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FINANCIAL MANAGEMENT

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Units (1-14)

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Financial Management

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INTRODUCTION

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Earlier, the scope of financial management was confined to raising funds. Little significance was attached to analytical thinking in financial decision-making and problem solving. As a consequence, the finance textbooks were structured around this theme and contained description of the instruments and institutions in terms of raising funds and major events, like promotion, reorganization, readjustment, merger, consolidation etc., when funds were raised. In the mid-fifties, emphasis shifted to the judicious utilization of funds. Modern thinking in financial management accords a far greater importance to management decision-making and policy. Today, financial managers do not perform the passive role of scorekeepers of financial data and information and arrange funds, whenever directed to do so. Rather, they occupy key positions in top management areas and play a dynamic role in solving complex management problems. The financial managers are now responsible for shaping the fortunes of enterprises and are involved in the most vital management decision of allocation of capital. It is their duty to ensure that the funds are raised most economically and used in the most efficient and effective manner. Due to this change in emphasis, the descriptive treatment of the subject of financial management is being replaced by growing analytical content and sound theoretical underpinnings.

Financial Management combines theory with practical applications. Supported by a strong foundation, readers can easily understand the theories and methods, decision criteria and financial policies and strategies necessary to manage funds and create and enhance the value of the firm. The book aims at assisting the reader to develop a thorough understanding of the concepts and theories underlying financial management in a systematic way.

This book, *Financial Management* has been divided into fourteen units. The book has been written in keeping with the self-instructional mode or the SIM format wherein each Unit begins with an Introduction to the topic, followed by an outline of the Objectives. The detailed content is then presented in a simple and organized manner, interspersed with Check Your Progress questions to test the student's understanding of the topics covered. A Summary along with a list of Key Words, set of Self-Assessment Questions and Exercises and Further Readings is provided at the end of each Unit for effective recapitulation.

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BLOCK - I
BASICS OF FINANCIAL MANAGEMENT

UNIT 1 INTRODUCTION TO FINANCIAL MANAGEMENT

Structure

1.0 INTRODUCTION

The financial function is that managerial activity which is concerned with the planning and controlling of the firm's financial resources. It was a branch of economics till 1890, but as a separate discipline it is of recent origin. It has no unique body of knowledge of its own, and draws heavily on economics for its theoretical concepts even today.

The subject of the finance function is of immense interest to both academicians and practising managers. It is of great interest to academicians because the subject is still developing, and there are still certain areas where controversies exist 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 the financial function provides them with conceptual and analytical insights to make those decisions skilful.

1.1 OBJECTIVES

After going through this unit, you will be able to:

- Examine the nature and concept of financial management
- Discuss the managerial and operative role of finance

- Explain the role of financial management in the organization
- Prepare an overview of the Indian financial system

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1.2 CONCEPT, NATURE, SIGNIFICANCE AND EVALUATION OF FINANCIAL MANAGEMENT

Firms create manufacturing capacities for production of goods; some provide services to customers. They sell their goods or services to earn profit and they raise funds to acquire manufacturing and other facilities. Thus, the three most important activities of a business firm are:

(i) production

(ii) marketing, and

(iii) 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).

Real and financial assets

A firm requires real assets to carry on its business. **Tangible real assets** are physical assets that include plant, machinery, office, factory, furniture and building. **Intangible real assets** include technical know-how, technological collaborations, patents and copyrights. **Financial assets,** also called securities, are financial papers or instruments such as shares and bonds or debentures. Firms issue securities to investors in the primary capital markets to raise necessary funds. The securities issued by firms are traded — bought and sold, by investors in the secondary capital markets, referred to as stock exchanges. Financial assets also include lease obligations and borrowing from banks, financial institutions and other sources. In a lease, the lessee obtains a right to use the lessor's asset for an agreed amount of rental over the period of lease. Funds applied to assets by the firm are called capital expenditures or investment. The firm expects to receive return on investment and might distribute return (or profit) as dividends to investors.

