short-term investment opportunities such as bank deposits, marketable securities, or intercorporate lending.

V. **Cash Planning:** Cash flows are inseparable parts of the business operations of firms. A firm needs cash to invest in inventory, receivable and fixed assets and to make payment for operating expenses in order to maintain growth in sales and earnings. It is possible that firm may be making adequate profits, but may suffer from the shortage of cash as its growing needs may be consuming cash very fast. The 'cash poor' position of the firm can be corrected if its cash needs are planned in advance. At times, a firm can have excess cash with it if its cash inflows exceed cash outflows. Such excess cash may remain idle. Again, such excess cash flows can be anticipated and properly invested if cash planning is resorted to. Thus, cash planning can help to anticipate the future cash flows and needs of the firm and reduces the possibility of idle cash balances (which lowers firm's profitability) and cash deficits (which can cause the firm's failure). Cash planning is a technique to plan and control the use of cash. It protects the financial condition of the firm by developing a projected cash statement from a forecast of expected cash inflows and outflows for a given period. The forecasts may be based on the present operations or the anticipated future operations. Cash plans are very crucial in developing the overall operating plans of the firm.

VI. **Cash Forecasts and Budgeting:** A cash budget is the most important device for the control of receipts and payments of cash. A cash budget is an estimate of cash receipts and

disbursements during a future period of time. It is an analysis of flow of cash in a business over a future, short or long period of time. It is a forecast of expected cash intake and outlay. The short-term forecasts can be made with the help of cash flow projections. The finance manager will make estimates of likely receipts in the near future and the expected disbursements in that period. Though it is not possible to make exact forecasts even then estimates of cash flows will enable the planners to make arrangement for cash needs. It may so happen that expected cash receipts may fall short or payments may exceed estimates. A financial manager should keep in mind the sources from where he will meet short-term needs. He should also plan for productive use of surplus cash for short periods. The long-term cash forecasts are also essential for proper cash planning. These estimates may be for three, four, five or more years. Long-term forecasts indicate company's future financial needs for working capital, capital projects, etc. Both short-term and long-term cash forecasts may be made with the help of following methods:

(i) Receipts and disbursements method

(ii) Adjusted net income method.

(i) **Receipts and Disbursements Method:** In this method the receipts and payments of cash are estimated. The cash receipts may be from cash sales, collections from debtors, sale of fixed assets, receipts of dividend or other incomes of all the items. Cash sales will bring receipts at the time of sale while credit sales will bring cash later on. The collections from debtors (Credit Sales) will depend upon the credit policy of the firm. Any fluctuation in sales will disturb the receipts of cash. Payments may be made for cash purchases, to creditors for goods, purchase of fixed assets, for meeting operating expenses such as wages rent, rates, taxes or other usual expenses, dividend to shareholders etc.

The receipts and disbursements are to be equalled over a short as well as long periods. Any shortfall in receipts will have to be met from banks or other sources. Similarly, surplus cash may be invested in risk free marketable securities. It may be easy to make estimates for payments but cash receipts may not be accurately made.. The payments are to be made by outsiders, so there may be some

problem in finding out the exact receipts at a particular period. Because of uncertainty, the reliability of this method may be reduced.

(ii) **Adjusted Net Income Method:** This method may also be known as sources and uses approach. The adjusted net income method helps in projecting the company's need for cash at some future date and to see whether the company will be able to generate sufficient cash. If not, then it will have to decide about borrowing or issuing shares, etc. In preparing its statement the items like net income, depreciation, dividends, taxes, etc. can easily be determined from company's annual operating budget. The estimation of working capital movement becomes difficult because items like receivables and inventories are influenced by factors such as fluctuations in raw material costs, changing demand for company's products and likely delays in collections. This method helps in keeping a control on working capital and anticipating financial requirements.

- **Management of Cash Flows**

In order to manage cash properly the finance manager has to ensure that cash is flowing in and flowing out as per the plan. This requires comparison of actual performance against predetermined plans and objectives, finding out discrepancies, if any, analysing their variations in order to pinpoint the underlying causes and finally, taking remedial steps to correct the anomaly. All this is possible with the help of cash budget report. Besides, efficient utilisation of cash involves accelerating cash inflows and slowing disbursements. There are various methods of speeding cash collections and delaying payments. We shall now discuss each of these methods in the following paragraphs:

Methods of accelerating the cash inflows

(1) **Quick deposit of customer's cheques:** One way of shortening the time lag between the date when a customer signs a cheque and the date when the funds are available for use is to make an arrangement for quick deposit of the cheques in the banks the moment they are received. Special attention should be given to large remittances. For example, these may be deposited individually or air mail services should be used for such remittances.

(2) **Prompt Payment by Customers:** In order to accelerate cash inflows, the collections from customers should be prompt. This will be possible by prompt billing. The customers should be promptly informed about the amount payable and the time by which it should be paid. It will be better if self addressed envelope is sent along with the bill and quick reply is requested. Another

method for prompting customers to pay earlier is to allow them a cash discount. The availability of discount is a good saving for the customer and in an anxiety to earn it they make quick payments.

(3) Decentralised collections: A big firm operating over wide geographical area can accelerate collections by using the system of decentralised collections. A number of collecting centres are opened in different areas instead of collecting receipts at on place. The idea of opening different collecting centres is to reduce the mailing time from customer's despatch of cheque and its receipt in the firm and then reducing the time in collecting these cheques. On the receipt of the cheque it is immediately sent for collection. Since the party may have issued the cheque on a local bank it will not take much time in collecting it. The amount so collected will be sent in the central office at the earliest. Decentralised collection system saves mailing and processing time and thus, reduces the financial requirements.

(4) **Lock Box System:** Lock box system is another technique of reducing mailing, processing and collecting time. Under this system the firm selects some collecting centres at different places. The places are selected on the basis of number of consumers and the remittances to be received from a particular place. The firm hires a Post Box in a post office and the parties are asked to send the cheques on that post box number. A local bank is authorised to operate the post box. The bank will collect the post a number of times in a day and start the collection process of cheques. The amount so collected is credited to the firm's account. The bank will prepare a detailed account of cheques received which will be used by the firm for processing purpose. This system of collecting cheques expedites the collection process and avoids delays due to mailing and processing time at the accounting department. By transferring clerical function to the bank, the firm may reduce its costs, improve internal control and reduce the possibility of fraud.

Methods of Slowing Cash Outflows

In order to optimize cash availability in the firm the finance manager must employ some devices that could slow down the speed of payments outward in addition to accelerating collections. Some of the important methods that may delay disbursements are as follows:

1. Delaying outward payment: By delaying the payment on bills until the last date of the no-cost period, the finance manager can economise cash resources. If purchases are made on terms of 1/10, n/30, this method suggests that payment should be made on 10th day. In this way the firm not

only avails of benefits of discount but also releases funds for eight days for investment in short-term channels.

2. Making Payroll periods less frequent: This can also help a company to economise cash. If the company is currently disbursing pay to its employees weekly, it can effect substantial cash savings if pay is disbursed only once in a month.

3. Where payroll is monthly, the finance manager should predict as to when employees will present cheques to the company's bank for collection. Supposing if pay day falls on Saturday, not all cheques will be presented on that day. The company need not deposit funds to cover its entire payroll. Even on Monday, some employees may not present cheques for payment. This, on the basis of the past experience, the finance manager could estimate on an average, the cheques presented on the pay day on the subsequent days for payment. Accordingly, the finance manager can assess fund requirements to cover payroll cheques on different days.

4. Using float: Float is the difference between the company's cheque book balance and the balance shown in the bank's books of account. When a firm writes a cheque, it will reduce the balance in its books of account by the amount of the cheque. But the bank will debit the account of its customers only after a week or so when the cheque is collected. Thus, there is no strange if the firm's books show a negative balance while the bank's books show positive balance. The firm can make use of the float if the magnitude of the float can be accurately estimated.

5. Inter-bank transfer: Another method of making efficient use of cash resources is to transfer funds quickly from one bank to another bank where disbursements are to be made. This would prevent building up of excess cash balances in one bank. This procedure could be adopted by a company having accounts with several banks.

6. Centralisation of Payments: The payments should be centralised and would be made through cheques. When cheques are issued from the main office then it will take time for the cheques to be cleared through post. The benefit of cheque collection time is availed.

- **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 utilisation but also to decide the level of investment in marketable securities. A number of cash management models have been developed to decide the optimal level of cash balance. There models are based on various considerations such as the demand for cash, the interest rate on marketable securities and the cost of transfers between marketable securities and cash.

(1) **Baumol Model:** This model was suggested by William J. Baumol. It is similar to one use for determination of economic order quantity. According to this model, optimum cash level is that level of cash where the carrying costs and transactions costs are the minimum.

Carrying Costs: This refers to the cost of holding cash, namely, the interest foregone on marketable securities. They may also be termed as opportunity costs of keeping cash balance.

Transaction Costs: This refers to the cost involved in getting the marketable securities converted into cash. This happens when the firm falls short of cash and has to sell the securities resulting in clerical, brokerage, registration and other costs. There is an inverse relationship between the two costs. When one increases, the other decreases. Hence, optimum cash level will be at that point where these two costs are equal.

The formula for determining optimum cash balance can be put as follows :

$$C = \sqrt{\frac{2U \times P}{S}}$$

where :

C = Optimum cash balance

U = Annual (or monthly) cash disbursements

P = Fixed costs per transaction

S = Opportunity cost of one rupee p.a. (or p.m.)

Illustration 3 :

Monthly cash requirements Rs 5,00,000

Fixed cost per transaction	Rs. 25
Interest rate on marketable securities	15% p.a.

You are required to calculate optimum cash balance.

Solution :

$$C = \sqrt{\frac{2U \times P}{S}}$$

$$\sqrt{\frac{2\times 5,00,000\times 25=}{.15}} = \text{Rs. } 12,910$$

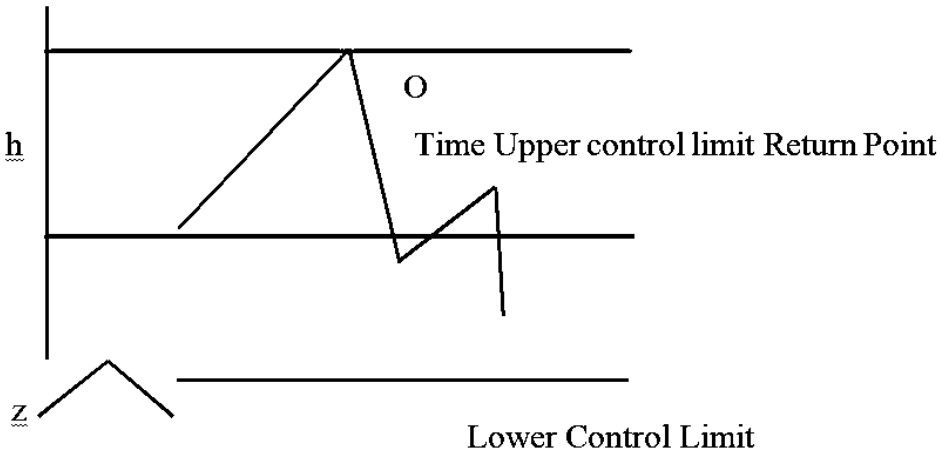
There are two limitations of the optimum Baumol's cash model:

(i) The model assumes a constant rate of use of cash. This is a hypothetical assumption. Generally the cash outflows in any firm are not regular and hence this model may not give correct results.

(ii) The transaction cost will also be difficult to be measured since these depend upon the type of investment as well as the maturity period.

In spite of the limitations, the model has a theoretical value. It gives an idea as to how the carrying cost and transaction cost should be optimized by the firm. The cash balance being maintained by the firm should be a level close to optimum level as given by the model so that the total cost is minimized.

(2) **Miller Orr-Model:** Baumol model is not suitable in those circumstances when the demand for cash is not steady and cannot be known in advance. Miller-Orr Model helps in determining the optimum level of cash in such circumstances. It deals with cash management problem under the assumption of stochastic or random cash flows by laying down control limits for cash balances. This limit consists of an upper limit (h), Lower limit (o) and return point (z). When cash balance reaches the upper limit, a transfer of cash equal to "h -z" is effected to marketable securities. When it touches the lower limit, a transfer equal to "z - o" from marketable securities to cash is made. No transaction between cash and marketable securities to cash is made during the period when the cash balance stays between these high and low limits. The model is illustrated in the form of the following chart:



The above chart shows that when cash balance reaches the upper limit, an amount equal to "h - z" is invested in the marketable securities and cash balance comes down to 'z' level. When cash balance touches the lower limit, marketable securities of the value of "z - o" are sold and the cash balance again goes up to 'z' level. The upper and lower limits are set on the basis of opportunity cost of holding cash, degree of likely fluctuation in cash balances and the fixed costs associated with a securities transaction. The optimal value of z, the return point for securities transactions, can be determined by the following formula

$$z = \sqrt[3]{\frac{3b \times \sigma^2}{4i}}$$

where:

b = fixed cost associated with a security transaction σ^2 = Variance of daily net cash flows

i = interest rate per day on marketable securities.

If the firm take 'L' to be lower limit of cash balance, then the return level may be defined as R=L+Z, and the upper limit H is defined as H=3Z + L. For example, if a firm has a standard deviation of Rs. 1,200 (i.e. $V=s^2$ = Rs. 14,40,000) in daily cash flows, the daily earnings on the short term investment is expected at .01% and the transaction cost for each sale and purchase of securities is Rs. 20.

The variable Z may be calculated as follows:

$$Z = [3TV/4i]^{1/3}$$

$$= [(3\times20\times14,40,000)/(4.0001)]^{1/3}$$

$$= 6,000$$

Now, if the firm has a minimum level of Rs. 1,000, then its return level, R would be Rs. 7,000 (i.e. Rs. 6,000+1,000), and the upper limit, H, is 3Z+L = Rs. (3×6,000)+1,000 = Rs. 19,000. The spread between the upper and the lower limit is Rs. 18,000 (i.e. 19,000-1,000). So, long as the firm has cash balance within the range of Rs. 1,000 and Rs. 19,000, it need not worry. However, as soon as the cash balance touches the lower level of Rs. 1,000, the firm should immediately sell off some securities to realize at least of Rs. 6,000 so that the cash level is returned to Rs. 7,000. Similarly, if the cash balance touches the level of Rs. 19,000, the firm should buy enough marketable securities to bring the cash level to Rs. 7,000. In general, it may be said that the cash model gives the financial manager a bench mark for judging the optimum cash balance. It does not have to be used as a precise rule governing his behaviour. The model merely suggests what would be the optimal balance under a set of assumptions. The actual balance may be more or less if the assumptions do not hold good entirely.

- **Investing Surplus Cash**

There is a close relationship between cash and money market securities or other short-term investment alternatives. Investment in these alternatives should be properly managed. Excess cash should normally be invested in those alternatives which can be conveniently and promptly converted into cash. Cash in excess of the requirement of operating cash balance may be held for two reasons. First, the working capital requirements of the firm fluctuate because of the elements of seasonality and business cycles. The excess cash may build up during slack seasons but it would be needed when the demand picks up. Thus, excess cash during slack season is idle temporarily, but has a predictable requirement later on. Second, excess cash may be held as buffer to meet unpredictable financial needs. A firm holds extra cash because cash flows cannot be predicted with certainty. Cash balance held to cover the future exigencies is called the precautionary balance and is usually invested in the short-term money market investments until needed. Instead of holding excess cash for the above mentioned purpose, the firm may meet its precautionary requirements as and when they arise by making short-term borrowings. The choice between the short-term borrowings and liquid assets holding will depend upon the firm's policy regarding the mix of short-term financing. The excess amount of cash held by the firm to meet its variable cash requirements and future contingencies should be temporarily invested in marketable securities, which can be regarded as near moneys. A

number of marketable securities may be available in the market. The financial manager must decide about the portfolio of marketable securities in which the firm's surplus cash should be invested.

Selecting Investment Opportunities

A firm can invest its excess cash in many types of securities or short-term investment opportunities. As the firm invests its temporary cash balance, its primary criterion in selecting a security or investment opportunities will be its quickest convertibility into cash, when the need for cash arises. Besides this, the firm would also be interested in the fact that when it sells the security or liquidates investment, it at least gets the amount of cash equal to the investment outlay. Thus, in choosing among alternative investment, the firm should examine three basic features of security: safety, maturity and marketability.

(i) **Safety**: An investing firm would normally prefer to invest in high yielding security. But high-yielding securities are relatively more risky. Therefore, since the balances invested in securities are needed in the near future, so the firm would invest in very safe securities. In other words the firm would invest in high-yielding securities subject to the constraint that the securities have acceptable level of risk. By risk here is meant the default risk, i.e., the possibility of default in the payment of interest or interest on time and in the amount promised. To minimise such a risk the firm should invest in safe securities.

(ii) **Maturity:** The term maturity signifies the time period over which interest and principal payments are to be made. It is a fact that there are wide fluctuations in the price of long-term securities with the changes in interest rates as against the short-term securities. This is so because the interest rates have a tendency to change over time. Thus, the long-term securities are more risky. Hence, for the purpose of investing excess cash, the firms prefer to invest in short-term securities.

(iii) **Marketability:** Convenience and the speed with which a security can be converted into cash is known as the marketability. When a security can easily be sold without loss of time it is highly marketable. Government treasury bills fall under this category of securities. Those securities with low marketability are usually high-yielding to attract investment in them.

Types of Short-term Investment Opportunities

The following short-term investment opportunities are available to companies in India to invest their temporary cash surplus:

(i) Treasury bills: Treasury bills (TBs) are short-term government securities. The usual practice in India is to sell treasury bills at a discount and redeem them at par on maturity. The difference between the issue price and the redemption price, adjusted for the time value of money, is return on treasury bills. They can be bought and sold any time; thus, they have liquidity. Also, they do not have the default risk.

(ii) Commercial papers: Commercial papers are short-term, unsecured securities issued by highly creditworthy large (CPs) companies.. They are issued with a maturity of three months to one year. CPs are marketable securities, and therefore, liquidity is not a problem.

(iii) Certificates of Deposits: Certificates of deposits (CDs) are papers issued by banks acknowledging fixed deposits for a specified period of time. CDs are negotiable instruments that make them marketable securities.

(iv) Bank Deposits: A firm can deposit its temporary cash in a bank for a fixed period of time. The interest rate depends on the maturity period. For example, the current interest rate for a 30 to 45 days deposit is about 5 per cent and for 180 days to one year is about 6.5 per cent. The default risk of the bank deposits is quite low since most banks in India are owned by the Government.

(v) Inter-corporate deposits: Inter-corporate lending/borrowing or deposits is a popular short-term investment alternative for companies in India. Generally a cash surplus company will deposit (lend) its funds in a sister or associate companies or with outside companies with high credit standing. In practice, companies can negotiate inter-corporate borrowing or lending for very short periods. The risk of default is high, but returns are quite attractive.

(vi) Money market mutual funds: Money market mutual funds (MMMFs) focus on short-term marketable securities such as TBs, CPs, CDs or call money. They have a minimum lock-in period of 30 days, and after this period, an investor can withdraw his or her money any time at a short notice or even across the counter in some cases. They offer attractive yields; yields are usually 2 per cent above than on bank deposits of same maturity. MMMFs are of recent origin in India, and they have become quite popular with institutional investors and some companies.

5.3 CHECK YOUR PROGRESS

1. When the period of payment becomes due (i.e., after the expiry of the credit period) but is not received from the customers, the same is known as……..

2. According to Baumol model, optimum cash level is that level of cash where the carrying costs and transactions costs are the…….

3. ……refers to the willingness of the customer to honour his obligations. It reflects integrity, a moral attribute considered very important by finance managers.

4……measures the ability of the potential customer to utilise the loan effectively and profitably.

5. ……represents the general financial position of the customer's firm with special emphasis on tangible net worth and profitability (which indicates ability to generate funds for debt repayment).

5.4 SUMMARY

When a firm makes an ordinary sale of goods and services and does not receive payment, the firm grants trade credit and creates accounts receivable which would be collected in future. Thus, accounts receivable represent an extension of credit to customers, allowing them a reasonable period of time, in which to pay for the goods/services which they have received.

The objective of receivables management is to have a trade-off between the benefits and costs associated with the extension of credit. The benefits are increased sales and associated increased profits/marginal contribution. The major categories of cost of accounts receivables are collection costs, capital costs, delinquency costs and default costs. The management of receivables involves crucial decision in three areas: (i) formulation of credit policy (ii) executing the credit policy and (iii) formulation in and execution of collection policy. The formulation of credit policy of a firm provides the framework to determine whether or not to extend credit to a customer and terms and conditions off extending credit. The two broad dimensions of credit policy decision are credit standards and credit terms. The term credit standards, represents the basic criterion for the extension of credit to customers. The credit terms specify the repayment terms comprising credit period, cash discount, if any, and cash discount period. The execution of credit policies includes obtaining credit information from different sources and its analysis. The third area involved in formulation and execution of collection policies. It refers to the procedure followed to collect receivables when they become due. Cash management is one of the key areas of working capital management. There are three motives of

holding cash: (i) transaction motive, (ii) precautionary motive, and (iii) speculative motive. The transaction motive refers to holding of cash to meet anticipated obligations whose time is not perfectly synchronised with cash receipts. The cash balances held in reserve for random and unforseen fluctuations in cash flows are called precautionary balances. The speculative motive indicates the desire of a firm to take advantage of opportunities which present themselves at unexpected moments and which are typically outside the normal course of business. The compensating motive means keeping the bank balance sufficient to earn a return equal to the cost of free services provided by the banks. The basic objectives of cash management are to reconcile two mutually contradictory and conflicting takes: to meet the payment schedule and to minimise funds committed to cash balances. Management of cash involves three things: (a) managing cash flows into and out of the firm, (b) managing cash follows within the firm, and (c) financing deficit or investing surplus cash and thus, controlling cash balance at a point of time. It is an important function in practice because it is difficult to predict cash flows and there is hardly any synchronisation between inflows and outflows. The cash management strategies are intended to minimise the operating cash balance requirement. The basic strategies that can be employed are (i) stretching accounts payable without affecting the credit of the firm, (ii) efficient inventory management and (iii) speedy collections of accounts receivables. Some of the specific techniques and processes for speedy collection of receivables from customers are ensuring prompt payment for customers and early payment/ conversion into cash. Concentration banking and lock-box system deserve specific mention as principal method of establishing a decentralised collection network. The techniques to delay payments of accounts payable include avoidance of early payment, centralised disbursements and float.

Marketable securities are an outlet for surplus cash as liquid security/ assets. To be liquid a security must have three basic characteristics, that is, a ready market, maturity period and safety of principal.

5.5 KEYWORDS

Receivables Management: It is the collection of steps and procedure required to properly weigh the costs and benefits attached with the credit policies.

Credit term: It is the time period allowed to the customer in payment against credit sales.

Trade Credit: It is the credit issued by a business to another business as a practice of trade transaction.

Cash Planning: Cash planning is a technique to plan and control the use of cash.

Cash Budget: It is a detailed budget of income and cash expenditure incorporating both revenue and capital items.

5.6 SELF- ASSESSMENT TEST

1. What do you mean by receivables management? Discuss the factors which influence the size of receivables.
2. What are the costs and benefits associated with receivable?
3. What is credit policy? What are the elements of a credit policy?
4. What are credit terms? Explain the role of credit terms in a credit policy.
5 ABC Ltd. is examining the question of relaxing its credit policy. It sells at present 20,000 units at a price of Rs. 100 per unit, the variable cost per unit is Rs. 88 and average cost per unit at the current sales volume is Rs. 92. All the sales are on credit, the average collection period being 36 days. A relaxed credit policy is expected to increase sales by 10% and the average age of receivables to 60 days. Assuming 15% return, should the firm relax its credit policy?
6. What are the objectives of cash management? What are the factors affecting the cash needs of a firm?
7. Explain the Baumol's model of cash management.
8. "Efficient cash management will aim at maximizing the availability of cash inflows by decentralizing collections and decelerating cash outflows by centralizing the disbursements". Discuss and explain.
9. Discuss the Miller-Orr model for determining the cash balance for the firm.
10. Explain and discus the role of marketable securities in cash management. What are the factors affecting the choice of marketable securities?

11. "It has been observed in your organization that substantial cash surplus is available for short period of time which is not being utilized properly to generate maximum yield". How would you go about planning for short term investment of funds?

5.7 ANSWERS TO CHECK YOUR PROGRESS

1. Delinquency costs

2. Minimum

3. Credit

4. Capacity

5. Capital

5.8 REFERNCES/SUGGESTED READINGS

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- Financial Management by Prasana Chandra.
- Financial Management by Ravi M. Kishore.
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Subject: Financial Management	
Subject Code: BCOM-502	
Lesson No. : 06	Updated By: Dr. Poonam

INVENTORY MANAGEMENT

STRUCTURE

6.0 LEARNING OBJECTIVE

- This lesson will make you conversant with Meaning and types of inventory
- Purpose of having inventories
- Costs associated with inventory
- Inventory management technique

6.1 INTRODUCTION

Inventory constitutes a major component of working capital. To a large extent, the success or failure of a business enterprise depends upon its inventory management performances. The inventories need not be viewed as an idle asset rather these are an integral part of firm's operations. But the question usually is as to how many inventories be maintained by a firm? If the inventories are too big, they become a strain on the resources; however, if they are too small, the firm may lose the sales. Therefore, the firm must have an optimum level of inventories. Managing the level of inventories is like maintaining the level of water in a bath tub with an open drain. The water is flowing out continuously. If water is let in too slowly, the tub is soon empty. If water is let in too fast, the tub over flows. Like the water in the tub, the particular item in the inventory keeps changing, but the level may remain the same. The basic financial problem is to determine the proper level of investment in the inventories and to decide how much inventory must be acquired during each period to maintain that level. The present lesson attempts to discuss different aspects of inventory management.

6.2 CONCEPT OF INVENTORY MANAGEMENT

The term 'inventory' refers to the stockpile of the products a firm is offering for sale and various components that make up these products. As per accounting terminology, inventory means "the aggregate of these items of tangible property which (i) are held for sale in the ordinary course of business, (ii) are in the process of production for such sale, and (iii) are to be currently consumed in the production of goods or services to be available for sale". Thus, inventory includes the stock of raw materials, goods-in-process, finished goods and stores and spares. The various forms in which inventories exist in a manufacturing company are : raw materials, work-in-process and finished goods.

Raw Materials are those basic inputs that are converted into finished product through the manufacturing process. Raw materials inventories are those units which have been purchased and stored for future productions.

Work-in-process inventories are semi-manufactured products. They represent products that need more work before they become finished products for sale.

Finished goods inventories are those completely manufactured products which are ready for sale. Stocks of raw materials and work-in-process facilitate production, while stock of finished goods is required for smooth marketing operations. Thus, inventories serve as a link between the production and consumption of goods. The level of three kinds of inventories for a firm depend on the nature of its business. A manufacturing firm will have substantially high level of all three kinds of inventories, while a retail or wholesale firm will have a very high level of finished goods inventories and no raw material and work-in-process inventories. Within manufacturing firms, there will be differences. Large heavy engineering companies produce long production cycle products; therefore, they carry large inventories. On the other hand, inventories of a consumer product company will not be large because of short production cycle and fast turnover. A fourth kind of inventory, supplies (or stores and spares), is also maintained by firms. Supplies include office and plant cleaning materials like soap, brooms, oil, fuel, light bulbs etc. These materials do not directly enter production, but are necessary for production process. Usually, these supplies are small part of the total inventory and do not involved significant investment. Therefore, a sophisticated system of inventory control may not be maintained for them.

NEED TO HOLD INVENTORIES

The question of managing inventories arises only when the company holds inventories. Maintaining inventories involves tying up of the company's funds and incurrence of storage and handling costs. If it is expensive to maintain inventories, why do companies hold inventories? There are three general motives for holding inventories.

I. **The transactions motive:** It expresses the need to maintain inventories to facilitate production and sales operation smoothly.

II. **The precautionary motive:** It necessitates holding of inventories to guard against the risk of unpredictable charges in demand and supply forces.

III. **The speculative motive:** It influences the decision to increase or reduce inventory levels to take advantages of price fluctuations.

In order to maintain an uninterrupted production, it becomes necessary to hold adequate stock of materials since there is a time lag between the demand for materials and its supply due to some unavoidable circumstances. Besides, there are two other motives for holding of inventories viz., to

receive the benefit of quantity discount on account of bulk purchases and to avoid the anticipated rise in price of raw material. The work-in-progress builds up since there is production cycle. Actually, the stock of work-in-progress is to be maintained till the production cycle completes. Similarly, stock of finished goods has also to be held since there is a time lag between the production and sales. When goods are demanded by the customers, it cannot immediately be produced and as such, for a continuous and regular supply of goods, minimum stock of finished goods is to be maintained. Stock of finished goods should also be maintained for sudden demands from customers and for seasonal sales.

Therefore, the primary objective of holding raw materials are : (i) to separate purchase and production activities and for holding finished goods there should be a separate production and sales activities; (ii) to obtain quantity discount against bulk purchases, and (iii) to avoid interruption in production. At the same time, work in progress inventory is necessary since production is not instantaneous and finished goods should also be maintained for: (i) serving customer on a continuous basis; (ii) meeting the fluctuating demands.

6.2.1 OBJECTIVES OF INVENTORY MANAGEMENT

Efficient inventory management should result in the maximisation of the owners's wealth. For this purpose, a firm should neither hold excessive inventories nor hold inadequate inventories, i.e., it should hold the optimum level of inventory. The optimum level of inventory investment lies between the point of excessive and inadequate levels. In other words, there must not be an over investment or under investment in inventories. The danger of over investment in inventories are: (i) funds of the firm are tied-up unnecessarily; (ii) it creates loss of profit; (iii) excessive carrying cost and risk of liquidity increases. As such, the opportunity cost and carrying costs (viz., cost of storage, handling, insurance etc.) increase proportionately. No doubt, these costs will impair the profitability of the firm. Excessive investment in raw materials, will prove the same result except at the time of inflation and scarcity. Similar results may also be noticed for the over investment in work-in-progress since it is very difficult to sell. Similarly, many difficulties will appear to dispose of excessive finished goods since time lengthens (viz., the goods may be sold at low price etc.) Moreover, for carrying excessive Inventory physical deterioration of the same may occur while in storage. From the above, it becomes clear that there must not be an over investment in inventories. Similarly, inadequate level of

inventories is not also free from snags. The consequences are: (i) production may shut-down; (ii) commitment for the delivery may not be possible; (iii) inadequate raw material and work-in-progress will create frequent production interruption; (iv) customers may shift to the competitor if their demands are not met up regularly, etc., Thus, the objective of inventory management is to maintain its optimum level in the following manner:

I. To ensure a continuous supply of materials to facilitate uninterrupted production;
II. To maintain sufficient stocks of raw materials during short-supply;
III. To maintain sufficient finished goods for efficient customer service;
IV. To minimise the carrying cost; and
V. To maintain the optimum level of investment in inventories.

6.2.2 COST OF HOLDING INVENTORY

The effective management of inventory involves a trade-off between having too little and too much inventory. In achieving this trade-off the Finance Manager should realise that costs may be closely related. The cost of holding inventories may include the following:

I. Ordering/Acquisition/Set-up Costs, and
II. Carrying Costs.
III. Cost of Running out of goods/cost of stock-outs

I. Ordering/Acquisition/Set-up Costs: These are the variable costs of placing an order for the goods. Orders are placed by the firm with suppliers to replenish inventory of raw materials. Ordering costs include the costs of: requisiting, purchasing, ordering, transporting, receiving, inspecting and storing. The ordinary costs vary in proportion to the number of orders placed. They also include clerical costs and stationery costs. (That is why it is called a set-up cost). Although, these costs are almost fixed in nature, the larger the order placed, or the more frequent the acquisition of inventory made, the higher are such costs. Similarly, the fewer the orders, the lower the order cost will be for the firm. Thus, the ordering/acquisition costs are inversely related to the level of inventory.

II. Carrying Cost: These are the expenses of storing goods, i.e., they are involved in carrying inventory. The cost of holding inventory may be divided into

(a) Cost of Storing the Inventory and (b) Opportunity Cost of Funds.

(a) Cost of Storing the Inventory: This include :

Storage Cost (i.e., tax, depreciation, insurance, maintenance of building etc.)

Insurance (for fire and theft);

Obsolescence and Spoilage;

Damage or Theft;

Cost of running out of goods.

(b) Opportunity Cost of Funds

Whenever a firm commits its resources to inventory, it is using funds that otherwise might be available for other purposes. The firm has lost the use of funds for other profit making purposes. This is its opportunity cost. Whatever the source of funds inventory has a cost in terms of financial resources. Excess inventory represents an unnecessary cost.

III. Cost of Running out of Goods/Cost of Stock-Outs

These are costs associated with the inability to provide materials to be production department and/or inability to provide finished goods to the marketing department as the requisite inventories are not available. In other words, the requisite items have run out of stock for want of timely replenishments. These costs have both quantitative dimensions. These are, in the case of raw materials, the loss of production due to stoppage or work, the uneconomical prices associated with 'cash' purchases and the set-up costs which can be quantified in monetary terms with a reasonable degree of precision. As a consequence of this, the production department may not be able to reach its target in providing finished goods for sale. When marketing personnel are unable to honour their commitment to the customers in making finished goods available for sale, the sale may be lost. This can be quantified to a certain extent. However, the erosion of the goods customer relations and the consequent damage done to the image and good-will of the company fall into the qualitative dimension and elude quantification. Even if the stock-out cost cannot be fully quantified a reasonable measure based on the loss of sales for want of finished goods inventory can be used with the understanding that the amount so measured cannot capture the qualitative aspects. The level of inventory and the carrying costs are positively related and move in the same direction, i.e., if inventory level decreases, the carrying costs also decrease and vice-versa.

6.2.3 TECHNIQUES OF INVENTORY MANAGEMENT

As in the case of other current assets, the decision making in investment in inventory involves a basic trade-off between risk and return. The risk is that if the level of inventory is too low, the various functions of the business do not operate independently. The return results because lower level of inventory saves money. As the size of the inventory increases, the storage and other costs also rise. Therefore, as the level of inventory increases, the risk of running out of inventory decreases but the cost of carrying inventory increases. Out of different current assets being maintained by the firm, inventory is one which requires be monitoring and managing not only in terms of monetary value but also in terms of number of physical units. The financial manager must see that the inventory does not become unnecessarily large when compared with the requirements; and for this, close control over the size and composition of inventories must be maintained. Moreover, since the investment in inventories is the least liquid of all the current assets, any error in its management cannot be readily rectified and hence may be costly to the firm. The goal of inventory management should therefore, be to established a level of each item of the inventory. There should be a systematic approach to inventory management which must attempt to balance out the expected costs and benefits of maintaining inventories. In order to ensure efficient management of inventories, the finance manager may be required to answer the following questions:

I. Are all items of inventories equally important, or some of the items are to be given more attention?
II. What should be the size of each order or each replenishment?
III. At what level should the order for replenishment be placed?

Various techniques have been suggested to deal with these problems. Some of these have been discussed as follows:

- **Determination of Stock Levels:** Carrying of too much and too little of inventories is detrimental to the firm. If the inventory level is too little, the firm will face frequent stock-outs involving heavy ordering cost and if the inventory level is too high it will be unnecessary tie-up of Capital. Therefore, an efficient inventory management requires that a firm should maintain an optimum level of inventory where inventory costs are the minimum and at the

same time there is no stock-out which may result in loss of sale or stoppage of production. Various stock levels are discussed as follows:

- **Minimum Level:** This represents the quantity which must be maintained in hand at all times. If stocks are less than the minimum level then the work will stop due to shortage of materials. Following factors are taken into account while fixing minimum stock level:
- **Lead Time:** A purchasing firm requires some time to process the order and time is also required by the supplying firm to execute the order. The time taken in processing the order and then executing it is known as lead time. It is essential to maintain some inventory during this period.
- **Rate of Consumption:** It is the average consumption of materials in the factory. The rate of consumption will be decided on the basis of past experience and production plans.
- **Nature of Material:** The nature of material also affects the minimum level. If a material is required only against special orders of the customer then minimum stock will not be required for such materials. Minimum stock level can be calculated with the help of following formula :
    - **Minimum stock level = Re-ordering level – (Normal consumption × Normal Re-order period).**

Re-ordering Level: When the quantity of materials reaches at a certain figure then fresh order is sent to get materials again. The order is sent before the materials each minimum stock level. Re-ordering level or ordering level is fixed between minimum level and maximum level. The rate of consumption, number of days required replenishing the stocks, and maximum quantity of materials required on any day are taken into account while fixing re-ordering level. Re-ordering level is fixed with the following formula:

Re-ordering Level = Maximum Consumption × Maximum Re-order period.

Maximum Level: It is the quantity of materials beyond which a firm should not exceed its stocks. If the quantity exceeds maximum level limit then it will be overstocking. A firm should avoid overstocking because it will result in high material costs. Overstocking will mean blocking of more working capital, more space for storing the materials, more wastage of

materials and more chances of losses from obsolescence. Maximum stock level will depend upon the following factors :

I. The availability of capital for the purchase of materials.
II. The maximum requirements of materials at any point of time.
III. The availability of space for storing the materials.
IV. The rate of consumption of materials during lead time.
V. The cost of maintaining the stores.
VI. The possibility of fluctuations in prices.
VII. The nature of materials. If the materials are perishable in nature, then they cannot be stored for long.
VIII. Availability of materials. If the materials are available only during seasons then they will have to be stored for the rest of the period.
IX. Restrictions imposed by the Government. Sometimes, government fixes the maximum quantity of materials which a concern can store. The limit fixed by the government will become the limiting factor and maximum level cannot be fixed more than this limit.
X. The possibility of change in fashions will also affect the maximum level.

The following formula may be used for calculating maximum stock level :

Maximum Stock Level = Re-ordering Level + Re-ordering Quantity – (Minimum Consumption × Minimum Re-ordering period).

Danger Level : It is the level beyond which materials should not fall in any case. If danger level arises then immediate steps should be taken to replenish the stocks even if more cost is incurred in arranging the materials. If materials are not arranged immediately there is a possibility of stoppage of work. Danger level is determined with the following formula :

Danger Level = Average Consumption × Maximum re-order period for emergency purchases.

Average Stock Level

The average stock level is calculated as follows:

Average Stock Level = Minimum Stock Level + ½ of Re-order quantity.

- **Determination of Economic Order Quantity (EOQ):** Determination of the quantity for which the order should be placed is one of the important problems concerned with efficient inventory management. Economic Order Quantity (EOQ) refers to the size of the order which gives maximum economy in purchasing any item of raw materials or finished product. It is fixed mainly after taking into account the following costs :

Ordering Cost: It is the cost of placing an order and securing the supplies. It varies from time to time depending upon the number of orders placed and the number of items ordered. The more frequently the orders are placed, and fewer the quantities purchased on each order, the greater will be the ordering cost and vice versa.

$$\sqrt{\frac{2U \times P}{S}}$$

(ii)

(iii) Economic ordering quantity

Quantity (units) purchased in a year (month) Cost

(iv) of placing an order

here, Q Annual (Monthly) cost of storage of one unit

= U =

Illustration 1 : A, a T.V. manufacturer, purchases 1,600 units of a certain component from B. His annual usage is 1,600 units. The order placing cost is Rs. 100 and the cost of carrying one unit for a year is Rs. 8. Calculate the economic Ordering Quantity and tabulate your results.

(v) (vi

(vi (vi

Solution :

$$Q = \frac{\sqrt{2U \times P}}{S}$$

$$= \sqrt{\frac{2 \times 1,600 \times 100}{8}}$$

$$= \sqrt{40,000} = 200 \text{ units}$$

Inventory carrying cost: It is cost of keeping items in stock. It includes interest on investment, obsolescence losses, store-keeping cost, insurance premium, etc. The larger the value of inventory, the higher will be the inventory carrying cost and vice versa. The former cost may be referred as the "cost of acquiring" while the latter as "cost of holding" inventory. The cost of acquiring decreases while the cost of holding increases with very increase in the quantity of purchase lot. A balance is therefore

struck between the two opposing factors and the economic ordering quantity is determined at a level for which the aggregate of two costs is the minimum.

Table Showing The Economic Ordering Quantity

Annual requirements	Orders per year	Units per order	Order placing costs	Average inventory in units (50% of order placed)	Carrying costs	Total annual costs
			Rs.			Rs.
1,600	1	1,600	100	800	6,400	6,500
	2	800	200	400	3,200	3,400
	3	533	300	267	2,136	2,436
	4	400	400	200	1,600	2,000
	5	320	500	160	1,280	1,780
	6	267	600	134	1,072	1,672
	7	229	700	115	920	1,620
	8	200	800	100	800	1,600
	9	178	900	89	712	1,612
	10	160	1,000	80	640	1,640

The above table shows that total cost is the minimum when each order is of 200 units. Therefore, economic ordering quantity is 200 units only.

Assumptions: EOQ model is based on the following assumptions:

I. The firm knows with certainty the annual usage or demand of the particular items of inventories.

II. The rate at which the firm uses the inventories or makes sales is constant throughout the year.

III. The orders for replenishment of inventory are placed exactly when inventories reach the zero level.

These assumptions have pointed out to illustrate the limitations of the basic EOQ model.

- **ABC Analysis:** ABC analysis is the technique of exercising selective control over inventory items. The technique is based on this assumption that a firm should not exercise the same degree of control on items which are more costly as compared to those items which are less costly. According to this approach, the inventory items are dividend into three categories – A, B and C. Category A may include more costly items, while category B may consist of less costly items and category C of the least costly items. Though, no definite procedure can be laid down for classifying the inventories in A, B, C categories as this will depend upon a large number of factors, such as nature and varieties of items, specific requirements of the business, etc., yet the following method is generally adopted.

(e) The quantity of each material expected to be used in a period is estimated.

(f) The value of each of the above items of materials is found out by multiplying the quantity of each item with the price.

(g) The items are then rearranged in the descending order of their value irrespective of their quantities.

(h) A running total of all the values will then be taken.

(i) It will be found that a small number of a first few items may amount to a large percentage of the total value of the items. The management then will have to take a decision as to the percentages of total value or the total number of items which have to be covered by A, B and C categories.

Inventory surveys in general have shown the following trends regarding the components of inventories manufacturing organisations:

Category	% of total value	% of total quantity
A	70	10
B	25	35
C	5	55

While exercising control over stores, items of category A should be given the utmost attention. Their levels of stock should be strictly controlled. In case of items category B, ordinary stores routine should be observed but the rules regarding levels of stock may not be so strictly adhered to as those in category

A. Items of category C may be considered as "free issue" items and even normal accounting procedure may be dispersed with. The advantages of this system are as follows:

(iii) It ensures closer control on costly items in which a large amount of capital has been invested.

(iv) It helps in developing a scientific method of controlling inventories. Clerical costs are reduced and stock is maintained at optimum level.

(ii) It helps in achieving the main objective of inventory control at minimum cost. The stock turnover rate can be maintained at comparatively higher level through scientific control of inventories.

The system of A B C analysis suffers from a serious limitation. The system analyses the items according to their value and not according to their importance in the production process. It may, therefore, sometimes create difficult problems. For example, an item of inventory may not be very costly and hence it may have been put in category C. However, the item may be very important to the production process because of its scarcity. Such an item as a matter of fact requires the utmost attention of the management though it is no advisable to do so as per the system of ABC analysis. Hence, the system of A B C analysis should not be followed blindly.

Illustration 2: The inventory of a company comprises of 7 different items. The average number of each of these items along with their unit costs is given below. The company wants to introduce ABC system of inventory management. You are required to give a break-down of the items into the classification of ABC. The details are:

Item	**Average No. of units in Inventory**	**Average Cost Per Unit (Rs.)**
1	40,000	121. 60
2	20,000	204. 80
3	64,000	22. 00
4	56,000	20. 56
5	1,20,000	6.80
6	60,000	6.00

7	40,000	2.60

Solution :

ABC Analysis

Item	Unit	% of Total Units	Unit Cost (Rs.)	total Cost (Rs.)	% of Total Cost
1	40,000	10	121.60	48,64,000.00	38.00
2	20,000	5	204.80	40,96,000.00	32.00
3	64,000	16	22.00	14,08,000.00	11.00
4.	56,000	14	20.56	11,52,000.00	9.00
5.	1,20,000	30	6.80	8,16,000.00	6.38
6.	60,000	15	6.00	3,60,000.00	2.80
7.	40,000	10	2.60	1,04,000.00	0.82
	4,00,000	100		1,28,00,000.00	100.00

An analysis of the above table brings out that A items (1 and 2) are less important in terms of number with only 15% of the total volume. But it accounts for 70% of the total value of inventory. Therefore this group is very important. Contrary to this C items (5,6 and 7) carry 55% of the total volume but have only 10% value of the total inventory value. The categorisation has been made on the basis of cost involvement. However, this analysis does not mean that B and C items, despite being less expensive, are of less importance. Instead their importance may be tremendous in the production process of the company.

- **VED Analysis**

The VED analysis is used generally for spare parts. The requirements and urgency of spare parts is different from that of materials. ABC analysis may not be properly used for spare parts. The demand for spares depends upon the performance of the plant and machinery. Spare parts are classified as Vital (V), Essential (E) and Desirable (D). The vital spares are a must for running the concern smoothly and these must be stored adequately. The non-availability of vital spares will cause havoc in the concern. The E types of spares are also necessary but their stocks may be kept at low figures. The stocking of D type of spares may be avoided at times. If the lead time of these spares is less, then

stocking of these spares can be avoided. The classification of spares under three categories is an important decision. A wrong classification of any spare will create difficulties for production department. The classification of spares should be left to the technical staff because they know the need, urgency and use of these spares.

- **SDE Analysis:** SDE Analysis evaluates the importance of the inventory item on the basis of its availability. Accordingly SDE analysis groups inventory items into the following categories :

I. S (Scarce items): The items which are in short-supply and mostly such items constitute imported items.

II. D (Difficult Items): This category refers to such items which cannot be procured easily.

III. E (Easy Items): The items which are easily available in the market.

1. Inventory Turnover Ratios: Inventory turnover ratios are also calculated to minimise the investment in inventories. Turnover ratio can be calculated regarding each item of inventory on the basis of the following formula :

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of goods consumed/sold during the period}}{\text{Average inventory held during the period}}$$

For example, if the cost of raw material consumed during January, 2002 is Rs. 10,000 and the average inventory held during the month is Rs. 2,000, the inventory turnover ratio comes to 5. Inventory turnover ratios regarding different items of inventory may be compared with the ratios of the earlier years as well as with each other item. Such a comparison may reveal the following four types of inventories:

(iv) Slow moving inventories. These are inventories which have a low turnover ratio. An attempt should be made to keep these inventories at the lowest level.

(v) Dormant inventories: Inventories which have at present no demand are classified as dormant inventories. A decision should be taken by the financial manager in consultation with the storekeeper, the production controller and the cost accountant whether to retain these inventories because of good chance of future demand or to cut losses by scraping them while they have some market value.

(vi) Obsolete inventories: These are inventories which are no longer in demand because of their becoming out of date. They should be immediately discarded or scrapped.

(vi) Fast moving inventories: These are inventories which are very much in demand. Special care should be taken in respect of these items of inventories so that the production of the sales does not suffer on account of their shortage.

(iii) Aging Schedule of Inventory: Classification of the inventories according to age also helps in identifying inventories which are moving slowly into production or sales. This requires identifying the date of purchase/manufacture of each item of the inventory and classifying them as shown in the table below :

Aging Schedule of Inventory as on 31 Dec., 2001

Age classification (days)	Date of purchase/ manufacture	Amount Rs.	Percentage to total
0-15	Dec. 16	8,000	20
16-30	Dec. 12	4,000	10
31-45	Nov. 26	2,000	5
46-60	Nov. 10	20,000	50
61 and above	Oct. 25	6,000	15
	Total	40,000	100

The above table shows that 50% of the inventory is of the age group of 46-60 days, while 15% is older than 60 days. In case steps are not taken to clear the inventories, it is possible that more than 50% inventories may suffer deterioration in its value or may even become obsolete.

2. **Just in time (JIT) Inventory System:** As discussed, every manufacturing company has to maintain three classes of inventories–raw materials, work-in-process and finished goods. These inventories are designed to act as buffers so that operations can proceed smoothly even if the suppliers are late with deliveries or the department is unable to operate for a short period because of breakdown or any other reason. However, carrying of inventories results in costs in terms of storage, blocking of capital investment, insurance, etc. Such costs can be reduced/ minimised by keeping the inventories at the lowest possible level. JIT system basically aims to achieve this objective. JIT Inventory System, as its name suggests, means all inventories whether of raw materials, work-in-process and finished goods

are received in time. In other words, raw material are received just in time to go into production, manufactured parts are completed just in time to be assembled into products, and products are completed 'just in time' to be shipped to customers. In a JIT environment the flow of goods is controlled by what is described as "pull approach" to the manufacture of products. The pull approach means at the final assembly stage, a signal is sent to the preceding work-station as to the exact quantum of parts and materials that will be needed over the next few hours' for the assembly of products, and only that quantum of parts and materials is provided. The same signal is sent back through each preceding work-station so that a smooth flow of parts and materials is maintained with no inventory build-up at any point. The "pull approach" described above is different from "push approach" as used in case of conventional inventory system. In the latter case, inventories of parts and materials are built up and 'pushed forward' to the next work-station. This result in blocking of funds and stockpiling of parts which may not be used for days or even weeks together.

Requirements of JIT System: The following are the key requirements for the successful operation of JIT Inventory System:

1. The company must have only a few suppliers.
2. Suppliers must be bound under long-term contracts and willing to make frequent deliveries in small lots.
3. The company must develop a system of total quality control (TQC). TQC means that no defects can be allowed over its parts and materials.
4. Poor quality of goods or parts cannot be accepted since JIT inventory system operates with no work-in-process inventory.
5. Workers must be multi-skilled in JIT environment. This is because in case of JIT system machine and equipments are arranged in small cells where several tasks can be performed in relation of a product. The workers assigned to these cells are expected to operate all the equipments which are there in the cells.

Benefits of JIT System: The following are the benefits of JIT System :

(iii) Inventories of all types can be reduced significantly. This results in saving of costs.

(iv) Storage space used for inventories can be made available for other more productive uses.

(v) Total Quality Control results in production of quality products.

(vi) Productivity of workers is increased and machine set-up time is decreased.

6.2.4 INVENTORY AND THE FINANCE MANAGER

The inventory control methods described in this lesson give us a means for determining an optimal level of inventory, as well as how much should be ordered and when. These tools are necessary for managing inventory efficiently and balancing the advantages of additional inventory against the cost of carrying it. Although inventory management usually is not the direct operating responsibility of the finance manager, the investment of funds in inventory is an important aspect of financial management. Consequently, the finance manager must be familiar with ways to control inventories effectively, so that capital may be allocated efficiency. The greater the opportunity cost of funds invested in inventory, the lower is the optimal level of average inventory and the lower the optimal order quantity, all other things held constant. The EOQ model also can be useful to the finance manger in planning for inventory financing. When demand or usage of inventory is uncertain, the finance manager may try to effect policies that will reduce the average lead time required to receive inventory, once an order is placed. The lower the average lead time, the lower is the safety stock needed and the lower the total investment in inventory, all other things held constant. The greater the opportunity cost of funds invested in inventory, the greater is the incentive to reduce this lead time. The purchasing department may try to find new vendors that promise quicker delivery, or it may pressure existing vendors to deliver faster. The production department may be able to deliver finished goods faster by producing a smaller run. In either case, there is trade off between the added cost involved in reducing the lead time and the opportunity cost of funds tied up in inventory. The finance manager is concerned also with the risks involved in carrying inventory. The main risk in inventory investment is that market value of inventory may fall below what the firm paid for it, thereby causing inventory losses. The sources of market value risk depend on the type of inventory. Purchased inventory of manufactured goods is subject to losses due to changes in technology. Such changes may sharply reduce final prices of the goods when they are sold or may even make the goods unsaleable. This risk is, of course, most acute in products embodying a high degree of technological sophistication, for example, electronic parts. There are also substantial risks in inventories of goods dependent on current styles. The readymade industry in particularly susceptible to the risk of changing consumer tastes. Agricultural commodities are a type of inventory subject to risks due to

unpredictable changes in production and demand. A bumper crop of a commodity can send prices plummeting. Of course, there is also the potential for shortage in these commodities, which cause rapid price rises. Moreover, all inventories are exposed to losses due to spoilage, shrinkage, theft or other risks of this sort. Insurance is available to cover many of these risks and, if purchased, is one of the costs of holding inventory. Also, poor inventory control and storage systems can "lose" inventory. That is, inventory may still exists in the store room, but if it cannot be found when desired by a customer, the firm does not profit from its investment. The financial manager must be aware of the degree of risk involved in the firm's investment in inventories. The manager must take those risks into account in evaluating the appropriate level of inventory investment. This can be done by including the relatively predictable losses as part of the holding costs.

6.3 CHECK YOUR PROGRESS

Fill in the blanks:

1. …… refers to the stockpile of the products a firm is offering for sale and various components that make up these products.
2. …… means all inventories whether of raw materials, work-in-process and finished goods are received in time.
3. ……. analysis is the technique of exercising selective control over inventory items.
4. …….. refers to the size of the order which gives maximum economy in purchasing any item of raw materials or finished product.
5. …….. analysis evaluates the importance of the inventory item on the basis of its availability.

6.4 SUMMARY

The term inventory refers to assets which will be sold in future in the normal course of business operations. The assets which the firm stores as inventory in anticipation of need are raw materials, work-in-process/semi-finished goods and finished goods. The objective of inventory management consists of two counter-balancing parts, namely, to minimise investments in inventory and to meet the demand for products by efficient production and sales operations. In operational terms, the goal of inventory management is to have a trade-off between costs and benefits at different levels of

inventory. The cost of holding inventory are ordering cost and carrying cost. The major benefits of holding inventory are in the area of purchasing, production and sales. The inventory management techniques illustrated here are (i) the determination of stock levels which shows the minimum, re-order, maximum and danger levels of inventory (ii) EOQ model which reveals the size of order for the acquisition of inventory by the firm; (iii) ABC system which is useful in determining the type and degree of control on inventory; (iv) inventory turnover ratios to minimise the investment in inventories; (v) classification of inventory according to age and (vi) Just in time, which aims to minimise/reduce the carrying cost of inventories.

6.5 **KEYWORDS**

Inventory: It refers to the stockpile of the products a firm is offering for sale and various components that make up these products.

Ordering Cost: These are the costs of placing an order for the goods.

Carrying Cost: These are the expenses of storing goods.

Economic Order Quantity: It is the optimum size of the order for a particular item of inventory calculated at a point where the total inventory costs are at a minimum for that particular stock item.

Minimum Stock Level: It is the lower limit below which the stock of any stock item should not normally be allowed to fall.

Just-in-time (JIT): JIT aims at eliminating as far as possible all manufacturing and finished goods inventories.

6.6 SELF-ASSESSMENT TEST

(ii) Explain the meaning and different types of inventory. Discuss the objectives of inventory management.

(iii) Why should inventory be held? Why is inventory management important?

(iv) "There are two dangerous situations that management should usually avoid in controlling inventories". Explain.

(v) Define the economic order quantity. How is it computed?

(vi) What are ordering and carrying costs? What is their role in inventory control?

(vii) What are the considerations governing the maximum and minimum level of inventory?

(viii) Explain the ABC technique of inventory control. What are its shortcomings?

(ix) Calculate the Economic Order Quantity from the following information. Also state the number of orders to be placed in a year.

Consumption of materials per annum	10,000 kg.
Order placing costs per order	Rs. 50
Cost per kg. of raw materials	Rs. 2
Storage costs	8% on average inventory

(iii) A company predicts that 3,000 units of a certain material will be needed next year. Each unit costs Rs. 6. Past experience indicates that the storage costs are approximately equal to 10 per cent of the inventory investment. The cost of place on order amounts to Rs. 9. Determine the economic order quantity so as to enable the company to balance its ordering and storage costs. How many orders will the company place in a year based upon EOQ?

6.7 ANSWERS TO CHECK YOUR PROGRESS

1. Inventory
2. JIT
3. A B C
4. Economic Order Quantity
5. S D E

6.8 REFERENCES/SUGGESTED READINGS

- Financial Management and Policy by James C. Van Horne.
- Financial Management by Prasana Chandra.
- Financial Management by Ravi M. Kishore.
- Financial Management by I.M. Pandey.
- Working Capital Management by V.K. Bhalla.

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SOURCES OF FINANCE

STRUCTURE

7.0 LEARNING OBJECTIVES

This lesson will enable the students to understand the nature, features, merits and demerits of the various instruments of working capital/short-term finance as well as long-term finance.

7.1 SOURCES OF SHORT TERM FINANCE

Funds available for a period of one year or less are called short-term finance. In India, short-term funds are used to finance working capital. The financial manager generally spends a good chunk of his time in finding money to finance current assets. Typically, current assets are supported by a combination of long term and short term sources of finance. Long-term sources of finance, discussed in lesson 11, which include equity share capital, preference share capital, debentures, long term borrowings, retained earnings etc. primarily support fixed assets and secondarily provide the margin money for working capital. Short-term sources of finance, the subject matter of this lesson, more or less exclusively support the current assets. The most significant short-term

sources of finance are: trade credit and bank borrowing. The use of trade credit has been increasing over years in India. Trade credit as a ratio of current assets is about 40 per cent. It is indicated by the Reserve Bank of India data that trade credit has grown faster than the growth in sales. Bank borrowing is the next important source of working capital finance. Before seventies, bank credit was liberally available to firms. It became a scarce resource after eighties because of the change in the government policy. The other short-term sources of working capital finance becoming popular in India are : (i) accruals, (ii) public deposits, (iii) short-term loans from financial institutions, (iv) factoring of receivables and (v) commercial paper.

7.1.1 TRADE CREDIT

Trade credit refers to the credit extended by the supplier of goods and services in the normal course business/sale of the firm. According to trade practices, cash is not paid immediately for purchases but after an agreed period of time. Thus, deferral of payment (trade credit) represents a source of finance for credit purchases. There is, however, no formal/specific negotiation for trade credit. It is an informal arrangement between the buyer and the seller. There are no legal instruments/acknowledgements of debt which are granted on an open account basis. Such credit appears in the records of the buyer of goods as sundry creditors/accounts payable. A variant of accounts payable is bills/notes payable. Unlike the open account nature of accounts payable, bills/notes payable represent documentary evidence of credit purchases and a formal acknowledgement of obligation to pay for credit purchases on a specified (maturity) date failing which legal/penal action for recovery will follow. A notable feature of bills/notes payable is that they can be rediscounted and the seller does not necessarily have to hold till maturity to receive payment. However, it creates a legally enforceable obligation on the buyer of goods to pay on maturity whereas the accounts payable have more flexible payment obligations. Although most of the trade credit is on open account as accounts payable, the suppliers of goods do not extend credit indiscriminately. Their decision as well as the quantum is based on a consideration of factors such as earnings record over a period of time, liquidity position of the firm and past record of payment.

Advantages

Trade credit, as a source of short-term/working capital finance, has certain advantages. It is easily, almost automatically, available. Moreover, it is a flexible and spontaneous source of finance. The availability and magnitude of trade credit is related to the size of operations of the firm in terms of sales/ purchases. For instance, the requirement of credit purchases to support the existing sales is Rs. 5 lakh per day. If the purchases are made on a credit of 30 days, the average outstanding accounts payable/trade credit (finance) will amount to Rs. 1.5 crore (Rs. 5 lakh × 30 days). The increase in purchases of goods to support higher sales level to Rs. 6 lakh will imply a trade credit finance of Rs. 1.8 crore (Rs. 6 lakh × 30 days). If the credit purchases of goods decline, the availability of trade credit will correspondingly decline. Trade credit is also an informal, spontaneous source of finance. Not requiring negotiation and formal agreement, trade credit is free from the restrictions associated with formal/negotiated source of finance/credit.

Cost of Trade Credit

The cost of trade credit depends on the terms of credit offered by the supplier. If the terms are, say, 30 days net, then trade credit is cost-free because the amount payable is the same whether the payment is made on purchase or on the 30th day. However, if the supplier offers discount for prompt payment and the terms are, say, 2/10, net 30, there is a cost associated with trade credit availed beyond the discount period. In such a case, we may divide the 30-day period into two parts as follows:

$$\frac{\text{10 days}}{\text{Discount period}} \quad ; \quad \frac{\text{20 days}}{\text{Non-discount period}}$$

The cost of trade credit during the discount period is nil, whereas the cost of trade credit during the non-discount period is:

$$\frac{\text{Discount \%}}{\text{1–Discount \%}} \times \frac{360}{\text{Credit period – Discount period}}$$

In our example, this works out to:

$$\frac{0.02}{1-0.02} \times \frac{360}{30-10} = 36.7 \text{ per cent}$$

The cost of trade credit for several credit terms is shown below:

Credit Terms Cost of Trade Credit 1/10, net 20 36.4 per cent 2/10, net 45 21.0 per cent 3/10, net 60 22.3 per cent 2/15, net 45 24.5 per cent

In general, the cost of additional trade credit is very high and unless the firm is hard pressed financially, it should not forego the discount for prompt payment. The above calculation is based on the assumption that once a firm foregoes discount, it would make payment only at the end of the net period. What happens if the firm fails to pay within the discount period but pays before the end of the net period? Naturally, the annual interest cost of trade credit is higher, the longer the difference between the day of payment and the end of the discount period. From the foregoing discussion two things are clear.

8. In general the cost of trade credit is very high beyond the discount period and unless the firm is hard pressed financially it should not forego the discount for prompt payment.
9. If the firm is unable to avail of the discount for prompt payment, it should delay the payment till the last day of the net period, and even beyond if such an action does not impair the credit worthiness of the firm.

7.1.2 ACCRUALS

The major accrual items are wages and taxes. These are simply what the firm owes to its employees and to the government. Wages are usually paid on a weekly, fortnightly, or monthly basis – between payments, the amounts owned but not yet paid is shown as accrued wages on the balance sheet. Income tax is payable quarterly and other taxes may be payable half-yearly or annually. In the interim, taxes owed but not paid may be shown as accrued taxes on the balance sheet. Accruals vary with the level of activity of the firm. When the activity level expands, accruals increase and when the activity level contracts accruals decrease. As they respond more or less automatically to changes in the level of activity, accruals are treated as part of spontaneous financing. Since no interest is paid by the firm on its accruals, they are often regarded as a 'free' source of financing. However, a closer examination would reveal that this

may not be so. When the payment cycle is longer, wages may be higher. For example, an employee earning Rs. 600 per week and receiving weekly payment may ask for a slightly higher compensation if the payment is made monthly. Likewise when the payment period is longer, tax authorities may raise the tax rates to some extent. Even when such adjustments are made, the fact remains that between established payment dates accruals do not carry any explicit interest burden. While accruals are a welcome source of financing, they are typically not amenable to control by management. The payment period for employees is determined by the practice in industry and provisions of law. Similarly, tax payment dates are given by law and postponement of payment normally results in penalties.

7.1.3 BANK FINANCE FOR WORKING CAPITAL

Advance by commercial banks is another very important source of short term finance in India. A bank considers a firm's sales and production plans and the desirable levels of current assets in determining its working capital requirements. The amount approved by the bank for the firm's working capital is called credit limit. Credit limit is the maximum funds which a firm can obtain from the banking system. In the case of firms with seasonal business, banks may fix separate limits for the 'peak level' credit requirements and 'normal non-peak level' credit requirement indicating the periods during which the separate limits will be utilised by the borrower. In practice, banks do not lend 100 per cent of the credit limit; they deduct margin money. Margin requirement is based on the principle of conservatism and is meant to ensure security. If the margin requirement is 30 per cent, bank will lend only upto 70 per cent of the value of the asset. This implies that the security of bank's lending should be maintained even if the asset's value falls by 30 per cent.

Application and Processing

A customer seeking an advance is required to submit an appropriate application form – there are different types of application forms for different categories of advances. The information furnished in the application covers, inter alia, the following: the name and address of the borrower and his establishment; the details of the borrower's business; the nature and amount of security offered. The application form has to be supported by various ancillary statements like the financial statements and financial projections of the firm. The application is processed by the

branch manager or his field staff. This primarily involves an examination of the following factors: (i) ability, integrity, and experience of the borrower in the particular business, (ii) general prospects of the borrower's business, (iii) purpose of advance, (iv) requirement of the borrower and its reasonableness, (v) adequacy of the margin, (vi) provision of security, and (vii) period of repayment.

Sanction and Terms and Conditions

Once the application is duly processed, it is put up for sanction to the appropriate authority. If the sanction is given by the appropriate authority, along with the sanction of advance the bank specifies the terms and conditions applicable to the advance. These usually cover the following : (i) the amount of loan or the maximum limit of the advance, (ii) the nature of the advance,(iii)the period for which the advance will be valid, (iv) the rate of interest applicable to the advance, (v) the primary security to be charged, (vi) the insurance of the security, (vii) the details of collateral security, if any, to be provided, (viii) the margin to be maintained, and (ix) other restrictions or obligations on the part of the borrower. It is a common banking practice to incorporate important terms and conditions on a stamped security document to be executed by the borrower. This helps the bank to create the required charge on the security offered and also obligates the borrower to observe the stipulated terms and conditions.

Forms of Bank Finance

Short-term finance is provided by commercial banks in three primary ways: (i) cash credits/overdrafts, (ii) loans, and (iii) purchase/discount of bills. In addition to these forms of direct finance, commercial banks help their customers in obtaining credit from other sources through the letter of credit arrangement.

Cash Credits/Overdrafts: Under a cash credit or overdraft arrangement, a pre-determined limit for borrowing is specified by the bank. The borrower can draw as often as required provided the outstandings do not exceed the cash credit/ overdraft limit. The borrower also enjoys the facility of repaying the amount, partially or fully, as and when he desires. Interest is charged only on the running balance, not on the limit sanctioned. A minimum charge may be payable, irrespective of the level of borrowing, for avail bling this facility. This form of advance is highly attractive from

the borrower's point of view because while the borrower has the freedom of drawing the amount in instalments as and when required, interest is payable only on the amount actually outstanding.

Loans: These are advances of fixed amounts which are credited to the current account of the borrower or released to him in cash. The borrower is charged with interest on the entire loan amount, irrespective of how much he draws. In this respect this system differs markedly from the overdraft or cash credit arrangement wherein interest is payable only on the amount actually utilised. Loans are payable either on demand or in periodical instalments. When payable on demand, loans are supported by a demand promissory note executed by the borrower. There is often a possibility of renewing the loan.

Bills Purchased/Discounted: This arrangement is of relatively recent origin in India. With the introduction of the New Bill Market Scheme in 1970 by the Reserve Bank of India (RBI), bank credit is being made available through discounting of usance bills by banks. The RBI envisaged the progressive use of bills as an instrument of credit as against the prevailing practice of using the widely-prevalent cash credit arrangement for financing working capital. The cash credit arrangement gave rise to unhealthy practices. As the availability of bank credit was unrelated to production needs, borrowers enjoyed facilities in excess of their legitimate needs. Moreover, it led to double financing. This was possible because credit was taken from different agencies for financing the same activity. This was done, for example, by buying goods on credit from suppliers and raising cash credit by hypothecating the same goods. The bill financing is intended to link credit with the sale and purchase of goods and, thus, eliminate the scope for misuse or diversion of credit to other purpose. The amount made available under this arrangement is covered by the cash credit and overdraft limit. Before discounting the bill, the bank satisfies itself about the credit-worthiness of the drawer and the genuineness of the bill. To popularise the scheme, the discount rates are fixed at lower rates than those of cash credit, the difference being about 1-1.5 per cent. The discounting banker asks the drawer of the bills (i.e. seller of goods) to have his bill accepted by the drawee (buyers) bank before discounting it. The latter grants acceptance against the cash credit limit, earlier fixed by it, on the basis of the borrowing value of stocks. Therefore, the buyer who buys goods on credit cannot use the same goods as a source of obtaining additional bank credit.

The modus operandi of bill finance as a source of working capital financing is that a bill arises out of a trade sale-purchase transaction on credit. The seller of goods draws the bill on the purchaser of goods, payable on demand or after a usance period not exceeding 90 days. On acceptance of the bill by the purchaser, the seller offers it to the bank for discount/purchase. On discounting the bill, the bank releases the funds to the seller. The bill is presented by the bank to the purchaser/acceptor of the bill on due date for payment. The bills can also be rediscounted with the other banks/RBI. However, this form of financing is not popular in the country.

Letter of Credit: While the other forms of bank credit are direct forms of financing in which banks provide funds as well as bear risk, letter of credit is an indirect form of working capital financing and banks assume only the risk, the credit being provided by the supplier himself. The purchaser of goods on credit obtains a letter of credit from a bank. The bank undertakes the responsibility to make payment to the supplier in case the buyer fails to meet his obligations. Thus, the modus operandi of letter of credit is that the supplier sells goods on credit/extends credit (finance) to the purchaser, the bank gives a guarantee and bears risk only in case of default by the purchaser.

Mode of Security

Banks provide credit on the following modes of security:

Hypothecation: Under this mode of security, the banks provide credit to borrowers against the security of movable property, usually inventory of goods. The goods hypothecated, however, continue to be in the possession of the owner of these goods (i.e., the borrower). The rights of the lending bank (hypothecatee) depend upon the terms of the contract between the borrower and the lender. Although the bank does not have physical possession of the goods, it has the legal right to sell the goods to realise the outstanding loan. Hypothecation facility is normally not available to new borrowers.

Pledge: Pledge, as a mode of security, is different from hypothecation in that in former the goods which are offered as security are transferred to the physical possession of the lender. An essential prerequisite of pledge, therefore, is that the goods are in the custody of the bank. The borrower who offers the security is, called a 'pawnor' (pledge), while the bank is called the 'pawnee' (pledgee). The lodging of the goods by the pledgor to the pledgee is a kind of bailment.

Therefore, pledge creates some liabilities for the bank. It must take reasonable care of goods pledged with it. The term 'reasonable care' means care which a prudent person would take to protect his property. He would be responsible for any loss or damage if he uses the pledged goods for his own purposes. In case of non-payment of the loans, the bank enjoys the right to sell the goods.

Lien: The term 'lien' refers to the right of a party to retain goods belonging to another party until a debt due to him is paid. Lien can be of two types: (i) particular lien, and (ii) general lien. Particular lien is a right to retain goods until a claim pertaining to these goods is fully paid. On the other hand, general lien can be applied till all dues of the claimant are paid. Banks usually enjoy general lien.

Mortgage: It is the transfer of a legal interest in specific immovable property for securing the payment of debt. The person who parts with the interest in the property is called 'mortgagor' and the bank in whose favour the transfer takes place is the 'mortgagee'. The instrument of transfer is called the 'mortgage deed'. Mortgage is, thus, conveyance of interest in the mortgaged property. The mortgage interest in the property is terminated as soon as the debt is paid. Mortgages are taken as an additional security for working capital credit by banks.

Charge: Where immovable property of one person is, by the act of parties or by the operation of law, made security for the payment of money to another and the transaction does not amount to mortgage, the latter person is said to have a charge on the property and all the provisions of simple mortgage will apply to such a charge. The provisions are as follows:

4. A charge is not the transfer of interest in the property though it is security for payment. But mortgage is a transfer of interest in the property.
5. A charge may be created by the act of parties or by the operation of law. But a mortgage can be created only by the act of parties.
6. A charge need not be made in writing but a mortgage deed must be attested.
7. Generally, a charge cannot be enforced against the transferee for consideration without notice. In a mortgage, the transferee of the mortgaged property can acquire the remaining interest in the property if any is left.

Regulation of Bank Finance

Traditionally, industrial borrowers enjoyed a relatively easy access to bank fiance for meeting their working capital needs. Further, the cash credit arrangement, the principal device through which such finance has been provided, is quite advantageous from the point of view of borrowers. Ready availability of finance in a fairly convenient form led to, in the opinion of many informed observers of the Indian banking scene, over-borrowing by industry and deprivation of other sectors. Concerned about such a distortion in credit allocation, the Reserve bank of India (RBI) has been trying, particularly from the mid-sixties onwards, to bring a measure of discipline among industrial borrowers and to redirect credit to the priority sectors of the economy. From time to time, the RBI has been issuing guidelines and directives to the banking sector towards this end. Important guidelines and directives have stemmed from the recommendations of certain specially constituted groups entrusted with the task of examining various aspects of bank finance to industry. In particular, the following committees have significantly shaped the regulation of bank finance for working capital in India : the Dhejia Committee, the Tandon Committee, the Chore Committee, and the Marathe Committee. The key elements of regulation are discussed below:

Norms for Inventory and Receivables

In the mid-seventies, the RBI accepted the norms for raw materials, stock-in-progress, finished goods, and receivables that were suggested by the Tandon Committee for fifteen major industries. These norms were based, on company finance studies made by the Reserve Bank of India, process periods in different industries, discussions with industry experts, and feedback received on the interim reports. These norms represented the maximum levels for holding inventory and receivables in each period. From the mid-1980s onwards, special committees were set up by the RBI to prescribe norms for several other industries and revise norms for some industries covered by the Tandon Committee. Banks have a discretion to deviate from the norms. Still banks often look at them.

Maximum Permissible Bank Finance

The Tandon Committee had suggested three methods for determining the maximum permissible bank finance (MPBF). To describe these methods, the following notation is used:

CA = current assets as per the norms laid down

CL = non-bank current liabilities like trade credit and provisions

CCA = core current assets – this represents the permanent component of working capital

The methods for determining the maximum permissible bank finance (MPBF) are described below:

Method 1	0.75 (CA-CL)
Method 2	0.75 (CA) - CL
Method 3	0.75 (CA - CCA) - CL

To illustrate the calculation of the MPBF under the three methods, consider the data for Omni Company:

Current Assets	Rs. (in million)
Raw material	18
Work-in-process	5
Finished goods	10
Receivables (including bills discounted)	15
Other current assets	2
Total	50
Current Liabilities	
Trade creditors	12
Other current liabilities	3
Bank borrowings (including bills discounted)	25
Total	40

The MPBF for Omni Company as per the three methods is as follows :

Method 1	0.75 (CA-CL)	= 0.75 (50-15)
		= Rs. 26.25 million
Method 2	0.75 (CA)-CL	= 0.75(50) - 15
		= Rs 22.5 million
Method 3	0.75(CA-CCA)-CL	= 0.75 (50-20) - 15
		3. Rs 7.5 million

The CCA are assumed to be Rs. 20 million.

The second method has been adopted. Note that under this method the minimum current ratio works out to be 1.33. An example will illustrate this point. Suppose the current assets and current liabilities (excluding bank finance) for a firm are 100 and 50 respectively. The MPBF will be:

0.75 (CL) - CA = 0.75 (100) - 50 = 25

This means that the current liabilities including MPBF will be: 50+25 =75. Hence, the current ratio works out to 100/75 = 1.33

Forms of Assistance

Traditionally, bank credit to industry has been mainly in the form of cash credit which was introduced by the Scottish bankers. Under the cash credit system, the bank bears the responsibility of cash management because the borrowers have the freedom to determine their drawls within the cash credit limit provided by the bank. With a view to bringing about a better discipline in the utilisation of bank credit, in 1995 a "Loan" system for delivery of bank credit was introduced. Under the new dispensation, within the MPBF so arrived at in terms of the extant guidelines, banks/consortia/syndicates are required to restrict sanction of cash credit limits to borrowers up to a certain portion (which is currently 25 percent) of the MPBF. Where borrowers desire to avail of bank credit for the balance portion (which is currently 75 percent) of the MPBF, or any part thereof, this will be considered on merit by banks/consortia/syndicates in the form of a short-term loan (or loans) repayable on demand for working capital propose for a stipulated period. Banks/consortia/syndicates will have the discretion to stipulate repayment of the short-term loan for working capital purpose by a borrower in instalments or by way of a "bullet" or "balloon" payment. In case the loan is repaid before the due date, it will be credited to the cash credit account.

Information and Reporting System

While banks can devise their own information and reporting system they largely follow the system recommended by the Chore Committee. Its key components are as follow:

- *Quarterly Information System-Form I* : This gives (i) the estimates of production and sales for the current year and the ensuing quarter, and (ii) the estimates of current assets and liabilities for the ensuing quarter.
- *Quarterly Information System-Form II* : This gives (i) the actual production and sales during the current year and for the latest completed year, and (ii) the actual current assets and liabilities for the latest completed quarter.
- *Half-yearly Operating statements-Form III* : This gives the actual operating performance for the half-year ended against the estimates for the same.
- *Half-yearly Funds Flow Statements-FormIIIB* : This give the sources and use of funds for the half-year ended against the estimates for the same.

The thrust of the information and reporting system is (i) to strengthen the partnership between the borrowers and the banker, (ii) to give the banker a deeper insight into the operations and funds requirements of the performance and efficiency of the borrower.

7.1.4 PUBLIC DEPOSITS

Many firms, large and small, have solicited unsecured deposit from the public in recent years, mainly to finance their working capital requirements.

Cost

The interest rate payable on public deposits was subject to a ceiling of till mid-1996. Just before the ceiling was withdrawn, it was 15 per cent. When the ceiling was withdrawn in 1996, companies started offering higher returns. Some of the NBFCs offered about 20 per cent. Due to unhealthy competition, RBI has re-imposed the ceiling of 15 per cent.

Regulation

The Companies (Acceptance of Deposits) Amendment Rules 1978 governs fixed deposits. The important features of this regulation are:

I. Public deposits cannot exceed 25 per cent of share capital and free reserves.

II. The maximum maturity period permitted for a public deposit is 6 months and the maximum maturity period allowed is 3 years. For non-banking financial corporations

(NBFCs) however, the maximum maturity period is 5 years. A minimum maturity period of 3 months, however, is allowed for deposits amounting to 10 per cent of share capital and free reserves.

III. A company which has public deposits is required to set aside, as deposit or investment, by 30th April of each year, an amount equal to 10 per cent of the deposits maturing by 31st March of the following year. The amount so set aside can be used only for repaying such deposits.

IV. A company inviting deposits from the public is required to disclose certain facts about its financial performance and position.

Evaluation

Public deposits offer the following advantages to the company:

= The procedure for obtaining public deposits is fairly simple.

= The restrictive covenants are involved.

= No security is offered against public deposits. Hence the mortgageable assets of the firm are conserved.

= The post-tax cost is fairly reasonable.

V. The quantum of funds that can be raised by way of public deposits is limited.

VI The maturity period is relatively short.

7.1.5 SHORT TERM LOANS FROM FINANCIAL INSTITUTIONS

The Life Insurance Corporation of India, the General Insurance Corporation of India, and the Unit Trust of India provide short-term loans to manufacturing companies with an excellent track record.

Eligibility

A company to be eligible for such loans should satisfy the following conditions:

a) It should have declared an annual dividend of not less than 6 per cent for the past five years (In certain cases, however, this condition is relaxed provided the company has paid an annual dividend of at lest 10 per cent over the last years).

b) The debt-equity ratio of the company should not exceed 1.5:1.

c) The current ratio of the company should be at least 1.33.

d) The average of the interest cover ratios for the past three years should be at least 2:1.

Features

The short-term loan provided by financial institutions have the following features:

a) They are totally unsecured and are given on the strength of a demand promissory note.

b) The loan is given for a period of 1 year and can be renewed for two consecutive years, provided the original eligibility criteria are satisfied.

c) After a loan repaid, the company will have to wait for at least 6 months before availing of a fresh loan.

d) The loans carry an interest rate of 18 per cent per annum with a quarterly rest, which works out to an effective rate of 19.29 per cent per annum. However, there is a rebate of 1 per cent for prompt payment, in which case the effective rate comes down accordingly

7.1.6 COMMERCIAL PAPERS

Commercial Paper (CP) is a short-term unsecured negotiable instrument, consisting of usance promissory note with a fixed maturity. It is issued on a discount on face value basis but it can also be issued in interest bearing form. A CP when issued by a company directly to the investor is called a direct paper. The companies announce current rates of CPs of various maturities, and investors can select those maturities which closely approximate their holding period. When CPs are issued by security dealers/dealers on behalf of their corporate customers, they are called dealer paper. They buy at a price less than the commission and sell at the highest possible level. The maturities of CPs can be tailored within the range to specific investments.

Advantages

A CP has several advantages for both the issuers and the investors. It is a simple instrument and hardly involves any documentation. It is additionally flexible in terms of maturities which can be tailored to match the cash flow of the issuer. A well-rated company can diversify its short-term sources of finance from banks to money market at cheaper cost. The investors can get higher returns than what they can get from the banking system. Companies which are able to raise funds through CPs have better financial standing. The CPs are unsecured and there are no limitations on the end-use of funds raised through them. As negotiable/transferable instruments, they are

highly liquid. The creation of the CP market can result in a part of intercorporate funds flowing into this market which would come under the control of monetary authorities in India.

Framework of Indian CP Market

The CPs emerged as sources of short-term financing in the yearly nineties. They are regulated by the RBI. The main elements of the present framework are given below:

a) CPS can be issued for periods ranging between 15 days and one year. Renewal of CPs is treated as fresh issue.

b) The minimum size of an issue is Rs. 25 lakh and the minimum unit of subscription is Rs. 5 lakh.

c) The maximum amount that a company can raise by way of CPs is 100 per cent of the working capital limit.

d) A company can issue CPs only if it has a minimum tangible net worth of Rs. 4 crore, a fund-based working limit of Rs. 4 crore or more, at least a credit rating of P2 (Crisil), A2 (Icra), PR-2 (Care) and D-2 (Duff & Phelps) and its borrowal account is classified as standard asset.

e) The CPs should be issued in the form of usance promissory notes, negotiable by endorsement and delivery at a discount rate freely determined by the issuer. The rate of discount also includes the cost of stamp duty (0.25 to 0.5 per cent), rating charges (0.1 to 0.2 per cent), dealing bank fee (0.25 per cent) and stand by facility (0.25 per cent).

f) The participants/investors in CPs can be corporate bodies, banks, mutual funds, UTI, LIC, GIC, NRIs on non-repatriation basis. The Discount and Finance House of India (DFHI) also participates by quoting its bid and offer prices.

g) The holder of the CPs would present them for payment to the issuer on maturity.

Effective Cost/Interest Yield

As the CPs are issued at discount and redeemed at its face value, their effective pre-tax cost/interest yield

$$= \frac{\text{Face value} - \text{Net amount realised}}{\text{(Net amount realised}} \times \frac{360}{\text{(Maturity period)}}$$

where net amount realised = Face value–discount–issuing and paying agent (IPA) charges, that is, stamp duty, rating charges, dealing bank fee and fee for stand by facility.

Assuming face value of a CP, Rs. 5,00,000, maturity period, 90 days, net amount realised/discount, Rs. 4,80,000 and other charges associated with the issue of CP, 1.5 per cent, the pre-tax effective cost of CP

$$= \frac{\text{Rs } 5{,}00{,}000 - (\text{Rs } 4{,}80{,}000 - \text{Rs } 7{,}500)}{(\text{Rs } 4{,}80{,}000 - \text{Rs } 7{,}500)} \times \frac{360}{90} = 23.3 \text{ per cent}$$

7.1.7 FACTORING

A factor is a financial institution which offers services relating to management and financing of debts arising from credit sales. While factoring is well-established in Western countries, only two factors, the SBI Factoring and Commercial Services Limited and Canbank Factoring Limited, which have been mandated by the Reserve Bank of India to operate in the western region and the southern region respectively, have been set up recently in India. The Punjab National Bank and the Bank of Allahabad are expected to set up factoring agencies to serve the northern region and the eastern region, respectively.

Features of a Factoring Arrangement

The key features of a factoring arrangement are as follows:

a) The factor selects the accounts of the client that would be handled by it and establishes, along with the client, the credit limits applicable to the selected accounts.

b) The factor assumes responsibility for collecting the debt of accounts handled by it. For each account, the factor pays to the client at the end of credit period or when the account is collected, whichever comes earlier.

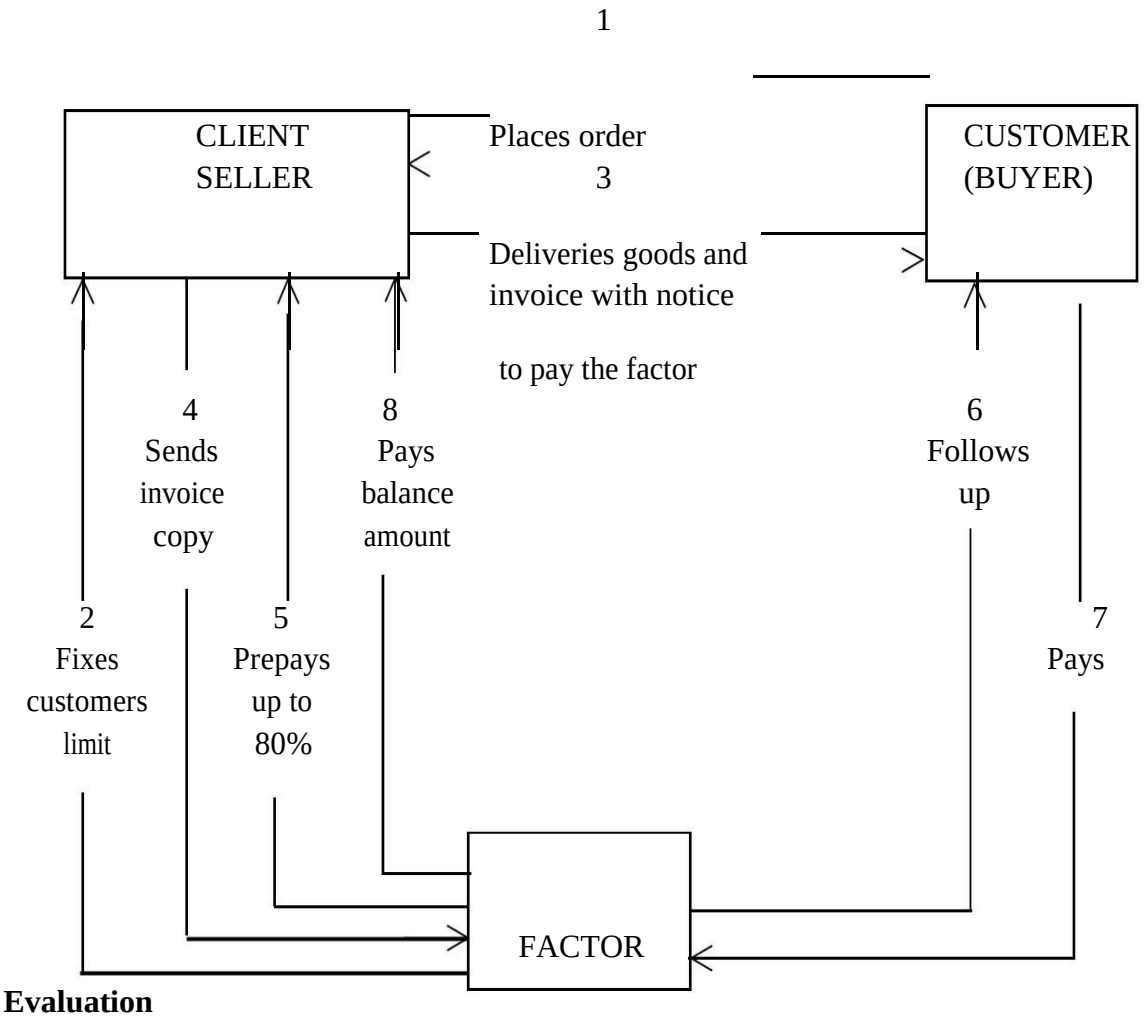
c) The factor advances money to the client against not-yet-collected and not-yet-due debts. Typically, the amount advanced is 70 to 80 per cent of the face value of the debt and carries an interest rate which may be equal to or marginally higher than the lending rate of commercial banks.

d) Factoring may be on a recourse basis (this means that the credit risk is borne by the client) or on a non-recourse basis (this means that the credit risk is borne by the factor). Presently, factoring in India is done on a recourse basis.

Besides the interest on advances against debt, the factor charges a commission which may be 1 to 2 per cent of the face value of the debt factored.

The mechanics of factoring are illustrated in Exhibit 1.

Exhibit 1 : Mechanics of Factoring



Evaluation

Factoring offer the following advantages which makes it quite attractive : (i) Factoring ensures a definite pattern of cash inflows from credit sales. (ii) Continuous factoring may virtually eliminate the need for the credit and collection department. As against these advantages, the limitations of factoring are: (i) The cost of factoring tends to be higher than the cost of other forms of short-term borrowing: (ii) Factoring of debt may be perceived as a sign of financial weakness.

7.2 LONG-TERM FINANCE

To support its long-term investments, a firm must find the means to finance them. Equity and debt represent the two broad sources of long-term finance for a business firm. Equity consists of

equity capital, retained earnings, and preference capital. Debt consists of term loan, debentures, and short-term borrowings. The key differences between equity and debt are as : (i) Debt investors are entitled to a contractual set of cash flows (interest and principal) whereas equity investors have a claim on the residual cash flows of the firm after it has satisfied all other claims and liabilities; (ii) Interest paid to debt investors represents a tax-deductible expense whereas dividend paid to equity investors has to come out of the profit after tax; (iii) Debt has a fixed maturity whereas equity ordinarily has an infinite life; (iv) Equity investors enjoy the prerogative to control the affairs of the firm whereas debt investors play a passive role.

7.2.1 EQUITY/ORDINARY SHARES

Equity shares represent the ownership position in a company and its owners-ordinary shareholders share the risk and rewards associated with the ownership of companies. Ordinary shares are the source of permanent capital since they do not have a maturity date. On the capital contributed by shareholders they are entitled for dividends. The amount or rate of dividend is not fixed; it is decided by the company's board of directors. Being the owners of the company, shareholders bear the risk of ownership; they are entitled to dividends after the income claims of others have been satisfied.

Equity shares have typically a par/face value in terms of the price for each share, the most popular denomination being Rs.10. The price at which the equity shares are issued is the issue price. The issue price for new companies is generally equal to the face value. It may be higher for existing companies, the excess being share premium. The book value of ordinary shares refers to the paid-up capital plus reserves and surplus (net worth) divided by the number of outstanding shares. The price at which equity shares are traded in the stock market is their market value. However, the market value of unlisted shares is not available.

Features:

The ordinary shares have some special features which are as follows:

Residual Claim to Income: The equity investors have a residual claim to the income of the firm. The income left after satisfying the claims of all other investors belongs to the equity shareholders. This income is simply equal to profit after tax minus preferred dividend. The income of equity shareholders may be retained by the firm or paid out as dividends. Equity

earnings which are ploughed back in the firm tend to increase the market value of equity shares and equity earnings distributed as dividend provide current income to equity shareholders. For example, if a firm earns Rs. 16 million during the year and pays dividend of Rs. 7 million, the value of equity shares may rise by about Rs. 9 million, the amount retained by the firm. Equity shareholders thus receive benefits in two ways: dividend income of Rs. 7 million and capital appreciation of Rs. 9 million. The dividend decision is the prerogative of the board of directors and equity shareholders cannot challenge this decision in a court of law. In this respect, the position of equity shareholders differs markedly from that of suppliers of debt capital. Debenture holders, for example, can take legal action against the company for its failure to meet contractual interest payment and principal repayment, irrespective of the financial circumstances of the company. Equity shareholders, on the other hand, cannot challenge the dividend decision of the board of directors in a court of law, however impressive the financial performance of the company may be.

Claim on Assets: The ordinary shareholders' claim in the assets of the company is also residual in that their claim would rank after the claims of the creditors and preference shareholders in the event of liquidation. If the liquidation value of assets is insufficient, their claims may remain unpaid.

Right to control: As owners of the company, the equity holders have the right to control the operations of the company. Their control is, however, indirect. The major policies/decisions are approved by the board of directors and the board-appointed management carries out the day-to-day operations. The shareholders have the legal right/power to elect the board of directors as well as vote on every resolution placed in various meetings of the company. Though, in theory, they have indirect right to control in actual practice, it is weak and ineffective partly because of the apathy and indifference of the majority of the shareholders who rarely bother to cast their votes and partly because scattered equity holders are unable to exercise their collective power effectively.

Voting rights: Equity shareholders are required to vote on a number of important matters. The most significant proposals include: election of directors and change in the memorandum of association. For example, if the company wants to change its authorised share capital or

objectives of business, it requires ordinary shareholders' approval. Directors are elected at the annual general meeting (AGM) by the majority votes. Each ordinary share carries one vote. Thus, an ordinary shareholder has votes equal to the number of shares held by him. Shareholder may vote in person or by proxy. A proxy gives a designated person right to vote on behalf of a shareholder at the company's annual general meeting. When management takeovers are threatened, proxy fights – battles between rival groups of proxy votes – occur. An earlier example in this regard was that of Gamon India where both existing management and the Chhabrias fought for the control of the company and put all efforts to collect proxy votes. The existing management could continue its hold on the company with the help of majority shareholders including the financial institutions.

Pre-emptive rights: The pre-emptive right entitles a shareholder to maintain his proportionate share of ownership in the company. The law grants shareholders the right to purchase new shares in the same proportion as their current ownership. Thus, if a shareholder owns 1 per cent of the company's ordinary shares, he has pre-emptive right to buy 1 per cent of new shares issued. A shareholder may decline to exercise this right. The shareholder's option to purchase a stated number of new shares at a specified price during a given period are called rights. These rights can be exercised at a subscription price which is generally much below the share's current market price, or they can be allowed to expire, or they can be sold in the stock market.

Limited liability: Ordinary shareholders are the true owners of the company, but their liability is limited to the amount of their investment in shares. If a shareholder has already fully paid the issue price of shares purchased, he has nothing more to contribute in the event of a financial distress or liquidation. This position of shareholders is different from the owners in the case of sole proprietary businesses or partnership firms where they have unlimited liability. The limited liability feature of ordinary share encourages otherwise unwilling investors to invest their funds in the company. Thus, it helps companies to raise funds.

Global Depository Receipts (GDRs): A GDR is an instrument issued abroad and is listed/traded on a foreign stock exchange. It represents one/more share(s) of the issuing company. It does not carry any voting rights. A holder of GDRs can at any time covert it into the

number of shares that it represents. After conversion, the underlying shares are listed/traded on the domestic stock exchanges. The dividend on GDRs is paid in local currency (Rupees).

Advantages and Disadvantages of Equity Financing

As the single most important source of long term funds, equity capital has merits as well demerits from the viewpoint of the company as well as the shareholders.

Advantages: The advantages of equity capital to a company are: first, it is a permanent source of funds without any repayment liability; second, it does not involve obligatory dividend payment and; thirdly, it forms the basis of further long-term financing in the form of borrowing related to the creditworthiness of the firm.

Disadvantages:

1. Shares have a higher cost at least for two reasons: Dividends are not tax deductible as are interest payments, and flotation costs on ordinary shares are higher than those on debt.
2. Ordinary shares are riskier from investors' point of view as there is uncertainty regarding dividend and capital gains. Therefore, they require a relatively higher rate of return. This makes equity capital as the highest cost source of finance.
3. The issue of new ordinary shares dilutes the existing shareholders' earnings per share if the profits do not increase immediately in proportion to the increase in the number of ordinary shares.
4. The issuance of new ordinary shares may dilute the ownership and control of the existing shareholders. While the shareholders have a pre-emptive right to retain their proportionate ownership, they may not have funds to invest in additional shares. Dilution of ownership assumes great significance in the case of closely-held companies.

7.2.2 PUBLIC ISSUE OF EQUITY SHARES

Public issue of equity means, raising of share capital directly from the public. For example, Megha Steel Limited (MSL), a subsidiary of Neha Steel Limited made a public issue of equity shares of Rs. 10 crore on 15 July, 1995. The issue price per share is Rs. 50 – representing a premium of Rs. 40 over its par value. The issue price is also higher than its book value of Rs. 26.35 per share. The company needs funds for expansion and modernisation of its plant as well

as for diversification into the manufacture of aluminium. The company expects to pay a dividend of 20 per cent in 1994-95 and 1995-96 and 25 per cent in 1996-97.

Consider another case: N.R. Goyal Industries Limited is approaching the public for the first time to raise Rs. 3.20 crore on 10 July, 1995. Incorporated as a public limited company in December 1994, the maiden issue of equity shares is intended to finance its project for manufacturing industrial paper in Reva, M.P. The share is issued at par at Rs. 10. As per the existing norms, a company with a track record is free to determine the issue price for its shares. Thus, it can issue shares at a premium. However, a new company has to issue its shares at par.

Underwriting of issues: It is legally obligatory to underwrite a public and a right issue. In an underwriting, the underwriters–generally banks, financial institutions, brokers etc. – guarantee to buy the shares if the issue is not fully subscribed by the public. The agreement may provide for a firm-buying by the underwriters. The company has to pay an underwriting commission to the underwriter for their services.

7.2.3 RIGHT ISSUE OF EQUITY SHARES

A right issue involves selling of ordinary shares to the existing shareholders of the company. When a company issues additional equity capital, it has to be offered in the first instance to the existing shareholders on a pro rata basis. This is required under Section 81 of the Companies Act, 1956. The shareholders, however, may by a special resolution forfeit this right, partially or fully, to enable the company to issue additional capital to public.

Features of Rights

1. The number of rights that a shareholders gets is equal to the number of shares held by him.
2. The number of rights required to subscribe to an additional share is determined by the issuing company. In an issue of right shares of Modi Xerox Ltd., for example, five rights were required to subscribe to two additional shares. (Note that five 'rights' as defined by us are equal to two 'rights' as defined in the market place).
3. The price per share for additional equity, called the subscription price, is left to the discretion of the company.
4. Rights are negotiable. The holder of rights can sell them.
5. Rights can be exercised only during a fixed period which is usually about 30 days.

Terms and Procedures

A company making a right issue sends a 'letter of offer', along with a composite application form consisting of four forms (A,B,C, and D) to the shareholders. Form A is meant for acceptance of the rights and application for additional shares. This form shows the number of right shares the shareholder is entitled to. It also has a column through which a request for additional shares may be made. Form B is to be used for renouncing the rights in favour of someone. Form C is meant for application by the renouncel in whose favour the rights have been renounced, by the original allottee, through Form B. Form D is to be used to make a request for split forms. The composite application form must be mailed to the company within a stipulated period, which is usually about 30 days. The conditions that have to be satisfied for obtaining the approval for right issues are as follows:

1. Existing shareholders, who exercise their rights in full, are given an opportunity to apply for additional shares.
2. Existing shareholders who renounce their rights, wholly or partially, are not entitled to apply for additional shares.
3. Shares which become available due to non-exercise of rights by some shareholders, are allotted to shareholders who have applied for additional shares in proportion to their shareholding.
4. Any balance shares left after meeting requests for additional shares by the existing shareholders are disposed of at the ruling market price or the issue price, whichever is higher.

To answer the question : What are the likely consequences of a rights issue on the market value per share, value of a right, earnings per share, and the wealth of shareholders? , let us look at the illustrative data of the Anita and Sunita Company given in Table 11.1

Table 5.1 Illustrative Data of the Anita and Sunita Company

Paid-up equity capital (1,000 shares of Rs. 10 each)	Rs. 10,000
Retained earnings	20,000
Earnings before interests and taxes	12,000
Interest	2,000
Profit before tax	10,000
Taxes (50 per cent)	5,000

Profit after taxes	5,000
Earnings per share	Rs. 5
Market price per share	Rs. 40
(Price-earnings ratio of 8 is assumed)	
Number of additional equity shares proposed to be issued as rights shares	200
Proposed subscription price	Rs. 20
Number of existing shares required for a rights share (1,000/200)	5

Value of Share

The value of share, after the rights issue, is expected to be :

$$\frac{NP_0 + S}{N + 1}$$

where N = number of existing shares required for a rights share P_0 = cum-rights market price per share

S = subscription price at which the rights share are issued.

The rationale behind this formula is as follows : For every N shares before the rights issue, there would be N+1 shares after the rights issue. The market value of these N+1 shares is expected to be the market value of N cum-rights shares plus S, the subscription price.

Applying this formula to the data given in Table 11.1 we find that the value per share after the rights issue is expected to be :

$$\frac{5 \times 40 \times 20}{5 + 1} = \text{Rs. } 36.67$$

Value of Right

The theoretical value of a right is

$$\frac{P_0 - S}{N + 1} \qquad \text{Equation 11.2}$$

The value is determined as follows. The difference between the market price of a share after the rights issue and the subscription price is the benefit derived from N rights, which are required along with the subscription price to obtain one rights shares. This means that the value of N rights is:

$$\frac{NP_0 - S}{N + 1} - S = \frac{N(P_0 - S)}{N + 1} \qquad \text{Equation 11.3}$$

Hence the value of one right is

$$\frac{N(P_0 - S)}{N + 1} \times \frac{1}{N} = \frac{P_0 - S}{N - 1} \qquad \text{Equation 11.4}$$

Apply the above formula to the data given in the Table 11.1 we find that the value of a right of the Anita and Sunita Company is

$$\frac{40 - 20}{5 + 1} = \text{Rs. } 3.33$$

Effect on Wealth of Shareholders

The wealth of existing shareholders, is not affected by the rights offering, provided the existing shareholders exercise their rights in full or sell their rights. To illustrate this point, consider what happens to a shareholder who owns 100 equity shares of the Anita and Sunita Company that has a market value of Rs. 40 each before the rights issue. The impact on his wealth when he exercises his rights, when he sells his rights, and when he follows his rights to expire is shown below:

10

He exercises his rights

Market value of original shareholding at the rate of Rs. 40 per share	= Rs.	4,000
Additional subscription price and for 20 rights shares at the rate of Rs. 20 per share	= Rs.	400
Total investment	= Rs	4,400

Market value of 120 shares at the rate of Rs. 36.67 per share after the rights subscription	= Rs.	4,440
Change in wealth (Rs. 4,400 - Rs. 4,400)	= Rs.	0

He sells his rights

Market value of original shareholding at the rate of Rs. 40 per share	= Rs.	4,000
Value realised from the sale of 100 rights at Rs. 3.33 per right	= Rs.	333
Market value of 100 shares held after the rights issue at the rate of Rs. 36.67 per share	= Rs.	3,667
Change in wealth (Rs. 3,667+Rs 333 - Rs. 4,000)	= Rs.	0

He allows his rights to expire

Market value of original shareholding at the rate of Rs. 40 per share	= Rs.	4,000
Market value of 100 shares and after the rights issue at the rate of Rs. 36.67 per share	= Rs.	3,667
Change in wealth (Rs. 3,667 - Rs. 4,000)	= Rs.	(333)

Setting the Subscription Price

The subscription price, infact, is irrelevant because the wealth of a shareholder who subscribes to the rights shares or sells the rights remains unchanged, irrespective of what the subscription price is. To illustrate this point, consider a shareholder who has N shares valued at P_0 and who enjoys the right to subscribe to an additional share for S. His total investment would be:

$$NP_0 + S \qquad \text{Equation 11.5}$$

The value of his shareholding after subscription would be :

Number of shares × Market value per share after rights issue

This is equal to:

$$(N+1) \times \frac{NP_0 + S}{(N+1)} = NP_0 + S \qquad \text{Equation 11.6}$$

Thus the value of his shareholding after subscription is equal to the value of his investment, irrespective of the subscription price S.

Practically, the subscription price is important. Existing shareholders do not like the idea of S being higher than P_0 because when S is higher than P_0, the market value after issue would be lower than S. Non-shareholders, who have an opportunity to subscribe to shares not taken by existing shareholders, will have no interest in the shares if S is higher than P_0 because they would then suffer a loss when the market value falls below S after the issue. Due to the above consideration, S has to be set equal to or lower to P_0. A value of S equal to P_0 is not advisable because it has no appeal to existing shareholders and other investors as they do not see any opportunity of gain in such a case. So, S has to be set lower than P_0. In determining S, the following considerations should be borne in mind:

1. The lower the S in relation to P_0, the greater is the probability of the success of offering.
2. When S is set low, a large number of rights shares have to be issued to raise a given amount of additional capital. If the company wishes to maintain a certain level of earnings per share and/or dividend per share, it would find it difficult to do so when S is set low.
3. The expectations of investors, the fluctuation of the share, the size of rights issue in relation to existing equity capital, and the pattern of shareholding are important factors in determining what S is acceptable to investors.

The subscription price for a right issue may be decided after taking into account several things : state of the capital market, the trend of share prices in general and of the company's shares in particular, the ruling cum-rights price, the ratio or proportion of the rights issue to the existing equity capital of the firm, the break-up value of the share, the profit-earning capacity of the firm, the dividend record of the firm, and the resources position of the firm.

Comparison between Right Issue and Public Issue

1. A right issue, in comparison with a public issue, is likely to be more successful because it is made to investors who are familiar with the operations of the company.

2. Since the rights issue is not underwritten, the floatation costs of a rights issue are significantly lower than those of a public issue.
3. A rights issue generally has to be made at a lower price than a public issue because existing shareholders expect rights issue to be made at a lower price. Due to this, a rights issue tends to result in a dilution of earnings per share.

Advantages and Disadvantages of Rights Issue

The main advantages of the rights issue are (1) The existing shareholders' control is maintained through the pro rata issue of shares. This is significant in the case of closely-held company or when a company is going into financial difficulties or is under a takeover threat; (2) Raising funds through the sale of rights issue rather than the public issue involves less flotation costs as the company can avoid underwriting commission; and (3) In the case of profitable companies, the issue is more likely to be successful since the subscription price is set below the current market price.

The main disadvantage to the shareholders who fail to exercise their rights is they lose in terms of decline in their wealth. Yet another disadvantage is for those companies whose shareholding is concentrated in the hands of financial institutions because of the conversion of loan into equity. They would prefer public issue of shares rather than the rights issue.

7.2.4 RETAINED EARNINGS

The internal sources of long-term funds of an existing company consist of depreciation charges and retained earnings. The depreciation charges are normally used to replace the concerned asset (s). In a way, therefore, the only internal source of financing expansion/growth/diversification for such companies are retained earnings. In fact, they are an important source of long-term finance for corporate enterprises. As a source of long-term finance, retained earnings have some commendable features. They are readily available to the firm. Flotation costs and losses on account of underpricing associated with external equity are avoided/eliminated. There is also no dilution of control of the firm. However, the magnitude of financing through retained earnings may be limited and variable primarily as a result of the quantum and variability of profits after tax. It has, moreover, high opportunity costs in terms of dividends foregone by the shareholders.

For the shareholders, retention of profits by the firm is a convenient way of reinvestment of their profit. But shareholders who want a current income would find it convenient to the extent that they will be compelled to sell some shares to convert them into income. Moreover, the easy availability of retained earnings coupled with the notion of low cost may result in its investment in submarginal/profitable projects which would have serious implications for, and hurt the interest, of the shareholders. Thus, retained earnings have both positive and negative attributes from the viewpoint of the firm as well as shareholders and should be employed with caution. They involve high cost and no risk, and put no restraint in management freedom and do not dilute control.

7.2.5 PREFERENCE CAPITAL

Preference share capital represents a hybrid form of financing –it has some characteristics of equity and some attributes of debentures. It resembles equity in the following ways: (i) preference dividend is payable only out of distributable profits; (ii) preference dividend is not an obligatory payment (the payment of preference dividend is entirely within the discretion of directors); and (iii) preference dividend is not a tax-deductible payment. Preference capital is similar to debentures in several ways : (i) the dividend rate of preference capital is usually fixed; (ii) the claim of preference shareholders is prior to the claim of equity shareholders; and (iii) preference shareholders do not normally enjoy the right to vote. Preference capital offers the following advantages:

1. There is no legal obligation to pay preference dividend. A company does not face bankruptcy or legal action if it skips preference dividend.
2. There is no redemption liability in the case of perpetual preference shares. Even in the case of redeemable preference shares, redemption can be delayed without significant penalties.

10. Preference capital is generally regarded as part of net worth. Hence, it enhances the creditworthiness of the firm.
11. Preference shares do not under normal circumstances, carry voting right. Hence, there is no dilution of control.

Preference capital, however, suffers from some serious shortcomings:

8. Compared to debt capital, it is an expensive source of financing because the dividend paid to preference shareholders is not, unlike debt interest, a tax-deductible expense.
9. Though there is no legal obligation to pay preference dividends, skipping them can adversely affect the image of the firm in the capital market.
10. Compared to equity shareholders, preference shareholders have a prior claim on the assets and earnings of the firm.

7.2.6 DEBENTURE CAPITAL

Akin to a promissory note, debentures/bonds represent creditorship security and debenture holders are long-term creditors of the company. As a secured instrument, it is a promise to pay interest and repay principal at stipulated times. In contrast to equity capital which is a variable income security, the debentures are fixed income (interest) security.

Features of Debentures

As a long-term source of borrowing, debentures have some contracting features compared to equities which are as follows:

Trust Indenture: When a debenture is sold to investing public, a trustee is appointed through an indenture trust deed. It is legal agreement between the issuing company and the trustee who is usually a financial institution/bank/ insurance company/firm of attorneys. The trust deed provides the specific terms of agreement such as description of debentures, rights of debenture holders, rights of the issuing company and responsibilities of the trustee. The trustee is responsible to ensure that the borrower/company fulfills all its contractual obligations.

Interest: The debentures carry a fixed (coupon) rate of interest, the payment of which is legally binding/enforceable. The debenture interest is tax-deductible and is payable annually/semi-annually/quarterly. Some public sector undertakings issue tax-free bonds the income from which is exempted from tax in the hands of the investors. A company is free to choose the coupon rate which may be fixed or floated, being determined in relation to some benchmark rate. It is also related to the credit rating of the debenture as an instrument.

Maturity : It indicates the length of time for redemption of par value. A company can choose the maturity period, though the redemption period for non-convertible debenture is typically 7-10

years. The redemption of debentures can be accompanied in either of two ways: (i) debentures redemption reserve (sinking fund) and (ii) call and put (buy-back) provision.

Debenture Redemption Reserve (DRR): A DRR has to be created for the redemption of all debentures with a maturity period exceeding 18 months equivalent to at the least 50 per cent of the amount of issue/redemption before commencement of redemption.

Call and Put Provision: The call/buy back provision provides an option to the issuing company to redeem the debentures at a specified price before maturity. The call price may be more than the part/face value by usually 5 per cent, the difference being call premium. The put option is a right to the debenture holder to seek redemption at specified time at predetermined prices.

Security: Debentures are generally secured by a charge on the present and future immovable assets of the company by way of an equitable mortgage.

Convertibility: Apart from pure non-convertible debentures (NCDs), debentures can also be converted into equity shares at the option of the debenture holders. The conversion ratio and the period during which conversion can be affected are specified at the time of the issue of the debenture itself. The convertible debentures may be fully convertible (FCDs) or partly convertible (PCDs). The FCDs carry interest rates lower than the normal rate on NCDs; they may even have a zero rate of interest. The PCDs have two parts: (a) convertible part, (b) non-convertible part. Typically, the convertible portion is converted into equity share at a specified premium after a specified date from the date of allotment, while the non-convertible portion is payable/redeemable in specified equal instalments on the expiry of specified years from the date of allotment.

Credit Rating: To ensure timely payment of interest and redemption of principal by a borrower, all debentures must be compulsorily rated by one or more of the four credit rating agencies, namely, Crisil, Icra, Care and DCR.

Claim on Income and Assets: The payment of interest and repayment of principal is a contractual obligation enforceable by law. Default would lead to bankruptcy of the company. The claim of debenture holders on income and assets ranks *paris passu* with other secured debt and higher than that of shareholders-preference as well as equity.

Types of Debentures

Debentures may be straight debentures or convertible debentures. A convertible debenture (CD) is one which can be converted, fully or partly, into shares after a specified period of time. Thus on the basis of convertibility, debentures may be classified into three categories.

4. Non-convertible debentures (NCDs)
5. Fully convertible debentures (FCDs)
6. Partly convertible debentures (PCDs)

Non-convertible debentures (NCDs): NCDs are pure debentures without a feature of conversion. They are repayable on maturity. The investor is entitled for interest and repayment of principal. Recently, the Industrial Credit and Investment Corporation of India (ICICI) had issued debentures for Rs. 200 crores fully non-convertible bonds of Rs. 1,000 each at 16 per cent rate of interest, payable half-yearly. The maturity period is five years. However, the investors have the option to be repaid fully or partly the principal after 3 years after giving due notice to ICICI.

Fully-convertible debentures (CFDs): FCDs are converted into shares as per the terms of the issue with regard to price and time of conversion. The pure FCDs interest rates, generally less than the interest rates on NCDs since they have the attraction feature of being converted into equity shares. Recently, companies in India are issuing FCDs with zero rate of interest.

Partly-convertible Debentures (PCDs): A number of debentures issued by companies in India have two parts: a convertible part and a non-convertible part. Such debentures are known as partly-convertible debentures (PCDs). The investor has the advantages of both convertible and non-convertible debentures blended into one debenture.

Pros and Cons

Debenture has a number of advantages as long-term source of finance:

Less costly : It involves less cost to the firm than the equity financing because investors consider debentures as a relatively less risky investment alternative and therefore, require a lower rate of return and (b) interest payments are tax deductible.

Non ownership dilution: Debenture holders do not have voting rights; therefore, debenture issue does not cause dilution of ownership.

Fixed payment of interest: Debenture do not participate in extraordinary earnings of the company. Thus the payments are limited to interest.

Reduced real obligation: During periods of high inflation, debenture issue benefits the company. Its obligation of paying interest and principal which are fixed decline in real terms. Debentures has some limitations also:

Obligatory payments: Debenture results in legal obligation of paying interest and principal, which, if not paid, can force the company into liquidation.

Financial risk: It increases the firm's financial leverage, which may be particularly disadvantageous to those firms which have fluctuating sales and earnings.

Cash outflows: Debentures must be paid on maturity, and therefore, at some points, it involves substantial cash outflows.

Restricted covenants: Debenture indenture may contain restrictive covenants which may limit the company's operating flexibility in future.

7.2.7 TERM LOANS

So far we looked at the sources of finance which fall under the broad category of equity finance (or shareholder's funds) and debentures. Now we turn our attention to long-term debt. Firms obtain long-term debt mainly by raising term loans or issuing debentures.

Historically, term loans given by financial institutions and banks have been the primary source of long-term debt for private firms and most public firms. Term loans, also referred to as term finance, represent a source of debt finance which is generally repayable in less than 10 years. They are employed to finance acquisition of fixed assets and working capital margin. Term loans differ from short-term bank loans which are employed to finance short-term working capital need and tend to be self-liquidating over a period of time, usually less than one year. The features of term loans are discussed as follows:

Currency: Financial institutions give rupee loans as well as foreign currency term loans. The most significant form of assistance provided by financial institutions, rupee term loans are given directly to industrial concerns for setting up new project as well as for expansion, modernisation, and renovation projects. These funds are provided for incurring expenditure for land, building,

plant and machinery, technical know-how, miscellaneous fixed assets, preliminary expenses, and margin money for working capital.

Financial institutions provide foreign currency term loans for meeting the foreign currency expenditure towards import of plant, machinery and equipment, and payment of foreign technical know-how fees. The periodical liability for interest and principal remains in the currency/currencies of the loan and is translated into rupees at the prevailing rate of exchange for making payments to the financial institutions.

Security: Term loans typically represent secured borrowing. Usually assets which are financed with the proceeds of the term loan provide the prime security. Other assets of the firm may serve as collateral security. All loans provided by financing institutions, along with interest, liquidated damages, commitment charges, expenses, etc. are secured by way of:

1. First equitable mortgage of all immovable properties of the borrower, both present and future; and
2. Hypothecation of all movable properties of the borrower, both present and future, subject to prior charges in favour of commercial banks for obtaining working capital advance in the normal course of business.

Interest Payment and Principal Repayment

The interest and principal repayment on term loans are definite obligations that are payable irrespective of the financial situation of the firm. To the general category of borrowers, financial institutions charge an interest rate that is related to the credit risk of the proposal, subject to usually a certain floor rate. Financial institutions impose a penalty for defaults. In case of default of payment of instalment of principal and/or interest, the borrower is liable to pay by way of liquidated damages additional interest calculated at the rate of 2 per cent per annum for the period of default on the amount of principal and/or interest in default. In addition to interest, lending institutions levy a commitment fee on the unutilised loan amount.

The principal amount of a term loan is generally repayable over a period of 6 to 10 years after the initial grace period of 1 to 2 years. Typically, term loans provided by financial institutions are repayable in equal semi-annual instalments or equal quarterly instalments.

Note that the interest burden declines over time, whereas the principal repayment remains constant. This means that the total debt servicing burden (consisting of interest payment and principal repayment) decline over time. This pattern of debt servicing burden, typical to India, differs from the pattern obtaining in western economies where debt is typically amortised to equal periodic instalments.

The latter pattern is relatively more acceptable to borrowers because it does not result in a heavy debt servicing burden in earlier years. It has also been recommended by the International Bank for Reconstruction and Development (popularly called the World bank). However, presently financial institutions in India do not follow the scheme of equal periodic amortisation. Yet they try to ensure, by suitably modifying the debt repayment schedule, within limits, that the debt servicing burden is not very onerous.

Restrictive Covenants

In order to project their interest, financial institutions generally impose restrictive conditions on the borrowers. While the specific set of restrictive covenants depends on the nature of the project and the financial situation of the borrower, loan contracts often require that the borrowing firm:

a) Broad-base its board of directors and finalise its management set-up in consultation with and to the satisfaction of the financial institutions.
b) Make arrangements to bring additional funds in the form of unsecured loans/deposits for meeting overruns/shortfalls.
c) Refrain from undertaking any new project and/expansion or make any investment without the prior approval of the financial institutions.
d) Obtain clearances and licences from various government agencies.
e) Repay existing loans with the concurrence of financial institutions.
f) Refrain from additional borrowings or seek the consent of financial institutions for additional borrowings.

= Reduce the proportion of debt in its capital structure by issuing additional equity and preference capital.

= Limit its dividend payment to a certain rate or seek the consent of financial institutions to declare dividend at a higher rate.

= Refrain from creating further charges on its assets.

= Provide periodic information about its operations.

= Limits the freedom of the promoters to dispose of their shareholding.

= Effect organisational changes and appoint suitable professional staff.

= Give financial institutions the right to appoint nominee directors.

Advantages and Disadvantages of Term Loans

Term loans and debentures are two important ways of raising long-term debt.

The advantages of term loans are as follows:

a) Interest of term loan is a tax-deductible expense, whereas equity and preference dividend are paid out of profit after tax.

b) Term loans do not result in dilution of control because debt-holders (term lending institutions and debenture-holders) are not entitled to vote.

c) Lending institutions do not partake in the value created by the company as payments to them are limited to interest and principle.

d) If there is a precipitous decline in the value of the firm, shareholders have the option of defaulting on debt obligations and turning over the firm to term-loan supplier.

Term loan financing is not an unmixed blessing. It has serious disadvantages associated with it:

a. They entails fixed interest and principal repayment obligation. Failure to meet these commitments can cause a great deal of financial embarrassment and even lead to bankruptcy.

b. Loan increases financial leverage which, according to CAPM, raises the cost of equity to the firm.

c. Loan contracts impose restrictions that limit the borrowing firm's financial and operating flexibility. These restrictions may impair the borrowing firm's ability to resort to value-maximising behaviour.

d. If the rate of inflation turns out to the unexpectedly low, the real cost of borrowing will be greater than expected.

7.2.8 CONVERTIBLE DEBENTURES/BONDS

Features: Convertible debentures give the debenture holders the right (option) to convert them into equity shares on certain terms. The holders are entitled to a fixed income till the conversion option is exercised and would share the benefits associated with equity shares after the conversion. The operational features of convertible debentures in India at present are as follows:

All the details about conversion terms, namely, conversion ratio, conversion premium/price and conversion timing are specified in the offer/document/ prospectus. The companies can issue fully convertible debentures (FCDs) or party convertible debentures (PCDs). The number of ordinary shares for each convertible debenture is the conversion ratio. The 'conversion price' is the price paid for the ordinary share at the time of conversion. Thus, 'conversion ratio' equals par value of convertible debentures divided by the conversion price. The 'conversion time' refers to the periods from the date of allotment of convertible debentures after which the option to convert can be exercised. If the conversion is to take place between 18-36 months, the holder will have the option to exercise his rights in full or part. A conversion period exceeding 36 months is not permitted without put and call options. The call options give the issuer the right to redeem the debentures/bonds prematurely on stated terms. The investor has the right to prematurely sell them back to the issuer on specified terms. In addition, compulsory credit rating is necessary for fully convertible debentures.

Valuation: The convertible debentures presently in India can be of three types: (i) compulsorily convertible within 18 months, (ii) optionally convertible within 36 months and (iii) convertible after 36 months with call and put features. However, only the first two types are popular.

Compulsory Partly/Fully Convertible Debentures

Value : The holders of PCDs receive interest at a specified rate over the term of the debenture plus equity share(s) on part conversion and repayment of unconverted part of principal. Symbolically.

$$V_0 = \sum_{t}^{n} \frac{I_t}{(1+k_d)\ t} + \sum_{i}^{n} \frac{aP_i}{(1+k_e)\ i} + \frac{aP_i}{i} \quad \text{Equation 11.7}$$

$t=1$ $j=m^{(1+k_e)}$

where V_0 = Value of the convertible debenture at the time of issue I_t = Interest receivable at the end of period, t

n = Term of debentures

a = Equity shares on part conversion at the end of period, i P_i = Expected per-equity share price at the end of period, i F_j = Instalment of principal payment at the end of period, j k_d = Required rate of return on debt

k_e = Required rate of return on equity

Example : 11.1

The Tata Iron and Steel Ltd. (TISCO) had offered in June 1989, Rs. 30 lakh partly convertible debentures of Rs. 1,209 each at par. The conversion terms were : (i) compulsory conversion of Rs. 600 par value into an equity share of Rs. 100 at a premium of Rs. 500 within six months of the date of allotment, that is, on February 1, 1990. (ii) 12 per cent per annum interest payable half-yearly and (iii) redemption of non-convertible portion of the debentures at the end of 8 years.

It had also simultaneously issued 32,54,167,12 per cent FCDs of Rs. 600 each at par on rights basis to the existing share holders. Each debenture was fully convertible into one share of Rs. 600, that is, Rs 100 par plus a premium of Rs 500 within six months from the date of allotment of debentures.

Assuming 8 and 10 per cent as the half-yearly required rate of return on debt and equity respectively, find the value of a TISCO convertible debenture at the time of issue.

Solution

$$\text{Value of PCD} = \left[\frac{\text{Rs } 72}{1.08}\right] + \sum_{t=2}^{16}\left[\frac{\text{Rs } 36}{(1.08)^t}\right] + \left[\frac{1\times\text{Rs } 1{,}200}{(1.10)^1}\right] + \left[\frac{\text{Rs } 600}{(1.08)16}\right]$$

$$= \text{Rs. } 352.03 + \text{Rs. } 1{,}090.91 + \text{Rs } 175.20 = \text{Rs. } 1{,}618.14$$

Cost : The cost of partly convertible debenture (k_e) is given by Equation

$$S_0 = \sum_{t=1}^{n} \frac{I_t (1-T)}{(I+k_c)^t} + \sum_{i=1}^{aP_1 b} \frac{i}{(1+k_c)} + \sum_{j=m}^{n} \frac{F_j}{(1+k_c)} \qquad \text{Equation 11.8}$$

S_0 = net subscription price of debentures at the time of issue I_t = interest payable at the end of period, t

T = tax rate

a = number of equity shares offered on the occurrence of conversion at the end of period, i

P_1 = per equity share price at the end of period i

b = proportion of net realisable proportion of Pi on the equity share issues to the public

F_j = principal repayment instalment at the end of period, j k_e = cost of capital/discount rate

For the TISCO convertible issue as detailed in Example 11.1, assuming future issue expenses, Rs. 80, 35 per cent tax rate and 75 per cent as the net realisable proportion of equity shares issued to public, the cost of capital (convertible debenture) on a semi-annual basis is the discount rate by solving the following equation :

$$1.120 = \sum_{t=2}^{16} \frac{72(1-0.35)}{(1+k_c)^t} + \frac{36(1-0.35)}{(1+k_c)} + \frac{1\times1{,}200\times0.75}{(1+k_c)} + \frac{600}{(1+k_c)^{16}}$$

k_c = 11.5 per cent

Optionally Convertible Debentures: The value of a debenture depends upon the three factors: (i) straight debenture value, (ii) conversion value and (iii) option value.

Straight Debenture Value (SDC): It equals the discounted value of receivable interest and principal repayment, if retained as a straight debt instrument. The discount factor would depend upon the credit rating of the debenture.

$$\sum_{n=1}^{P} \frac{8}{12} + \frac{100}{}$$

$$\text{Symbolically SDV} = \sum_{t=1}^{16} \frac{}{(1+k_d)} + \frac{}{(1+k_d)^{16}} = \sum_{t=1}^{} \frac{}{(1.16)^t} + \frac{}{(1.16)^8}$$

Equation 11.9

where,

Maturity period = 8 years, Discount factor = 0.16, Interest = 0.12 payable annually and Face value of debenture = Rs. 100.

Conversion Value (CV) : If the holders opt for conversion, is equal to the share price multiplied by the conversion ratio, that is, the number of equity share offered for each debenture.

If the price of share is, Rs. 50 and one debenture is convertible in to 5 shares (conversion ratio =5), the CV=Rs 250 (Rs 50×5).

The value of a convertible debenture cannot be less than the SDV and CV which, in a sense, represent its two floor values. In other words, the value of convertible debenture would be the higher of the SDV and CV.

Optional Value (OV): The investors have an option, that is, they may not exercise the right/exercise the right at a time of the their choosing and select the most profitable alternative. Thus, the option has value in the sense that the value of debenture will be higher than the floor values. Therefore, the value of the convertible debentures = Max [SDV, CV] + OV.

Evaluation: Convertible debentures/bonds have emerged as fairly popular instruments of long-term finance in India in recent years. In the first place, they improve cash flow matching of firms. With the invariably lower initial interest burden, a growing firm would be in a better position to service the debt. Subsequently, when it would do well, it can afford the servicing of the financing instrument after conversion.

Secondly, they generate financial synergy. The assessment of risk characteristics of new firm is costly and difficult. Convertible debentures provide a measure of protection against error of risk assessment. They have two components: straight debentures and call option. In case the firm turns out risky, the former will have a low value while the latter will have a high value and vice versa if the firm turns out to be relatively risk free. As a result, the required yield will not be very

sensitive to default risk. In other words, Thus, convertible debentures offer a financial synergy to companies to obtain capital on more favourable terms.

Finally, convertible debentures can mitigate agency problems associated with financing arising out of conflicting demand of equity holders and debenture holders/lenders. The focus of the latter is on minimising default risk whereas the former would like the firm to undertake high risk projects. This conflict can be resolved by the issue of convertible debentures/bonds. The debenture holders would not impose highly restrictive covenants to protect the interest and firms can undertake profitable investment opportunities.

Foreign Currency Convertible Bonds (FCCBs) : These are basically equity-linked debt securities. Convertible into equity/depository receipts after a specified period. The holder has the option either to convert the FCCBs into equity, normally at a predetermined price and even at a predetermined exchange rate, or retain them. The FCCBs are freely tradeable. Till conversion the interest has to be paid in foreign currency (dollar). The FCCB are issued in a currency different from the currency in which the shares of the company are denominated. This feature enables the option of diversifying the currency risks.

Callabale/Puttable Bonds/Debentures/Bond Refunding

Beginning from 1992 when the Industrial Development Bank of India issued bonds with call features, several callable/puttable bonds have emerged in the country in recent years. The call provisions provide flexibility to the company to redeem them prematurely. Generally, firms issue bonds presumably at lower rate of interest when market conditions are favourable to redeem such bonds.

Evaluation: The bond refunding decision can be analysed as a capital budgeting decision. If the present value of the stream of net cash savings exceeds the initial cash outlay, the debt should be refunded.

Example: 11.2

The 22 per cent outstanding bonds of the Sugar Industries Ltd. (SIL) amount to Rs. 50 crores, with a remaining maturity of 5 years. It can now issue fresh bonds of 5 year maturity at a coupon rate of 20 per cent. The existing bonds can be refunded at a premium (call premium) of 5 per cent. The flotation costs (issue expenses + discount) on new bonds are expected to be 5 per cent.

The unamortised portion of the issue expenses on existing bonds is 1.5 crore. They would be written off as soon as the existing bonds are called/refunded.

If the SIL is in 35 per cent tax bracket, would you advise it to call the bond?

Solution	**(Amount in Rs. crore)**
Annual net cash savings (Working note 2)	0.71
PVIFA (10,13) (Working note 3)	3.517
Present value of annual net cash savings	2.497
Less Initial outlay (Working note 1)	3.600
NPV (bond refunding)	1.103

It is not advisable to call the bond as the NPV is negative

Working notes

2. (a) Cost of calling/refunding existing bonds

Face value		50.0
Plus call premium (5 per cent)		2.5
(b) Net proceeds of new bonds		52.5
Gross proceeds		50.0
Less flotation costs		2.5
(c) Tax savings on expenses		47.5
Call premium	2.5	
Plus Unamortised issue costs	1.5	
	4.0×(0.35 tax)	1.40
Initial outlay [(1a)] -(1b) - (1c)		3.60

(2) (a) Annual net cash outflow on existing bonds

Interest expenses	11.00	
Less tax savings on interest on expenses and amortisation of issue costs :		
0.35[11.0+(1.5/5)]	3.96	7.04
(b) Annual net cash outflow on new bonds		
Interest expenses	10.00	

Less tax savings on interest expenses and		
amortisation of issue costs:0.35[11.00+(2.5/5)]	3.67	6.33
Annual net cash savings[(2)(a) - (2) (b)]		0.71

IV. Present value interest factor of 5 year annuity, using a 13 per cent after tax [0.20 (1-0.35)] cost of new bonds = 3.517

7.2.9 WARRANTS

A warrant entitles its holders to subscribe to the equity capital of a company during a specified period at a particular price. The holder acquires only the right (option) but he has no obligation to acquire the equity shares. Warrants are generally issued in conjunction with other instruments, for example, attached to (i) secured premium notes of TISCO in 1992, (ii) debentures of Deepak Fertilisers and Petrochemical Corporation Ltd. in 1987, Ranbaxy and Reliance in 1995. They can be issued independently also.

Difference with Convertible Debentures: Warrants are akin to convertible debentures to the extent that both give the holder the option/right to buy ordinary shares but there are differences between the two. While the debenture and conversion option are inseparable, a warrant can be detached. Similarly, conversion option is tied to the debenture but warrants can be offered independently also. Warrant are typically exercisable for cash.

Features: The important features of warrants are as follows:

Exercise Price: It is the price at which the holder of a warrant is entitled to acquire the ordinary shares of the firm. Generally, it is set higher than the market price of the shares at the time of the issue.

Exercise Ratio: It reflects the number of shares that can be acquired per warrant. Typically, the ratio is 1:1which implies that one equity share can be purchased for each warrant.

Expiry Date: It means the date after which the option to buy shares expires, that is, the life of the warrant. Usually, the life of warrants is 5-10 years although theoretically perpetual warrants can also be issued.

Types: Warrants can be (i) detachable, and (ii) non-detachable. A detachable warrant can be sold separately in the sense that the holder can continue to retain the instrument to which the warrant was tied and at the same time sell it to take advantage of price increases. Separate sale

independent of the instrument is not possible in case of non-detail detachable warrants. The detachable warrants are listed independently for stock exchange trading but non-detachable warrants are not.

Theoretical Value: A warrant is an option (call option) to buy a number of ordinary share (exercise ratio) at the exercise price. Therefore, the theoretical value of a warrant would depend upon market price of the shares of the company, the exercise price and the exercise ratio. Thus,

Theoretical value = (Market share price – Exercise price) × Exercise ratio

Assuming an exercise price of Rs. 75, the expected market price of share of the company at the time of exercise for the option (expiry date) of Rs. 100 and exercise ratio of 2, theoretical value of a warrant = (Rs 100 - Rs. 75)×2=Rs. 50.

If the market value of shares is lower than the exercise price, the value of a warrant would be zero.

The difference between the market value of shares and the theoretical value of the warrant is the premium. The premium divided by the theoretical value expresses premium in percentage terms.

As an option, the value of a warrant can be computed using sophisticated option pricing models. However, they are beyond the scope of this lesson.

7.2.10 ZERO INTEREST BONDS/DEBENTURES (ZIB/D)

Also known as zero coupon bonds, ZIBs do not carry any explicit rate of interest. They are sold at a discount from their maturity value. The difference between the face value of the bond and the acquisition cost is the return to the investors. The implicit rate of return/interest on such bonds can be computed by Equation 11.10.

Acquisition price = Maturity (face) value/(1-i)n Equation 11.10

where i = rate of interest

n = maturity period (years)

Deep Discount Bond (DDB): A deep discount bond is a form of ZIB. It is issued at a deep/steep discount over its face value. It implies that the interest (coupon) rate is far less than the yield to maturity. The DDB appreciates to its face value over the maturity period

The DDBs are being issued by the public financial institutions in India, namely, IDBI, SIDBI and so on. For instance, IBDI sold in 1992 a DDB of face value of Rs. 1 lakh at a deep discount price of Rs. 2,700 with a maturity period of 25 years. If the investor could hold the DDB for 25 years, the annualised rate of return would work out to 15.54 per cent. The investor had the option to withdraw (put option) at the end of every five years with a specified maturity/deemed face value ranging between Rs. 5,700 (after 5 years) and Rs. 50000 (after 20 years), the implicit annual rate of interest being 16.12 and 15.71 per cent respectively. The investors could also sell the DDBs in the market. The IDBI had also the option to redeem them (call option) at the end of every 5 years presumably to take advantage of prevailing interest rates. A second series of DDBs was issued by the IDBI in 1996 with a face value of Rs. 2 lakh and a maturity period of 25 years, the deep discount issue price being Rs. 5,300. The merit of DDBs/ZIDs is the that they enable the issuing companies to conserve cash during their maturity. They protect the investors against the reinvestment risk to the extent the implicit interest on such bonds is automatically reinvested at a rate equal to its yield to maturity. However, they are exposed to high repayment risk as they entail a balloon payment on maturity.

7.3 CHECK YOUR PROGRESS

1. Accruals vary with the…… of the firm.

2. The amount approved by the bank for the firm's working capital is called……

3. Loans are advances of fixed amounts which are credited to the……. of the borrower or released to him in cash.

4. ……is the transfer of a legal interest in specific immovable property for securing the payment of debt.

5……., as a mode of security, is different from hypothecation in that in former the goods which are offered as security are transferred to the physical possession of the lender.

6. …….. represent the ownership position in a company and its owners share the risk and rewards associated with the ownership of companies.

7. ……. are converted into shares as per the terms of the issue with regard to price and time of conversion.

8 …… represents a hybrid form of financing –it has some characteristics of equity and some attributes of debentures.

9 The internal sources of long-term funds of an existing company consist of …… and …….

7.4 SUMMARY

The more important short-term sources of financing current assets are : (a) trade credit, (b) accruals (c) bank finance. The first two sources are available in the normal course of business, and therefore, they are called spontaneous sources of working capital finance. They do not involve any explicit costs. Bank finances have to be negotiated and involve explicit costs. They are called non-spontaneous or negotiated sources of working capital finance. Two alternative ways of raising short-term finances in India are : factoring and commercial paper. Trade credit refers to the credit that a buyer obtains from the suppliers of goods and services. Payment is required to be made within a specified period. Suppliers sometimes offer cash discount to buyers for making prompt payment. Buyer should calculate the cost of foregoing cash discount to decide whether or not cash discount should be availed. Accruals also provide some funds for financing working capital. However, it is a limited source as payment of accrued expenses cannot be postponed for a long period. Similarly, advance income will be received only when there is a demand-supply gap or the firm is a monopoly. Bank finance is the most commonly negotiated source of the working capital finance. It can be availed in the forms of overdraft, cash credit, purchase/ discount of bills and loans. Each company's working capital need is determined as per the norms. These norms are based on the recommendation of the Tandon Committee and later on, the Chore Committee. The policy is to require firms to finance more and more of their capital needs from sources other than bank. Banks are the largest providers of working capital finance to firms. Commercial paper is an important money market instrument for raising short-term finances. Firms, banks, insurance companies, individuals etc. with short-term surplus funds invest in commercial papers. Investors would generally invest in commercial paper of a financially sound and credit worthy firm. In India, commercial papers of 91 to 180 days maturity

are being floated. The interest rate will be determined in the market. Factoring involves sale of accounts receivables to a factor that charges a commission, bears the credit risk associated with the accounts receivable purchased by it and provides funds in advance of collection and, thus, finances receivables.

Equity and debt represent the two broad sources of finance for a business firm. The key differences between equity and debt are: (i) Debt investors are entitled to a contractual set of cash flows (interest and principal) whereas equity investors have a claim on the residual cash flows of the firm after it has satisfied all other claims and liabilities. (ii) Interest paid to debt investors represents a tax-deductible expense whereas dividend paid to equity investors has to come out of the profit after tax. (iii) Debt has a fixed maturity whereas equity ordinarily has an infinite life (iv) Equity investors enjoy the prerogative to control the affairs of the firm whereas debt investors pay a passive role – of course, they often impose restrictions on the way the firm is run to protect their interests. Ordinary shares provide ownership rights to ordinary shareholders. They are the legal owners of the company. As a result, they have residual claims on income and assets of the company. They have the right to elect the board of directors and maintain their proportionate ownership in the company, called the pre-emptive right. The pre-emptive right of the ordinary shareholders is maintained by raising new equity funds through rights offerings. Rights issue does not affect the wealth of a shareholder. The price of the share with rights-one gets divided into ex-rights price and the value of a right. So what the shareholder gains in terms of the value of right he loses in terms of the loan ex-rights price. However, he will lose if he does not exercise his rights. Debenture or bond is a long-term promissory note. The debenture trust deed or indenture defines the legal relationship between the issuing company and the debenture trustee who represents the debenture holders. Debenture holders have a prior claim on the company's income and assets. They will be paid before shareholders are paid anything. Debentures could be secured and unsecured and convertible and non-convertible. Debentures are issued with a maturity date. In India, they are generally retired after 7 to 10 years by instalments. Preference share is a hybrid security as it includes some features of both an ordinary share and a debenture. In regard to claims on income and assets, it stands before an ordinary share but after a debenture. Most preference shares in India have a cumulative feature, requiring that all past

outstanding preference dividends be paid before any dividend to ordinary shareholders is announced. Term loans are loans for more than a year maturity. Generally, in India, they are available for a period of 6 to 10 years. In some cases, the maturity could be as long as 25 years. Interest on term loans is tax deductible. Mostly, term loans are secured through an equitable mortgage on immovable assets. To protect their interest, lending institutions impose a number of restrictions on the borrowing firm. Convertible security is either a debenture or a preference share that can be exchanged for a stated number of ordinary shares at the option of the investor. Companies offer convertible securities to sweeten debt and thereby market it attractive. It is a form of deferred equity financing, and provides low cost funds during the early stage of investment project. A warrant is an option to buy a specified number of ordinary shares at an indicated price during a specified period. A detachable warrant is bought and sold independent of the debenture to which it is associated. Warrants are generally used to sweeten a debt to make it marketable and lower the interest costs. When warrants are exercised, the firm obtains additional cash. The market value of warrants depends primarily on the ordinary share price. Warrants generally sell above their minimum theoretical value. The difference between the market price and theoretical value of warrants is the premium. Company may also issue zero-interest or deep-discount bonds or debentures. Such debentures are issued at a price much lower than their face value. Thus, there is an implicit rate of interest. A company may also issue debentures redeemable at premium and/or with warrants attached. These features are added to make the issue of debentures attractive to the investors.

7.5 KEYWORDS

Trade Credit: It refers to the credit extended by the supplier of goods and services in the normal course of business.

Factoring: It is a method of financing whereby a firm sells it trade debts at a discount to financial institutions.

Lien: Lien refers to the right of a party to retain goods belonging to another party until a debt due to him is paid.

Commercial Paper: It is a short-term unsecured negotiable instrument, consisting of usance promissory note with a fixed maturity.

Right Issue: It involves selling of ordinary shares to the exiting shareholders of the company.

Warrant: A warrant entities its holder to subscribe to the equity capital of a company during a specified period at a particular price.

Equity Shares: They represent the ownership position in a company and its owners share the risk and rewards associated with the ownership of companies.

Public Issue: It means raising the capital directly from the public.

Preference Share Capital: It represents a hybrid form of financing having some characteristics of equity and some attributes of debentures.

7.6 SELF- ASSESSMENT TEST

1. What are the features of trade credit as a short-term source of working capital finance?
2. How can the cost of trade credit be calculated?
3. Discuss the main forms of working capital advance by banks. What is the kind of security required by them?
4. Discuss briefly commercial papers as source of working capital finance. How would you compute the cost of commercial papers?
5. What is factoring? Give a brief account of the major functions of a factor.
6. "Accruals are a 'free source of finance". Comment.
7. What is the kind of security required by banks for working capital advance?
8. Evaluate public deposits from the point of view of the company and the investor.
9. What is the annual percentage interest cost associated with the following credit terms?

   (i) 2/10 net 50 (ii) 2/15 net 40

   (iii) 1/15 net 30 (iv) 1/10 net 30
10. Assume that the firm does not avail of the cash discount but pays on the last day of the net period. Assume 360 days to a year.
11. What is an ordinary share? How does it differ from a preference share and a debenture? Explain its most important features.

12. What are the advantages and disadvantages of ordinary shares to the company? What are the merits and demerits of the shareholders' residual claim on income from the investors' point of view?
13. What is a rights issue? What are its advantages and disadvantages from the company's and shareholders' points of view?
14. What is a debenture? Explain the features of a debenture.
15. What are the pros and cons of debentures from the company's and investors' point of views?
16. Why a preference share is called a hybrid security? Do you agree that it combines the worst features of ordinary shares and bonds?
17. What are term loans? What are their features?
18. What is common between term loans and debentures in India? Explain the comparative merits and demerits of both.
19. How do various instruments of long-term financing compare?
20. What has been the pattern of corporate financing in India?
21. What are the important features of a convertible security? What reasons are generally given for issuing convertible securities? How is a convertible security valued?
22. What is a warrant? What are its characteristics features? Why are warrants issued?
23. Explain the difference between a convertible security and a warrant.
24. What is meant by zero-interest debentures and deep-discount debentures? How is their cost determined? Illustrate your answer.
25. A firm is thinking of a rights issue to raise Rs. 5 crore. It has a 5 lakh shares outstanding and the current market price of the share is Rs. 170. The subscription price on the new share will be Rs. 125 per share.
    (i) How many shares should be sold to raise the required funds? (ii) How many rights are needed to purchase one new share? (iii) What is the value of one right?

7.7 ANSWERS TO CHECK YOUR PROGRESS

1. Level of activity

2. Credit limit

3. Current account

4. Mortgage

5. Pledge

6. Equity Share

7. Fully Convertible Debenture

8. Preference share capital

9. Depreciation Charges and Retained Earnings

7.8 REFERENCES/SUGGESTED READINGS

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Subject: Financial Management	
Course Code: BCOM-502	
Lesson No.-08	**Updated By**: Dr. Poonam

COST OF CAPITAL

STRUCTURE

8.0 LEARNING OBJECTIVE

The objectives of this lesson are:

1. to explain the concept of cost of capital;
2. to learn about the methods of calculating component cost of capital and the weighted average cost of capital; and

3. to understand the concept and calculation of the marginal cost of capital.

8.1 COST OF CAPITAL

The use of capital budgeting techniques for evaluating an investment project require two basic inputs: (1) the estimates of the project's cash flow and (2) the discount rate. In our discussions of the investment decisions so far we have assumed that the cost of capital is known. Here we focus on the discount rate. The discount rate is the project's opportunity cost of capital (or simply the cost of capital) for discounting its cash flows. The project's cost of capital is the minimum acceptable rate of return on funds committed to the project. The minimum acceptable rate, or the required rate of return is a compensation for time and risk in the use of capital by the project. Since the investment projects may differ in risk, each one of them will have its own unique cost of capital. The firm's cost of capital is not the same thing as the project's cost of capital. The firm's cost of capital will be the overall, or average, required rate of return on the aggregate of the investment projects.

8.1.1 SIGNIFICANCE OF THE COST OF CAPITAL

The concept of cost of capital is of vital importance in financial decision-making. Its usefulness to the finance manager is as follows:

Firstly, the cost of capital is an important element, as basic input information, in capital budgeting decisions. In the present value method of discounted cash flow technique, the cost of capital is used as the discount rate to calculate the NPV. The profitability index or benefit-cost ratio method similarly employs it to determine the present value of future cash inflows. When the internal rate of return method is used, the computed IRR is compared with the cost of capital. The cost of capital, thus, constitutes an internal part of investment decisions. It provides a yardstick to measure the worth of investment proposal and, thus, performs the role of accept-reject criterion. This underlines the crucial significance of cost of capital. It is also referred to as cut-off rate, target rate, hurdle rate, minimum required rate of return, standard return and so on. The cost of capital is related to the firms' objective of wealth maximisation. The accept-reject rules require that a firm should avail of only such investment opportunities as promise a rate of

return higher than the cost of capital. Conversely, the firm would be well advised to reject proposals whose rates of return are less than the cost of capital. If the firm accepts a proposal having a rate of return higher than the cost of capital, it implies that the proposal yields returns higher than the minimum required by the investors and the prices of shares will increase and, thus, the shareholders' wealth. By virtue of the same logic, the shareholders' wealth will decline on the acceptance of a proposal in which the actual return is less than the cost of capital. The cost of capital, thus, provides a rational mechanism for making optimum investment decisions. In brief, the cost of capital is important because of its practical utility as an acceptance-rejection decision criterion.

Secondly, the debt policy of a firm is significantly influenced by the cost consideration. In designing the financing policy, that is, the proportion of debt and equity in the capital structure, the firm aims at minimising the overall cost of capital. The relationship between the cost of capital and the capital structure decision is discussed somewhere else in this book.

Finally, the cost of capital framework can be used to evaluate the financial performance of top management. Such an evaluation will involve a comparison of actual profitabilities of the investment projects undertaken by the firm with the projected overall cost of capital, and the appraisal of the actual costs incurred by management in raising the required funds.

The cost of capital also plays a useful role in dividend decision and investment in current assets. The chapters dealing with these decisions show their linkages with the cost of capital.

8.1.2 THE CONCEPT OF THE COST OF CAPITAL

The term 'cost of capital' refers to the discount rate that is used in determining the present value of the estimated future cash proceeds and eventually deciding whether the project is worth undertaking or not. In this sense, it is defined as the minimum rate of return that a firm must earn on its investment for the market value of the firm to remain unchanged.

The cost of capital is visualised as being composed of several elements. These elements are the cost of each component of capital. The term 'component' means the different sources from which funds are raised by a firm. Obviously, each source of funds or each component of capital has its cost. For example, equity capital has a cost, so also preference share capital and so on. The cost of each source or component is called specific cost of capital. When these specific costs are

combined to arrive at overall cost of capital, it is referred to as the weighted cost of capital. The terms, cost of capital, weighted cost of capital, composite cost of capital and combined cost of capital are used interchangeably. In other words, the term, cost of capital, as the acceptance criterion for investment proposals, is used in the sense of the combined cost of all sources of financing.

Opportunity Cost

The opportunity cost is the rate of return foregone on the next best alternative investment opportunity of comparable risk. The required rate of return on an investment project is an opportunity cost.

For example, you may invest your savings of Rs. 1,000 either in 10 per cent 3-year postal certificates or in 11 per cent 3-year fixed deposit in a bank. In both the cases, the payment is assured by the government; so the investment opportunities reflect equivalent risk. You decide to deposit your savings in the bank. By this action, you have foregone the opportunity of investing in the postal certificates. You have, thus, incurred an opportunity cost equal to the return on the foregone investment opportunity. It is 10 per cent in this case of your investment.

In the case of companies as there is a divorce between management and ownership the investment decisions are made by management, but the capital is supplied by shareholders. He also has the responsibility for the investment decision. Here a question arises: Whose opportunity cost should the manager use? Since shareholders are the supplier of funds to the firm and the manager is acting on their behalf, shareholders will require him to use their required rate of return in making investment decisions. If he is unable to earn returns equal to shareholders required rate of return, they can ask him to return the money to them which they can invest outside and earn the required rate of return.

Thus the manager should consider the owner's (shareholders') required rate of return in evaluating the investment decisions. If the manager is unable to earn the rates on the investment projects which the shareholders could themselves earn on alternative investment opportunities, they will be within their rights to ask for returning their funds.

Investors will require different rates of return on various securities since they have risk differences. Higher the risk of a security, the higher the rate of return demanded by investors.

Since ordinary share is most risky, investors will require highest rate of return on their investment in ordinary shares.

The firm sells various securities to investors to raise capital for financing investment projects. Viewed from all investors point of view, the firm's cost of capital is the rate of return required by them for supplying capital for financing the firm's investment projects by purchasing various securities. It may be emphasised that the rate of return required by all investors will be an overall rate. Thus, the firm's cost of capital is the 'average' of the opportunity cost (or required rates of return) of various securities which have claims on the firm's assets. Recall that the cost of capital of an all equity financed firm is simply equal to the ordinary shareholders' required rate of return.

Opportunity Cost of Capital Formula

The opportunity cost of a source of capital is given by the following formula:

$$I_0 = \frac{CF_1}{(1+k)\,1} + \frac{CF_2}{(1+k)\,2} + \ldots\ldots + \frac{CF_n}{(1+k)\,n} \qquad (8.1)$$

where I_0 is the capital supplied by investors in period 0 (it represents a net cash inflow to the firm), CF_1, CF_2 ....., CF_n are returns expected by investors (they represent cash outlfows to the firm) and k is the required rate of return or the cost of capital.

In terms of Equation (8.1), the cost of capital is the internal rate of return which equates the present values of inflows and outflows of a financial opportunity. The outflows in this equation represent the returns which investors could earn on the alternative investment opportunities of equivalent risk. The opportunity cost of retained earnings is the rate of return which the ordinary shareholders would have earned to these funds if they would have been distributed as dividends to them.

Concept of Average Cost of Capital

A firm's cost of capital is the weighted average cost of various sources of finance used by it, viz., equity, preference, long-term debt, and short-term debt. Note that many companies leave out the cost of short-term debt while calculating the weighted average cost of capital (WACC). In principle, this is not correct. Investors who provide short-term debt also have a claim on the operating earnings of the firm. If a company ignores this claim, it will misstate the rate of return required on capital investments.

Suppose that a firm uses equity costing 16 per cent and debt costing 9 per cent. If the proportions in which equity and debt are used are respectively 40 per cent and 60 per cent, its WACC will be:

WACC = Proportion of equity × cost of equity + Proportion of debt × Cost of debt

= 0.40 × 16% + 0.6 × 9%

= 6.4% + 5.4%

= 11.8%

In general, if the firm uses n different sources of finance, its WACC is:

$$WACC = p_i r_i \quad (8.2)$$

where P_i is the proportion of the ith source of finance and r_i is the cost of the ith source of finance.

The rationale for using the WACC as the hurdle rate in capital budgeting is fairly straight-forward. If a firm's rate of return on its investments exceeds its cost of capital, the wealth of equity stockholders is enhanced. Why? When the firm's rate of return on its investments is greater than its cost of capital, the rate of return earned on equity capital will exceed the rate of return required by equity stockholders. Hence, the wealth of equity stockholders will increase.

Two basic conditions should be satisfied for using WACC for evaluating new investments.

(iii) The risk of new investments is the same as the average risk of existing investments. In other words, the adoption of new investments will not change the risk complexion of the firm.

(iv) The capital structure of the firm will not be affected by the new investments. Put differently the firm will continue to pursue the same financing policy.

Thus, strictly speaking, WACC is the right discount rate for a project that is a carbon copy of the firm's existing business. However, in practice WACC is used as a benchmark hurdle rate that is adjusted for variations in risk and financing patterns. More details regarding WACC are available in section 7.6 of present lesson.

8.2 DETERMINING COMPONENT COST OF CAPITAL

The term 'cost of capital' is the combined cost of the specific costs associated with specific sources of financing. The cost of the different sources of financing represents the components of the combined cost. The computation of the cost of capital, therefore, involves two steps: (i) the computation of the different elements of the cost in terms of the cost of the different sources of finance (specific costs), and (ii) the calculation of the overall cost by combining the specific costs into a composite cost.

The first step in the measurement of the cost of capital of the firm is the calculation of the cost of individual sources of raising funds. In the following pages we will discuss the same.

8.2.1 Cost of Debt

A company may raise debt from financial institutions or public either in the form of public deposits or debentures for a specified period of time at certain rate of interest. The cost of funds raised through debt in the form of debentures or loan from financial institutions can be determined from Eq. 8.3. To apply the formulation of explicit cost of debt, we need data regarding: (i) the net cash proceeds/inflows (the issue price of debentures/amount of loan minus all floatation costs) from specific source of debt, and (ii) the net cash outflows in terms of the amount of periodic interest payment and repayment of principal in instalments or in lump sum on maturity. The interest payments made by the firm on debt issues qualify for tax deduction in determining net taxable income. Therefore, the effective cash outflows is less than the actual payment of interest made by the firm to the debt holders by the amount of tax shield on interest payment. The debt can be either perpetual/irredeemable or redeemable. A debenture or bond may be issued at par or at discount or premium.

Cost of Perpetual Debt: The measurement of the cost of perpetual debt is relatively easy. It is the rate of return which the lenders expect. The coupon interest rate or the market yield on debt can be said to represent an approximation of the cost of debt. The nominal/coupon rate of interest on debt is the before-tax cost of debt. Since the effective cost of debt is the tax-adjusted rate of interest, the before-tax cost of debt should be adjusted for the tax effect. Thus:

$$k_i = \frac{I}{SV} \quad (8.3)$$

$$k_d = \frac{I}{SV}(1-t) \quad (8.4)$$

k_i = Before tax cost of debt

k_d = Tax-adjusted cost of debt

I = Annual interest payment

SV = Sale proceeds of the bond/debenture t = Tax rate

Example 8.1: Assume a company has 12 per cent perpetual debt of Rs. 1,00,000. The tax rate is 35 per cent. Determine the cost of capital (before tax as well as after tax) assuming the debt is issued at (i) par, (ii) 10 per cent discount, and (iii) 10 per cent premium.

Solution :

(i) Debt issued at par

Before-tax cost, $k_i = \text{Rs.} \frac{12,000}{1,00,000} = 12$ per cent

After-tax cost, $k_d = k_i (1 - t) = 12\% (1-0.35) = 7.80$ per cent

2. Issued at discount

Before-tax cost, $k_i = \text{Rs.} \frac{12,000}{90,000} = 13.33$ percent

After-tax cost, $k_d = 13.33 (1-0.35) = 8.67$ per cent

(iii) Issued at premium

Before-tax cost, $k_i = \text{Rs.} \frac{12,000}{1,10,000} = 10.91$ per cent

After-tax cost, $k_d = 10.91 (1-0.35) = 7.09$ per cent

Cost of Redeemable Debt: While computing the cost of redeemable debt, account has to be taken in addition to interest payments, of the repayment of the principal. When the amount of principal is repaid in one lump sum at the time of maturity, the before tax cost of debt would be given by solving Eq. 8.5. If, however, the repayments are in a number of instalments, the cost of debt can be calculated on the basis of Eq. 8.6.

$$I_0 = \sum_{t=1}^{n} \frac{I_t}{(I + k_d)^t} + \frac{P_n}{(I + k_d)^n} \qquad (8.5)$$

where I_0 = Net cash proceeds from issue of debentures or from raising debt

$I_1 + I_2 + ... + I_n$ = Interest payments in time period 1,2 and so on up to the year of maturity after adjusting tax savings on interest payment.

P_n = Principal repayment in the year of maturity k_d= before tax

cost of debt

If the repayment of debt is in a number of instalments instead of one lump sum payment, the equation would be:

$$I_0 = \sum_{t=1}^{n} \frac{I_t + P_n}{(I + k_d)^t} \qquad (8.6)$$

Example 8.2: A company decides to sell a new issue of 7 year 15 per cent debenture of Rs. 100 each. The debenture is expected to be sold at 5 per cent discount. It will also involve floatation costs of 2.5 per cent. The company's tax rate is 40 per cent. What would the cost of debt be?

Solution:

11. Trial and Error/Long Approach

Cash flow pattern of the debenture would be as follows:

Years		Cash flow
0	+	Rs. 92.5 (Rs. 100 - Rs. 7.5, that is, par value less flotation cost less discount)
1-7	-	Rs. 15 (interest outgo)
7	-	Rs 100 (repayment of principal at maturity)

We are to determine the value k_d in the following equation :

$$\text{Rs. } 92.5 = \sum_{t=1}^{7} \frac{\text{Rs. } 9.0}{(1 + k_d)^t} + \frac{\text{Rs. } 100}{(1 + k_d)^7}$$

The value k_d for this equation would be the cost of debt. The value of k_d can be obtained, as in the case of IRR, by trial and error.

Determination of PV at 10% and 11% rates of interest

Year(s)	Cash	PV factor at		Total PV at	
	outflows	10%	11%	10%	11%
1-7	Rs. 9.0	4.868	4.712	43.81	42.41
7	100	0.513	0.482 (Table A-3)	51.30	48.20
				94.11	90.61

The value of k_d would be 10.5 approximately (i.e. between 10 % and 11%).

7. Shortcut Method : The formula for approximating the effective cost of debt can, as a shortcut, be shown in the Equation (7.7) :

$$k_d = \frac{I (1- t) + (f+d+pr-pi) / N_m}{(RV + SV) / 2} \qquad (7.7)$$

where

I = Annual interest payment

RV = Redeemable value of debentures/debt

SV = Net sales proceeds from the issue of debenture/debt (face value of debt minus issue expenses)

N_m = Term of debt

f = Flotation cost

(f) = Discount of issue of debentures pi= Premium on issue of debentures

pr= Premium on redemption of debentures t = Tax rate

$$k_d = \frac{\text{Rs } 15\ (1\text{-}.40) + (5+2.5)/7}{(\text{Rs. } 92.5 + \text{Rs. } 100)/2} = 10.46 \text{ per cent}$$

Illustration 8.3: A 7-year Rs. 100 debenture of a firm can be sold for a net price of Rs. 97.75. The coupon rate of interest is 15 per cent per year, and bond will be redeemed at 5 per cent premium on maturity. The firm's tax rate is 35 per cent. Compute the after-tax cost of debenture.

Solution: The annual interest will be Rs. 100 × 0.15 =Rs. 15, and maturity price will be : Rs. 100 (1.05) = Rs. 105. We can use Equation (7.5) to compute the after-tax cost of debenture:

$$97.75 = \sum_{t=1}^{7} \frac{15}{(1+k_d)^t} + \frac{105}{(I + k_d)^7}$$

By trial and error, we find k_d = 16%:

$$15(4.038) + 105\ (0.354) = 97.75$$

The after-tax cost of debenture will be:

$$k_d\ (1\text{-}t) = 0.16\ (1\text{-}0.35) = 0.104 \text{ or } 10.4\%$$

Thus the calculation of the cost of debt is relatively easy. Also, debt is the cheapest source of long-term funds from the point of view of the company. In the first place, it is the safest form of investment from the point of view of the creditors because they are the first claimants on the company's assets at the time of its liquidation. Likewise, they are the first to be paid their interest before any dividend is paid to preference and equity shareholders. Therefore, the supplier's required rate of return on debt instruments is lower vis-a-vis other financial instruments, and, hence, lower cost of debt to the firm. Another, reasons for debt having the lowest cost is the tax-deductibility of interest payments.

8.2.2 Cost of Preference Capital

Preference capital carries a fixed rate of dividend and is redeemable in nature. Even though the obligation of a company towards its preference shareholders is not as firm as that towards its debenture holders, we will assume that preference dividend will be paid regularly and preference capital will be redeemed as per the original intent.

Thus, preference stock will be considered much like a bond with fixed commitments. However, preference dividend, unlike debt interest, is not a tax-deductible expense and hence does not produce any tax saving.

The failure to pay dividends, although does not cause bankrupety, yet it can be a serious matter from the ordinary shareholders' point of view. The nonpayment of dividends on preference capital may result in voting rights and control to the preference shareholders. More than this, the firm's credit standing may be damaged. The accumulation of preference dividend arrears may adversely affect the prospects of ordinary shareholders for receiving any dividends, because dividends on preference capital represent a prior claim on profits. As a consequence, the market value of the equity shares can be adversely affected if dividends are not paid to the preference shareholders and, therefore, to the equity shareholders. For these reasons, dividends on preference capital should be paid regularly except when the firm does not make profits, or it is in a very tight cash position.

Perpetual preference share: The preference share may be treated as a perpetual security if it is irredeemable. Thus, its cost is given by the following equation:

$$k_p = \frac{PD}{P_0} \qquad (8.8)$$

where k_p is the cost of preference share, PD is the expected preference dividend, and P_0 is the issue price of preference share.

Example 8.4: A company issues 10 per cent irredeemable preference shares. The face value per share is Rs. 100, but the issue price is Rs. 95. What is the cost of preference share? What is the cost if the issue price is Rs. 105?

Solution: We can compute cost of a preference share as follows :

Issue price Rs. 95 :

$$k_p = \frac{PD}{P_0} = \frac{10}{95} = 0.1053 \text{ or } 10.53\%$$

Issue price Rs. 105 :

$$K_p = \frac{PD}{P_0} = \frac{10}{105} = 0.0952 \text{ or } 9.52\%$$

Cost of Redeemable Preference capital:

The explicit cost of preference share in such a situation is the discount rate that equates the net proceeds of the sale of preference shares with the present value of the future dividends and principal repayments. The appropriate formula to calculate cost is given by Eq. (8.9).

$$P_0 (1-f) = \frac{PD_1}{(1 + k_p)^1} + \frac{PD_2}{(1 + k_p)^2} + ...+ \frac{P_n}{(1 + k_p)^n} + \frac{PD_n}{(1 + k_p)^n}$$

$$P_0 (1-f) = \sum_{t=1}^{n} \frac{PD_t}{(1 + k_p)^t} + \frac{P_n}{(1 + k_p)^n} \quad (8.9)$$

where P_0 = Expected sale price of preference shares

f = Floatation cost as percentage of P_0

PD = Dividends paid on preference shares

P_n = Repayment of preference capital amount

Example 8.5: Krishan Kant Ltd. has issued 14 per cent preference shares of the face value of Rs. 100 each to be redeemed after 10 years. Flotation cost is expected to be 5 per cent. Determine the cost of preference shares (k_p).

Solution :

$$\text{Rs. } 95 = \sum_{t=1}^{10} \frac{\text{Rs. } 14}{(1 + k_p)^t} + \frac{\text{Rs. } 100}{(1 +$$

$$10$$

The value of k_p is likely to be between 14 andk_p)15 per cent as the rate of dividend is 14 per cent.

Determination of the PV at 14 per cent and 15 per cent

Year	Cash	PV factor at	Total PV at

	outflows	14%	15%	14%	15%
1-10	Rs. 14	5.216	5.019	Rs. 73	Rs. 70.30
10	100	0.270	0.247	27	24.70
				100	95.00

k_p = 15 per cent

8.2.3 Cost of Equity Capital:

Equity finance may be obtained in two ways: (i) retention of earnings and (ii) issue of additional equity. The cost of equity or the return required by equity shareholders is the same in both the cases. Remember that when a firm decides to retain earnings, an opportunity cost is involved. Shareholders could receive the earnings as dividends and invest the same in alternative investments of comparable risk to earn a return. So, irrespective of whether a firm raises equity finance by retaining earnings or issuing additional equity shares, the cost of equity is the same. The only difference is in floatation costs. There is no floatation cost for retained earnings whereas there is a floatation cost of 2 to 10 per cent or even more for additional equity. In our present discussion we will discuss cost of external equity as well as cost of retained earnings. It may, therefore, *prima facie*, appear that equity capital does not carry any cost. But this is not true. Equity capital, like other sources of funds, does certainly involve a cost to the firm. It may be recalled that the objective of financial management is to maximise shareholders' wealth and the maximisation of market price of shares is the operational substitute for wealth maximisation. When equity holders invest their funds they also expect returns in the form of dividends. The market value of shares is a function of the return that the shareholders expect and get. If the company does not meet the requirements of its shareholders and pay dividends, it will have an adverse effect on the market price of shares. The equity shares involve the highest degree of financial risk since they are entitled to receive dividend and return of principal after all other obligations of the firm are met. As a compensation to the higher risk exposure, holders of such securities expect a higher return and, therefore, higher cost is associated with them.

Cost of External Equity:

There are two important approaches that can be employed to calculate the cost of external equity capital: (i) dividend approach, and (ii) capital asset pricing model.

Dividend Approach: The dividend approach is based on the following assumptions:

3. The market price of the ordinary share (P_0) is a function of expected dividends.
4. The initial dividend, D_1, is positive (i.e. $D_1 > 0$).
5. The dividends grow at a constant rate g, and the growth rate (g) is equal to the return on equity (ROE) times the retention ratio (b) (i.e. g = ROE×b).
6. The dividend payout ratio [i.e. (1-b)] is constant.

Mathematically :

$$P_0 = \frac{D_1}{(1+k_e)^1} + \frac{D_2}{(1+k_e)^2} + \ldots\ldots = \sum_{t=1}^{\infty} \frac{D_t}{(1+k_e)^t} \qquad (8.10)$$

where P_0 = current price of the stock

D_t = dividend expected to be paid at the end of year *t*

k_e = equity shareholders' required rate of return/cost of equity capital.

If dividends are expected to grow at a constant rate of g per cent per year, then Eq. (8.10) becomes:

$$P_0 = \frac{D_1}{(1+k_e)^1} + \frac{D_1(1+g)}{(1+k_e)^2} + \frac{D_1(1+g)^2}{(1+k_e)^3} + \ldots\ldots$$

This simplifies to :

$$P_0 = \frac{D_1}{k_e - g}$$

Solving the above equation for k_e, we get :

$$k_e = \frac{D_1}{P_0} + g = \frac{D_0 (1+g)}{P_0} + g \qquad (8.11)$$

So, the expected return of shareholders, which in equilibrium is also the required return, is equal to the dividend yield plus the expected growth rate.

Example 8.6: The share of a company is currently selling for Rs. 100. It wants to finance its capital expenditures of Rs. 1,00,000 either by retaining earnings or selling new shares. If the company sells new shares, the issue price will be Rs. 95. The dividend per share next year is Rs. 4.75 and it is expected to grow at 6 per cent. Calculate (i) the cost of internal equity (retained earnings) and (ii) the cost of external equity (new issue of shares).

Equation (8.11) can be used to calculate also the cost of internal equity:

$$k_e = \frac{\text{Rs. } 4.75}{\text{Rs } 100} + 0.06 = 0.0475 + 0.06 = 0.1075 \text{ or } 10.75\%$$

The cost of external equity can be calculated as follows :

$$k = \frac{\text{Rs. } 4.75}{\text{Rs } 95} + 0.06 = 0.05 + 0.06 = 0.11 \text{ or } 11\%$$

6.

It is obvious that the cost of external equity is greater than the cost of internal equity because of the underpricing (cost of external equity = 11% > cost of internal equity = 10.75%).

For publicly traded company, it is fairly easy to determine the dividend yield. However, estimating the expected growth rate, g, is difficult. You can estimate g by using the following methods:

= You can get g by relying on analysts' forecasts for the future growth rates. Analysts' forecasts may be available from a variety of sources. Since different sources are likely to give different estimates, a simple approach may be to obtain multiple estimates and then average them.

= You can look at dividends for the preceding 5-10 years, calculate the annual growth rates, and average them. Suppose you observe the following dividends for some stock :

Year	Dividend	Rupee change	Growth (%)
1996	Rs. 3.00	–	–
1997	Rs. 3.50	Rs. 0.50	16.7
1998	Rs. 4.00	Rs. 0.50	14.3
1999	Rs. 4.25	Rs. 0.25	6.3
2000	Rs. 4.75	Rs. 0.50	11.8

If you average the four growth rates, the result is 12.3 per cent, so you can use this as an estimate of the expected growth rate, g.

3. You can use the retention growth rate method. Here, you first forecast the firm's average retention rate (this is simply 1 minus the dividend payout rate) and then multiply it by the firm's expected future return on equity (ROE).

g = (Retention rate) (Return on equity)

For example, if the forecasted retention rate and return on equity are 0.60 and 15 per cent the expected growth rate is: g = (0.6) (15%) = 9 per cent.

The dividend growth model is simple. It is easy to understand and easy to apply. However, there are some problems associated with it.

2 First, it cannot be applied to companies that do not pay dividends or to companies that are not listed on the stock market. Even for companies that pay dividends, the assumption that dividends will grow at a constant rate may not be valid.

15. Second, it does not explicitly consider risk. There is not direct adjustment for the risk associated with the estimated growth. Of course, there is an implicit adjustment for risk as the current stock price is used.

Example 8.7: From the under mentioned facts determine the cost of equity shares of company X :

3. Current market price of a share = Rs. 150.

4. Cost of floatation per share on new shares, Rs. 3

5. Dividend paid on the outstanding shares over the past six years :

Year	Dividend per share
1	Rs. 10.50
2	11.02
3	11.58
4	12.16
5	12.76
6	13.40

V. Assume a fixed dividend pay out ratio.

VI. Expected dividend on the new shares at the end of the current year is Rs. 14.10 per share.

Solution:

To begin with, we have to estimate the growth rate in dividends. Using the compound interest table (Table A), the annual growth rate of dividends would be approximately 5 per cent. (During the five years the dividends have increased from Rs. 10.50 to Rs. 13.40, giving a compound factor of 1.276, that is, Rs. 13.40/Rs. 10.50. The sum of Re 1 would accumulate to Rs 1.276 in five years @ 5 per cent interest).

$$K_e = \frac{\text{Rs. } 14.10}{\text{Rs } 147 \text{ (Rs } 150 - \text{Rs } 3)} + 5\% = 14.6 \text{ per cent}$$

Supernormal growth: Dividends may grow at different rates in future. The growth rate may be very high for a few years, and afterwards, it may become normal indefinitely in the future. The dividend valuation model can also be used to calculate the cost of equity under different growth assumptions. For example, if the dividends are expected to grow at a super-normal growth rate g_s for n years and thereafter, at a normal, perpetual growth rate of g_n beginning in year n+1, then the cost of equity can be determined by the following formula:

$$P_0 = \sum_{t=1}^{n} \frac{D_0 (1+g_s)^t}{(1+k_e)^t} + \frac{P_n}{(1+k_e)^n} \qquad (8.12)$$

P_n is the discounted value of the dividend stream, beginning in year n+1 and growing at a constant, perpetual rate g_n, at the end of year n, and therefore it is equal to :

$$P_n = \frac{D_{n+1}}{k_e - g_n} \quad (8.13)$$

When we multiply P_n by $1/(1+k_e)^n$ we obtain the present value of P_n in year 0.

Substituting Equation (7.13) in Equation (7.12), we get:

$$P_0 = \sum_{t=1}^{n} \frac{D_0 (1+g_s)^t}{(1+k_e)^t} + \frac{D_{n+1}}{k_e + g_n} \times \frac{1}{(1+k_e)^n} \quad (8.14)$$

The cost of equity, k_e, can be computed by solving equation (12) by trial and error.

Illustration 8.8: Assume that a company's share is currently selling for Rs.

6. Current dividend, D_0 are Rs. 3.50 per share and are expected to grow at

8. per cent over the next 6 years and then at a rate of 8 per cent for ever. The company's cost of equity can be found out as follows :

$$134 = \sum_{t=1} \frac{3.50(1.15)t}{(1+k_e)^t} + \frac{D_7}{(k_e - 0.08)} \times \frac{1}{(1+k_e)^6}$$

$$= \frac{4.03}{(1+k_e)} + \frac{4.63}{(1+k_e)^2} + \frac{5.33}{(1+k_e)^3}$$

$$+ \frac{6.13}{(1+k_e)^4} + \frac{7.05}{(1+k_e)^5} + \frac{8.11}{(1+k_e)^6} + \frac{8.11(1.08)}{(k_e - 0.08)} \times \frac{1}{(1+k_e)^6}$$

9. $4.03\,(PVF_{1,ke}) + 4.63(PVF_{2,ke}) + 5.33(PVF_{3,ke}) + 6.13(PVF_{4,ke})$

$$+ 7.05(PVF_{5,ke}) + 8.11\,(PVF_{6,ke}) + \frac{76}{k_e - 0.08}\,(PVF_{6,ke})$$

By trial and error, we find that $k_e = 0.12$ or 12 per cent :

$$134 = 4.03(0.893) + 4.63(0.797) + 5.33\,(0.712) + 6.13\,(0.636) + 7.05\,(0.567) + 8.11\,(0.507) + \frac{8.76}{0.12-0.08}(0.507)$$

Zero Growth: In addition to its use in constant and variable growth situations, the dividend valuation model can also be used to estimate the cost of equity of no-growth companies. The cost of equity of a share on which a constant amount of dividend is expected perpetually is given as follows:

$$k_e = \frac{D_1}{P_0} \qquad (8.15)$$

The growth rate g will be zero if the firm does not retain any of its earnings; that is, the firm follows a policy of 100 per cent payout. Under such case, dividends will be equal to earnings, and therefore Equation (7.15) can also be written as:

$$k_e = \frac{EPS_1}{P0} \qquad (8.16)$$

which implies that in a no-growth situation, the expected earnings-price (E/P) ratio may be used as the measure of the firm's cost of equity.

Cost of Retained Earnings

The opportunity cost of the retained earnings (internal equity) is the rate of return on dividends foregone by equity shareholders. The shareholders generally expect dividend and capital gain from their investment. The required rate of return of shareholders can be determined from the dividend valuation model.

Normal growth: The dividend-valuation model for a firm whose dividends are expected to grow at a constant rate of g is as follows:

$$P_0 = \frac{D_1}{k_e - g}$$

where $D_1 = D_0\,(1+g)$

Above equation can be solved for calculating the cost of equity k_e as follows:

$$k_e = \frac{D_1}{P_0} + g$$

The cost of retained earnings determined by the dividend-valuation model implies that if the firm would have distributed earnings to shareholders, they could have invested it in the shares of the firm or in the shares of other firms of similar risk at the market price (P_0) to earn a rate of return equal to k_e. Thus, the firm should earn a return on retained funds equal to k_e to ensure growth of dividends and share price. If a return less than k_e is earned on retained earnings, the market price of the firm's share will fall. It may be re-emphasised that the cost of retained earnings will be equal to the share-holders' required rate of return.

Example 8.9: Suppose that the current market price of a company's share is Rs. 90 and the expected dividend per share next year is Rs. 4.50. If the dividends are expected to grow at a constant rate of 8 per cent, the shareholders' required rate of return is :

$$k_e = \frac{D_1}{P_0} + g$$

$$k_e = \frac{\text{Rs } 4.50}{\text{Rs } 90} + 0.08 = 0.05 + 0.08 = 0.13 \text{ or } 13\%$$

if the company intends to retain earnings, it should atleast earn a return of 13 per cent on retained earnings to keep the current market price unchanged.

Capital Asset Pricing Model Approach: Another approach that can be used to estimate the cost of equity is the capital asset pricing model (CAPM) approach.

The CAPM explains the behaviour of security prices and provides a mechanism whereby investors could assess the impact of proposed security investment on their overall portfolio risk and return. In other words, it formally describes the risk return trade-off for securities. It is based on the following assumptions. (i) All investors have common (homogenous) expectations regarding the expected returns, variances and correlation of returns among all securities; (ii) All investors have the same information about securities; (iii) There are no restrictions on investments; (iv) There are no taxes; (v) There are no transaction costs; and (vi) No single

investor can affect market price significantly. (vii) All investors prefer the security that provides the highest return for a given level of risk or the lowest amount of risk for a given level of return, that is, the investors are risk averse. Thus, the basic assumption of CAPM is that the capital market is efficient and the investors are risk averse. The risk to which security investment is exposed falls into two groups: (i) diversifiable/unsystematic, and (ii) non-diversifiable/systematic. The first represents that portion of the total risk of an investment that can be eliminated/ minimised through diversification. The events/factors that cause such risks vary from firm to firm. The sources of such risks include management capabilities and decisions, strikes, unique government regulations, availability or non-availability of raw materials, competition, level of operating and financial leverage of the firm, and so on.

The systematic/non-diversifiable risk is attributable to factors that affect all firms. Illustrative sources of such risks are interest rate changes, inflation or purchasing power change, changes in investor expectations about the overall performance of the economy and political changes, and so on. As unsympathetic risk can be eliminated by an investor through diversification, the systematic risk is the only relevant risk. Therefore, an investor (firm) should be concerned, according to CAPM, solely with the non-diversifiable (systematic) risk.

According to CAPM, the non-diversifiable risk of an investment/security is assumed in terms of the beta coefficient. Beta is a measure of the volatility of a security's return relative to the returns of a broad-based market portfolio. The beta for the market portfolio as measured by the broad-based market index equals one. Beta coefficient of 1 would imply that the risk of the specified security is equal to the market; the interpretation of zero coefficient is that there is no market-related risk to the investment. A negative coefficient would indicate a relationship in the opposite direction. The 'going' required rate of return in the market for a given amount of systematic risk is called the Security Market Line (SML). Beta can be calculated as follows:

$$_i = \frac{COV_{im}}{^2m} \qquad (8.17)$$

where $_i$ is the beta of security i, COV_{im} is the covaraince between the returns of security and market portfolio m and ^2_m is the variance of returns on the market portfolio m. In practice the following equation can be used to calculate k_e under CAPM:

$$K_e = R_f + B (R_m - R_f) \quad (8.18)$$

where K_e = cost of equity capital

^{R}f = the rate of return required on a risk-free asset/security/ investment

^{R}m = the required rate of return on the market portfolio of assets that can be viewed as the average rate of return on all assets.

B = the beta coefficient

Example 8.10: To illustrate the SML approach, let us assume that R_f = 10 per cent and R_M =18 per cent. The required return on equity stocks of companies with different betas is given below.

Beta	Required return = R_f + $_E$ (R_M - R_f)
0.5	10 + 0.5 (18-10) = 14%
1.0	10 + 1.0 (18-10) = 18%
1.5	10 + 1.5 (18.10) = 22%

To use the SML, the following inputs are required: R_f, the risk-free rate; (R_M - R_f) the market risk premium, and $_E$ the beta of the stock.

The CAPM has wider applications and it is determined in an objective manner by using sound statistical methods. One practical problem with the use of beta, however, is that it does not probably remain stable over time.

8.2.4 WEIGHTED AVERAGE COST OF CAPITAL (WACC)

After calculating the component costs they are multipled by the weights of the various sources of capital to obtain a weighted average cost of capital (WACC). The composite or overall cost of capital is the weighted average of the costs of various sources of funds, weights being the proportion of each source of funds in the capital structure. It should be remembered that it is the weighted average concept, not the simple average, which is relevant in calculating the overall cost of capital. The simple average cost of capital is not appropriate to use because firms hardly use various sources of fund equally in the capital structure. The following steps are involved to calculate the weighted average cost of capital:

1. Calculate the cost of the specific sources of funds (i.e. cost of debt, cost of equity, cost of preference capital etc.)
2. Multiply the cost of each source by its proportion in the capital structure.
3. Add the weighted component costs to get the firm's weighted average cost of capital

Example 8.11: The market value proportions and cost of capital of equity, preference, and debt are

E/V	=	0.60	k_e	=	16.0%
P/V	=	0.05	k_P	=	14.0%
D/V	=	0.35	k_d	=	12.0%

The corporate tax rate, T_c is 30 per cent.

The WACC for Bharat Nigam Limited is calculated in Table 8.1.

Table 8.1: Calculation of the WACC for Bharat Nigam Limited

Source of Capital	Proportion (1)	Cost (2)	Weighted Cost [(1)×(2)]
Equity	0.60	16.0%	9.60%
Preference	0.05	14.0%	0.70%
Debt	0.35	8.4%	2.94%

Thus, given the cost of specific sources of financing and the scheme of weighting, the weighted average cost of capital (WACC) can be readily calculated by multiplying the specific cost of each source of financing by its proportion in the capital structure and adding the weighted values. In symbols, the weighted average cost of capital may be expressed as follows:

$$WACC = \frac{E}{V} k_e + \frac{P}{V} k_p + \frac{D}{V} k_d (1-T_c)$$

where WACC = weighted average cost of capital

E	=	market value of equity
V	=	market value of the firm
k_e	=	cost of equity
P	=	market value of preference
k_p	=	cost of preference

D = market value of debt

k_d = cost of debt

T_c = corporate tax rate

Example 8.12: (Book Value Weights)

A firm's after-tax cost of capital of the specific sources is as follows:

Cost of debt	8 per cent
Cost of preference shares	14 per cent
Cost of equity funds	17 per cent

The following is the capital structure:

Source	**Amount**
Debt	Rs. 3,00,000
Preference capital	2,00,000
Equity capital	5,00,000
	10,00,000

Calculate the weighted average cost of capital, k_0, using book value weights.

Solution:

Table: Computation of Weighted Average Cost of Capital (Book value weights)

Sources of funds	Amount	Proportion		Cost (%)	Weighted cost (3×4)
(1)	(2)	(3)		(4)	(5)
Debt	Rs. 3,00,000	0.3	(30)	0.08	0.024
Preference capital	2,00,000	0.2	(20)	0.14	0.028
Equity Capital	5,00,000	0.5	(50)	0.17	0.085
	10,00,000	1.00	(100)		0.137

Weighted average cost of capital = 13.7 per cent

Book-Value VS, Market-Value Weights

The weighted cost of capital can be computed by using the book-value or the market-value weights. If there is a difference between the book-value and market-value weights, the weighted average cost of capital would differ according to the weights used. The weighted average cost of capital calculated by using the book-value weights will be understated if the market-value of the share is higher than the book-value and vice-versa.

Illustration: Suppose in example 7.12 the firm has 40,000 equity shares outstanding and that the current market price per share is Rs. 20. Assume that the market-values and the book-values of the debt and the preference capital are same. If the component costs are the same as before, the market-value weighted average cost of capital would be:

Table: Computation of Weighted Average Cost of Capital (Market-Value Weights)

Source	Amount (Rs.)	Proportion	After-tax Cost	Weighted Cost
(1)	(2)	(3)	(4)	(5)=(3)×(4)
Equity capital (Rs.40,000) share @ Rs. 20)	8,00,000	0.615	0.18	0.1107
Preference capital	2,00,000	0.154	0.11	0.0169
Debt	3,00,000	0.231	0.08	0.0180
	13,00,000	1,000		k_0 = 0.1456

It should be noted that the equity capital of the firm is the total market-value of the ordinary shares outstanding which includes retained earnings (reserves). It is obvious that the market value weighted cost of capital (14.56%) is higher than the book-value weighted cost of capital (13.7%), because the market-value of equity share capital (Rs. 8,00,000) is higher than its book-value (Rs. 5,00,000).

Besides the simplicity of their use, the book-value weights are said to have the following advantages:

1. Firms in practice set their capital structure targets in terms of book-values.
2. The book-value information can be easily derived from the published sources.

3. The book-value debt-equity ratios are analysed by investors to evaluate the riskiness of the firms in practice.

The use of the book-value weights can be seriously questioned on theoretical grounds. First, the component costs are opportunity rate and are determined in the capital markets. The weights should also be market-determined. Second, the book-value weights are based on arbitrary accounting policies that are used to calculate retained earnings and value of assets. Thus, they do not reflect economic values. It is very difficult to justify the use of the book-value weights in theory. Market-value weights are not influenced by accounting policies. They are also consistent with the market-determined component costs. The difficulty in using market-value weights is that the market prices of securities fluctuate widely and frequently.

8.2.5 WEIGHTED MARGINAL COST OF CAPITAL SCHEDULE

At the outset we assumed, *inter alia*, that the adoption of new investment proposals will not change either the risk complexion or the capital structure of the firm. Does it mean that the weighted average cost of capital will remain the same irrespective of the magnitude of financing? Apparently not. Generally, the weighted average cost of capital tends to rise as the firm seeks more and more capital. This happens because the supply schedule of capital is typically upward sloping - as suppliers provide more capital, the rate of return required by them tends to increase. A schedule or graph showing the relationship between additional financing and the weighted average cost of capital is called the weighted marginal cost of capital schedule.

Determining the Weighted Marginal Cost of Capital Schedule

The procedure for determining the weighted marginal cost of capital involves the following steps:

11. Estimate the cost of each source of financing for various levels of its use through an analysis of current market conditions and an assessment of the expectations of investors and lenders.
12. Identify the levels of total new financing at which the cost of the new components would change, given the capital structure policy of the firm.

    These levels, called breaking points, can be established using the following relationship.

$$BP_j = \frac{TF_j}{w_j}$$

where BP_j = breaking point on account of financing source j

TF_j = total new financing from source j at the breaking point

W_j = proportion of financing source j in the capital structure

(c) Calculate the WACC for various ranges of total financing between the breaking points.

(d) Prepare the weighted marginal cost of capital schedule which reflects the WACC for each level of total new financing.

Illustration:

To illustrate the preparation of the weighted marginal cost of capital schedule, let us consider an example. Shiva chemicals Limited wishes to use equity, preference, and debt capital in the following proportions:

Equity : 0.45

Preference : 0.05

Debt : 0.50

Cost of Each Source of Financing for Various Levels of its Use: Based on its discussions with its merchant bankers and lenders Shiva Chemicals Limited estimates that the cost of each of its three sources of financing for various levels of usage as given in Table 8.2.

Breaking Points: Given the target capital structure proportions and the financing ranges for each source of finance, the breaking points for each source of finance and the corresponding ranges of total new financing are given in columns 3 and 4 of Table 8.2:

Table 7.2: Data for Calculating the Weighted Marginal Cost of Capital (MWCC) Schedule for Shiva Chemicals

Source of capital	Target Proportion	Range of New Financing	Cost
Equity	45%	0-10	15%
		10-30	16.50

		30 and above	18.00
Preference	5%	0-1	14.50
		1 and above	15.00
Debt	50%	0-15	7.50
		15-40	8.0
		40 and above	8.40

3. These ranges are for the respective sources of financing and not for total new financing

Table: Determination of Breaking Points and the Resulting Ranges of Total New Financing for Shiva Chemicals Limited

Source of New Capital	Cost (%)	Range of New Financing (Rs. in million)	Breaking Point (Rs. in million)	Range of Total Financing (Rs. in million)
	(1)	(2)	(3)	(4)
Equity	15.00	0-10	10/0.45=22.22	0-22.22
	16.50	10-30	30/0.45=66.67	22.22-66.67
	18.00	30 and above	–	66.67 and above
Preference	14.50	0-1	1/0.05 = 20.00	0 - 20.00
	15.00	1 and above	–	20.00 and above
Debt	7.50	0-15	15/0.50=30.00	0 - 30.00
	8.00	15-40	40/0.50=80.00	30.00-80.00
	8.40	40 and above	–	80.00 and above

WACC for Various Ranges of total New Financing : An examination of column 4 of above table shows that the firm's weighted average cost of capital will change at Rs. 20.00, Rs. 22.22, Rs. 30.00, Rs. 66.67, and Rs. 80.00 million of total new financing. Exhibit 12.4 shows the calculation of the weighted average cost of capital over three ranges.

Weighted Marginal Cost of Capital Schedule: The weighted marginal cost of capital schedule is shown in the following table. It is represented graphically in Exhibit 8.1.

WACC for Various Ranges of Total New Financing for Shiva Chemicals Limited

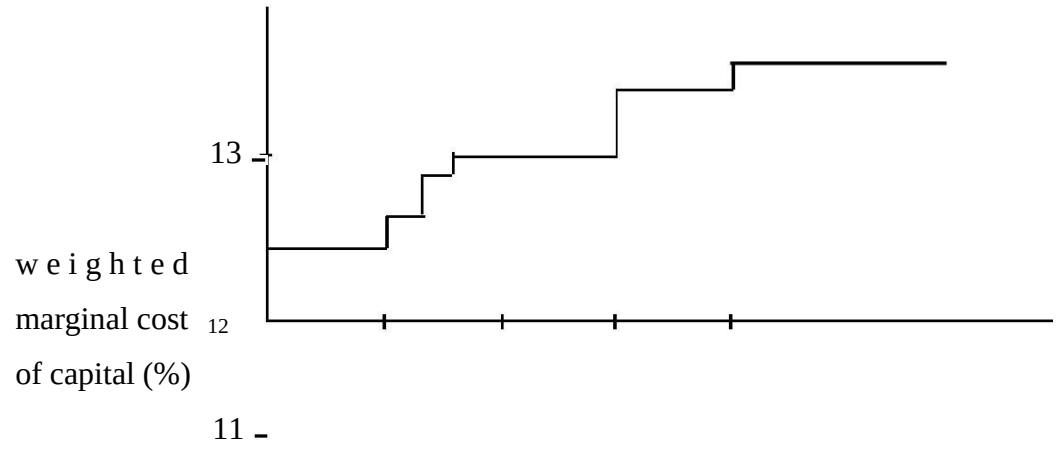
Range of Total New Financing (Rs in million) (1)	Source of Capital (2)	Proportion (3)	Cost (%) (4)	Weighted Cost(%) [(2) × (3)]
0-20.00	Equity	0.45	15.00	6.750
	Preference	0.05	14.50	0.725
	Debt	0.50	7.50	3.750
	Weighted average cost of capital			11.225
20.00-22.22	Equity	0.45	15.00	6.750
	Preference	0.05	14.50	0.750
	Debt	0.50	7.50	3.750
	Weighted average cost of capital			11.250
22.22-30.00	Equity	0.45	16.50	7.425
	Preference	0.05	15.00	0.750
	Debt	0.50	7.50	3.750
	Weighted average cost of capital			11.925
30.00-66.67	Equity	0.45	16.50	7.425
	Preference	0.05	15.00	0.750
	Debt	0.50	8.00	4.000
	Weighted average cost of capital			12.175
66.67-80.00	Equity	0.45	18.00	8.100
	Preference	0.05	15.00	0.750
	Debt	0.50	8.00	4.000
	Weighted average cost of capital			12.850
80.00 and above	Equity	0.45	18.00	8.100
	Preference	0.05	15.00	0.750
	Debt	0.50	8.40	4.200
	Weighted average cost of			

capital	13.050

Exhibit 8.1 : Weighted Marginal cost of Capital Schedule

Range of Total Financing (Rs. in million)	Weighted Marginal Cost of capital (%)
0-20.00	11.225
22.00-22.22	11.250
22.22-30.00	11.925
30.00-66.67	12.175
66.67-80.00	12.850
80.00 and above	13.050

Exhibit Weighted Marginal Cost of Capital Schedule



4. Assuming that a firm pays tax at a 50 per cent rate, compute the after-tax cost of capital in the following cases:

7. A ten-year, 8 per cent, Rs. 1000 per bond sold at Rs. 950 less 4 per cent underwriting commission.
8. A preference share sold at Rs. 100 with a 9 per cent dividend and a redemption price of Rs. 110 if the company redeems it in five years.

9. An ordinary share selling at a current market price of Rs. 120, and paying a current dividend of Rs. 9 per share which is expected to grow at a rate of 8 per cent.

10. An ordinary share of a company which engages no external financing is selling for Rs. 50. The earnings per share are Rs. 7.50 of which sixty per cent is paid in dividends. The company reinvests retained earnings at a rate of 10 per cent.

Solution:

11. The after-tax cost of bond is (using approximate method) :

$$\frac{(1-T)[INT+ \frac{1}{n} (F-B_0)]}{1/2 (F + B_0)} = \frac{(1-0.5) [Rs.\ 80 +1/10 (Rs.\ 1000- Rs.\ 950)]}{1/2 (Rs\ 1000 + Rs\ 950)}$$

$$= \frac{(1-0.5) [Rs.\ 80 +1/10 (Rs.\ 50)]}{1/2 (Rs.\ 1950)} = \frac{(1-0.5)(Rs.85)}{Rs.\ 975}$$

$$c \quad \frac{Rs.\ 4250}{} = 0.0436 \text{ or } 4.36\% \quad Rs.\ 975$$

Note :Flotation costs such as underwriting commission should be adjusted to the project's cash flows.

(ii) $$100 = \sum_{t=1}^{n} \frac{9}{(1+k_p)^t} + \frac{110}{(1+k_p)^5}$$

By trial and error, we find $k_p = 0.105$ or 10.5%

(iii) $$k_e = \frac{D_1}{P_0} + g = \frac{Rs\ 9(1.08)}{Rs\ 120} + 0.08 = \frac{Rs\ 9.72}{Rs\ 120} + 0.08$$

$$= 0.081 + 0.08 = 0.161 \text{ or } 16.1\%$$

(iv) $P_0 = \frac{EPS(1-b)}{k_e - br}$

$= \frac{EPS(1-b)}{P_0} + br = \frac{Rs\ 7.50(1-0.4)}{Rs\ 50} + 0.10 \times 0.4$

$= \frac{Rs\ 4.50}{Rs\ 50} + 0.10 \times 0.4$

(j) Suppose that dividend of firm is expected to be Re. 1 per share next year and is expected to grow at 6 per cent per year perpetually. Determine the cost of equity capital, assuming the market price per share is Rs. 25.

Solution: This is a case of constant growth of expected dividends. The k_e can be calculated by using the following equation:

$$k_e = \frac{D_1}{P_0} + g = \frac{Re.\ 1}{Rs.\ 25} + 0.06 = 10 \text{ per cent}$$

The dividend approach can be used to determine the expected market value of a share in different years. The expected value of share at the end of years 1 and 2 would be as follows, applying Eq. 8.13

(i) Price at the end of the first year (P_1) = $\frac{D_2}{k_e - g} = \frac{Rs\ 1.06}{0.10-0.06}$

= Rs. 26.50

(ii) $P_2 = \frac{D_3}{k_e - g} = \frac{Rs\ 1.124}{0.10-0.06}$ = Rs. 28

(v) The following information is available in respect of company X :

Current dividend per share, Rs. 2.

Current market price per share, Rs. 75.

Compound growth rates of dividends :

1-5 years	15 per cent
6-10 years	10 per cent
11 years and beyond	5 per cent

What would the cost of its equity capital be, assuming a fixed dividend pay out ratio?

Solution:

The cost of equity capital would be obtained by solving for k_e in the following equation, as it is a case of different growth rates in expected dividends:

$$P_0 = \sum_{t=1}^{5} \frac{D_0(1.15)^t}{(1+k_e)^t} + \sum_{t=6}^{10} \frac{D_5(1.10)^{t-5}}{(1+k_e)^t} + \sum_{t=11}^{\infty} \frac{D_{10}(1.05)^{t-10}}{(1+k_e)^t} = k_e = 9.5 \text{ per cent.}$$

(iii) Shiva Chemicals plans to use equity and debt in the following proportions:

Equity : 40

Debt : 60

Based on its discussion with its merchant bankers and lenders, Shiva Chemicals estimates the cost of its sources of finance for various levels of usage as follows:

Source of Finance	Range of New Financing (Rs. in million)	Cost (%)
Equity	0-30	18
	More than 30	20
Debt	0-50	10
	More than 50	11

Determine the weightage marginal cost of capital schedule for Shiva Chemicals.

Solution: The breaking points and the resulting range of total new financing for Shiva Chemicals are as follows:

Source of capital	Cost	Range of new financing (Rs in million)	Breaking point (Rs. in million)	Range of total new financing (Rs in million)
	(1)	(2)	(3)	(4)
Equity	18%	0-30	30/0.4=75	0-75

	20%	Above 30	–	Above 75
Debt	10%	0-50	50/0.6=83.3	0-83.3
	11%	Above 50	–	Above 83.3

The weightage average cost of capital for various range of total financing for Shiva Chemicals is as follows:

Range of total new financing (Rs in million)	Source of capital	Proportion	Cost %	Weighted cost % [(2) × (3)]
	(1)	(2)	(3)	(4)
0-75	Equity	0.4	0.18	.072
	Debt	0.6	0.10	.060
	Weighted average cost of capital			.132
75-83.3	Equity	0.4	0.20	.080
	Debt	0.6	0.10	.060
	Weighted average cost of capital			.140
83.3 and above	Equity	0.4	0.20	.080
	Debt	0.6	0.11	.066
	Weighted average cost of capital			.146

The weighted marginal cost of capital schedule is as shown below:

Range of total financing (Rs. in million)	Weighted marginal cost of capital (%)
0-75	13.2
75-83.3	14.0
83.3 and above	14.6

(b) Consider the following figures pertaining to risk free rate, market rate and return rate of a security of A Ltd. during the last 6 years.

Year	risk-free rate (R_f)	Market rate (R_m)	Security return (R_j)
1	0.06	0.14	0.08
2	0.05	0.03	0.11
3	0.07	0.21	0.29
4	0.08	0.26	0.25
5	0.09	0.03	007
6.	0.07	0.11	0.04

On the basis of the above information, you are required to determine the cost of equity capital in the context of CAPM. Past data may be taken as proxy for the future.

Solution:

Year	risk-free rate(R_f)	Market return (K_m)	Excess in market returns (M) [col.3-col.2]	$(M)^2$	Security return (R_j)	Excess in security return (J) [col.6-col.2]	Cross product (MJ) [col.4×col.7]
1	2	3	4	5	6	7	8
1	0.06	0.14	0.08	0.0064	0.08	0.02	0.0016
2	0.05	0.03	(0.02)	0.0004	0.11	0.06	(0.0012)
3	0.07	0.21	0.14	0.0196	0.29	0.22	0.0308
4.	0.08	0.26	0.18	0.0324	0.25	0.17	0.0306
5.	0.09	0.03	(0.06)	0.0036	0.07	(0.02)	0.0012
6.	0.07	0.11	0.04	0.0016	0.04	(0.03)	(0.0012)
Total	0.42	0.78	0.36	0.064 0		0.4 2	0.0618
Average return	0.07	0.13	0.06	–		0.07	–

Figures in brackets represent negative returns

$$b = \frac{MJ - NMJ}{M^2 - NM^2} = \frac{0.0618 - 6(0.06 \times 0.07)}{} = \frac{0.0366}{} = 0.863$$

$$= \frac{0.0640 - 6\times(0.06)^2}{} = \frac{0.0424}{}$$

$^{k}e = R_f + b\,(k_m - R_f) = 0.07 + 0.863\,(0.13 - 0.07) = 12.18$ per cent

8.3 CHECK YOUR PROGRESS

1. The coupon interest rate or the …… on debt can be said to represent an approximation of the cost of debt.

2. Preference capital carries a …….. rate of dividend and is redeemable in nature.

3. The…….. involve the highest degree of financial risk since they are entitled to receive dividend and return of principal after all other obligations of the firm are met.

4. The composite or ……. is the weighted average of the costs of various sources of funds, weights being the proportion of each source of funds in the capital structure.

5. The weighted cost of capital can be computed by using the ……..or the market-value weights.

8.4 SUMMARY

The cost of capital is an important element in capital expenditure management. In operational terms, the cost of capital is a discount rate that is used in determining the present value of future cash flows. Conceptually, it is the minimum rate of return that a firm must earn on its investments to keep its market value unchanged. It consists of three elements: (i) the riskless cost of a particular form of financing (r_f); (ii) the business risk premium (b) and (iii) the financial risk premium (f). The cost of capital means the weighted average cost of capital (k_0) of all long-term sources of finance. It comprises of several components in terms of specific cost of each source of finance. When these specific costs are combined, it is known as the overall/composite/combined cost of capital. There are four types of specific costs, namely, cost of debt (k_d), cost of preference shares (k_p), cost of equity capital (k_e) and cost of retained earnings (k_r). The cost of debt is on after-tax basis and its measurement depends on whether it is perpetual or redeemable. While, in the former situation the cost is determined in terms of the only interest out go, the repayment of the loan either in instalments or in lump sum on maturity is also taken into account in the later situation. The cost of debt is generally the lowest among all sources partly because the risk involved is low but mainly because interest paid on debt is tax liability. There are two

approaches to measure cost of equity k_e : (i) the dividend valuation model approach and (ii) capital asset pricing model (CAPM) approach. Both the approaches faces problems in its application since the required data may not be available in readily usable form. The cost of retrained earning (k_r) is equally difficult to calculate in theoretical terms. Since retained earnings essentially involves use of funds, it is associated with an opportunity/implicit cost. The alternative to retained earnings is the investment of the funds by the firm itself in a homogenous outside investment. Therefore, k_r, is equal to k_e. However, it might be slightly lower than k_e in the case of new equity issue due to floatation costs. Firms obtain their supply of capital for financing their investments in the form of equity or debt or both. Also, in practice, they maintain a target debt-equity mix. Therefore, the firm's cost of capital means the weighted average cost of debt and equity. Three steps are involved in calculating the firm's weighted average cost of capital (WACC). First, the component costs of debt and equity are calculated. Second, weights to the each component of capital assigned in proportion of its amount in the capital structure. Third, the product of component costs and weights is summed up to determine WACC. The weighted average cost of new capital is called the marginal cost of capital (MCC).

8.5 KEYWORDS

Cost of Capital: It is the minimum rate of return, a firm has to earn to maintain its market value and value of its shares.

Opportunity Cost: It is the rate of return foregone on the next best alternative investment opportunity of comparable risk.

Cost of equity capital: Cost of equity is the minimum rate of return that a company must earn in the equity share capital financed portion of an investment project so that market price of the shares remain unchanged.

Weighted Average Cost of Capital: It is defined as the weighted average of the cost of various sources of finance, weight being the market value of each source of finance and outstanding.

8.6 SELF-ASSESSMENT TEST

1. Define cost of capital? Explain its significance in financial decision making.

2. How is the cost of debt computed? How does it differ from the cost of preference capital?

3. "The equity capital is cost free". Do you agree? Give reasons

4. Explain why:

5. The cost of preference shares is less than the cost of equity.

6. The cost of retained earnings is less than the cost of new equity.

7. The cost of equity and retained earnings is not zero.

8. The cost of capital is most appropriately measured on an after-tax basis.

9. Explain the problems faced in determining the cost of capital. How is the cost of capital relevant in capital budgeting decisions?

10. Examine critically the different approaches to the calculation of cost of equity capital.

11. What is the CAPM approach for calculating the cost of equity? What is the difference between this approach and the constant growth approach? Which one is better and why?

12. How is the weighted average cost of capital calculated? What weights should be used in its calculation?

13. Distinguish between the weighted average cost of capital and the marginal cost of capital. Which one should be used in capital budgeting and valuation of the firm? Why?

14. Discuss the approach to determine the cost of retained earnings. Also explain the rationale behind treating retained earnings as a fully subscribed issue of equity shares.

15. Calculate the explicit cost of debt for each of the following situations:

(i) Debentures are sold at part and flotation costs are 5 per cent

(ii) debentures are sold at premium of 10 per cent and flotation costs are 5 per cent of issue price.

(iii)Debentures are sold at discount of 5 per cent and flotation costs are 5 per cent of issue price.

Assume: (i) coupon rate of interest on debentures is 15 per cent; (ii) face value of debentures is Rs. 100; (iii) maturity period is 10 years; and (iv) tax rate is 35 per cent.

16. A company issues new debentures of Rs. 20 lakh, at par, the net proceeds being Rs. 18 lakh. It has a 13.5 per cent rate of interest and 7 year maturity. The company's tax rate is 52 per cent. What is the cost of debenture issue? What will be the cost in 4 years if the market value at that time is Rs. 22 lakh?

17. A company has 1,00,000 shares of Rs. 100 at par of preference shares outstanding at 9.75 per cent dividend rate. The current market price of the preference share is Rs. 80. What is its cost?

18. A firm has 80,00,000 ordinary shares outstanding. The current market price is Rs. 25 and book value is Rs. 18 per share. The firm's earnings per share are Rs. 3.50 and dividend per share is Rs. 1.44. What is the growth rate assuming that the past performance will continue? Calculate the cost of equity capital.

19. An investor is contemplating the purchase of equity shares of a company which had paid a dividend of Rs. 5 per share last year. The dividends are expected to grow at 6 per cent for ever. The required rate of return on the shares of this company in the capital market is 12 per cent. What will be the maximum price you will recommend the investor to pay for an equity share of the company? Will your answer be different if he wants to hold the equity share for 3 years and 6 years?

20. A mining company's iron ore reserves are being depleted, and its cost of recovering a declining quantity of iron ore are rising each year. As a consequence, the company's earnings and dividends are declining, at a rate of 8 per cent per year. If the previous year's dividend was Rs. 10 and the required rate of return is 15 per cent, what would be the current price of the equity share of the company?

A. A company is contemplating an issue of new equity shares. The firm's equity shares are currently selling at Rs. 125 a share. The historical pattern of dividend payments per share, for the last 5 years is given below :

Year	Dividend
1	Rs. 10.70
2	Rs. 11.45
3	Rs. 12.25
4	Rs. 13.11
5	Rs. 14.03

The flotation costs are expected to be 3 per cent of the current selling price of the shares.

You are required to determine the following:

B. growth rate in dividends;

C. cost of equity, assuming growth rate determined under situation (i) continues for ever ;

D. cost of new equity shares.

21. The Sewing Company has the following capital structure on 30 June 1998 :

Ordinary shares (200,000 shares)	Rs. 40,00,000
10% Preference shares	10,00,000
14% Debentures	30,00,000
	80,00,000

The share of the company sells for Rs. 20. It is expected that company will pay next year a dividend of Rs. 2 per share which will grow at 7 per cent forever. Assume a 50 per cent tax rate. Compute a weighted average cost of capital based on the existing capital structure.

Compute the new weighted average cost of capital if the company raises an additional Rs. 20 lakh debt by issuing 15 per cent debenture. This would result in increasing the expected dividend to Rs. 3 and leave the growth rate unchanged, but the price of share will fall to Rs. 15 per share.

Compute the cost of capital if in (b) above growth rate increases to 10 per cent.

8.7 ANSWERS TO CHECK YOUR PROGRESS

1. Market yield
2. Fixed
3. Equity shares
4. Overall cost of capital
5. Book-value

8.8 REFERENCES/SUGGESTED READINGS

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CAPITAL STRUCTURE DECISIONS

STRUCTURE

9.0 LEARNING OBJECTIVE

After reading this lesson, you should be able to

(a) Understand the meaning of capital structure and its assumptions.

(b) Evaluate the different approaches to capital structure.

(c) Explain the guidelines for capital structure planning.

9.1 INTRODUCTION

The two primary sources of finance for a business firm are equity and debt. What should be the magnitude of equity and debt in the capital structure of a firm? Put in a different way, how

much financial leverage (kind of capital structure) should a firm employ? The choice of a firm's capital structure is a marketing problem. It is essentially concerned with how the firm decides to segregate its cash flows into two broad components, a fixed component that is earmarked to meet the obligations towards debt capital and a residual component that belongs to equity shareholders.

Since the objective of financial management is to maximise shareholders' wealth, the key issue in the capital structure decision is: What is the relationship between capital structure and firm value? Alternatively, what is the relationship between capital structure and cost of capital? Remember that valuation and cost of capital are inversely related. Given a certain level of earnings, the value of the firm is maximised when the cost of capital is minimised and vice versa. There are different views on how capital structure influences value. Some argue that there is no relationship whatsoever between capital structure and firm value; others believe that financial leverage (i.e. the use of debt capital) has a positive effect on firm value up to a point and negative effect thereafter; still others argue that, other things being equal, greater the leverage, greater the value of the firm.

This lesson explores the various positions taken on the relationship between financial leverage and cost of capital, one of the most contentious issues in finance.

9.2 ASSUMPTIONS AND DEFINITIONS

To examine the liaison between capital structure and cost of capital (or valuation) the following simplifying assumptions are commonly made:

- There is no income tax, corporate or personal. (We shall, however, later in the lesson consider the implications of taxes.)
- The firm pursues a policy of paying all of its earnings as dividends. Put differently a 100 per cent dividend payout ratio is assumed.
- Investors have identical subjective probability distributions of net operating income (earnings before income and taxes) for each company.
- The net operating income is not expected to grow or decline over time.
- A firm can change as capital structure almost instantaneously without incurring transaction costs.

The justification for the above assumptions is to abstract away the influence of taxation, dividend policy, varying perceptions about risk, growth, and market imperfections so that the influence of financial leverage on cost of capital can be discussed with greater clarity.

Given the above assumptions, the analysis focuses on the subsequent discussion:

K_d =F/B = Annual interest charges/Market value of debt

Assuming that the debt capital is perpetual, k_d represents the cost of debt.

k_e = E/S = Equity earnings/Market value of equity

When the dividend pay out ratio is 100 per cent, and earnings constant; k_e as defined here, represents the cost of equity capital.

k_o = O/V = Net operating income/Market value of the firm

where V=B + S k_o is the over all capitalisation rate for the firm. Since it is the weighted average cost of capital, it may be expressed as:

$k_o = k_d (B/B+S) + k_s (S/B + S)$

In terms of the above definitions, the question of interest to us is: *What happens to k_d k_e and k_o when financial leverage, measured by the ratio B/S, changes? This would be answered through various approaches of capital structure.*

9.2.1. NET INCOME APPROACH

According to this approach, the cost of debt capital, k_d and the cost of equity capital, k_e remain unchanged when B/S the degree of leverage, varies. The constancy of k_d and k_e with respect to B/S means that k_o the average cost of capital, measured as:

$K_o = k_d (B/B + S) + k_e (S/B +S)$

declines as B/S increases. This happens because when B/S increases, k_d, which is lower than k_e receivers a higher weight in the calculation of k_o.

Illustration 4.1: The net income approach may be illustrated with numerical example. There are two firms A and B similar in all respects except in the degree of leverage employed by them. Financial data for these firms are shown below:

		Firm A	Firm B
O	Net operating income	Rs. 10,000.	Rs. 10,000
F	Interest on debt	Rs. 0	Rs. 3000
E	Equity earnings	Rs. 10,000	Rs. 7,000
k_e	cost of equity capital	10%	10%
k_d	cost of debt capital	6%	6%
S	Market value of equity	Rs. 100,000	Rs. 70,000
B	Market value of debt	Rs. 0	Rs. 50,000
V	Total value of the firm	Rs. 100,000	Rs. 120,000

The average cost of capital for firm A is

6% x 0/10000+10% x 100,000/100,000=10%

The average cost of capital for firm B is

6% x 50,000/120,000 + 10% x 70,000/100,000 =8.33%

9.2.2 NET OPERATING INCOME APPROACH

According to the net operating income approach, the overall capitalisation rate and the cost of debt remain constant for all degrees of leverage. In the equation

$k_o = k_d (B/B+S) + k_e (S/B+S)$

k_o and k_d are constant for all degrees of leverage. Given this the cost of equity can be expressed as:

ke =k0 + (k0 -kd) (B/S)

The critical premise of this approach is that the market capitalizes the firm as a whole at a discount rate, which is independent of the firm's degree of leverage. As a consequence, the division between debt and equity is irrelevant. An increase in the use of debt funds, which are apparently cheaper, is offset by an increase in the equity capitalisation rate. This happens because equity investors seek higher return as they are exposed to greater risk arising from increase in the degree of leverage. They raise the capitalisation rate ke (lower the price-earnings ratio, P/E), as the degree of leverage increases.

The net operating income position has been advocated eloquently by David Durand. He argued that the market value of a firm depends on its net operating income and business risk. The change in the degree of leverage employed by a firm cannot change these underlying factors. It merely changes the distribution of income and risk between debt and equity without affecting the total income and risk, which influence the market value of the firm. Hence the degree of leverage per se cannot influence the

market value (or equivalently the average cost of capital) of the firm. Arguing in a similar vein, Modigliani and Miller, in a seminal contribution made in 1958, forcefully advanced the proposition that the cost of capital of a firm is independent of its capital structure.

Illustration 4.2: Two firms, A and B, are similar in all respects except the degree of leverage employed by them. Relevant financial data for these firms are given below:

		Firm A	**Firm B**
O	Net operating income	10000	10000
K o	Overall capitalisation rate	0.15	0.15
V	Total market value	66667	66667
F	Interest on debt	1000	3000
Kd	Debt capitalisation rate	0.10	0.10
B	Market value of debt	10000	30000
S	Market value of equity	56667	36667
B/S	Degree of leverage	0.176	0.818

The equity capitalisation rates of firms A and B are as follows:

Firm A Equity earnings/Market value of equity = 9000/56667 = 0.159=15.9%

Firm B Equity earnings/Market value of equity = 7000/36667=0.191=19.1%

9.2.3 TRADITIONAL APPROACH

The main propositions of the traditional approach are:

1. The cost of debt capital k_d remains more or less constant up to a certain degree of leverage but rises thereafter at an increasing rate.
2. The cost of equity capital, k_e remain more or less constant or rises only gradually up to a certain degree of leverage and rises sharply thereafter.
3. The average cost of capital, k_o as a consequence of the above behaviour of k_e and k_d (i) decrease up to a certain point; (ii) remains more or less unchanged for moderate increases in leverage thereafter; and (iii) rises beyond a certain point.

The traditional approach is not as sharply defined as the net income approach. Several shapes of k_d, k_e and k_o are consistent with this approach. The principal implication of the traditional position is that the cost of capital is dependent on the capital structure and there is an optimal capital structure, which minimizes the cost of capital. At the optimal capital structure the real marginal cost of debt and equity is the same. Before the optimal point the real marginal cost of debt is less than the real marginal cost of equity and beyond the optimal point the real marginal cost of debt it more than the real marginal cost of equity.

Illustration 4.3: A numerical illustration of the traditional approach is given in Table 4.1. This table shows the average cost of capital for a firm which has a net operating income of Rs. 100000 that is split variously between interest and equity earnings depending on the degree of leverage employed by the firm.

Table 4.1: Numerical illustration of the Traditional Approach

F Rs.	E Rs.	kd (%)	ke (%)	B Rs.	S Rs.	V Rs.	ko (%)
0	100000	6.0	10.0	0	1000000	1000000	10.00
10000	90000	6.0	10.0	166667	900000	1066667	9.37
20000	80000	6.5	10.5	307692	761905	1069597	9.36
30000	70000	6.5	11.0	461538	636363	1097901	9.10
40000	60000	7.0	11.0	571429	545455	1116884	8.95
50000	50000	7.5	11.5	666667	434783	1101450	9.08
60000	40000	9.0	12.0	666667	333333	1000000	10.00
70000	30000	11.0	14.0	636364	214286	850650	11.75
80000	20000	15.0	16.0	533333	125000	658333	15.20
90000	10000	18.0	20.0	500000	100000	600000	16.67

9.2.4 MODIGLIANI AND MILLER APPROACH

In their celebrated 1958 paper, Modigliani and Miller (MM, hereafter) have restated and amplified the net operating income position terms of three basic propositions. Before discussing their propositions, let us look at the assumptions underlying their analysis.

- Capital markets are perfect. Information is freely available and transactions are costless securities are infinitely divisible.

- Investors are rational. Investors are well-Informed and choose a combination of risk and return that is most advantageous to them.
- Investors have homogenous expectations. Investors hold identical subjective probability distributions about future operating earnings.
- Firms can be grouped into equivalent risk classes on the basis of their business risk.
- There is no corporate income tax.

Basic Propositions

Based on the above assumptions, MM derived the following three propositions.

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

$V_j = S_j + B_j = O_j/k_o$

Where V_j = total market value of firm j

S_j = market value of the equity of firm j

B_j = market value of the debt of firm j

O_j = expected operating income of firm j

K_o = discount rate applicable to the risk class to which the firm j belongs.

Proposition II: The expected yield on equity, k_e is equal to k_o plus a premium. This premium is equal to the debt-equity ratio times the difference between k_o and the yield on debt, k_d. In symbols

$K_e = k_o + (k_o - k_d)\ B/S$

Proposition III: The cutoff 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. (This proposition states the implication of the earlier propositions for investment decision-making. It emphasizes the point that investment and financing decisions are independent because the average cost of capital is not affected by the financing decision).

Proof of MM Argument - The Arbitrage Mechanism

MM has recommended an arbitrage mechanism to prove their argument. To thrash out their proof, consider two firms P and Q in the identical risk class with the equivalent expected operating income but different capital structures.

	P	Q
Expected operating income	O	O
Market value of equity	S_p	S_q
Market valueof debt	-	B_q
Market value of the firm	V_p	V_q
Interest rate of debt	-	r
Interest burden	-	rB_q

Suppose the market value of the unlevered firm, firm P, is less than the market value of the levered firm, firm Q, ($V_p < V_q$). Now consider the case of an investor who holds S_q rupees worth of equity shares of firm Q, representing a fraction of the total outstanding market value of equity shares of firm Q ($S_q = aS_q$). The return he gets is:

$Y_q = a (O - rB_q)$

If this investor sells aS_q worth of shares of firm Q and borrows aB_q on his personal account at an interest rate of r percent, he can purchase a $(S_q + B_q)/S_p$ of the equity shares of firm P. (Remember for firm P, $V_p = S_p$ since it is an all-equity firm). The return obtained by the investor after these transactions would be:

$Y_p = a (S_q + B_q) / S_p$, $O\text{-}raB_q = aV_q/V_p$, $O - RaB_q$

Comparing EPS, we find that as long as $V_q > V_p$ we have $Y_p > Y_q$. This means that equity shareholders of firm Q will sell their shareholders, resort to personal leverage, and acquire shares of firm P since it is profitable to do so. In this process Sq (and hence V_q) will get depressed and S_p (and hence V_p) will rise till the equality between V_p and V_q is established. Thus we find that a levered firm cannot enjoy a premium over an unlevered firm because investors by their personal leverage will abolish the difference.

We next consider the possibility $V_p > V_q$. Let us here put $V_p/V_q = B > 1$. Suppose an investor holds equity shares of firm P worth s_p representing a fraction a of the total market value of outstanding shares, S_p.

His return is

$Y_p = s_p / S_p O = aO$

If he sells his shareholdings worth aV_p ($V_p = S_p$) he can buy a fraction aB of the equity shares and bonds of firm Q because the market value of firm P is B times the market value of firm Q. Such an action will make his return equal to

$Y_q = aB(O - rB_q) = aBO$

Without changing the level of risk borne by him.

Comparing EPS, we find that as long as $V_p > V_q$ (B > 1), we have $Y_q > Y_p$. This means that equity shareholders of firm P will sell shares of firm P and buy a portfolio consisting of shares and bonds of firm Q since it is profitable to do so. In this process V_p will get depressed and V_q will rise till the equality between V_p and V_q is established.

Illustration 4.4: A numerical illustration may be given to show how the arbitrage mechanism works. Take two firms, X and Y, similar in all respects except in their capital structure. Firm X is financed by equity only; a mixture of equity and debt finances firm Y. Relevant financial particulars of the two firms are as shown in Table 4.2.

According to Table 4.2 the value of the levered firm Y is higher than that of the unlevered firm. Such a situation, argues MM, cannot persist because equity investors would do well to sell their equity investment in firm Y and invest in the equity of firm X with personal leverage. For example, an equity investor who owns 1 per cent equity in firm Y would do well to:

1. Sell his equity in firm Y for Rs. 6667;
2. Borrow Rs. 4000 at 5 per cent interest on personal account; and
3. Buy 1.0667 per cent of the equity of rim X with the amount of Rs. 10667 that he has.

Such an action will result in the following income:

	Rs.
Income on investment in firm X	1066.7
Less interest (4000 x 0.5)	200.0
Net income	866.7

Table 4.2: Financial Particulars of Firms X and Y

	X	Y
Total Capital Employed	Rs.1000000	1000000
Equity Capital	Rs.1000000	600000
Debt	Rs. 0	400000
Net Operating income	Rs. 100000	100000
Debt Interest	Rs. 0	20000
Market Value of Debt	Rs. 0	400000
(Debt capitalisation rate is 5%)		
Equity Earnings	Rs. 100000	80000
Equity Capitalisation Rate	10%	12%
Market Value of Equity	Rs.1000000	666667
Total Market Value of the Firm	Rs.1000000	1066667
Average Cost of Capital	10%	9.37%
Debt Equity Ratio (in terms of market Value)	0	0.6

This net income of Rs. 866.7 is higher than a net income of Rs. 800.0 foregone by selling 1 per cent equity of firm Y and the leverage ratio is the same in both the cases. (In the case of investment in firm X with personal borrowing we have personal leverage; in the case of investment in firm Y we have corporate leverage).

When investors sell their equity in firm Y and buy the equity in firm X with personal leverage, the market value of equity of firm Y tends to decline and the market value of equity of firm X tends to increase. This process continues until the net market values of both the firms become equal because only then the possibility of earning a higher income for a given level of investment and leverage by arbitraging is eliminated. As a result of this the cost of capital for both the firms is the same.

In the preceding discussion we explained that due to the arbitrage mechanism the value of a levered firm couldn't be higher than of an unlevered firm, other things being equal. A similar explanation, with arbitrage in the opposite direction, may be offered to prove that the value of an unlevered firm cannot be higher than that of a levered firm, other things being equal.

Assume that the valuation of the two firms X and Y is as follows:

	X	Y
Debt Interest	Rs. 0	20000
Market Value of Debt (Debt capitalisation rate is 5%)	Rs. 0	400000
Equity Earnings	Rs. 100000	80000
Equity Capitalisation Rate	8%	12%
Market Value of Equity	Rs.1250000	666667
Total Market Value	Rs.1200000	1066667

If a situation like this obtains, equity investors in firm X would do well to sell the equity in firm X and use the proceeds partly for investment in the equity of rim Y and partly for investment in the debt of firm Y. For example, an equity investor who owns 1 per cent equity in firm X would do well to:

1. Sell his 1 percent equity in firm X for Rs. 12,500, and
2. Buy $1\frac{11}{64}$ percent of equity and debt in firm Y involving an outlay of Rs 12500 (The total market value of Y is Rs $1{,}066{,}667\frac{11}{64}$ percent of this is Rs 12,500).

Such an action will result in an increase of income by Rs 172 without changing the risk shouldered by the investor. When investors resort to such a change, the market value of the equity of firm X tends to decline and the market value of the equity of firm Y tends to increase. This process continues until the total market value of both the firms becomes equal.

9.3 TAXATION AND CAPITAL STRUCTURE

The leverage irrelevance of MM is valid if the perfect market assumptions underlying their analysis are satisfied. However in the face of imperfections characterising the real world capital markets the capital structure of a firm may affect its valuation. Presence of taxes is a major imperfection in the real world. This section examines the implications of corporate and personal taxes for the capital structure. Other imperfections and their effect on the optimal capital structure are examined in a later section.

Corporate Taxes: When taxes are applicable to corporate income, debt financing is advantageous. Why? While dividends and retained earnings are not deductible for tax purposes, interest on debt is a tax-deductible expense. As a result, the total income available for both stockholders and debtholders is greater when debt capital is used. To illustrate consider two firms which have an expected net operating income of Rs. 1 million and which are similar in all respects, except in the degree of leverage employed

by them. Firm A employs no debt capital whereas firm B has Rs. 4 million in debt capital on which it pays 12 per cent interest. The corporate tax rate applicable to both the firms is 50 per cent. The income to stockholders and debtholders of these two firms is shown in Table 4.3. From this table it is clear that the combined income of debt-holders and stockholders of the levered firm (firm B) is higher than that of the unlevered firm (firm A).

Table 4.3: Corporate Taxes and Income of Debt-holders and Stockholders

	A	B
Net operating income	1000000	1000000
Interest on debt	0	480000
Profit before taxes	1000000	520000
Taxes	500000	260000
Profit after tax (income Available to stockholders)	500000	260000
Combined income of debt-holders and stockholders	500000	740000

The explanation for this is fairly simple: the interest payment of Rs. 480000 made by the levered from brings a tax shield of Rs. 240000 (Rs. 480000 x tax rate). Hence the combined income of debtholders and stockholders of firm B is higher by this amount.

If the debt employed by a levered firm is perpetual in nature, the present value of the tax shield associated with interest can be obtained by applying the formula for perpetuity.

Present value of tax shield = $t_c rB/r = t_c B$

Where tc = corporate tax rate

B = market value of debt

r = interest rate on debt.

For firm B the present value of tax shield works out to: 0.5 (Rs. 4000000 = Rs. 2000000. This represents the increase in its market value arising from financial leverage.

In general the value of a firm may be represented as:

$V = O(1 - t_c)/k + t_c B$

Where V = value of the firm

O = net operating income

t_c = corporate tax rate

k = capitalisation rate applicable to the unlevered firm.

B = market value of debt.

The first term in the above equation, $O(1 - t_c)/k$, represents the value of the unlevered firm and the second term, $t_c B$, denotes the value of tax shield arising out of financial leverage. Hence it implies that:

Value of levered firm = Value of unlevered firm + Gain from leverage

$V_t = V_u + t_c B$

From the above equation, it is evident that greater the leverage, greater the value of the firm, other things being equal. This implies that the optimal strategy of a firm should be to maximize the degree of leverage in its capital structure.

Corporate Taxes and Personal Taxes: What happens when personal taxes are considered along with corporate taxes? If investors pay the same rate of personal taxes on debt returns as well as stock returns, the advantage corporate tax in favour of debt capital remains in tact. This point cab be proved by applying a 30 per cent personal tax rate to debt as well stock returns in the previous example. The income to debtholders and stockholders after taxes, both corporate and personal, is calculated in Table 4.4. From this table it is clear that although the combined post-tax income to stockholders and debtholders decreases in both the firms, the proportional advantage of debt remains unaffected because the combined income of stockholders and debtholders still is higher by 48 per cent in the levered firm.

Table 4.4 Personal Taxes and Income of Debtholders and Stockholders

	Firm A	**Firm B**
Income available to stockholders	500000	260000
Less personal taxes at 30%	150000	78000
Income available to stockholders after Personal taxes	350000	182000
Income to debtholders	0	480000
Less personal taxes at 30%	——	144000
Income to debtholders after personal taxes	0	336000
Combined income of stockholders and Debtholders after personal taxes	350000	518000

If the personal tax rate is t_p the tax advantage of debt becomes:

$t_c B (1-t_p)$

This formula is valid when the personal tax rate applicable to stock as well as debt income is the same as was assumed in the preceding example. In many countries, including India this is not true. Stock income, which comprises of dividend income and capital gains is taxed at a rate which is effectively lover than that of debt income. When the tax rate on stock income (t_{ps}) differs from the tax rate on debt income (t_{pd}), the tax advantage of a rupee of debt may be expressed as:

$(1-(1-_{tc})(1-t_{ps}) / (1-t_{pd}))$

This expression is derived as follows:

X = earning before interest and taxes

B = face value of risk-free debt

r = coupon rate (as well the bondholders' required rate)

t_c = corporate tax rate

t_{pd} = personal tax rate on debt income

t_{ps} = personal tax rate on equity income

The total post -tax cash flow to all investors is:

$=rB(1-t_{pd})+(X-rB)(1-t_c)(1-t_{ps})$

$=X(1-t_c)(1-t_{ps}) +rB(1-t_{pd})(1- (1-t_c)(1-t_{ps})/(1-t_{pd})$

First term Second term

The first term represents the post-tax cash flow to the shareholders of the unlevered firm. If it is capitalized using the discount rate applicable to the unlevered firm its capitalized value is

V_u (value of the unlevered firm)

The second term is the product of $rB(1-t_{pd})$ the post-tax interest income of bond holders, and a constant term

$1-(1-_{tc})(1-t_{ps})/1-t_{pd})$

Hence its capitalized value, using the discount rate applicable to debt capital is:

$B [1-(1-t_c)(1-t_{ps})/(1-t_{pd})]$

The value additivity principle implies that:

$V_1 = V_u + B[1-(1-t_c)1-t_{ps})/(1-t_{pd})]$

From the second term in the above equation it is clear that the gain from using one rupee of debt is:

$[1-(1-t_c)(1-t_{ps})/(1-t_{pd})]$

To illustrate, if t_c is 50 per cent, t_{ps} 5 per cent, and t_{pd} 30 per cent , the tax advantage of every rupee of debt is: 1 - (0.5) (0.95)/(.070) = 0.32 rupee From above equation, it is clear that:

If $(1 - t_c) (1 - t_{ps}) < (1 - t_{pd})$

the tax advantage of debt is positive

- If $(1 - t_c) (1- t_{ps}) = (1-t_{pd})$
- the tax advantage of debt is nil
- If $(1 - t_c) (1 - t_{ps}) > ((1 - t_{pd})$

the tax advantage of debt is negative

Merton Miller Argument

Merton Miller in his 1976 Presidential Address to the American answered the issue of optimal debt policy in a novel, though controversial, manner. He argued that the original MM proposition, which says that financial leverage does not matter in a tax free world, is valid in a world where both corporate and personal taxes exist.

To understand Miller's argument, let us begin with the model of firm valuation when corporate and personal taxes exist:

$V_l = V_u + B [1 - (1-t_c) 1-t_{ps} /1-t_{pd})]$

If $(1-t_{pd}) = (1-t_c) (1-t_{ps})$,

Eqn becomes: $V_1 = V_u$

This is the Modigliani and Miller Proposition in a tax-free world.

If $t_{pd} = t_{ps}$ Eqn. becomes:

$V_L = V_U + t_c B$

This is the Modigliani and Miller proposition taking into account only the corporate taxes.

Miller posits that the former case is the correct case. Broadly, the key premises and links in his argument are as follows:

- The personal tax rate on equity income, t_{ps}, is nil; the personal tax rate on debt income, t_{pd}, varies across investors; the corporate tax rate, t_c, is constant across companies.
- Companies will change their capital structure in such a manner that, at the margin, the after tax value of a rupee of debt income is the same as the after tax value of a rupee of equity income.
- If the starting point is an all-equity capital structure, as long as some investors are tax exempt ($t_{pd} = 0$), companies can by borrowing a rupee of debt enhance their value by t_c - this is clear from the above equations.
- Once companies exhaust their tax-exempt clientele, they have to sell debt to investors who pay taxes. To induce investors to switch from equity (whose income is tax-exempt) to debt (whose income is taxed), companies have to raise the interest rate. If the risk adjusted expected rate of return on equity is k_e the risk adjusted expected rate of return on debt should be at least $k_e/(1 - t_{pd})$ in order to compensate investors for personal taxes on debt.
- In the aggregate, companies will issue debt till the tax rate for the marginal bondholder, t_{pd}, is the same as the corporate tax rate, t_c. Beyond this point, there is no tax advantage to companies from issuing debt. Thus, the equilibrium supply of corporate debt is that aggregate amount at which the tax bracket of the marginal debtholders just equals the corporate tax rate.
- If the corporate tax rate exceeds the marginal personal tax rate on debt income, companies will use only debt capital; if it is the other way companies will not use any debt capital. Hence, the supply curve for debt capital remains horizontal at a given risk adjusted interest rate $[k_e/(1-t_c)]$. Figure 12.4 shows two such supply curves.
- The demand curve for debt capital slopes upwards because investors would buy more debt as companies offer a higher pre-tax expected rate of return. The slope of this curve will depend on funds available to investors in various tax brackets.
- The point at which the supply and demand curves of debt interest represents the optimal economy-wide debt-equity ratio. If the tax burden on debt income rises, the optimal debt-equity ratio will decline; on the

other hand, if the corporate tax rate rises in relation to personal tax rate, the optimal debt equity ratio will increase. The important point is that no single firm can derive any benefit from varying its financial leverage — only the optimal debt-equity ratio for the economy changes.

9.3.1 OTHER IMPERFECTIONS OF CAPITAL STRUCTURE

In addition to taxation, which is the most important imperfection, there are several other imperfections, which have a bearing on the optimal capital structure. Among them the following need to be discussed:

- Bankruptcy costs
- Difference between home-made leverage and corporate leverage
- Agency costs

Bankruptcy Costs

An important imperfection affecting the capital structure decision is the existence of bankruptcy costs. In a perfect capital market, there are no costs associated with bankruptcy. If a firm becomes bankrupt its assets cab be sold at their economic values and there are no legal and administrative expenses. In the real world, however, there are considerable costs associated with bankruptcy. Assets, when disposed under distress conditions, generally sell at a significant discount below their economic values. Further, the legal and administrative cost associated with bankruptcy proceedings is quite high. Finally, an impending bankruptcy entails significant costs in the form of sharply impaired operational efficiency.

Other things being equal, the probability of bankruptcy is higher for a levered firm than for an unlevered firm. It seems that the probability of bankruptcy increases at an increasing rate as the debt-equity ratio increases beyond a certain threshold level. This means the expected cost of bankruptcy increases when the debt-equity ratio increases. Since bankruptcy costs represent a loss that cannot be diversified away, investors expect a higher rate of return from a firm, which is faced, with the prospect of bankruptcy.

Difference Between Corporate and Home-made Leverage

MM assumes that personal leverage and corporate leverage are perfect substitutes. However, there are some differences.

- An individual may not be able to borrow on his personal account at the same rate of interest as a company can do. In India, the average rate of interest n personal borrowings is higher than the average rate of interest on corporate borrowings.

- An individual usually cannot adopt as high a leverage ratio as a company can do, Why? The creditors simply may refuse to lend to individuals who want to employ a high leverage ratio.
- When an individual borrows on his personal account, his liability towards that borrowing is unlimited. The equity shareholders of a company, however, have limited liability; irrespective of the company's level of borrowing.

Due to the above differences, the substitutability of personal and corporate leverages is suspect. Hence the efficiency of the arbitraging mechanism is questionable.

Agency costs

When a firm obtain debt capital, the creditors generally impose restrictions on the firm in the form of protective covenants incorporated in the debt/loan contract. These restrictions may release to several things; approval of the creditors before key managerial appointments are made, maintenance of current ratio above a certain level, limitation on the rate of dividend during the currency of the loan, constraints on additional issue of capital, limitation on further investments, and so on.

The restrictions imposed by the creditors entail considerable legal and enforcement costs and also impair the operating efficiency of the firm. All these costs, broadly referred to as monitoring costs or agency costs, detract from the value of the firm. Michael C Jensen and William H. Heckling, who have put forward a sophisticated and elegant theory of agency costs, argue that these costs are eventually borne by equity shareholders in the form of wealth reduction. (When the creditors incur the monitoring costs in the first instance they are likely to enhance the interest rate and other charges to cover these costs.)

Monitoring costs are a function of the level of debt in the capital structure. When there is little debt lenders may limit their monitoring activity. However, when the level of debt is high lenders may insist on extensive monitoring which entail substantial costs.

9.3.2 GUIDELINES FOR CAPITAL STRUCTURE PLANNING

The capital structure decision is a difficult decision that involves a complex tradeoff among several considerations like income, risk, flexibility, control, timing, and so on. Given the overriding objective of maximizing the market value of a firm, bear in mind the following guidelines while hammering out the capital structure of the firm.

Avail of the Tax Advantage of Debt

Interest on debt finance is a tax-deductible expense. Hence finance scholars and practitioners agree that debt financing gives rise to tax shelter, which enhances the value of the firm. What is the impact of this tax shelter on the value of the firm? In their 1963 paper Modigliani and Miller argued that the present value of interest tax shield is:

Where t_c = corporate tax rate on a unit of marginal earnings

D = debt financing

The above formula assumes that the investor pays the same tax on equity income as well as debt income. In most countries (including India), however, the tax rate on equity income (t_{ps}) is different from that on debt income (t_{pd}). Typically, the former is lesser than the latter. In view of this, the contribution of debt to value id expressed as follows:

$1 - (1 - t_c)(1 - t_{ps})/(1 - t_{pd})$

The contribution of a rupee of debt to the value of the firm for various combinations of corporate tax rate, personal tax on stock income, and personal tax rate on debt income can be calculated.

What is the empirical evidence on this issue? Empirical evidence suggests that a dollar of debt financing enhances company value by 10 to 17 cents.

Preserve Flexibility

The tax advantage of debt should not persuade one to believe that a company should exploit its debt capacity fully. By doing so, it loses flexibility. And loss of flexibility can erode shareholder value. As Modigliani and Miller say: "the existence of a tax advantage of debt financing …. Does not necessarily mean that corporations should at all times seek to use the maximum possible amount of debt in their capital structure. There are, as we pointed out, limitations imposed by lenders as well as many other dimensions in real world problems of financial strategy, which are not fully comprehended within the framework of static equilibrium models. …. These additional considerations, which are typically grouped under the rubric of the need for preserving flexibility, will normally imply the maintenance by the corporation of a substantial reserve of untapped borrowing power."

Flexibility implies that the firm maintains reserve borrowing power to enable it to raise debt capital to fund unforeseen changes in government policies, necessary conditions in the market place, disruption in supplies, decline in production caused by power shortage or labour unrest, intensification in

competition, and, perhaps most importantly, emergence of profitable investment opportunities. The timing and magnitude of such development cannot often be forecast easily. Hence the firm must maintain some unused debt capacity as an insurance against adverse future developments.

Flexibility is a powerful defense against financial distress and its consequences, which may include bankruptcy. Of course, in most cases, bankruptcy costs are fairly small. What is likely to be more important, however, is that the loss of flexibility and the accompanying liquidity crisis may adversely affect product market strategies and operating policies and impair the value of the firm. As Thomas R. Piper and Wold A. Weinhold say: "Mangers fearful of incurring liquidity constraints or of violating debt covenants will usually trim strategic expenditures, be un-aggressive in exploiting market and investment opportunities, and base operating policies on the low end of a range of sales forecasts."

Note that flexibility or financial slack is more valuable to a firm with abundant growth opportunities. Likewise, it is more important to firms, which have more intangible assets. Hence such firms would do well to have more conservative capital structures.

Ensure That the Total Risk Exposure Is Reasonable

While examining risk from the point of view of the investor, a distinction is made between systematic risk (also referred to as the market risk or non-diversifiable risk) and unsystematic risk (also referred to as the non market risk or diversifiable risk). We now dwell on the distinction between business risk and financial risk.

Business risk refers to the variability of earnings before interest and taxes. It is influenced, inter alias, by the following factors:

- Demand Variability Other things being equal, the higher the variability of demand for the products manufactured by the firm, the higher is its business risk.
- Price Variability A firm which is exposed to a higher degree of volatility in the prices of its products is, in general, characterized by a higher degree of business risk in comparison with similar firms which are exposed to a lesser degree of volatility in the prices of their products.
- Variability in Input Prices When input prices are highly variable, business risk tends to be high.
- Proportion of Fixed Costs If fixed costs represent a substantial proportion of total costs, other things being equal, business risk is likely to be high. This is because when fixed costs are high, EBIT is more sensitive to variations in demand.

Financial risk represents the risk emanating from financial leverage. When a firm employs a high proportion of debt in its capital structure, i.e., when it has a high degree of financial leverage, it carries a high burden of fixed financial commitment. Equity stockholders, who have a residual interest in the income and wealth of the firm, are naturally exposed to the risk arising from such fixed commitments. Equity stockholders face this risk, also referred to as financial risk, in addition to business risk.

Generally, the affairs of the firm are, or should be, managed in such a way that the total risk borne by equity stockholders, which consists of business risk plus financial risk, is not unduly high. This implies that if the firm is exposed to a high degree of business risk, its financial risk should be kept low. On the other hand, if the firm has a low business risk profile, it can assume a high degree of financial risk.

Examine the Control Implications of Alternative Financing Plans

Consider the case of a firm, which presently has an equity capital of 1000, owned entirely by the original promoters. If the firm wants to raise additional capital, say another 1000 it may go for debt finance, or a rights issue of equity stock, or a public issue of equity stock or a combination of two or more of these. The pros and cons of the three basic ways of raising additional finance are shown as follows:

		Pros	**Cons**
1.	Rights issue of equity stock	*No dilution of control* *No financial risk*	*Severe limits on the financing ability of the firm* *Financial risk*
2.	Debt finance	*No dilution of control* *Lower cost*	*Dilution of control*
3.	Public issue of equity stock	*No financial risk*	*Higher cost*

Since the rights issue option severely limits the financing ability of rim the present owners may lack resources or inclination or both the options, which may merit serious consideration, are debt finance and public issue of equity stock. In evaluating these options, among other things, the issue of control is important.

Generally, the control issue is critical at three points: when the equity holding of the promoters is reduced below 100 per cent, below 50 per cent, and below 26 per cent. The introduction of outside owners for the first time represents more of a psychological problem and less of a managerial one. As

long as the original promoters are able to hold more than 50 per cent of the equity stock of the company, their control over the management of the firm cannot be challenged. However, they become answerable for their actions and performance to the new shareholders. While offering equity capital to outsiders may not be psychologically appealing to the promoters, it becomes unavoidable if the company wants to raise substantial funds through the capital market. Once outsiders participate in equity ownership, the original promoters would be concerned when their share in ownership is likely to fall below 50 per cent. It may be difficult for some owners to cross this hurdle. However, the original promoters will have to accept a reduction of their equity holding below 50 per cent to support growth.

Further dilution may also be required to ensure that the firm has resources needed to support its growing financing needs. The last major hurdle in India seems to be 26 per cent. This stems largely from a provision of company law according to which 75 per cent of the votes are required to pass a special resolution. It implies that a shareholding of 26 per cent is adequate to block any special resolution. In practice, of course, effective control can be exercised with a smaller holding also. This is the reason why many business houses have brooked dilution of their holdings, in companies controlled by them, to much lower levels. Essentially, they seem to have reconciled themselves to dilution because it appeared to be the only way to facilitate expansion and growth. However, the episodes of Delhi Cloth and General Mills Limited and Escorts India Limited, which sharply highlighted the risk associated with dilution, have introduced conservatism, in business circles.

Subordinate Financial Policy to Corporate Strategy

Financial policy and corporate strategy are often integrated well. This may be because financial policy originates in the capital market and corporate strategy in the product market. As Richard R. Ellsworth says: “Caught between the disparate demands of the operating divisions for capital to fuel strategies and of the capital markets for near term increases in earnings per share and adherence to long accepted financial standards, many CEOs take positions that seem more suspicious than supportive of investment ideas”. In a similar vein he adds: “When apparently objective financial policies become arbitrarily imposed corporate goals, they lose their flexibility, become sacrosanct, and can even restrict a company’s potential value.

To facilitate an integration of financial policies with corporate strategy, Ellsworth argues that the chief executive of the company should:

- Critically examine the assumptions underlying the firm's financial policies.
- Persuade finance officers to ensure that financial policies.
- Involve operating managers in financial policy discussions.
- Prevent financial policies from becoming corporate goals.

Mitigate Potential Agency Costs

Due to separation of ownership and control in modern corporations, agency problems arise. Shareholders, scattered and dispersed as they are, are not able to organise themselves effectively. More important, given their limited stake and the 'free rider' problem they often lack the required incentive to supervise management behaviour. Hence, very little monitoring take place in the securities markets.

Since agency costs are borne by shareholders and the management, the financing strategy of a firm should seek to minimise these costs. One way to minimise agency costs is to employ an external agent who specialises in low cost monitoring. Such an agent may be a lending organisation like a commercial (or a term- lending institution). It appears that commercial banks(and term lending institutions) have a comparative advantage in low cost monitoring. This stems from a continuing relationship between the bank and borrower and the repetitive lending that the does. Hence when a bank give a loan it conveys two positive signals to other investors:

(1) The bank considers the firm to be sound and creditworthy.

(2) The bank will monitor the firm on a regular basis to ensure that the management behaves well. This will induce other investors to look at the securities of the firm favourably.

As Alan Shapiro says: If this line of reasoning to look at the securities of the firm takes out a bank loan, it is renting more than money; it is hiring the bank to certify that the firm is behaving efficiently and to act as a watchdog.

Resort to Timing judiciously

Suppose a firm has determined that it should have debt and equity in equal proportions in its capital structure. Does it mean that every time it raises finance, it will tap debt and equity in equal proportions? This does not happen. One reason is that financing is often a 'lumpy' process-so it is difficult for the firm to maintain strict proportions each time it raises finance.

There is yet another, and perhaps a more potent, reason. The management of a firm may perceive that the capital market may not always be favourable for raising finances from both the sources, viz. debt

and equity. On some occasions it may like to raise debt capital because it believes that the company's equity stock is depressed; on other occasions it may want to raise equity capital; because it thinks that the company's equity stock is buoyant. Put differently the management may want to resort to timing based on its assessment of the conditions in the capital market.

Is timing a profitable proposition? The proponents of efficient market theory believe that it is not. They argue that the market had no memory and an attempt to catch the market when it is high or avoid it when it is low is a futile exercise.

Practitioners however are often not convinced about the efficient market theory. Warren Buffet, for example, questions the wisdom of those who advocate the efficient market theory. He says: "Observing correctly that the market was frequently efficient, they went on to conclude incorrectly that it was always efficient. The difference between these propositions is night and day." Practitioners believe that market aberrations occur and timing matters.

While it is very difficult-almost impossible- to achieve perfect timing, thanks to market uncertainties, the following guidelines may be helpful in improving the performance of a firm with respect to timing.

- Never be Greedy If present conditions are favourable for a certain type of financing, take advantage of it. Driven by greed, do not wait for an even better possible tomorrow. The advice of Bernard Baruch formulated for the stock market investor applies equally well to the participant in a financial market:" Leave the first 10 percent and the last 10 percent for someone else."
- Avoid Being Dominated by Other's Advice. While it nay be helpful to consult others, avoid being dominated by their opinions. It is difficult to fully fathom and assess the biases and attitudes on which such opinion based.
- Rely on Long term Market Relationships Financial markets seem to follow certain pattern of behaviour which tend to recur. Even though these patterns may not be perfectly regular, they have sufficient persistence. They can profitably be used as general signals, If not as precise markers, of turning points.
- Emphasize Timing when Inside Information Suggests that the Stock is Mispriced Suppose the financial manager is aware of some good news, which is not known to the market and hence not reflected, in the stock price. In such a case he should wait till the good news is captured in the stock price and issue equity shares only after that.

Finance proactively not reactively

Opportunities for smart moves on investment and financing sides of the business often do not synchronize. Hence financing decision should be decoupled from investment decisions. warren Buffet, arguably one of the most outstanding managers of our times, says:

"Unlike many in the business world, we prefer to finance in anticipation of need rather than in reaction to it. A business to obtain the best financial results possibly by managing both sides of its balance sheet well".

This means obtaining the highest-possible returns on assets and the lowest-possible cost on liabilities. It would be convenient if opportunities for intelligent actions on both fronts coincided. However, reason tells us that just the opposite is likely to be the case: Tight money conditions, which translate into high costs for liabilities, will create the best opportunities for acquisitions, and cheap money will cause assets to be bid to the sky. Our conclusion: Action on the liability side sometimes to be taken independent of any action on the asset side.

Alas, what is "tight" and "cheap" money is far from clear at any particular time. We have no ability to forecast interest rates and maintaining our usual open-minded spirit-believe that no one else can. Therefore, we simply borrow when conditions seem non-oppressive and hope that we will later find intelligent expansion or acquisition opportunities, which as we have said - are more likely to pop up when conditions in the debt market are clearly oppressive. Our basic principle is that if you want to shoot rare, fast moving elephants, you should always carry a loaded gun."

9.4 CHECK YOUR PROGRESS

1. The tax advantage of..... should not persuade one to believe that a company should exploit its debt capacity fully.
2. The two ..... sources of finance for a business firm are equity and debt.
3. According to the ..... approach, the overall capitalisation rate and the cost of debt remain constant for all degrees of leverage.
4. The principal implication of the traditional position is that the ..... is dependent on the capital structure and there is an optimal capital structure, which minimizes the cost of capital.

5. An important ..... affecting the capital structure decision is the existence of bankruptcy costs.

9.5 SUMMARY

What is the relationship between financial leverage and cost of capital? This question has been answered by the discussion made so far. Is has been established that the effect of taxation is to reduce the cost of capital as financial leverage increases. Alternatively, it implies that the value of the firm increases with financial leverage. Imperfections like bankruptcy costs and agency costs, however, tend to increase the cost of capital as financial leverage increases. Put differently these imperfections detract from the value of the firm as financial leverage increases.

Several positions have been taken on the relationship between financial leverage and cost of capital: net income approach; net operating income approach; traditional position; and Modigliani and Miller position. According to the net income approach the cost of debt capital and the cost of equity capital remain unchanged when the leverage ratio varies. As a result, the average cost of capital declines as the leverage ratio increases. This happens because when the leverage ratio increases, the cost of debt, which is lower than the cost of equity, receives a higher weightage in the average cost of lower than the cost equity receives a higher weightage in the average cost of capital calculation.

According to the net operating income approach (i) the overall capitalisation rate remains constant for all levels of financial leverage, (ii) the cost of debt remains constant for all levels of financial leverage, and (iii) the cost of equity increases linearly with financial leverage. The main propositions of the traditional approach are (i) The cost of debt remains more or less constant up to a certain degree of leverage but rises thereafter at an increasing rete. (ii) The cost of equity capital remains more or less constant or rises only gradually up to a certain degree of leverage and rises sharply thereafter. (iii) The average cost of equity of capital, as a consequence of the above behaviour of the cost of debt and the cost of equity (a) decreases up to a certain point (b) remains more or less uncharged for moderate increases in leverage thereafter, and (c) rises beyond that at an increasing rate.

Modigliani and Miller (MM) have rested and amplified the net operating income position in three basic propositions: (i) The total market value of a firm is equal to its expected operating income divided by the discount rate appropriate to its risk class. (ii) The expected yield on equity is equal to the risk-free

rate plus a premium. The premium is equal to the debt-equity ratio times the difference between the discountrate applicable to the risk class to which the firm belongs and the risk free rate. (iii)The cut-off rate for investment decision making for a firm in risk class k is P_k and it is not affected by the manner in which the investment is financed.

Modigliani and Miller suggested an arbitrage mechanism to prove their point. In the presence of taxes, the MM valuation model changes. When corporate taxes alone are considered, financial leverage changes the value of the firm by $t_c B$. When personal taxes are also considered, the advantage of debt capital is equal to:

$1 - [(1 - t_c) (1 - t_{ps})/(1 - t_{pd})] B$

Merton Miller in his 1976 Presidential Address to the American Finance Association answered the issue of optimal debt policy in a novel, though controversial, manner. He argued that the original MM proposition, which says that financial leverage does not matter in a tax free world, is valid in a world where both corporate and personal taxes exists. In addition to taxation, which is the most important imperfection, there are several other imperfections, which have a bearing on the optimal capital structure. In particular, the following are very relevant: bankruptcy costs, difference between homemade leverage and corporate leverage, and agency costs.

9.6 KEYWORDS

Capital Structure: Capital structure ordinarily implies the proportion of debt and equity in the total capital of a company.

Arbitrage: The process of buying an asset or security in one market and selling the same in another market to desire the benefit from the price differential is known as arbitrage.

Agency Cost: In order to minimise the risks in debt finance, the suppliers of loan will impose restrictive conditions in loan agreements that restricts management's freedom of action and is known as agency costs.

9.7 SELF- ASSESSMENT TEST

1. What is the relationship between leverage and cost of capital as per the net income approach?

2. What is the relationship between leverage and cost of capital as per the net operating income approach?
3. What are the main propositions of the traditional approach?
4. State the principal propositions of the Modigliani and Miller (MM) position.
5. Prove the MM hypothesis with the help of the arbitrage mechanism.
6. Illustrate the arbitrage mechanism suggested by MM with the help of a suitable numerical example.
7. What are the implications of corporate taxes for firm valuation?
8. What is the bearing of taxes, bankruptcy costs, and agency costs on the optimal structure?
9. Mahatma Limited has a net operating income of Rs. 30 million. Mahatma employs Rs. 100 million of debt capital carrying 10 per cent interest charge. The equity capitalisation rate applicable to Mahatma is 15 per cent. What is the market value of Mahatma under the net income method? Assume there is no tax.
10. The following information is available for two firms, Sachet Corporation and Zox Corporation.

	Sachet	**Zox**
Net Operating Income	Rs. 2000000	Rs. 2000000
Interest on Debt	Nil	500000
Cost of Equity	15%	15%
Cost of Debt	10%	10%

(a) Calculate the market value of equity, market value of debt, and market value of the firms.

(b) What is the average cost of capital for each of the firms?

(c) What happens to the average cost of capital of Box Corporation if it employs Rs. 30 million of debt to finance a project that yields an operating income or Rs. 4 millions?

(d) What happens to the average cost of capital of Zox Corporation if it sells Rs. 10 millions of additional equity (at par) to retire Rs. 10 million of outstanding debt?

In answering the above questions assume that the net income approach and MM approach apply and there are no taxes.

9.8 ANSWERS TO CHECK YOUR PROGRESS

1. Debt
2. Primary
3. Net Operating Income
4. Cost of capital
5. Imperfection

9.9 REFERENCES/SUGGESTED READINGS

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OPTIMUM CAPITAL STRUCTURE

STRUCTURE

10.0 LEARNING OBJECTIVE

After reading this lesson, you should be able to

(a) Explain the features of an optimal capital structure.

(b) Discuss the various optimum capital structure models.

(c) Present the Indian Scene of optimal capital structure.

10.1 INTRODUCTION

Capital structure refers to the mix of long-term sources of funds, such as debentures, long-term debt, preference share capital and equity share capital including reserves and surpluses (i.e., retained earnings). Some companies do not graph their capital structure, and the financial manager takes the financial decisions without any prescribed planning. These companies may do well in the short-run, but in due course they may face considerable difficulties in raising funds to finance their activities. With spontaneous capital structure, these companies may also fail to economize the use of their funds. As a result, it is being all the time more realized that a company should graph its capital structure to maximise the use of the funds and to be able to adapt more easily to the changing market state of affairs. Theoretically, the financial manager should plan an optimum capital structure for his company. The optimum capital structure is obtained with the market value per share is most favourable. The value will be maximised when the marginal real cost of each source of funds is the identical. In practice, the determination of an optimum capital structure is a terrifying task, and one has to go beyond the theory. There are significant variations among industries and among individual companies within an industry in terms of capital structure. Since a number of factors influence the capital structure decision of a company, the judgment of the person making the capital structure decision, plays a decisive role. Two similar companies can have different capital structures if the decision makers differ in their judgment of the implication of various factors. A totally theoretical model possibly cannot effectively handle all those factors, which have an effect on the capital structure decision. These factors are highly psychological, complex and qualitative and do not always follow acknowledged theory, since capital markets are not perfect and the decision has to be taken under flawed acquaintance and risk. The purpose of this lesson is to discuss some of the most important factors, which influence the planning of the optimum capital structure in theory and practice.

10.2 FEATURES OF AN APPROPRIATE CAPITAL STRUCTURE

The board of directors or the chief financial executive of a company ought to develop an appropriate capital structure, which is most gainful to the company. This can be done only when all those factors, which are pertinent to the company's capital structure decision, are properly analyzed and even handed. The capital structure should be planned generally keeping in view the interests of the equity shareholders and the financial requirements of a company. The equity shareholders, being the owners

of the company and the providers of risk capital (equity) would be fretful about the ways of financing a company's operations. However, the interests of other groups, such as employees, customers, creditors, society and government, should also be given sensible consideration. When the company lays down its objective in terms of the shareholders' well being, it is generally attuned with the welfare of other groups.

Thus, while developing a suitable capital structure for its company, the financial manager should *inter alia* aim at maximizing the long-term market price per share. Theoretically, there may be a precise point or range within which the market value per share is maximum. In practice, for most companies within an industry there may be a range of an appropriate capital structure within which there would not be great differences in the market value per share. One way to get an idea of this range is to observe the capital structure patterns of companies' vis-à-vis their market prices of shares. I may be found pragmatic that there are not significant differences in the share values within a agreed range. The management of a company may fix its capital structure near the top of this range in order to make maximum use of favourable leverage, subject to other necessities such as flexibility, solvency, control and norms set by the financial institutions, the Security Exchange Board of India (SEBI) and stock exchanges. A sound or appropriate capital structure should have the following facial appearances.

- **Profitability:** The capital structure of the company should be most advantageous. Within the constraints, maximum use of leverage at a minimum cost should be made.
- **Solvency:** The use of excessive debt threatens the solvency of the company. To the point debt does not add significant risk it should be used, otherwise its use should be avoided.
- **Flexibility:** The capital structure should be flexible to meet the changing conditions. It should be possible for a company to adapt its capital structure with a minimum cost and delay if warranted by a changed situation. It should also be possible for the company to provide funds whenever needed to finance its profitable activities.
- **Capacity:** The capital structure should be determined within the debt capacity of the company, and this capacity should not be exceeded. The debt capacity of a company depends on its ability to generate future cash flows. It should have enough cash to pay creditors fixed changes and principal sum.
- **Control:** The capital structure should involve minimum risk of loss of control of the company. The owners of closely-held companies are particularly concerned about dilution of control.

The above-mentioned are the universal features of a suitable capital structure. The particular characteristics of a company may reflect some additional particular features. Further, the emphasis given to each of these features will be at variance from company to company. For example, a company may give more importance to flexibility than control, while another company may be more apprehensive about solvency than any other requirement. Furthermore, the relative weight of these requirements may change with changing state of affairs. The company's capital structure should, therefore, be easily adjustable.

10.3 THE OPTIMUM CAPITAL STRUCTURE MODELS

The capital structure will be planned at the outset when company is incorporated. The initial capital structure ought to be designed very cautiously. The management of the company ought to set a target capital structure and the subsequent financing decisions ought to be made with a view to achieve the target capital structure. The financial manager has also to deal with an existing capital structure. The company needs funds to finance its activities constantly. Every time when funds have to be procured, the financial manager weighs pros and cons of various sources of finance and selects most gainful sources keeping in view the target capital structure. Thus the capital structure decision is a continuous one and has to be taken whenever a firm needs further finances.

The following are the three most common models to decide about a firm's optimum capital structure:

I. Operating and financial leverage model for analyzing the impact of debt on EPS
II. Cost of capital and valuation model for determining the impact of debt on the shareholders value.
III. Cash flow models governing the capital structure decisions, many other factors such as control, flexibility, or marketability are also considered in practice.

10.3.1 OPERATING AND FINANCIAL LEVERAGE MODEL: EBIT-EPS ANALYSIS

We shall emphasize some of the main conclusions here. The use of fixed cost sources of finance, such as debt and preference share capital to finance the assets of the company is known as financial leverage or trading on equity. If the assets financed with the use of debt yield a return greater than the cost of debt the earning per share increases without an increase in the owners' investment. The earning per share also increases when the preference share capital is used to acquire assets. But the leverage impact

is more pronounced in case of debt because (i) the cost of debt is usually lower than the cost of preference share capital and (ii) the interest paid on debt is tax deductible.

Because of its effect on the earnings per share, financial leverage is an important consideration in planning the capital structure of a company. The companies with high level of the earnings before interest and taxed (EBIT) can make profitable use of the high degree of leverage to increase return on the shareholders equity. One common method of examining the impact of leverage is to analyze the relationship between EPS and various possible levels of EBIT under alternative methods of financing.

Illustration: Suppose that a firm has an all-equity capital structure consisting of 1,00,000 ordinary shares of Rs. 10 per share. The firm wants to raise Rs. 2,50,000 to finance its investments and is considering three alternative methods of financing: (i) to issue 25,000 common shares at Rs. 10 each, (ii) to borrow Rs. 2,50,000 at a 8 per cent rate of interest, (iii) to issue 2,500 preference shares of Rs. 100 each at a 8 per cent rate of dividend. If the firm's earnings before interest and taxes after additional investment are Rs. 3,12,500 and the tax rate is 50 per cent, the effect on the earnings per share under the three financing alternatives will be as follows:

Table 1. EPS UNDER ALTERNATIVE FINANCING FAVOURABLE EBIT

	Equity Financing	Debt financing	Preference financing
	Rs.	Rs.	Rs.
EBIT	312500	312500	312500
Less : Interest	0	20000	0
	312500	292500	312500
Less Tax	156250	146250	156250
PAT	156250	146250	156250
Less Preference dividend	0	0	20000
Earning available to common Shareholders	156500	146250	136250
Shares outstanding	125000	100000	100000
EPS	1.25	1.46	1.36

The firm is able to maximise the earnings per share when it used debt financing. Though the rate of preference dividend is equal to the rate of interest, EPS is high in case of debt financing because interest charges are tax deductible while preference dividends are not. With increasing levels of EBIT, EPS will

increase at a faster rate with a high degree of leverage. However, if a company is not able to earn a rate of return on its assets higher than the interest rate (or the preference dividend rate), debt (or preference financing) will have adverse impact on EPS. Suppose the firm in the above example has an EBIT of Rs. 75000, EPS under different methods will be as follows:

Table 2. EPS UNDER ALTERNATIVE FINANCING METHODS: UNFAVOURABLE EBIT

	Equity Financing	Debt financing	Preference financing
	Rs.	Rs.	Rs.
EBIT	75000	75000	75000
Less : Interest	0	20000	0
PBT	75000	55000	75000
Less Taxes	37500	27500	37500
PAT	37500	27500	37500
Less Preference dividend	0	0	20000
Earning available to common Shareholders	37500	27500	17500
Shares outstanding	125000	100000	100000
EPS	0.30	0.27	0.17

It is obvious that, under unfavourable conditions, i.e., when the rate of return on total assets is less than the cost of debt, the earning per share will fall with the degree of leverage.

The EBIT-EPS analysis is one important tool in the hands of the financial manager to get an insight into firm's capital structure management. He can consider the possible fluctuations in EBIT and examine their impact on EPS under different financial plans. If the probability of earning a rate of return on the firm's assets less than the cost of debt is insignificant, the firm in its capital structure to increase the earnings per share can use a large amount of debt. This may have a favourable effect on the market value per share. On the other hand, if the probability of earning a rate of return on the firm's assets less than the cost of debt is very high, the firm should refrain from employing debt capital. It may, thus, be concluded that the greater the level of EBIT and lower the probability of downward fluctuation, the more beneficial it is to employ debt in the capital structure. However, it should be realised that the EBIT-EPS is a first step in deciding about a firm's provide unambiguous guide in determining the capital structure of a firm in practice.

Limitations of EPS as a financing-decision criterion. EPS is one of the most widely used measures of the company's performance. As a result of this, in choosing between debt and equity in practice, sometimes too much attention is paid on EPS. EPS, however, has some serious limitations as a financing-decision criterion. The major shortcoming of the EPS criterion is that is does not consider risk; it ignores the variability about the expected value of EPS. The belief that investors would be just concerned with the expected EPS is not well founded. Investors in valuing the shares of the company consider both expected value and variability.

EPS variability. The EPS variability resulting from the use of leverage is called financial risk. As discussed, financial risk is added with the use of debt because of (a) the increased variability in the shareholders earnings and (b) the threat of insolvency. A firm can avoid financial risk altogether if it does not employ any debt in its capital structure. But then the shareholders will be deprived of the benefit of the expected increases in EPS. As we have seen, if a company increased its debt beyond a point, the expected EPS will continue to increase, but the value of the company will fall because of the greater exposure of shareholders to financial risk in the form of financial distress.

The EPS criterion does not consider the long-term perspectives of financing decisions. It fails to deal with the risk-return trade-off. A long-term view of the effects of financing decisions will lead one to a criterion of wealth maximization rather than EPS maximization. The EPS criterion is an important performance measure but not a decision criterion.

> Given its limitations should EPS criterion be ignored in making financing decision? Remember that it is an important index of the firm's performance and that investors rely heavily on it for their investment decisions. Investors also do not have information on the projected earnings and cash flows and base their evaluation on historical data. In choosing between alternative financial plans, management should start with the evaluation of the impact of each alternative on near-term EPS. But the best interests of shareholders should guide management's ultimate decision making. Therefore, a long-term view of the effect of the alternative financial plans on the value of the shares should be taken.

If management opts for a financial plan that will maximize value in the long run but has an adverse impact on near-term EPS, the reasons must be communicated to investors. A careful communication to market will be helpful in reducing the misunderstanding between management and investors.

Operating conditions. One very important factor on which the variability of EPS depends is the growth and stability of sales. The magnitude of the EPS variability with sales will depend on the degrees of operating and financial leverages employed by the company. The firms with stable sales and favourable cost price structure and successful operating strategy will have stable earnings and cash flows and thus, can employ a high degree of leverage, as they will not face difficulty in meeting their fixed commitments. The likely fluctuations in sales increase the business risk. A small change in sales can lead to a dramatic change in the earnings of a company when its fixed costs and debt are high. As a result, the shareholders perceive a high degree of financial risk if such companies employ debt. A company will get into a debt trap if operating conditions become unfavourable and it lacks focussed strategy. (See Exhibit 1 for an example of a company in a debt trap.)

Exhibit 1. Debt trap: case of Hindustan Shipyard

1. *The fluctuating raw material and components price ups and downs in the revenues and profits of a ship-building company. With right operating strategy and appropriate and prudent financing a company can manage to sail safely. Hindustan Shipyard Limited (HSL), however, is finding it quite difficult to come out of the troubled waters due to huge borrowings. It has total out standings of Rs. 554 crore: working capital loan Rs. 138 crore, development loan for modernization Rs. 69 crore, outstanding interest on these loans Rs. 160 crore; cash credit Rs. 62 crore; outstanding interest on cash credit Rs. 65 crore, and penal interest Rs. 60 crore. How did this happen?*
2. *HSL's trouble began when, between 1981 and 1982, Japanese and South Korean shipbuilders started offering "heavily subsidized rates" against the rates fixed by the Indian government, based on international parity price. In effect, building ships turned out to be unviable for the yard. Further, HSL's overline bill soared up, being a highly overstaffed company. It has 11000 workers in 1990. A lack of strategy paved way for unchecked downfall. Orders continued declining, and became almost nil by 1988 and 1989. To not improve, the company fell deeper and deeper into debt trap.*
3. *HSL is technically insolvent. The capital restructuring plans are on to put company back on its feet.*

Sales of the consumer goods industries show wide fluctuations; therefore, they do not employ a large amount of debt. On the other hand, the sales of public utilities are quite stable and predictable. Public utilities, therefore, employ a large amount of debt to finance their assets. The expected growth in sales also affects the degree of leverage. The greater the expectation of growth, the greater the amount of external financing needed since it may not be possible for the firm to cope up with growth through internally generated funds. A number of managers consider debt to be cheaper and easy to raise. The growth firms, therefore, may usually employ a high degree of leverage. Companies with declining sales should not employ debt in their capital structures, as they would find difficulty in meeting their fixed obligations. Non-payment of fixed charges can force a company into liquidation. It may be noted that sales growth and stability is just one factor in the leverage decision; many other factors would dictate the decision. There are instances of a large number of high growth firms employing no or small amount of debt.

10.3.2 COST OF CAPITAL AND VALUATION MODEL

We are familiar with the problem of measuring the cost of various sources of finance. Here we shall compare the costs of various sources of finance to show the desirability of one source over the other. Let us reiterate the main conclusions of our discussion of the cost of capital and valuation discussed earlier.

The cost of a source of finance is the minimum return expected by its suppliers. The expected return depends on the degree of risk assumed by investors. Shareholders than debt-holders assume a high degree of risk. In the case of debt-holders, the rate of interest is fixed and the company is legally bound to pay interest whether it makes profits or not. For shareholders the rate of dividends is not fixed and the board of directors has no legal obligation to pay dividends even if the company makes the profits.

The loan of debt-holders is returned within a prescribed period; while shareholders will have to share the residue only when the company is would up. This leads one to conclude that debt is a cheaper source of funds than equity. This is generally the case even when taxes are not considered. The tax deductibility of interest charges further reduces the cost of debt. The preference share capital is also cheaper than equity capital, but is not as cheap as debt is. Thus, using the component, or specific, cost of capital as a criterion for financing decisions, a firm would always like to employ debt since it is the cheapest source of funds.

Pecking Order Hypothesis: The cost of equity includes the cost of new issue of shares and the cost of retained earnings. The cost of debt is cheaper than the costs of both these sources of equity funds. Between the cost of new issue and retained earnings, the latter is cheaper. The cost of retained earnings is less than the cost of new issues because the personal taxes have to be paid by shareholders on distributed earnings while no taxes are paid on retained earnings and because no floatation costs are incurred when the earnings are retained. As a result, between the two sources of equity funds, retained earnings are preferred. It has been found in practice that firms prefer internal finance. If the internal funds are not sufficient to meet the investment outlays, firms go for external finance, issuing the safest security first. They start with debt, then possibly hybrid securities such as convertible debentures, then perhaps equity as a last resort. Myers has called it the pecking order theory since there is not well-defined debt-equity target and there are two kinds of equity, internal and external, one at the top of the pecking order and one at the bottom.

Trade-off Theory: The specific cost of capital criterion does not consider the entire issue. It ignores risk and the impact on equity value and cost. The impact of financing decision on the overall cost of capital should be evaluated and the criterion should be to minimize the overall cost of capital, or to maximise the value of the firm. If we consider the tax shield advantage of debt (on account of interest tax deductibility), then debt would have a favourable impact on value and would help to reduce the overall cost of capital. It should, however, be realised that a company cannot continuously minimize its overall cost of capital by employing debt. A point or range is reached beyond which debt becomes more expensive because of the increased risk of excessive debt to creditors as well to shareholders (financial distress). When the degree of leverage increases, the risk of creditors increased and they demand a higher interest rate and to not grant loan to the company at all once its debt has reached a particular level. Further, the excessive amount of debt makes the shareholder's position very risky. This has the effect of increasing the cost of equity. Thus, up to a point the overall cost of capital decreases with debt, but beyond that point the cost of capital would start increasing and, therefore, it would not be advantageous to employ debt further. So there is a combination of debt and equity, which minimizes the firm's average cost of capital and maximizes the market value per share. In practice, there is generally a range of debt-equity ration within which the cost of capital is minimum or the value is

maximum. As stated earlier in this chapter for individual companies this range can be found out empirically and the can operate safely within that rang.

The valuation framework makes it clear that excessive debt will reduce the share price (or increase the cost of equity) and thereby lower the overall return to shareholders, despite the increase in EPS. The return of shareholders is made of dividends and appreciation in share prices, not of EPS. Thus, the impact of debt-equity ratio should be evaluated in terms of value, rather than EPS. The difficulty with the valuation framework is that managers find it difficult to put into practice. It is not possible for them to quantify all variables. Also, the operations of the financial markets are so complicated that it is not easy to understand them. But this kind of analysis does provide insights and qualitative guidance to the decision maker.

The trade-off between cost of capital and EPS set the maximum limit to the use of debt. However, other factors should be evaluated to determine the appropriate capital structure for a company.

10.3.3 CASH FLOW MODEL

One of the features of a sound capital structure is conservation. Conservatism does not mean employing no debt or small amount of debt. Conservatism is related to the fixed changes created by the use of debt or preference capital in the capital structure and the firm's ability to generate cash to meet these fixed charges. In practice, the question of the optimum (rather appropriate) debt-equity mix boils down to the firm's ability to service debt without any threat and operating inflexibility. A firm is considered prudently financed if it is able to service its fixed charged under any reasonably predictable adverse conditions.

The fixed charges of a company include payment of interest, preference dividends and principal, and they depend on both the amount of senior securities and the terms of payment. The amount of fixed charges will be high if the company employs a large amount of debt or preference capital with short-term maturity. Whenever a company thinks of raising additional debt, it should analyze its expected future cash flows to meet the fixed charges. It is mandatory to pay interest and return the principal amount of debt. If a company is not able to generate enough cash to meet its fixed obligation, it may have to face financial insolvency. The companies expecting larger and stable cash inflows in the future can employ a large amount of debt in their capital structure.

It is quite risky to employ fixed charges sources of finance by those companies whose cash inflows are unstable and unpredictable. It is possible for a high growth, profitable company to suffer from cash shortage if its liquidity (working capital) management is poor. We have examples of companies like BHEL, NTPC etc., whose debtors are very sticky and they continuously face liquidity problem in spite of being profitable. Servicing debt is very burdensome for them.

One important ratio, which should be examined at the time of planning the capital structure, is the ratio of net cash inflows to fixed charges (debt-servicing ratio). It indicates the number of times the fixed financial obligations are covered by the net cash inflows generated by the company. The greater the coverage, the greater the amount of debt a company can use. However, a company with a small coverage can also employ a large amount of debt if there are not significant yearly variance in its cash inflows and a small probability of the cash inflows being considerably less to meet fixed charges in a given period. Thus, it is not the average cash inflows but the yearly cash inflows, which are important to determine the debt capacity of a company. Fixed financial obligations must be met when due, not on an average and not in most years but always. This requires a full cash flow analysis.

Debt capacity. The technique of cash flow analysis is helpful in determining the firm's debt capacity. Debt capacity is the amount, which a firm can service easily, even under adverse conditions; it is the amount that the firm should employ. There may be lenders who are prepared to lend to you. But you should borrow only if you can service debt without any problem. A firm can avoid the risk of financial distress if it can maintain its ability to meet contractual obligation of interest and principal payments. Debt capacity therefore should be thought in terms of cash flows rather than debt ratios. A high debt ratio is not necessarily bad. If you can service high debt without any risk, it will increase shareholders wealth. On the other hand, a low debt ratio can prove to be burdensome for a firm, which has liquidity problem. A firm faces financial distress (or even insolvency) when it has cash flow problem. It sis dangerous to finance a capital-intensive project out of borrowings which has built in uncertainty about the earnings and cash flows. National Aluminium Company is an example of a wrong initial choice of capital structure, without analyzing the company's debt servicing ability (See Exhibit 2).

Exhibit 2. Debt Burden Under Cash Crunch: A Case of Nalco

1.	*National Aluminium Company (NALCO). Started in 1981, is the largest integrated aluminium complex in Asia of total investment of Rs. 2,408 crore, borrowings from a*

consortium of European banks financed to the extent of $830 million or Rs. 1119 crore (46.5 per cent). The loan was repayable by 1995. Aluminium is an electricity intensive business; each tonne of aluminium needs over 15000 kWh of electricity. Since it's commissioning in 1988. Nalco has exported substantial portion of its production since the domestic demand has been very low than what the company had projected at its inception. The falling international prices in last few years have eroded the company's profitability. The net profit of Rs. 172 crore in 1989 dropped to Rs. 14 crore in 1991-92. The Rs. 1119 crore Eurodollar loan has appreciated to Rs. 2667 crore in spite of having repaid Rs. 644 crore. Due to profitability and liquidity problem and hit by the depreciating rupee and the liberalized exchange mechanism, the company is forced to reschedule repayments of its debt by the year 2003 instead of 1995. Nalco's debt-equity ratio has increased from 1: 1 to 2.7: 1.

2. *The reasons for Nalco's plight are its decision to go for the production of aluminium, which consumes heavy electricity in addition to alumina. The problem of power shortage led to the setting up of power plant, which is proving very costly to the company. The overcapacity of aluminium production world wide and highly competitive prices has added to Nalco's woes. Nalco is trying to get out of its problems by attempting to diversity into value-added products.*
3. *Nalco's fate can change if the domestic demand for aluminium picks up and international fate can change if the domestic debt of the company poses a question: Should you use heavy dose of debt (since it is available from certain sources) to finance investments in a business like aluminium which has worldwide overcapacity, fluctuating international prices and expensive and short supply of electricity in the country in which it is set up? Debt would accentuate the financial crises when a company has built in operating uncertainties.*

Components of cash flows. The cash flows should be analyzed over a long period of time, which can cover the various adverse phases, for determining the firm's debt policy. Preparing proforma cash flow statements to show the firm's financial conditions under adverse conditions such as a recession can carry out the cash flow analysis. The expected cash flows can be categorized into three groups:

1. Operating cash flows
2. Non-operating cash flows
3. Financial flows.

Operating cash flows relate to the operations of the firm and can be determined from the projected profit and loss statements. The behaviour of sales volume, output price and input price over the period of analysis should be examined and predicted.

Non-operating cash flows generally include capital expenditures and working capital changes. During a necessary period, the firm may have to specially spend for the promotion of the product. Such expenditures should be included in the non-operating cash flows. Certain types of capital expenditure cannot be avoided even during most adverse conditions. They are necessary to maintain the minimum operating efficiency. Such irreducible, minimum capital expenditure should be clearly identified.

Financial flows include interest, dividends, lease rentals, repayment of debt etc. they are further divided into: contractual obligations and policy obligations. Contractual obligations include those financial obligations, like interest, lease rentals and principal payments that are matters of contract, and should not be defaulted. Policy obligations consist of those financial obligations, like dividends, that are at the discretion of the board of directors. Policy obligations, like dividends, that are at the discretion of the board of directors. Policy obligations are also called discretionary obligations.

The **cash flow** analysis may indicate that decline in sales resulting into profit decline or losses may not necessarily cause cash inadequacy. This may be so because cash may be released from permanent inventory and receivables. Also, some of the permanent current liabilities may decline with fall in sales and profits. On the other hand, when sales and profits are growing the firm may face cash inadequacy as large amount of cash is needed to finance growing inventories and receivables. If the profits decline due to increase in expenses or falling output prices instead of the decline in the number of units sold, the firm may face cash inadequacy because its funds in inventories and receivables will not be released. The point to be emphasized is that a firm should carry out cash flow analysis to get a clear picture of its ability to service debt obligations even under the adverse conditions, and thus, decide about the proper amount of dent in the capital structure. Examining the impact of alternative debt policies on the firm's cash flow ability can do this. The firm should then choose the debt policy, which it can service.

Cash flow analysis versus EBIT-EPS analysis. Is cash flow analysis superior to EBIT-EPS analysis? How does it incorporate the insights of the finance theory? The cash flow analysis has the following advantages over EBIT-EPS analysis.

- It focuses on the liquidity and solvency of the firm over a long -period of time, even encompassing adverse circumstances. Thus, it evaluates the firm's ability to meet fixed obligations.
- It goes beyond the analysis of profit and loss statement and also considers changes in the balance sheet items.
- It identifies discretionary cash flows. The firm can thus prepare an action plan to face adverse situations.
- It provides a list of potential financial flows, which can be utilized under emergency.
- It is long-term, dynamic analysis, and does not remain confined to a single period analysis.

The most significant advantage of the cash flow analysis is that it provides a practical way of incorporating the insights of the finance theory. As per the theory, debt financing has tax advantage. But is also involves risk of financial distress. Therefore, the optimum amount of debt depends on the trade-off between tax advantage of debt and risk of financial distress. Financial distress occurs when the firm is not in a position to meet its contractual obligations. The cash flow analysis indicates when the firm will find it difficult to service its debt. Therefore, it is useful in providing good insights to determine the debt capacity, which helps to maximise the market value of the firm.

Cash flow analysis versus debt-equity ratio. The cash flow analysis discussed above clearly reveals that a higher debt equity ratio is not risky if the company has the ability of generating substantial cash inflows in the future to meet its fixed financial obligations. Financial risk in this sense is indicated by the company's cash flow ability, not by the debt equity ratio.

> To quote Van Horne.……the analysis of debt-to-equity ratios alone can be deceiving, and analysis of the magnitude and stability of cash-flows relative to fixed charges is extremely important in determining the appropriate capital structure for the firm. To the extent that creditors and investors analyze a firm's cash flow ability to service debt, and management's risk preferences correspond to those of investors, capital structure decisions made in this basis should tend to maximise share price.

The cash flow analysis does have its limitations. It is difficult to predict all possible factors that may influence the firm's cash flows. Therefore, it is not a perfect technique to determine the firm's debt policy.

10.3.4 ADDITIONAL PRACTICAL CONSIDERATIONS

The determination of capital structure in practice involves additional considerations in addition to the concerns about EPS, value and cash flow. Attitudes of managers with regard to financing decisions are quite often influenced by their desire not to lose control, to maintain operating flexibility, and to have convenient and cheaper means of raising funds. The most important considerations are discussed hereunder:

1. Control. In designing the capital structure, sometimes the existing management is governed by its desire to continue control over the company. This is particularly so in the case of the firms promoted by entrepreneurs. The existing management team not only wants control and ownership but also to manage the company, without any outside interference.

2. Widely-held companies. The ordinary shareholders elect the directors of the company. If company issues new shares, there is risk of dilution of control. This is not a very important consideration in the case of a widely held company. The shares of such company are widely scattered. Most of the shareholders are not interested in taking active part in the company's management. Nor do they have time and money to attend the meetings. They are interested in dividends and capital gains. If they are not satisfied, they will sell their shares. Thus, the best way to ensure control and to have the confidence of the shareholders is to mange company most efficiently and compensate shareholders in the form of dividends and capital gains. The risk of loss of control can be reduced by distribution of shares widely and in small lots.

3. Closely-held companies. The consideration of maintaining control may be significant in case of a closely held, small company. A shareholder or a group of shareholders can purchase all or most of the new shares and control the company. Even if the owner managers hold the majority shares, their freedom to manage the company will be curtailed when they go public for the first time. Fear of sharing control and being interfered by others often delays the decision of the closely held companies to go public. To avoid the risk of loss of control, small companies may slow their rate of growth or issue

preference shares or raise debt capital. If the closely held companies can ensure a wide distribution of shares, they need not worry about the loss of control so much.

The holders of debt do not generally have voting rights. Therefore, it is suggested that a company should use debt to avoid the loss of control. However, when a company uses large amount of debt, a lot of restrictions are put by the debt holders, specifically the financial institutions in India since they are the major providers of loan capital to the companies, on company to protect their interest. These restrictions curtail the freedom of the management to run the business. A very excessive amount of debt can also cause serious liquidity problem and ultimately render the company sick, which means a complete loss of control.

4. Flexibility. Flexibility is one of the most serious considerations in setting up the capital structure. Flexibility means the firm's ability to adapt its capital structure to the needs of the changing conditions. The company should be able to raise funds, without undue delay and cons, whenever needed to finance the profitable investments. It should also be in a position to redeem its preference capital or debt whenever warranted by the future conditions. The financial plan of the company should be flexible enough to change the composition of the capital structure as warranted by the company's operating strategy and needs. It should also be able to substitute one form of financing for another to economise the use of funds.

5. Loan covenants. Restrictive covenants are commonly included in long-term loan agreements and debentures. These restrictions curtail the company's freedom in dealing with the financial matters and put it in an inflexible position. Covenants in loan agreements may include restrictions to distribute cash dividends, to incur capital expenditure, to raise additional external finances or to maintain working capital at a particular level. These restrictions may be quite reasonable from the lenders point of view as they are meant to protect their interest, but they reduce the flexibility of company to operate freely and may become burdensome if conditions change. Therefore, a company while issuing debentures or accepting other forms of long term debt, should ensure that a minimum of restrictive clauses, that circumscribe its financial action in future are included in debt agreements.

6. Early repayability. A considerable degree of flexibility will be introduced in a company has the discretion of early repaying its debt and preference share capital. This will enable management to retire or replace cheaper source of finance for the expensive one whenever warranted by the circumstances.

When a company has excess cash inflows and does not have profitable investment opportunities, it becomes desirable to retire debt. Similarly, a company can take advantage of a declining rate of interest if it has a right to repay debt at its option. Suppose that funds are available at 15 per cent rate of interest presently. The company has outstanding debt at an 18 per cent rate of interest. It can save in terms of interest cost if in can retire the 'old' debt and replace it by the 'new' debt.

7. Reserve capacity. The flexibility of the capital structure also depends on the company's debt capacity. The greater the debt capacity and the greater the availability of unused debt capacity, the greater the degree of flexibility. If a company borrows to the limit of its capacity, it will not be in a position to borrow additional funds to finance unforeseen and unpredictable demands except at restrictive and unfavourable terms. Therefore, a company should not borrow to the limit of its capacity, but keep available some unused capacity to raise funds in future to meet some sudden demand for finances.

Although flexibility is most desirable, it is achieved at a cost. A company trying to obtain loans on easy terms will have to pay interest at a higher rate. Also, to obtain the right of refunding, it may have to compensate lenders by paying a higher interest. Therefore, the company should compare the benefits and costs of attaining the desired degree of flexibility and balance them properly.

8. Marketability. Marketability means the readiness of investors to purchase a security in a given period of time and to demand reasonable return. Marketability does not influence the initial capital structure, but it is an important consideration to decide about the appropriate timing of security issues. The capital markets are changing continuously. At one time, the market favours debenture issues, and, at another time, it may readily accept common share issues. Due to the changing market sentiments, the company has to decide whether to raise funds with a common shares issue or with a debt issue. The alternative methods of financing should, therefore, be evaluated in the light of general market conditions and the internal conditions of the company.

9. Market conditions. If the share market is depressed, the company should not issue common shares, but issue debt and wait to issue common shares till the share market revives. During boom period in the share market, it may be advantageous for the company to issue shares at high premium. These will help to keep its debt capacity unutilized. The internal conditions of a company may also

dictate the marketability of securities. For example, a highly levered company may find it difficult to raise additional debt. Similarly, when restrictive covenants in existing debt agreements preclude payment of dividends on common shares, convertible debt may be the only source to raise additional funds. A company may find difficulty to issue any kind of security in the market merely because of its small size. The heavy indebtedness, low rating of the company, which would make it difficult for the company to raise external finance at favourable terms.

10. Flotation costs. Flotation cost is not a very important factor influencing the capital structure of a company. Flotation costs are incurred only when the funds are externally raised. Generally, the cost of floating a debt is less than the cost of floating an equity issue. This may encourage a company to use debt than issue common shares. If retaining the earning no flotation cost increases the owners capital are incurred. To repeat, except sometimes in the case of small companies, flotation cost are not a significant consideration to decide about the alternative forms of financing.

Flotation costs, as a percentage of funds raised will decline with larger amount of funds. Therefore, it can be an important consideration in deciding the size of a security issue. The company will save in terms of flotation costs if it raises funds through large issues of securities. But a large issue can curtail company's financial flexibility. Also, the company should raise only that much of funds, which can be employed profitably. Many other more important factors, as discussed above, have to be considered when deciding about the methods of financing and the size of a security issue.

11. Availability of funds. The size of a company may influence the availability of funds from different sources. A small company finds great difficulties in raising long-term loans. If it is able to obtain some long-term loan, it will be available at a higher rate of interest and inconvenient terms. The highly restrictive covenants in loan agreements in case of small companies make their capital and retained earnings for their long-term funds. It is quite difficult for small companies to raise share capital in the capital markets. Also, the capital base of most small companies is so small that they are not allowed to be registered in the stock exchanges. Those small companies, which are able to approach the capital markets, the cost of issuing shares is generally more for them than the large ones. Further, resorting frequently to ordinary share issues to raise long-term funds carries a greater danger of the possible loss of control to a small company than to a large company. The shares of a small company are

not widely scattered and the dissident group of shareholders can be easily organized to get control of the company. The small companies, therefore, sometimes limit the growth of their business to what can easily be financed by retaining the earnings.

A large company has relative flexibility in designing its capital structure. It can obtain loans on easy terms and sell common shares, preference shares and debentures to the public. Because of the large size of issues, its cost of distributing a security is less than that for a small company. A large issue of ordinary shares can be widely distributed and thus, making the loss of control difficult. The size of the firm has an influence on the amount and the cost of funds, but it does not necessarily determine the pattern of financing. In practice, the debt-equity ratios of the firms do not have a definite relationship with their size.

10.3.5 MANAGER'S ATTITUDE TOWARDS DEBT

We know now the factors, which are theoretically important in determining the capital structure policy of a company. They are interest tax shield (adjusted for personal taxed) and financial risk. We also know the additional factors in practice such as sales growth and stability, cash flow, market conditions, transaction costs etc. which may have influence on the choice of capital structure. How do managers view the question of borrowing? There seems to be a mixed feeling. Some would prefer borrowing while others would like to decide after considering variety of factors. They also feel that they can borrow only when lenders are prepared to lend. They think that lenders evaluate a number of before deciding to lend, and these factors go beyond the theoretical considerations or risk and returns. Exhibit 3 summarizes the perceptions of manager's vis-à-vis borrowing.

Analysis of Capital Structure in Practice: Case of Larsen and Toubro

In this section, we analyze the capital structure of Larsen and Toubro (L & T). L & T is a well-known engineering company in India. It was founded in 1938. It is a well-diversified company, having sales of Rs. 1,092 crore and total assets of Rs. 1,651 crore in 1990. L&T covers a wide range of manufacturing activities. Main activities include dairy equipment, cement and cement equipment, steel, paper, nuclear power and space exploration, hydraulic excavators, switchgears, electronic controls, valves welding alloys, computer peripherals, excavators, switchgears, electronic controls, valves welding alloys, computer peripherals, test and measuring equipments etc.

Exhibit 3. Do managers prefer borrowing?

A number of companies in practice would always prefer to borrow for the following reasons:

1. Tax deductibility of interest
2. Higher return to shareholders due to gearing
3. Complicated procedure for raising equity capital
4. No dilution of ownership and control
5. Equity results in a permanent commitment than debt.

There are, however, managers whose choice of financing depends on internal and external factors. The internal factors include: purpose of financing, company's earning capacity, existing capital structure, cash flow ability, investment plans etc. The external factors are: capital and money market conditions, debt-equity stipulations followed by financiers, restrictions imposed etc. A company, for example, feels: "There can be no specific preference towards borrowings as a source of finance. The company's financial requirement will vary from time to time depending on factors such as its existing capital structure, investment plans vis-à-vis expansion, modernization and replacement as also its margin money requirement for incremental working capital. In addition, the cost of share issue, existing money market and banking conditions and the impact of statutory regulations would influence the mix of finance required by a company."

In practice, it may not be possible for a company to borrow whenever it wants. Lenders may analyze a number of characteristics of the borrower before they decide to lend. What factors do borrowers think are considered by lenders? Borrowing-firms managers perceive the following factors in order of importance being considered by lenders: (i) profitability, (ii) quality of management, (iii) security, (iv) liquidity, (v) existing debt-equity ratio, (vi) sales growth, (vii) net worth, (viii) reserve position, and (ix) fluctuations in profits.

Table 3 provides data about L&T's debt-equity ratio, interest coverage, interest as a percentage of sales, and average market price (AMP). We may observe three phases in L & T's borrowing policy. Prior to 1982, the company followed a conservative debt-equity ratio; its equity always exceeded its debt.

Table 3 Larsen & Toubro's debt ratios and other data

Year	Debt equity ratio	Interest coverage	Interest as %of sales	AMP (Rs.)
1976	0.57	5.50	2.80	25.33
1977	0.47	10.30	1.50	56.80
1978	0.43	6.90	2.10	54.20
1979	0.71	6.10	2.40	57.80
1980	0.58	5.60	2.60	57.00
1981	0.55	7.70	1.90	80.60
1982	1.45	2.90	5.50	163.84
1983	1.54	2.30	7.80	143.04
1984	1.75	2.20	9.20	187.52
1985	1.14	2.10	9.60	312.32
1986	1.27	2.00	9.40	587.52
1987	1.43	1.80	10.10	366.72
1989	1.22	1.50	8.70	416.64
1990	1.85	1.60	7.50	335.20
1991	1.25	2.56	7.04	465.60
1992	0.63	3.50	4.08	940.80
1993	0.10	4.73	2.06	no

Note: L & T changes its accounting period in 1981 and 1989. Data for these years has been annualized. The company paid bonus share in 1976, 1982, and 1986. AMP data has been adjusted accordingly.

This is also reflected in the interest coverage ratio (viz., earnings before interest and taxed divided by interest), which has generally remained around 5-6 times. The company resorted to heavy reliance on debt after 1981; as a consequence, debt-equity ratio significantly increased — it was highest at 1.85 in 1990. Once again 1991 onwards the use of debt has reduced considerably. In fact, total debt to equity ratio has declined to 0.19 in 1993. It is reported that it has further reduced to 0.10 in 1994 (see figure 1). Because of heavy borrowing, interest coverage ratio has deteriorated after 1981; it hovered around 2-3 times until 1986 and became less than 2 thereafter. Coverage ratio has again improved in the last three

years because of low debt. (See Figure 2). Interest charges constitute around 8-10 per cent of sales since 1984 until recently. As a percentage to sales, it has come down to 2.6 per cent in 1993.

L&T capital structure has changes after 1981 on account of its large diversification activities. The company has grown more than what could be financed from internal funds. After 1981, company's capital expenditures (CAPEX) have increased substantially, and a large part of them has been financed out of borrowing. Thus, its borrowing has been moving up with its capital expenditures. The company continues retaining 70 per cent of its earnings. It has also made three rights issues of about Rs. 300 crore during last 17 years. The company also augmented its equity base to borrow more by converting loans and debentures into equity.

The company's financing policy has undergone a change recently. During last three years it has financed its expansion mainly from retained earnings and to some extent issue of shares. It has been able to "retire" its long-term debt partly through conversion into equity. The change in the company's financial position during last three year is shown in Table 4.

Table 4. L & T's financial position: 1991-93.

	1990-91	**1991-92**	**1992-93**
CAPEX	106.84	128.23	365.84
Investments	(54.11)	65.13	(89.53)
Net current assets	(2.15)	123.60	59.20
Total use	50.58	316.96	335.51
Internal funds	155.64	363.52	544.12
Share capital	7.34	54.19	80.33
Net worth	162.98	417.71	624.45
Long-term borrowing	(47.91)	(125.56)	(373.07)
Bank borrowing	(63.74)	23.81	84.90
Net borrowing	(111.65)	(101.75)	(288.17)
Total Source	51.33	315.96	336.28

** The discrepancy in total use and total source is due to rounding off error.*

The company's capital structure until 1980's had a history of heavy reliance on the shareholder's equity. This pattern charged during the next decade when L & T borrowed heavily for financing its

growth. A large part of the borrowing during this period was raised through convertible debentures. The company has again consolidated its financial position and capability by improving internal generation of funds and reducing debt. At the end of 1993 the company's total debt-equity ratio was 0.19: 1 and merely 0.10 in 1994. Thus the company has a large reserve debt capacity providing it with financial capability to easily fund its diversification and expansion programmes in future. L & T has plans to diversify into related areas, which have a synergy with its current operations. It is estimated that company may require additional Rs. 800 crore to carry out its investments. L &T has already planned to make $ 100 million Euro issue. The company can also make a rights issue to finance its expansion.

10.4 OPTIMUM CAPITAL STRUCTURE: INDIAN SCENE

Raising of funds to finance the firm's investments is an important function of the financial manager. In practice, it is observed that financial managers use different combinations of debt and equity. A practical question therefore is: What motivates them to do so ? More fundamental questions to be answered are: (1) Does use of debt create value? (2) If so, do firms gravitate towards an optimum mix of debt and equity?

In theory, it is argued that the financing decision is irrelevant under perfect capital markets. When within the framework of perfect capital markets, taxes and bankruptcy costs are assumed, the financial economists argue that an optimum capital structure, which maximized the market value of the firm (or minimizes cost of capital), can exist. In the finance literature, two alternate theories are also found justifying the optimum capital structure in the absence of bankruptcy costs and taxes. One theory justifies optimum capital structure in items of the agency costs while another justifies it in terms of the information signaling. Agency costs are costs of monitoring the performance of managers. To protect their interests, debt holders will provide for various covenants in the loan agreement. Similarly, the new shareholders will have to incur monitoring costs for safeguarding their interests. Thus, agency costs are involved both in raising debt and equity. At the optimum mix of debt and equity total agency costs will be minimised. Alternatively, it is also plausible that managers may use the decision of debt-equity mix to convey information to investors, as market prices of shares do not reflect entire information.

The empirical evidence on the capital structure and the cost of capital is as conflicting or inconclusive as the theory is. The empirical evidence, however, seems to be somewhat titled in favour of the view that debt has net tax advantage. What is also clear is that zero debt is not optimum. In practice, firms in

developed countries like USA or in developing countries like India are found following different financing policies - some aggressive and some conservative. One needs to investigate in to the causes of this behaviour.

Capital structure and the cost of capital: We would refer to two Indian's studies on the relationship between the cost of capital and the capital structure. Sarma and Rao (1968)[2] following Modigliani and Miller's (M-M's) 1966 article, 3 employed a two-stage least square method on the data of 30 Indian engineering firms for three years. In their estimates, the leverage variable had a coefficient greater than the tax rate. Thus, agreeing with the traditional view, they concluded that the cost of capital is affected by debt apart from its tax advantages.

Another study was conducted by Pandey (1981). He attempted to determine the empirical relationship between cost of capital and the capital structure using data of 4 industries viz., cotton (47), chemicals (32) engineering (32), and electricity generation (20). To account for the heterogeneous characteristics of the sample firms, be introduced a proxy for risk variable measured by the coefficient of variation of the net operating income. Other explanatory variables, expected to influence the cost of capital and/or leverage, were also incorporated in the regression equations. These variables were: size, growth, payout, and liquidity. Two measures of leverage were used. The first measure included preference capital in debt, while the second measure treated it as a part of equity. Because of the substitutability of short-term loans for long-term loans in India, debt included both short-term and long-term debt. When the average cost of capital was regressed with leverage, holding other variables constant, the results were found consistent with the traditional position. In view of the M-M's (1963) tax corrected article, for supporting the traditional view, it should be shown that the cost of capital would decline with leverage even in the absence of tax deductibility of interest charges. Therefore, a modified model was used in Pandey's study. The regressions were run for the pooled data of 3 industries; electricity generation industry was excluded for the lack of sufficient number of observations. The coefficients of leverage variable were significant and negative in sign. The third regression model was used to determine the empirical relation with leverage and the cost of equity. If the M-M view is correct, the cost of equity must increase linearly with leverage. On the other hand, if the traditional view approximates the reality, the cost of equity function would be either horizontal or rise slightly up to some level of leverage. Contrary to these views, Pandey's study explored the possibility of the cost of equity declining with

leverage up to a certain level. The basis for this possibility is that leverage could accelerate growth in earnings and if growth in earnings is higher than the risk, then cost of equity could decline with leverage. This hypothesis could be established only in the case of electricity industry. The results of other industries, however, showed that cost of equity remains constant up to a level of leverage change. Thus, the results of these models also generally supported the traditional view. It is observed that the lack of consistency in the behaviour of equity with leverage is not entirely unexpected. Firms within the same industry differ widely with respect to their economic characteristics. Moreover, risk preferences of investors differ. As a result, leverage may affect the cost of equity differently.

Determinants of capital structure: Some studies have been conducted to ascertain the determinants of financial leverage under the Indian context. Bhat's (1980) paper concerned the impact of size, growth, business risk, dividend policy, profitability, debts service capacity and the degree of operating leverage on the leverage ratio of the firm. They study used the multiple regression model to find out the contribution of each characteristic. Business risk (defined as earnings instability), profitability, dividend payout and debt service capacity were found to be significant determinants of the leverage ratio. The study used a sample of 62 companies from engineering industry.

Pandey's (1984) study about the corporate managers' attitude towards use of borrowings in India revealed that the practicing managers generally preferred to borrow instead of using other sources of funds because of low cost of debt due to the interest tax deductibility and the complicated procedures for raising the equity capital. In the light of this finding, Pandey (1985) conducted another empirical study examining the industrial patterns, trend, and volatilities of leverage and the impact of size, profitability, and growth on leverage. For this purpose, data of 743 companies in 18 industrial groups for the period 1973-74 to 1980-81 were analyzed. It was found that about 72 to 80 per cent of the assets of sample companies were financed by external debt, including current liabilities. Companies employed trade credit as much as bank borrowings. The level of leverage for all industries showed a noticeable increase after 1973-74. The study also indicated that classifying leverage percentages by the type of industry does not produce any patients, which may be regarded as systematic and significant. The trends and volatilities associated with the leverage percentages also did not give any support to the belief that the type of industry had an impact on the degree of leverage. It also revealed that there was some evidence of the tendency of large size companies to concentrate in the high levels of leverage. But it is

difficult to say conclusively that size has an impact on the degree of leverage since a large number of small firms were also found employing high levels of debt. The study also did not show a definite structural relationship between the degrees of leverage, on the one hand and profitability and growth, on the other hand; although over time profitability and growth have improved and so has the degree of leverage. The majority of the profitability and growth groups of companies were concentrated within narrow bands of leverage.

Chakraborty (1977) has also conducted a study to investigate debt-equity ratio in the private corporate sector in India. He tested the relation of debt-equity ratio with age, total assets, retained earnings, profitability and capital intensity. He found that age; retained earnings and profitability were negatively correlated while total assets and capital intensity were positively related to debt-equity ratio. He also provided a glimpse of the regional patterns of debt-equity rations in different industrial centres in India. He also attempted a prediction equation for debt-equity ratio for each industry. Chakraborty also used a very simple methodology for calculating the cost of capital. He showed calculation of cost of capital for 22firms. He found that cost of capital increased from 7.36 per cent to 12.36 per cent over years. The average cost of capital for all the consumer goods industry firms taken together was the highest while it was lowest for the intermediate goods firms. One of the reasons for this was attributed to the relatively low amount of debt used in the former industry than in the latter. An indirect attempt was also made to test the M-M hypothesis by plotting debt-equity ratios on the X-axis and the rest of capital on the Y-axis for 22 firms. The result showed almost a horizontal line parallel to the X-axis. The study also discussed environmental factors influencing corporate debt-equity ratios and cost of capital in India.

10.5 CHECK YOUR PROGRESS

1. The ..... capital structure is obtained with the market value per share is most favourable**.**
2. The ..... variability resulting from the use of leverage is called financial risk.
3. The magnitude of the EPS variability with sales will depend on the ..... of operating and financial leverages employed by the company.
4. Therefore, the optimum amount of debt depends on the .....between tax advantage of debt and risk of financial distress.

5. Operating cash flows relate to the operations of the firm and can be determined from the ..... profit and loss statements.

10.6 Summary

The gain of debt is that is saves taxes since interest is a deductible expense. On the other hand, its drawback is that it can reason financial sorrow. Therefore, the trade off between tax gain and costs of financial pain should administer the optimum capital structure decision of the firm in practice. Financial sorrow becomes costly when the firm finds it hard to pay interest and principal. From this point of view, both debt ratio and EBIT-EPS analysis have their precincts. They do not reveal the debt-servicing ability of the firm. A full cash flow analysis over a long period, which covers the adverse state of affairs also, helps to decide the firm's debt capacity. Debt capacity means the amount of debt, which a firm should use, given its cash flows. Cash flow analysis indicates how much debt a firm can service without any intricacy. A firm does not wear out its debt capacity at one time. It keeps reserve debt capacity to meet financial emergencies. The actual amount of debt also depends on flexibility, control and size of the firm in terms of its assets. Other factors, which are important when capital is actually raised, include timing (marketability) and flotation costs.

10.7 KEYWORDS

Optimal Capital Structure: It is that combination of debt and equity that leads to the maximisation of the value of the firm.

Pecking Order Theory: The theory suggests that when a company is looking to finance its long-term investments, it has well defined order to preference with respect to the sources of finance it uses.

EBIT–EPS Analysis: It provides a simple picture of the consequences of alternative financing methods.

10.8 SELF- ASSESSMENT TEST

1. Define the capital structure. What do you mean by an appropriate capital structure? What should generally be the features of an appropriate capital structure?

2. Briefly explain the factors, which influence the planning of the capital structure in practice.
3. Explain the features and limitations of three approaches to the determination of a firm's capital structure: (a) EBIT-EPS approach, (b) valuation approach and (c) cash flow approach.
4. "…….the analysis of debt to equity ratios along can be deceiving, and a analysis of the magnitude and stability of cash flows relatives to fixed changes is extremely important in determining the appropriate capital structure ——'' Give your opinion.
5. What is meant by a flexible capital structure? Is a flexible capital structure more costly?
6. If debt is cheaper than equity why do companies not finance their assets with say 80 or 90 percent debt ratio?
7. What is the importance of marketability and floatation costs in the capital structure decision of a company?
8. How do considerations of control size affect the capital structure decision of the firm?
9. GSFC Consider the following financial data of the Gujrat State Fertilizers Company Ltd. (Rs. Lakh)

Year	Sales	PAT	Inter-est	Net Worth	Long Term Debt	Gross block
1986	35331	2298	817	17023	4563	26036
1987	35827	3623	2082	19732	6649	31479
1989	67631	4666	4116	23583	20959	39277
1990	68251	5134	2110	38045	19143	50153
1991	73989	6467	3395	44125	37177	67050

Note: Data for 1989 is for 15 months.

You are required to analyze GSFC's debt policy.

10. Philips India Limited. Philips has the following financial data for last five years. Comment on the company's investment and financial policy.

Year	Sales	PAT	Net Assets	current net fixed	Invest-ment	Net worth	Debe-ntures	Loans
1989-90	4169.4	32.4	714.6	1036.3	20.8	606.1	566.6	599.0
1990-91	5642.2	287.3	767.2	991.7	75.9	808.6	482.7	543.5
1991-92	7445.9	183.1	959.2	1004.1	122.3	935.1	411.8	738.7
1992-93	7970.3	134.9	1233.9	1183.3	130.5	1082.1	394.7	1071.1
1993-94	7074.6	124.1	790.9	1219.8	138.0	1456.0	228.1	464.6

Note: Data are for a twelve-month period from April to March except for 199394 for which data are for a nine-month period form April to December.

10.9 ANSWERS TO CHECK YOUR PROGRESS

1. Optimum
2. EPS
3. Degree
4. Trade-off
5. Projected

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DIVIDEND POLICY

STRUCTURE

11.0 LEARNING OBJECTIVES

After reading this lesson, you should be able to

(i) Explain the factors determining the mobilization of internal funds.

(ii) State the importance of dividend decisions.

(iii) List out the determinants of dividend policy.

(iv) Discuss the legal and procedural aspects of dividend.

11.1 INTRODUCTION

Financing an enterprise through its internal sources is known as internal financing. Such internal resources comprise of earnings retained by the company in the form of income left over after meeting

all expenses. Such funds are available to an enterprise which has been carrying on its business successfully and thereby has been in a position to set aside a portion of its earnings for future needs. This retaining of earnings is technically termed as ploughing back of profits. Retained earnings constitute an important source of corporate financing. The funds are relatively economic and without any obligation to refund the same. These funds can be effectively utilized for modernisation and expansion requirements and that too without creating any charge against any asset. The earning position of the company improves tremendously when the modernisation and expansion schemes are successfully undertaken. Consequently the company is in a position to pay fair amount of dividend to its shareholders regularly. It can also retain a portion of the enhanced earnings for financing further growth requirements. This will carry forward further the pace of development and progress of the company. The excess of assets over capital and liabilities of company is the surplus attained by it. This surplus is used for payment of dividends. If only a part of this surplus is paid as dividends, the balance would be carried forward from year to year as accumulated surplus. This in fact is the amount of retained earnings of the company. With a fair amount of accumulated surplus or retained earnings, a company can also absorb the shocks of business vicissitudes and resist adverse conditions with confidence. Again, since the retained earnings result in the company being strong and stable, it will be, in turn, in a better position to attract investors and creditors. With this it can raise funds from external sources conveniently at reasonable rates. Similarly, any deficiency of depreciation, depletion and obsolescence can be mitigated by the company when it has its own accumulated resources. Thus, the company shall maintain its operating efficiency. In the same way the drudgeries of debt burden can be avoided by a company when it possesses its own retained accumulated funds for financing. Internal financing through retained earnings results in benefits to shareholders as well. It is a fact that in the short-run they have to forego a portion of their dividends but their equity in the business tends to increase when the portion of retained earnings increases. The price of the shares increases as there is considerable improvement in the credit standing of the company. At this time shareholders can either wholly or partly sell their shares and get benefited. If they want to hold shares, the proportion of their income will increase as greater dividends will be declared with the improved prosperity of the company. This is because the earnings of the company are expected to improve considerably. Furthermore, the retention of earnings offers tax saving advantages as well to shareholders. This is

because the tax liability of shareholders is reduced to the extent income is retained by the company. The earnings are more and more retained by closely-held companies for this purpose mainly as the owners/ shareholders are already in the very high bracket of tax payment and with more dividend income the tax rate will shoot up still further.

11.2 MOBILIZATION OF INTERNAL FUNDS

There are a number of important factors that determine the magnitude of internal funds raised in a company. These factors have been identified as:

1. **Dividend Policy:** This is the crucial policy of the company management that determines the level of retained earnings vis-a-vis the declaration of dividends. The level of retained earnings thereby will determine the level of internal funds available to an enterprise through its ploughing back of profits. Of course, a suitable dividend policy of a company shall be framed by a capable financial executive, keeping in view a host of factors. These are the investment opportunities available to the company, the preferences of shareholders, access of the company to capital market, rate of growth of the company, liquidity position and fund requirements of the company and control and repayment scheme of debts of the company. All these factors help an enterprise to declare a suitable rate of dividend payable to the shareholders. The left over portion of the earning shall be the retained earnings available for internal financing.

2. **Level of Earnings:** This is the main factor that influences the magnitude of retained earnings and the level of internal financing of an enterprise, after, of course, all other expenditures of the business are met. The level of earnings is in itself a function of several economic and commercial factors. The factors may be cited as cost of production, general price level, cost of distribution, product demand and supply, the size of business etc. Obviously, a company either suffering losses or not earning good profits can not retain back a portion of the same. Thus an enterprise that is run successfully and which shows positive results shall be in a better position to plough back profits for use in re-investment plans of the business.

3. **Depreciation Policy:** The level of internal financing is also greatly affected by the allocation of funds for obsolescence and depreciation of the company assets in pursuit of an appropriate depreciation policy. If the company follows conservative policy there will be very little funds raised

through internal sources for replacement of assets, whereas a company following liberal depreciation policy shall be in a comfortable position to effect replacements and renewals necessitated by obsolescence and wear and tear.

4. **Taxation Policy of Government:** The taxation policy of the government greatly affects the funds available for internal financing of a company. If the corporate tax rate is high it will have adverse effects on the level of retained earnings as the greatest chunk of the earnings will go to the exchequer. As against this if there is a liberal tax policy followed by government whereby rebate is provided on undistributed portion of business earnings and additional tax is levied on dividends distributions beyond a limit, the business would be more inclined to retain more of its earnings to meet its future expansion plans and the programmes of modernisation. Such a policy on the part of the government as stated above suits a developing economy like India. The corporate sector would thereby be more inclined to save, retain and invest within. Therefore, the policy of the government should be to encourage large savings and retentions. For this, concessions should be provided to companies that retain larger portion of earnings. Also dividend tax may be levied when dividend is distributed by a company beyond a prescribed limit. Thus, when companies are encouraged to retain more, there will be a boost to the industrial prosperity of the company which is so vital for the progress and development of the country as whole.

11.3 CONCEPT AND SIGNIFICANCE OF DIVIDEND DECISIONS

The term dividend refers to that portion of profit (after tax) which is distributed among the owners/shareholders of the company and the profit which is not distributed is known as retained earnings. A company may have preference share capital as well as equity share capital and dividends may be paid on both types of capital. However, there is as such, no decision involved as far as the dividend payable to preference shareholders is concerned. The reason being that the preference dividend is more or less, a contractual liability and is payable at a fixed rate. On the other hand, a firm has to consider a whole lot of factors before deciding for the equity dividend. The expected level of cash dividend, from the point of view of equity shareholders, is the key variable from which the shareholders and equity investors determine the share value. The establishment and determination of an effective dividend policy is therefore, of significant importance to the firm's overall objective.

However, the development of such a policy is not an easy job. A whole gamut of considerations affecting the dividend decision is thee. The dividend decision may seem to be simple enough, but it evokes a surprising amount of controversy. The dividend decision is one of the three basis decisions which a financial manager is required to take, the other two being the investment decisions and the financing decisions. In each period any earning that remains after satisfying obligations to the creditors, the Government, and the preference shareholders can either be retained, or paid out as dividends or bifurcated between retained earnings and dividends. The retained earnings can then be invested in assets which will help the firm to increase or at least maintain its present rate of growth. The dividend decision requires a financial manager to decide about the distribution of profits as dividends. It may be noted that the profits may be distributed either in the form of cash dividends to shareholders or in the form of stock dividends (also known as bonus shares). In dividend decision, a financial manger is concerned to decide one or more of the followings :

a. Should the profits be ploughed back to finance the investment decisions?
b. Whether any dividend be paid?
c. How much dividends be paid?
d. When these dividends be paid?
e. In what form the dividends be paid?

All these decisions are inter-related and have bearing on the future growth plans of the company. If a company pays dividends, it affects the cash flow position of the firm but earns a goodwill among the investors who therefore, may be willing to provide additional funds for the financing of investment plans of the firm. On the other hand, the profits which are not distributed as dividends become an easily available source of funds at no explicit costs. However, in the case of ploughing back of profits, the firm may loose the goodwill and confidence of the investors and may also defy the standards set by other firms. Therefore, in taking the dividend decision, the financial manage has to consider and analyze various factors. Every aspects of dividend decision is to be critically evaluated. The most important of these considerations is to decide as to what portion of profit should be distributed. This is also known as the dividend payout ratio. While deciding the dividend payout ratio the firm should consider the effect of such policy on the objective of maximization of shareholder's wealth. If payment of dividend is expected to increase the market value of the share (i.e. increase in

the wealth of the shareholders) the dividend must be paid, otherwise, the profits may be retained and used as an internal source of finance. So, the firm must find out and establish a relationship between the dividend policy and the market value of the share.

11.4 DETERMINANTS OF DIVIDEND POLICY

The payment of dividend involves financial as well as legal considerations. It is difficult to determine a general dividend policy which can be followed by different firms at different times because the dividend decision has to be taken considering the special circumstances of an individual case. The factors which determine the dividend policy are as follow:

Dividend Payout (D/P) Ratio

A major aspect of the dividend policy of a firm is its dividend payout (D/P) ratio, that is, the percentage share of the net earnings distributed to the shareholders as dividends. Dividend policy involves the decision to pay out earnings or to retain them for reinvestment in the firm. The retained earnings constitute a source of financing. The payment of dividends results in the reduction of cash and, therefore, is a depletion of total assets. In order to maintain the asset level, as well as to finance investment opportunities, the firm must obtain funds from the issue of additional equity or debt. If the firm is unable to raise external funds, its growth would be affected. Thus, dividends imply outflow of cash and lower future growth. In other words, the dividend policy of the firm affects both the shareholders' wealth and the long-term growth of the firm. The optimum dividend policy should strike the balance between current dividends and future growth which maximises the price of the firm's shares. The D/P ratio of a firm should be determined with reference to two basic objectives – maximising the wealth of the firm's owners and providing sufficient funds to finance growth. The objectives are not mutually exclusive, but interrelated. Given the objective of wealth maximising, the firm's dividend policy (D/P ratio) should be one which can optimise the wealth of its owners in the 'long run'. In theory, it can be expected that the shareholders take into account the long-run effects of D/P ratio, that is, if the firm is paying low dividends and having high retentions, they recognise the element of growth in the level of future earnings of the firm. However, in practice, they have a clear cut preference for dividends because of uncertainty and imperfect capital markets. The payment of dividends can, therefore, be expected to affect the price of shares : a low D/P ratio may cause a

decline in share prices, while a high ratio may lead to a rise in the market price of the shares. Making a sufficient provision for financing growth can be considered a secondary objective of dividend policy. Without adequate funds to implement acceptable projects, the objective of wealth maximising cannot be achieved. The firm must forecast its future needs for funds, and taking into account the external availability of funds and certain market considerations, determine both the amount of retained earnings needed and the amount of retained earnings available after the minimum dividends have been paid. Thus, dividend payments should not be viewed as a residual, but rather a required outlay after which any remaining funds can be reinvested in the firm.

General State of Economy: As a whole, it affects the decision of the management to a great extent whether the dividend should be retained or the same should be distributed amongst the shareholders. In the following cases, the business may prefer to retain the whole or part of the earnings in order to build up reserves:

- where there is uncertain economic and business conditions;
- if there is a period of depression (management may withhold the payment of dividends for maintaining the liquidity position of the firm.) ;
- if there is a period of prosperity (since there is large profitable investment opportunities) ; and
- where there is a period of inflation.

Capital Market Considerations: This also affects the dividend policy to the extent to which the firm has access to the capital market. In other words, if easy access to the capital market is possible whether due to financially strong or, big in size, the firm in that case, may adopt a liberal dividend policy. In the opposite case, i.e., if easy access to capital market is not possible, it must have to adopt a low dividend pay out ratio, i.e., they have to follow a conservative dividend policy. As such, they must have to rely more on their own funds, viz., retained earnings.

Legal, Contractual, Internal Constraints and Restrictions: The dividend decision is also affected by certain legal, contractual, and internal requirements and constraints. The legal factors stem from certain statutory requirements, the contractual restrictions arise from certain loan covenants and the internal constraints are the result of the firm's liquidity position.

= **Legal Requirements**

Legal stipulations do not require a dividend declaration but they specify the condition under which dividends must be paid. Such conditions pertain to (i) capital impairment, (ii) net profits and (iii) insolvency.

1. **Capital Impairment Rules**

Legal enactment limit the amount of cash dividends that a firm may pay. A firm cannot pay dividends out of its paid-up capital, otherwise there would be a reduction in the capital adversely affecting the security of its lenders. The rationale of this rule lies in protecting the claims of preference shareholders and creditors on the firm's assets by providing a sufficient equity base since the creditors have originally relied upon such an equity base while extending credit. Any dividends that impair capital are illegal and the directors are personally held liable for the amount of illegal dividend. Therefore, the financial manager should keep in mind that payment of dividend is in order and does not violate capital impairment rules.

2 Net Profits

The net profits requirement is essentially a corollary of the capital impairment requirement, in that it restricts the dividend to be paid out of the firm's current profits plus past accumulated retained earnings. Alternatively, a firm cannot pay cash dividends greater than the amount of current profits plus the accumulated balance of retained earnings. For instance, section 205 of the Indian Companies Act provides that dividends shall be paid only out of the current profits or past profits after providing for depreciation. The point to be recognised is that the company can count on the profits of previous years, if the current years' profits fall short of the required funds for maintaining a desired stable dividend policy. Likewise, if there are past accumulated losses, they should be first set off against current earnings before the payment of dividend.

3. Insolvency

A firm is said to be insolvent in two situations : *First*, when its liabilities exceed the assets; and *second*, when it is unable to pay its bills. If the firm is currently insolvent in either sense, it is prohibited from paying dividends. Similarly, a firm would not pay dividends if such a payment leads to insolvency of either type. The rationale of the rule is to protect the creditors by prohibiting the liquidation of near bankrupt firms through cash dividend payments to the equity owners.

Contractual Requirements

Important restrictions on the payment of dividend may be accepted by a company when obtaining external capital either by a loan agreement, a debenture indenture, a preference share agreement, or a lease contract. Such restrictions may cause the firm to restrict the payment of cash dividends until a certain level of earnings has been achieved or limit the amount of dividends paid to a certain amount or percentage of earnings. Since the payment of dividend involves a cash outflow, firms are forced to reinvest the retained earnings within the firm. The restriction on dividends may take three forms. In the first place, firms may be prohibited from paying dividends in excess of a certain percentage, say, 12 per cent. Alternatively, a ceiling in terms of the maximum amount of profits that may be used for dividend payment may be laid down, say not more than 60 per cent of the net profits, or a given absolute amount of such profits can be paid as dividends. Finally, dividends may be restricted by insisting upon a minimum of earnings to be retained. Reinvestment leads to a lower debt/equity ratio and, thus, enhances the margin of cushion (safety) for the lenders.

Therefore, contractual constraints on dividend payments are quite common. The payment of cash dividend in violation of a restriction would amount to default in the case of a loan and the entire principal would become due and payable. Keeping in view the severity of penalty, the financial manager must ensure that the amount of dividend is within the covenants already committed to lenders.

3. Internal Constraints

Such factors are unique to a firm and include (i) liquid assets, (ii) growth prospects, (iii) financial requirements, (iv) availability of funds, (v) earnings stability and (vi) control.

Liquid Assets

Once the payment of dividend is permissible on legal and contractual grounds, the next step is to ascertain whether the firm has sufficient cash funds to pay cash dividends. It may well be possible that the firm's earnings are substantial, but the firm may be short of funds. This situation is common for (a) growing companies; (b) companies which have to retire past loans as their maturity year has come; and (c) companies whose preference shares are to be redeemed. Such companies may not like to borrow at exorbitant rates because of the increased financial risk especially if their existing leverage ratio is already very high. Moreover, lenders may be reluctant to lend money for dividend

payments since they produce no tangible or operating benefits that will help the firm to repay the loan. Thus, the firm's ability to pay cash dividends is largely restricted by the level of its liquid assets. On the other hand, if excess cash is available, the firm can have a more liberal dividend policy.

Growth Prospects

Another set of factors that can influence dividend policy relates to the firm's growth prospects. The firm is required to make plans for financing its expansion programmes. In this context, the availability of external funds and its associated cost together with the need for investment funds would have a significant bearing on the firm's dividend policy.

Financial Requirements : Financial requirements of a firm are directly related to its investment needs. The firm should formulate its dividends policy on the basis of its foreseeable investment needs. If a firm has abundant investment opportunities, it should prefer a low payout ratio, as it can usually reinvest earnings at a higher rate than the shareholders can. Such firms, designated as 'growth' companies, are constantly in need of funds. Their financial requirements may be characterized as large and immediate. That retention of earnings is less costly than selling a new issue of equity needs no reiteration. Moreover, retention of earnings provides the base upon which the firm can borrow additional funds. Therefore, it provides flexibility in the company's capital structure, that is, it make room for unused debt capacity. The importance of creation of debt raising potential for a growing firm is overwhelming. On the other hand, if the firm has little or no growth opportunities, it will probably prefer low retention and relatively high dividend payouts. This is so for two vital reasons. *First,* the shareholders can reinvest earnings at a higher rate than the firm can do, and, *secondly*, such firms may need funds largely to replace or modernise assets. In many instances, these outlays may not be required immediately but after two or three years. Therefore, the need for funds is small and periodic vis-a-vis large and fast growing companies. The nature of the firm's needs, therefore, is an important factor in determining the destination of the firm's fund-retention or distribution.

Availability of Funds

The dividend policy is also constrained by the availability of funds and the need for additional investment. In evaluating its financial position, the firm should consider not only its ability to raise funds but also the cost involved in it and the promptness with which financing can be obtained. In general, large, mature firms have greater access to new sources for raising funds than firms which are

growing rapidly. For this reason alone, the availability of external funds to the growing firms may not be sufficient to finance a large number of acceptable investment projects. Obviously, such firms have to depend on their retained earnings so as to amount of maximum number of available profitable projects. Therefore, large retentions are necessary for such firms.

Earnings Stability

The stability of earnings also has a significant bearing on the dividend decision of a firm. Generally, the more stable the income stream, the higher is the dividend payout ratio. Public utility companies are classic examples of firms that have relatively stable earnings pattern and high dividend payout ratio. Growing firms, characterised by stable earnings, can muster debt funds at a relatively lower cost because of a smaller total risk (business and financial). This is unlike the experience of other firms which, though growing, suffer form fluctuating earnings. However, the financial manager should remember that dividends have information value. Withholding the payment of dividends will raise the required rate of return of the investors and, therefore, depress the market price of the shares. The increase in earnings should be such that it can offset the unfavourable effect of the increased cost of equity (k_e).

Control

Dividend policy may also be strongly influenced by the shareholders' or the management's control objectives. That is to say, sometimes management employs dividend policy as an effective instrument to maintain its position of command and control. The management, in order to retain control of the company in its own hands, may be reluctant to pay substantial dividends and would prefer a smaller dividend payout ratio. This will particularly hold good for companies which require funds to finance profitable investment opportunities when an outside group is seeking to gain control of the firm. Added to this, if a controlling group of shareholders either cannot or does not wish to purchase new shares of equity, under such circumstances, by the issue of additional shares to finance investment opportunities, management may lose its existing control. Conversely, if management is securely in control, either through substantial holdings or because the shares are widely held, and the firm has a good image, it can afford to have a high dividend payout ratio. If it requires funds later, the firm can easily raise additional funds owing to its reputation.

Owner's Considerations

The dividend policy is also likely to be affected by the owner's considerations of (a) the tax status of the shareholders, (b) their opportunities of investment, and (c) the dilution of ownership. It is well-nigh impossible to establish a policy that will maximise each owner's wealth. The firm must aim at a dividend policy which has a beneficial effect on the wealth of the majority of the shareholders.

Taxes Status

The dividend policy of a firm may be dictated by the income tax status of its shareholders. If a firm has a large percentage of owners who are in high tax brackets, its dividend policy should seek to have higher retentions. Such a policy will provide its owners with income in the form of capital gains as against dividends. Since capital gains are taxed at a lower rate than dividends, they are worth more, after taxes, to the individuals in a high tax bracket. On the other hand, if a firm has a majority of low income shareholders who are in a lower tax bracket, they would probably favour a higher payout of earnings because of the need for current income and the greater certainty associated with receiving the dividend now, instead of the less certain prospects of capital gains later.

Opportunities of Investment

The firm should not retain funds if the rate of return earned by it would be less than one which could have been earned by the investors themselves from external investments of funds. Such a policy would obviously be detrimental to the interests of shareholders. It is difficult to ascertain the alternative investment opportunities of each of its shareholders and, therefore, the alternative investment opportunity rate. However, the firm should evaluate the rate of return obtainable from external investments in firms belonging to the same risk class. If evaluation shows that the owners have better opportunities out side, the firm should opt for a higher dividend payout ratio. On the other hand, if the firm's investment opportunities yield a higher rate than that obtained from similar external investment, a low dividend payout is suggested. Therefore, in formulating dividend policy, the evaluation of the external investment opportunities of owners is very significant.

Dilution of Ownership

The financial manager should recognize that a high dividend payout ratio may result in the dilution of both control and earnings for the existing equity holders. Dilution in earnings results because low retentions may necessitate the issue of new equity shares in the future, causing an increase in the

number of equity shares outstanding and ultimately lowering earnings per share and their price in the market. By retaining a high percentage of its earnings, the firm can minimize the possibility of dilution of earnings.

Inflation

It may also affect the dividend policy of a firm. With rising prices, funds which are generated by way of depreciation may fall short in order to replace obsolete equipment. The shortfall may be made from retained earnings (as a source of funds). This is very significant when the assets are to be replaced in the near future. As such, the dividend payout ratio tends to be low during the periods of inflation.

Stability of Dividends

Stability of dividends is another guiding principle in the formulation of a dividend policy. Stability of dividend policy refers to the payment of dividend regularly and shareholders, generally, prefer payment of such regular dividends. The dividend policy, of course, should have a degree of stability, i.e., earnings/profits may fluctuate from year to year but not the dividend since the equity shareholders prefer to value stable dividends than the fluctuating ones. In other words, the investors favour a stable dividend in as much as they do the payment of dividend. The stability of dividends can be in any of the following three forms:

a) Constant Dividend Per Share ;

b) Constant Percentage of Net Earnings (constant dividend payout ratio); and

c) Constant Dividend Per Share plus Extra Dividend.

a) Constant Dividend Per Share: Under this form, a firm pays a certain fixed amount per share by way of dividend. For example, a firm may pay a fixed amount of, say, Rs. 5 as dividend per share having a face value of Rs. 50. The fixed amount would be paid regularly year after year irrespective of the actual earnings, i.e., the firm will pay dividend even if there is a loss. In short, fluctuation in earnings will not affect the payment of dividend. It does not necessarily mean that the amount of dividend will remain fixed for all times in future. When the earnings of the company will increase the rate of dividend will also increase provided the new level can be maintained in future. If there is a temporary increase in earnings, there will not be any change in the payment of dividends. The

relationship between the EPS (Earning per share) and DPS (Dividend per share) can better be represented with the help of the following diagram:

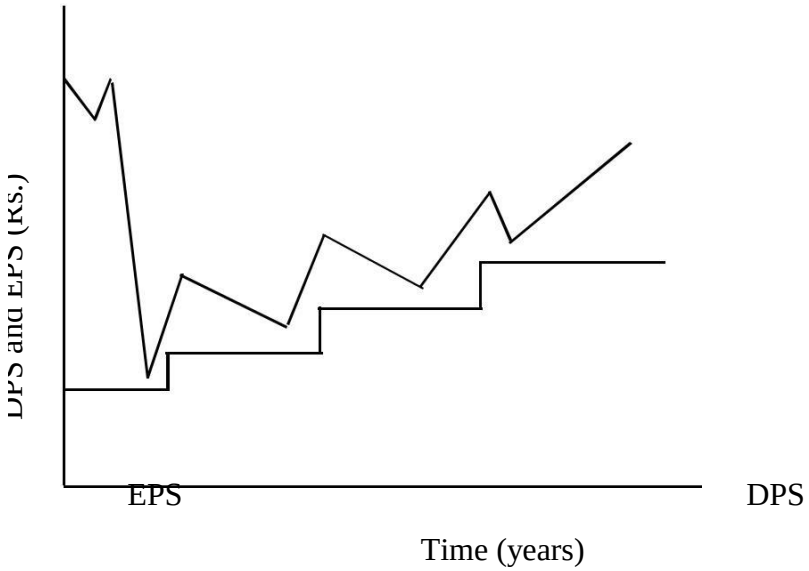

Fig. 1 : Showing stable dividend policy per Share

From the above, it becomes clear that earnings per share many fluctuate from year to year but the dividend per share is constant. In order to formulate this policy, a firm whose earnings are not stable may have to make provisions to those years when there is higher earnings. i.e., a Dividend Equalization Reserve' fund may be created for the purpose.

b) Constant Percentage of Net Earnings: According to this policy, a certain percentage of the net earnings/profits is paid by way of dividend to shareholders year after year, i.e., when a constant pay out ratio is followed by a firm. In other words, it implies that the percentage of earnings paid out each year is fixed and as such, dividends would fluctuate proportionately with earnings. This is particularly very useful in cases where there is wide fluctuations in the earnings of a firm. This policy suggests that when the earnings of a firm decline, the dividend would naturally be low. For instance, if a firm adopts a 40% dividend payout ratio and earns Rs. 5 per share then it will pay Rs. 2 to the shareholder by way of dividend. The relationship under this policy between the EPS an DPS is presented below with the help of a diagram that shows.

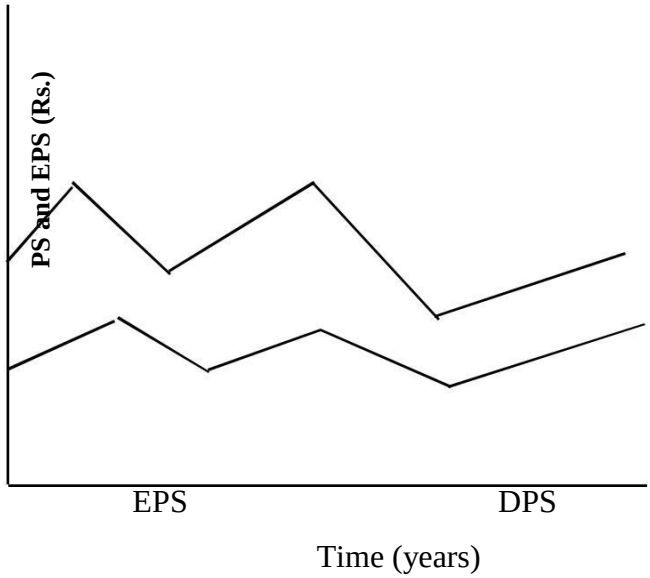

Fig. 2: Showing stable dividend policy under constant payout ratio

(c) **Constant Dividend Per Share Plus Extra Dividend:** Under this policy, a firm usually pays a fixed dividend per share to the shareholders. At the time of market prosperity, additional or extra dividend is paid over and above the regular dividend. This extra dividend is waived as soon as the normal conditions return.

Now, the questions that arise us are which policy is the most appropriate one and what is their relative suitability or which one is most favourable to the investors or what are the implications to the shareholders. The most appropriate policy may be considered as the first one, viz., Constant Dividend Per Share. Because, most of the investors desire a fixed rate of return from their investment which will gradually increase over a period of time. This is satisfied by the said policy. But in case of constant percentage of net earnings the return actually fluctuates with the amount of earnings and it also involves uncertainties and that is why it is not preferred by the shareholders although the same is favoured by the management since it correlates the amount of dividends to the ability of the company to pay its dividend. At the same time, in case of constant dividend per share plus extra dividend, there is always an uncertainty about the extra dividend and as a result it is not generally preferred by the shareholders. A stable dividend policy is advantageous due to the following:

- **Desire for Current Income:** There are investors like, old and retired persons, widows etc., who desire to have a stable income in order to meet their current living expenses since such expenses are almost fixed in nature. Such a stable dividend policy will help them.

- **Resolution of Investors' Uncertainty:** If a firm adopts a stable dividend policy, it must have to declare and pay dividend even if the earnings are temporarily reduced. It actually conveys to the investors that the future is bright. On the contrary, if it follows a policy of changing dividend with cyclical changes in the rate of earnings, the investors will not be confined about their return which may induce them to require a higher discount factor. The same is not desired in case of a stable dividend policy.
- **Raising additional finance:** If stable dividend policy is adopted by a firm, raising additional funds from external sources become advantageous on the part of the company since it will make the shares of a firm an investment. The shareholders/investors will hold the shares for a long time as it will create some confidence in the company and as such, for further issue of shares, they would be more receptive to the offer by the company. This dividend policy also helps the company to sale preference shares and debentures. Because, past trend regarding the payment of dividend informs them that the company has been regularly paying the dividends and their interest/dividend naturally will be paid by the company when it will mature for repayment together with the principal.
- **Requirement of Institutional Investors:** Sometimes the shares of a company are purchased by financial institutions, like, IFC, IDB, LIC, UTI etc., educational and social institutions in addition to the individuals. These financial institutions are the largest purchasers of shares in corporate securities in our country and every firm is intended to sell their shares to these institutions. These financial institutions are interested to buy the shares of those companies who have a stable dividend policy.
- **Danger of Stability of Dividends**

  Once this policy is being adopted by a firm it cannot be changed with an immediate affect which will adversely affect the investors' attitude towards the financial stability of the company. Because, if a company, with stable dividend policy, fails to pay the dividend in any year, there will be a severe effect on the investors than the failure to pay dividend under unstable dividend policy. That is why, in order to maintain that rate, sometimes the directors pay dividend, even if there is insufficient earning, i.e., declaring dividend out of capital which ultimately invites the liquidation of a firm. From the foregoing discussions it becomes clear

that the rate of dividend should be fixed at a conservative figure which is possible to pay even in a lean period for several years. Extra dividend can be declared out of extra earnings which, in other words, will not create any adverse effect in future.

11.4.1 FORMS OF DIVIDEND

Dividends can be distributed by a company in various forms. These forms are cash dividends, stock dividends, scrip dividends and bond dividends. These forms of dividends are briefly explained as under:

(i) Cash Dividends: It is the common practice to pay dividends in cash. These dividends are paid when profits are earned by an enterprise. In the event of a company following a policy of stable dividends, it has to pay the same even though the profits of the enterprise are small. If this is so the company may even have to borrow to meet the fund requirement for dividend payment.

The payment of cash dividend results in the reduction of reserves of the company. Consequently both the net worth and the assets of the company get reduced. Such a reduction may be the cause of reduction of the share prices of the enterprise. At the same time cash dividends are desirable especially in case of those shareholders who supplement their income with the dividend receipts.

(ii) **Stock Dividend:** Such dividend payment in India is know as bonus shares. This is an alternative form of dividend payment. In this case the current shareholders get their share of dividends by way of share distribution. Such a distribution may be either in lieu of cash dividend or it may be in addition to the cash dividend.

Stock dividends are distributed in the proportion of shareholding with the result there is no change in the ownership proportion of the shareholders. The payment by way of stock dividends does not change the net worth of the company. With the help of distribution of dividend through stock dividend method, the company is in a position to conserve its cash. There are two conflict ends that are met by stock dividends. *Firstly*, the retention of earnings and secondly the payment of dividends. With single action of stock dividends both the two conflicting ends of an enterprise are satisfied. A company can declare stock dividends even when it is put in a stringent financial position. Again, such a dividend arrangement helps when the creditors put restriction on

cash dividend payment. Thus, the stock dividends are beneficial on this account as well. The stock dividends do not affect the wealth of shareholders and so they are beneficial to them as well. With this the shareholders are exempt from the payment of tax as otherwise they would be subject to if dividends were paid in cash. In the event of their selling of the stock dividends, they would be subject to capital gains tax which is charged comparatively at a lower rate as against rate applicable to cash dividends. In addition, when the company pays cash dividend in future, the shareholders shall receive higher dividend as they are holding increased number of shares now. This will be so when there is constancy in earnings per share of the company. From creditors point of view also, the stock dividends are preferable. With stock dividends the creditors realise that the liquidity position of the company becomes strong and with this their interests are more protected. On the other hand, payment of dividends through proportionate stock issues increases administrative costs. Also the earnings per share tend to drop, if there is no proportionate increase in the earnings. This is turn affects adversely the credit worthiness of the company. As such, while formulating a policy regarding stock dividend payment, these factors need thorough consideration on the part of the management of the company.

(i ii) Scrip Dividend: This is another form of dividend whereby the dividend is paid by a company in the shape of a scrip or a promissory note. The document bears a maturity date and when it reaches this date the stated payment is made in cash. However, there are instances wherein no maturity date is given on the promissory note. The payment in that case is made as per the direction of the Board of Directors. The amount of scrip dividend carries interest, though in most of the cases it is interest-free. This form of dividend payment is resorted by a company when despite high earnings it faces a temporarily tight financial position. With scrip dividend the company maintains an established record of dividend payments, of course not making any cash payment, though for a short period. Scrip dividend form is not in practice in India.

(iv) **Bond Dividend:** This form of dividend payment also is not popular in India. This is just like a scrip dividend wherein bonds are issued by a company when despite sufficient earnings the financial position of the company is tight. The bonds are issued in lieu of dividend payments. But, as against scrip dividends bonds carry a long maturity period. With bond dividends issued, the shareholders have a stronger claim against the enterprise. Alongwith this the company has another liability of interest payment. Therefore, before deciding about the payment of dividends through

issue of bonds, the company is advised to weigh properly the benefits of each conservation against the cost involved by way of interest liability of the bonds desired to the issued in lieu of dividends.

11.4.2 LEGAL AND PROCEDURAL ASPECTS OF DIVIDEND LEGAL ASPECTS

The amount of dividend that can be legally distributed is governed by company law, judicial pronouncements in leading cases, and contractual restrictions. The important provisions of company law pertaining to dividends are described below:

1. Companies can pay only cash dividends (with the exception of bonus shares).
2. Dividends can be paid only out of the profits earned during the financial year after providing for depreciation and after transferring to reserves such percentage of profits as prescribed by law. The companies (Transfer to Reserve) Rules, 1975, provide that before dividend declaration, a percentage of profit as specified below should be transferred to the reserves of the company :

   Where the dividend proposed exceeds 10 per cent but not 12.5 per cent of the paid-up capital, the amount to be transferred to the reserve should not be less than 2.5 per cent of the current profits.

   Where the dividend proposed exceeds 12.5 per cent but not 15 per cent, the amount to be transferred to reserves should not be less than

   per cent of the current profits.

   Where the dividend proposed exceeds 15 per cent but not 20 per cent, the amount to be transferred to reserves should not be less than

   5 per cent of the current profits.

   Where the dividend proposed exceeds 20 per cent, the amount to be transferred to reserve should not be less 10 per cent.

3. Due to inadequacy or absence of profits in any year, dividend may be paid out of the accumulated profits of previous years. In this context, the following conditions, as stipulated by the Companies (Declaration of Dividend out of Reserves) Rules, 1975 have to be satisfied :

4. The rate of the declared dividend should not exceed the average of the rates at which dividend was declared by the company in 5 years immediately preceding that year or 10 per cent of its paid-up capital, whichever is less.

(i) The total amount to be drawn from the accumulated profits earned in previous years and transferred to the reserves should not exceed an amount equal to one-tenth of the sum of its paid-up capital and free reserves and the amount so drawn should first be utilised to set off the losses incurred in the financial year before any dividend in respect of preference or equity shares is declared.

(ii) The balance of reserves after such drawl should not fall below 15 per cent of its paid-up capital

5. Dividends cannot be declared for past years for which accounts have been closed.

Procedural Aspects

The important events and dates in the dividend payment procedure are :

a) Board resolution: The dividend decision is the prerogative of the board of directors. Hence, the board of directors should in a formal meeting resolve to pay the dividend.

b) Shareholders approval: The resolution of the board of directors to pay the dividend has to be approved by the shareholders in the annual general meeting.

c) Record date: The dividend is payable to shareholders whose names appear in the register of members as on the record date.

d) Dividend payment: Once a dividend declaration has been made, dividend warrant must be posted within 42 days. Within a period of 7 days, after the expiry of 42 days, unpaid dividends must be transferred to a special account opened with a scheduled bank.

11.5 CHECK YOUR PROGRESS

1. The term……. refers to that portion of profit (after tax) which is distributed among the owners/shareholders of the company and the profit which is not distributed is known as retained earnings.

2. (D/P) ratio, that is, the……. share of the net earnings distributed to the shareholders as dividends.

3. If a firm has a large percentage of owners who are in high tax brackets, its dividend policy should seek to have …….

4. …… refers to the payment of dividend regularly and shareholders, generally, prefer payment of such regular dividends.

5. Dividends can be distributed in various forms like cash dividends, stock dividends, scrip dividends and……..

11.6 SUMMARY

A dividend decision of the firm is another crucial area of financial management. The important aspect of dividend policy is to determine the amount of earnings to distributed to shareholders and the amount to be retained by the firm. Retained earnings are the most significant internal sources of financing the growth of the firm. On the other hand dividends may be considered desirable from shareholders' point of view as they tend to increase their return. Dividends, however, constitute the use of the firm's funds. The determinants of the dividend policy of a firm are dividend payout ratio, stability of dividends, capital market considerations, general state of economy, legal, contractual and internal constraints and restrictions, owners' considerations, capital market considerations and inflation.

A stable dividend policy refers to the consistency or lack of variability in the stream of dividends, that is, a certain minimum amount of dividend is paid out regularly. Of the three forms of stability of dividend, namely, constant dividend per share, constant percentage of net earnings and constant dividend per share plus extra dividend, the first one is the most appropriate. The investors prefer a stable dividend policy for a number of reasons, such as, desire for current income, information contents, institutional requirement, and so on. The legal restrictions on payment of dividends stipulate conditions pertaining to capital impairment, net profits, insolvency and illegal accumulation of excess profits. The contractual restrictions on payment of dividends are imposed by loan agreements. The internal constraints impinging on the dividend restrictions relate to growth prospects, availability of funds, earnings stability and control. The dividend policy is also likely to be affected by the owners' consideration of

5. tax status of the shareholders, (b) their opportunities for investment and (c) dilution of ownership.

11.7 KEYWORDS

Internal Financing: Financing an enterprise through its internal sources is known as internal financing.

Dividend: It is that portion of profit after tax which is distributed among the shareholders of the company.

Dividend Payout Ratio: It represents the percentage of dividend declared and paid out of earning per share.

Scrip Dividend: The dividend paid by the company in the shape of a scrip or a promissory note is known as scrip dividend.

11.8 SELF ASSESSMENT QUESTIONS

1. What is meant by internal financing? Discuss the factors determining the magnitude of internal funds.
2. Explain the various factors which influence the dividend decision of a firm.
3. "A firm should follow a policy of very high dividend pay-out". Do you agree? Why or why not?
4. What do you understand by a stable dividend policy? Why should it be followed?
5. Discuss the various forms of dividends.

11.9 ANSWERS TO CHECK YOUR PROGRESS

1. Dividend

2. Percentage

3. Higher retentions.

4. Stability of dividend policy

5. Bond dividends

11.10 REFERENCES/FURTHER READINGS

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Subject: Financial Management	
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Lesson No.: 12	

THEORIES AND TYPES OF DIVIDEND POLICY

STRUCTURE

12.0 LEARNING OBJECTIVES

This lesson will make you familiar with the models explaining the relevance or irrelevance of the dividend policy.

12.1 INTRODUCTION

Dividend policy is primarily concerned with deciding whether to pay dividend in cash now, or to pay increased dividends at a later stage or distribution of profits in the form of bonus shares. The current dividend provides liquidity to the investors but the bonus share will bring capital gains to the shareholders. The investor's preferences between the current cash dividend and the future capital gain have been viewed differently. Some are of the opinion that the future capital gain are more risky than the current dividends while others argue that the investors are indifferent between the current dividend and the future capital gains. The basic question to be resolved while framing the dividend policy may be stated simply : What is sound rationale for dividend payments? In the light of the objective of maximizing the value of the share, the question may be restated as follows: Given the firms investments and financing decisions, what is the effect of the firm's dividend policies on the share price? Does a high dividend payment decrease, increase or does not affect at all the share price. However, the dividend policy has been a controversial issue among the financial managers and is often refer to as a dividend puzzle. Various models have been proposed to evaluate the dividend policy decision in relation to value of firm. While agreement is not found among the models as to the precise relationship, it is still worth while to examine some of these models to gain insight into the effect which the dividend policy might have on the market price of the share and hence on the wealth of the shareholders. Two schools of thoughts have emerged on the relationship between the dividend policy and value of the firm.

One school associated with Walter, Gordon etc. holds that the future capital gains (expected to result from lower current dividend payout) are more risky and the investors have preference for current dividends. The investors do have a tilt towards those firms which pay regular dividend. So, the dividend payment affects the market value of the share and as a result the dividend policy is relevant for the overall value of the firm. On the other hand, the other school of thought associated with Modigliani and Miller holds that the investors are basically indifferent between current cash dividends and future capital gains. Both these schools of thought on the relationship between dividend policy and value of the firm have been discussed as follows:

11 Relevance of Dividend Policy

12 Irrelevance of Dividend Policy

12.2 RELEVANCE OF DIVIDEND POLICY

Generally, the firm pays dividends and views such dividend payments positively. The investors also expect and like to receive dividend income on their investments. The firms not paying dividends may be adversely rated by the investors affecting the market value of the share. The basic argument of those supporting the dividend relevance is that because current cash dividends reduce investors uncertainty, the investors will discount the firm's earnings at a lower rate, k_e, thereby placing a higher value on the share. If dividends are not paid then the uncertainty of shareholders/investors will increase, raising the required rate of return, k_e, resulting in relatively lower market price of the share. So, it may be argued that the dividend policy has an effect on the market value of the share and the value of the firm. The market price of the share will increase if the firm pays dividends, otherwise it may decrease. A firm therefore, must pay a dividend to shareholders to fulfill the expectations of the shareholders in order to maintain or increase the market price of the share. Two models representing this argument may be discussed here:

1 Walter Model

The dividend policy given by James E Walter considers that dividends are relevant and they do affect the share price. In this model he studied the relationship between the internal rate of return (r) and the cost of capital of the firm (k), to give a dividend policy that maximizes the shareholders' wealth. The model studies the relevance of the dividend policy in three situations : (i) $r > k_e$ (ii) $r < k_e$ (iii) $r = k_e$. According to the Walter Model, when the return on investment (r) is more than the cost of equity capital (k_e), the earnings can be retained by the firm since it has better and more profitable investment opportunities than the investors. It implies that the returns the investor gets when the company re-invests the earnings will be greater than what they earn by investing the dividend income. Firms which have their $r > k_e$ are the growth firms and the dividend policy that suits such firms is the one which has a zero pay-out ratio. This policy will enhance the value of the firm. In the second case the return on investment is less than the cost of equity capital and in such situation the

investor will have a better investment opportunity than the firm. This suggests a dividend policy of 100% pay-out. This policy of a full pay-out ratio will maximise the value of the firm.

Finally, when the firm has rate of return that is equal to the cost of equity capital, the firms' dividend policy will not affect the value of the firm. The optimum dividend policy for such normal firms will range between zero to a 100% pay-out ratio, since the value of the firm will remain constant in all cases.

In nutshell, a firm can maximize the market value of its share and the value of the firm by adopting a dividend policy as follows:

a) If $r > k_e$, the payout ratio should be zero (i.e., retention of 100% profit).
b) If $r < k_e$, the payout ratio should be 100% and the firm should not retain any profit, and
c) If $r = k_e$, the dividend is irrelevant and the dividend policy is not expected to affect the market value of the share.

Assumptions: The relevance of the dividend policy as explained by the Walter's Model is based on a few assumptions, which are as follows:

= Retained earnings is the only source of finance available to the firm, with no outside debt or additional equity used.

a) r and k are assumed to be constant and thus additional investments made by the firm will not change its risk and return profiles.
b) Firm has an infinite life.
c) For a given value of the firm, the dividend per share and the earnings per share remain constant.

In order to testify, Walter has suggested a mathematical valuation model i.e.

$$P = \frac{D}{k_e} + \frac{(r/k_e)(E-D)}{k_e}$$

Where

P = Market price of Equity share

D = Dividend per share paid by the Firm

r = Rate of return on Investment of the Firm

k_e = Cost of Equity share capital, and

E = Earnings per share of the firm

As per the above formula, the market price of a share is the sum of two components i.e.,

d) The present value of an infinite stream of dividends, and

e) The present value of an infinite stream of return from retained earnings.

Thus, the Walter's formula shows that the market value of a share is the present value of the expected stream of dividends and capital gains. The effect of varying payout ratio on the market price of the share under different rate of returns, r, have been shown in Example.

Example 1: Given the following information about ABC Ltd., show the effect of the dividend policy on the market price of its shares, using the Walter's model:

Equity capitalization rate (ke) = 12%

Earnings per share (E) = Rs. 8

Assumed return on investments (r) as follows :

(i) r = 15%

(ii) r = 10%

(iii) r = 12%

Solution:

To show the effect of the different dividend policies on the share value of the firm for the three levels of r let us consider the dividend pay-out (D/P) ratios of zero, 25%, 50%, 75% and 100%.

$r > k_e$ (r= 15%, k_e = 12%)

a.D/P ratio = 0 ; dividend per share = zero

$$P = \frac{0 + (0.15/0.12)\ (8-0)}{0.12}$$

0. Rs. 83

b.D/P ratio = 25%; dividend per share : Rs. 2.00

P = 2.0 + (0.15/0.12) (8-2)

$$\frac{}{0.12}$$

Rs. 79

c.D/P ratio = 50%; dividend per share = Rs. 4

$$P = \frac{4.0 + (0.15/0.12)\,(8-4)}{0.12}$$

Rs. 75

d.D/P ratio = 75%; dividend per share = Rs. 6

$$P = \frac{6 + (0.15/0.12)\,(8-6)}{0.12}$$

Rs. 71

e.D/P ratio = 100%; dividend per share = Rs. 8

$$P = \frac{8.0 + (0.15/0.12)\,(8-8)}{0.12}$$

= Rs. 67

Interpretation: From the above calculations it can be observed that when the return on investment is greater than the cost of capital, there is an inverse relation between the value of the share and the pay-out ratio. Thus, the value of ABC Ltd. is the highest when the D/P ratio is zero (P=Rs.83) and this goes on declining as the D/P ratio increases. Hence the optimum dividend policy for a growth firm is a zero dividend pay-out ratio.

$r < k_e$ (r=10%, k_e = 12%)

a.D/P ratio = 0 ; dividend per share = zero

$$P = \frac{0 + (0.10/0.12)\,(8-0)}{0.12}$$

Rs. 56

b.D/P ratio = 25%; dividend per share : Rs. 2

$$P = \frac{2.0 + (0.10/0.12)\,(8-2)}{0.12}$$

Rs. 58

c.D/P ratio = 50%; dividend per share = Rs. 4

$$P = \frac{4.0 + (0.10/0.12)\,(8-4)}{0.12}$$

( ) Rs. 61

d.D/P ratio = 75%; dividend per share = Rs. 6

$$P = \frac{6 + (0.10/0.12)\ (8-6)}{0.12}$$

a Rs. 64

e.D/P ratio = 100%; dividend per share = Rs. 8

$$P = \frac{8.0 + (0.10/0.12)\ (8-8)}{0.12}$$

= Rs. 67

Interpretation: When the return on investment is less than the cost of equity capital, the calculations reveal that the firm's value will enhance as the D/P ratio increase. Due to this positive correlation between the share price and the dividend pay-out ratio, firms which have their return on investment less than the cost of equity capital should prefer a higher dividend pay-out ratio in order to maximize the share value.

$r = k_e$ (r=12%, k_e = 12%)

a.D/P ratio = 0 ; dividend per share = zero

$$P = \frac{0 + (0.12/0.12)\ (8-0)}{0.12}$$

= Rs. 67

b.D/P ratio = 25%; dividend per share : Rs. 2

$$P = \frac{2 + (0.12/0.12)\ (8-2)}{0.12}$$

Rs. 67

c.D/P ratio = 50%; dividend per share = Rs. 4

$$P = \frac{4 + (0.12/0.12)\ (8-4)}{0.12}$$

Rs. 67

d.D/P ratio = 75%; dividend per share = Rs. 6

$$P = \frac{6 + (0.12/0.12)\ (8-6)}{}$$

0.12

Rs. 67

e.D/P ratio = 100%; dividend per share = Rs. 8

$$P = \frac{8 + (0.12/0.12)\ (8-8)}{0.12}$$

= Rs. 67

Interpretation: In the final case where the firm has its' return on investment equal to the cost of equity capital, the dividend policy does not effect the share price of the firm. The price of the firm remains Rs. 67 for all the given levels of the D/P ratio. However, in actual practice r and k will not be the same and it can only be hypothetical case. Excepting the hypothetical cases of $r = k_e$ in other cases where $r<k_e$ or $r>k_e$, according to Walter model the dividend policy of a firm, as shown above is relevant for maximizing the share price of the firm.

Limitations of the Walter's Model

Most of the limitations for this model arise due to the assumptions made. The first assumption of exclusive financing by retained earnings make the model suitable only for all-equity firms. Secondly, Walter assumes the return on investments to be constant. This again will not be true for firms making high investments. Finally, Walter's model on dividend policy ignores the business risk of the firm which has a direct impact on the value of the firm. Thus, k cannot be assumed to be constant.

II. Gordon's Dividend Capitalization Model

Yet another model that has given importance to the dividend policy of the firm is the Gordon Model. Myron Gordon used the dividend capitalization approach to study the effect of the firm's dividend policy on the stock price. The model is however, based on the following assumptions:

Assumptions: The following are the assumptions based on which Gordon gave the dividend policy for firms:

(e) The firm will be an all-equity firm with the new investment proposals being financed solely by the retained earnings.

(f) Return on investment (r) and the cost of equity capital (k_e) remain constant.

(g) Firm has an infinite life

(h) The retention ratio remains constant and hence the growth rate also is constant (g=br).

(i) k > br i.e. cost of equity capital is greater than the growth rate.

Gordon's Model assumes that the investors are rational and risk-averse. They prefer certain returns to uncertain returns and thus put a premium to the certain returns and discount the uncertain returns. Thus, investors would prefer current dividends and avoid risk. Retained earnings involve risk and so the investor discounts the future dividends. This risk will also affect the stock value of the firm. Gordon explains this preference for current income by *bird-in-hand* argument. Since a bird-in-hand is better than two in the bush, the investors would prefer the income that they earn currently to that income in future which may or may not be available. Thus, investors would prefer to pay a higher price for the stocks which earn them current dividend income and would discount those stocks which either postpone/reduce the current income. The discounting will differ depending on the retention rate (percentage of retained) and the time. Gordon's dividend capitalization model gives the value of the stock as follows:

$$P = \frac{E(1-b)}{k_e - br}$$

where,

P = Share price
E = Earnings per share
b = Retention ratio
(1-b) = Dividend pay-out ratio
k_e = Cost of equity capital (or cost capital of firm)
br = Growth rate (g) in the rate of return on investment

This mode shows that there is a relationship between payout ratio (i.e., 1-b), cost of capital k_e, rate of return, r, and the market value of the share. This can be explained with the help of Example 2.

Example 2 : The following information is available in respect of XYZ Ltd :

Earning per share = Rs. 10 (Constant)

Cost of Capital, ke, = .10 (Constant)

Find out the market price of the share under as per Gordon Model different rate of return, r, of 8%, 10% and 15% for different payout ratios of 0%, 40%, 80% and 100%.

Solution: The market price of the share as per Gordon's model may be calculated as follows:

If r =15% and payout ratio is 40%, then the retention ratio b is .6 (i.e. 1-.4) and the growth rate, g=br=.09 (i.e., 6×.15) and the market price of the share is

$$P = \frac{E(1-b)}{k_e - br}$$

$$P = \frac{10(1-.6)}{.10 - .09}$$

4. Rs. 400

If r = 8% and payout ratio is 80%, then the retention ratio b is .2 (i.e., 1-.8) and the growth rate, g=br=.016 (i.e., .2×.08) and the market price of the share is

5. $= \frac{10(1-.2)}{.10 - .016} =$ Rs. 95

Similarly, the expected market price under different combinations of 'r' and dividend payout ratio have been calculated and placed in Table 16.1

Table-12.1 : Market Price under Gordon's Model for Different Combinations of 'r' and Payout Ratio.

D/P Ratio =	r=15%	r=10%	r=8%
0%	0	0	0
40%	Rs. 400	Rs. 100	Rs. 77
80%	Rs.114.3	Rs. 100	Rs. 95
100%	Rs.100	Rs. 100	Rs. 100

On the basis of figures given in Table 16.1, it an be seen that if the firm adopts a zero payout then the investor may not be willing to offer any price. For a growth firm (i.e., $r>k_e>br$), the market price decreases when the payout ratio is increased. For a firm having $r<k_e$, the market price increases when the payout ratio is increased.

If r = k_e, the dividend policy is irrelevant and the market price remains constant at Rs. 100 only. However, in his revised model, Gordon has argued that even if r = k_e, the dividend payout ratio matters and the investors being risk averse prefer current dividends which are certain to future capital gains which are uncertain. The investors will apply a higher capitalization rate i.e., k_e to discount the future capital gains. This will compensate them for the future uncertain capital gain and thus, the market price of the share of a firm which retains profit will be adversely affected. Thus, Gordon's conclusion about the relationship between the dividend policy and the value of the firm are similar to that of Walter's model. The similarity is due to the reason that the underlying assumptions of both the models are same.

12.3 IRRELEVANCE OF DIVIDEND POLICY

The other school of thought on dividend policy and valuation of the firm argues that what a firm pay as dividends to shareholders is irrelevant and the shareholders are indifferent about receiving current dividends or receiving capital gains in future. The advocates of this school of thought argue that the dividend policy has no effect on the market price of a share. The shareholders do not differentiate between the present dividend or future capital gains. They are basically interested in higher returns either earned by the firm by reinvesting profits in profitable investment opportunity or earned by themselves by making investment of dividend income. The underlying intuition for the dividend irrelevance proposition is simple : Firms that pay more dividends offer less price appreciation but provide the same total return to shareholders, given the risk characteristics of the firm. The investors should be indifferent of receiving their returns in the form of current dividends or in the form of price increase in the market. Modigliani- Miller model comprehensively argues in favour of irrelevance of dividends which is as follows:

III. Modigliani -Miller Model

Modigliani-Miller have propounded the MM hypothesis to explain the irrelevance of the firm's dividend policy. This model which is based on a few assumptions, sidelined the importance of the dividend policy and its effect thereof on the share price of the firm. According to the model, it is only the firms' investment policy that will have an impact on the share value of the firm and hence should be given more importance.

Assumptions: Before discussing the details of the model let us first look into the assumptions upon which the model is based:

a) The first assumption is the existence of a perfect market in which all investors are rational. In perfect market condition there is easy access to information and the floatation and the transaction costs do not exist. The securities are infinitely divisible and hence no single investor is large enough to influence the share value.
b) Secondly, it is assumed that there are no taxes implying that there is no differential tax rates for the dividend income and the capital gain.
c) Thirdly, a firm has a given investment policy which does not change. The operational implication of this assumption is that financing of new investments out of retained earnings will not change the business risk complexion of the firm and, therefore, there would not be no change in the required rate of return.
d) Finally, it was also assumed that the investors are able to forecast the future earnings, the dividends and the share value of the firm with certainty. This assumption was however, dropped out of the model.

Based on these assumption and using the process of arbitrage Modigliani and Miller have explained the irrelevance of the dividend policy. The process of arbitrage balances completely offsets two transactions which are entered into simultaneously. The two transactions here are the acts of paying out dividends and raising external funds–either through the sale of new shares or raising additional loans–to finance investment programmes. Assume that a firm has some investment opportunity. Given its investment decision, the firm has two alternatives: (i) it can retain its earnings to finance the investment programme; (ii) or distribute the earnings to the shareholders as dividend and raise an equal amount externally through the sale of new shares/bonds for the purpose. If the firm selects the second alternative, arbitrage process is involved, in that payment of dividends is associated with raising funds through other means of financing. The effect of dividend payment on shareholder's wealth will be exactly offset by the effect of raising additional share capital. Further, that the increase in market price of the share (resulting as a consequence of dividend payment) will be completely off set by the decline in terminal value of the share (as more shares would have already been issued at the time of dividend payment). The benefit of increase in market value as a result of dividend

payment will be offset completely by the decrease in terminal value of the share. The market price before and after the payment of dividend would be identical. The investors, according to Modigliani and Miller, would, therefore, be indifferent between dividend and retention of earnings. Since the shareholders are indifferent, the wealth would not be affected by current and future dividend decisions of the firm. It would depend entirely upon the expected future earnings of the firm. There would be no difference to the validity of the MM premise, if external funds are raised in the form of debt instead of equity capital. This is because of their indifference between debt and equity with respect to leverage. The cost of capital is independent of leverage and the real cost of debt is the same as the real cost of equity. That investors are indifferent between dividend and retained earnings implies that the dividend decision is irrelevant. The arbitrage process also implies that the total market value plus current dividends of two firms which are alike in all respects except D/P ratio will be identical. The individual shareholder can retain and invest his own earnings as well as the firm would. With dividends being irrelevant, a firm's cost of capital would be independent of its D/P ratio. Finally, the arbitrage process will ensure that under conditions of uncertainty also the dividend policy would be irrelevant. When two firms are similar in respect of business risk, prospective future earnings and investment policies, the market price of their shares must be the same. This, MM argue, is because of the rational behaviour of investors who are assumed to prefer more wealth to less wealth. Differences in current and future dividend policies cannot affect the market value of the two firms as the present value of prospective dividends plus terminal value is the same. In order to testify their model, MM have started with the following valuation model :

Step I : The market price of a share in the beginning of the period is equal to the present value of dividends paid at the end of the period plus the market price of share at the end of the period. Symbolically,

$$P_0 = \frac{1}{(1+k_e)}(D_1 + P_1) \quad (1)$$

where P_0 = Prevailing market price of a share Cost of equity capital

K_e = Dividend to be received at the end of period 1

D_1 = Market price of a share at the end of period 1

P_1 =

Step 2: Assuming no external financing, the total capitalised value of the firm would be simply the number of shares (n) times the price of each share (P_0).Thus.

$$nP_0 = \frac{1}{(1+k_e)}(nD_1 + nP_1) \quad (2)$$

Step 3 : If the firm's internal sources of financing its investment opportunities fall short of the funds required, and n is the number of new shares issued at the end of year 1 at price of P_1, Eq. 2 can be written as :

$$nP_0 = \frac{1}{(1+k_e)}[nD_1 + (n+ n) P_1 - nP_1)] \quad (3)$$

where n = Number of shares outstanding at the beginning of the period

n = Change in the number of shares outstanding during the period/ Additional shares issued

Equation 3 implies that the total value of the firm is the capitalised value of the dividends to be received during the period plus the value of the number of shares outstanding at the end of the period, considering new shares, less the value of the new shares. Thus, in effect, Eq. 3 is equivalent to Eq. 2.

Step 4: If the firm were to finance all investment proposals, the total amount raised through new shares issued would be given in Eq. 4

$$nP_1 = I - (E - nD_1)$$

Or $$nP_1 = I - E + nD_1 \quad (4)$$

Where nP_1 = Amount obtained from the sale of new shares

I = Total amount/requirement of capital budget

E = Earnings of the firm during the period

nD_1 = Total dividends paid

$(E-nD_1)$ = Retained earning

According to Equation 4, whatever investment needs (I) are not financed by retained earnings, must be financed through the sale of additional equity shares.

Step 5: If we substitute Eq. 4 into Eq. 3 we derive Eq. 5

$$nP_0 = \frac{1}{(1+k_e)} (nD_1 + (n + n) P_1 - (I - E + nD_1)] \quad (5)$$

Solving Eq. 5 we have

$$nP_0 = \frac{nD_1 + (n + n) P_1 - I + E - nD_1}{(1 + k_e)}$$

There is a positive nD_1 and negative nD_1. Therefore, nD_1 cancels. We then have

$$nP_0 = \frac{(n + n) P_1 - I + E}{(1 + k_e)} \quad (6)$$

Step -6 : Since dividends (D) are not found in Eq. 6, Modigliani and Miller conclude that dividends do not count and that dividend policy has no effect on the share price.

MM's approach to irrelevance of dividend to valuation is illustrated in Example 3.

Example 3: A company belongs to a risk class for which the approximate capitalisation rate is 10 per cent. It currently has outstanding 25,000 shares selling at Rs. 100 each. The firm is contemplating the declaration of a dividend of Rs. 5 per cent share at the end of the current financial year. It expects to have a net income of Rs. 2,50,000 and has a proposal for making new investments of Rs. 5,00,000. Show that under the MM assumption, the payment of dividend does not affect the value of the firm.

Solution

(k) Value of the firm, when dividends are paid :

(vi) Price per share at the end of year 1, P_0 =

$$\text{Rs. } 100 = \frac{1}{1.10}(\text{Rs. } 5 + P_1) \qquad \frac{1}{(1+k_e)}(D_1 + P_1) \qquad 1$$

$$100 = \text{Rs. } 5 + P_1$$

$$105 = P_1$$

(iv) Amount required to be raised from the issue of new shares,

$nP_1 = 1-(E - nD_1)$
= Rs. 5,00,000 - (Rs. 2,50,000 - Rs. 1,25,000) = Rs. 3,75,000

(iii) Number of additional shares to be issued, $n = \frac{\text{Rs.3,75,000}}{\text{Rs. 105}} = \frac{5,00}{21}^{7}0$ shares

(c) Value of the firm,

$$nP_0 = \frac{(n+ n)P_1 - I + E}{1+k_e} =$$

$$[\frac{25,00}{1}^{0} + \frac{75,000}{21}] (\text{Rs.}105) - \text{Rs.}5,00,000 + \text{Rs. } 2,50,000$$

$$= \frac{\text{Rs. } 27,50,000}{1.10} = \text{Rs. } 25,00,000$$

(b) Value of the firm when dividends are not paid :

(i) Price per share at the end of the year 1, Rs. 100 = $\frac{P_1}{1.10}$, or $110 = P_1$

(d) Amount required to be raised from the issue of new shares, nP_1 = (Rs. 5,00,000 - Rs. 2,50,000) = Rs. 2,50,000

(e) Number of additional shares to be issued

$$= \frac{\text{Rs. } 2,50,000}{} = \frac{25,000}{} \text{ shares}$$

(f) Value of the firm = $[\frac{25,00}{1}{}^{0} + \frac{25,000}{21}](\text{Rs}110) - \text{Rs. } 5,00,000 + \text{Rs.}2,50,000$

$$= \frac{\text{Rs. } 27,50,000}{1.1} = \text{Rs. } 25,00,000$$

Thus, whether dividends are paid or not, value of the firm remains the same. The above example clearly demonstrates that the shareholders are indifferent between the retention of profits and the payment of dividend.

Criticism of M M Hypothesis

It has already been stated M M hypothesis is actually based on some assumptions. Under these assumptions, no doubt, the conclusion which is derived is logically sound and onsistent although they are not well-based. For instance, the assumption of perfect capital market does not usually hold good in many countries. Since the assumptions are unrealistic in real world situation, it lacks practical relevance which indicates that internal and external financing are not equivalent. The shareholders/investors cannot be indifferent between dividends and capital gains as dividend policy itself affects their perceptions, which, in other words, proves that dividend policy is relevant. As a result, M M hypothesis, is criticised on the following grounds:

Tax Differential: M M hypothesis assumes that taxes do not exist, in reality, it is impossible. On the contrary, the shareholders have to pay taxes on the dividend so received. We know that different tax rates are applicable to dividend and capital gains and tax rate on capital gains is comparatively low than the tax rate on dividend. That is why, an investor should prefer the capital gains as against the dividend due to the fact that capital gains tax is comparatively less and such capital gains tax is payable only when the shares are actually sold in the market at a profit. In short, the cost of internal financing is cheaper as compared to cost of external financing. Thus, on account of tax advantages/differential, an investor will prefer a dividend policy with retention of earnings as compared to cash dividend.

Existence of Floatation Costs: M M also assumes that both internal and external financing are equivalent. It indicates that if dividend is paid in cash, a firm is to raise external funds for its own investment opportunities. There will not be any difference in shareholders' wealth whether the firm retains its earnings or issues fresh shares provided there will not be any floatation cost. But, in reality, floatation cost exists for issuing fresh shares, and there is no such cost if earnings are retained. As a result of the floatation cost, the external financing becomes costlier than internal financing. Therefore, if floatation costs are considered, fresh issue and retained earnings will never be equivalent.

Existence of Transaction Costs: M M also assumes that whether the dividends are paid or not, the shareholders' wealth will be the same. When the dividends are not paid in cash to the shareholder, he may desire current income and as such, he can sell his shares. When a shareholder sells his shares for the desire of his current income, there remains the transaction costs which are not considered by MM approach. Because, at the time of sale, a shareholder must have to incur some expenses by way of brokerage, commission, etc., which is again more for small sales. A shareholder will prefer dividends to capital gains in order to avoid the said difficulties and inconvenience.

Diversification : M M hypothesis considers that the discount rate should be the same whether a firm uses internal or external financing. But, practically, it does not so happen. If the shareholders desire to diversify their portfolios they would like to distribute earnings which they may be able to invest in such dividends in other firms. In such a case, shareholders/investors will be inclined to have a higher value of discount rate if internal financing is being used and vice-versa.

Uncertainty: According to M M hypothesis, dividend policy of a firm will be irrelevant even if uncertainty is considered. M M reveal that if the two firms have identical investment policies, business risks and expected future earnings, the market price of the two firms will be the same. This view is actually not accepted by some other authorities. According to them, under conditions of uncertainty, dividends are relevant because, investors are risk-averters and as such, they prefer near dividends than future dividends since future dividends are discounted at a higher rate as dividends involve uncertainty. Thus, the value of the firm will be higher if dividend is paid earlier than when the firm follows a retention policy.

12.4 CHECK YOUR PROGRESS

1. The famous Walter model was given by…….

2. According to Walter model, dividends are…….. and they do affect the share price.

3. Gordon model was given by……..

4. Gordon model used the dividend capitalization approach to study the effect of the firm's dividend policy on the……...

5. Modigliani-Miller have propounded the MM hypothesis to explain the…… of the firm's dividend policy.

12.5 SUMMARY

The discussions on the dividend policies of the firms consider the two different schools of thought. According to one school of thought in a perfect market situation investment and financing decisions are independent and thus, the dividend decisions become irrelevant. The model given by Modigliani and Miller belongs to this school of thought. They also consider that the share value of the firm is based on the investment opportunities of the firm. However, the imperfect market conditions and the uncertainty prevailing in the future earnings do not provide enough support to this model. The second school of thought explains the relevance of the dividend policy and the impact of the same on the share value. However, inspite of these dividend models, it should be noted that investors are risk-averse and prefer current dividend to future earnings. Further, with maximization of shareholder wealth being the most important issue, the dividend policies will vary for the firms, depending on the operational environment.

12.6 KEYWORDS

Walter Model: The model states that the optimum dividend policy of a firm is determined by the relationship of firm's IRR and its cost of capital.

Gordon Model: It proposes that the value of a share reflects the value of future dividends accruing to that share, and the market price of the share is equal to the sum of its discounted future dividend payments.

Modigliani - Miller Model: Modigliani and Miller argued that the value of the firm is unaffected by dividend policy, and it is determined solely by the firm's investment policy.

12.7 SELF- ASSESSMENT TEST

1. What are the essentials of Walter's dividend model? Explain its shortcomings?
2. What are the assumptions which underline Gordon's model of dividend effect? Does dividend policy affect the value of the firm under Gordon's model?
3. "Walter's and Gordon's models are based on the same assumptions. Thus, there is no basic difference between the two models". Do you agree or not? Why?
4. "The assumptions underlying the irrelevance hypothesis of Modigliani and Miller are unrealistic". Explain.
5. Explain the Modigliani-Miller hypothesis of dividend irrelevance. Does this hypothesis suffer from deficiencies?
6. The earnings per share of a company are Rs. 10. It has rate of return of 15% and the capitalization rate of risk class is 12.5%. If Walter's model is used:
7. What should be the optimum payout ratio of the firm? (ii) What would be the price of the share at this payout? (iii) How shall the price of the share be affected if a different payout was employed?
8. The ABC Ltd., currently has outstanding 1,00,000 shares selling at Rs. 100 each. The firm is considering to declare a dividend of Rs. 5 per share at the end of the current fiscal year. The firm's opportunity cost of capital is 10%. What will be the price of the share at the end of the year if (i) a dividend is not declared, (ii) a dividend is declared?

Assuming that the firm pays the dividend, has net profits of Rs. 10,00,000 and makes new investments of Rs. 20,00,000 during the period, how many new shares must be issued? Use the MM model to answer these questions.

12.8 ANSWERS TO CHECK YOUR PROGRESS

1. James E. Walter

2. Relevant

3. Myron Gordon

4. Stock price

5. Irrelevance

12.9 REFERENCES/SUGGESTED READINGS

- Financial Decision Making by John J. Hampton.
- Corporation Finance by S.C. Kuchhal.
- Financial Management by Ravi M. Kishore.
- Financial Management by I.M. Pandey.

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