Equity and borrowed funds

There are two types of funds that a firm can raise: (a) equity funds (simply called equity), and (b) borrowed funds (called debt). A firm sells shares to acquire equity funds. Shares represent ownership rights of their holders. Buyers of shares are called shareholders (or stockholders), and they 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 a return on their invested capital. The return of shareholders consists of dividend and capital gain. Shareholders make capital gains (or loss) by selling their shares.

Shareholders can be of two types: (a) ordinary and (b) preference. Preference shareholders receive dividend at a fixed rate, and they have a priority over ordinary shareholders. The dividend rate for ordinary shareholders is not fixed, and it 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 depends on the discretion of the board of directors. Since ordinary shareholders receive dividend (or repayment of invested capital, only when the company is wound up) after meeting the obligations of others, they are generally called 'owners of residue'. Dividends paid by a company are not deductible expenses for calculating corporate income taxes, and they are paid out of profits after corporate taxes. As per the current laws in India, a company is required to pay 12.5 per cent tax on dividends.

A company can also obtain equity funds by retaining earnings available for shareholders. Retained earnings, which could be referred to as internal equity, are undistributed profits 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 reacquire new capital from the same sources (existing shareholders) by issuing new shares called 'rights shares'. Also, a public issue of shares may be made to attract new (as well as the existing) shareholders to contribute equity capital.

Another important source of securing capital is creditors or lenders. Lenders are not the owners of the company. They make money available to the firm as loan or debt and retain title to the funds lent. Loans are generally furnished for a specified period at a fixed rate of interest. For lenders, the return on loans or debt comes in the form of interest paid by the firm. Interest is a cost of debt to the firm. Payment of interest is a legal obligation. The amount of interest paid by a firm is a deductible expense for computing corporate income taxes. Thus, interest provides tax shield to a firm. The interest tax shield is valuable to a firm. The firm may borrow funds from a large number of sources, such as banks, financial institutions, public or by issuing bonds or debentures. A bond or a **debenture** is a certificate acknowledging the amount of money lent by a bondholder to the company. It states the amount, the rate of interest and the maturity of the bond or debenture. Since bond or debenture is a financial instrument, it can be traded in the secondary capital markets.

Finance and management functions

There exists an inseparable relationship between finance on the one hand, and production, marketing and other functions on the other. Almost all 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

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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 is the separation between production and marketing functions on the one hand and the finance function of making money available to meet the costs of production and marketing operations on the other hand? Where do the production and marketing functions end and the finance function begin? There are no clear-cut answers to these questions. Though the finance function of raising and using money has a significant effect on other functions, it needs not necessarily limited or constrained to 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 reservoir of funds or 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.

Check Your Progress

1. State the three most important activities of a business firm.
2. Name the two kinds of funds that can be raised by a firm.

1.3 MANAGERIAL AND OPERATIVE ROLE OF FINANCE

It may be difficult to separate the finance functions from production, marketing and other functions, but the functions themselves can be readily identified. The functions of raising funds, investing them in assets and distributing returns earned from assets to shareholders are respectively known as financing decision, investment decision and dividend decision. A firm attempts to balance cash inflows and outflows while performing these functions. This is called liquidity decision, and we may add it to the list of important finance decisions or functions. Thus finance functions include:

- Long-term asset-mix or investment decision
- Capital-mix or financing decision
- Profit allocation or dividend decision
- Short-term asset-mix or liquidity 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.

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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 maximize the market value of shares. This point is elaborated in detail later on in the unit.

Investment decision

A firm's investment decisions involve capital expenditures. They are, therefore, referred to as capital budgeting decisions. A **capital budgeting decision** involves the decision of allocation of capital or commitment of funds to long-term assets that would yield benefits (cash flows) in the future. Two important aspects of investment decisions are: (*a*) the evaluation of the prospective profitability of new investments, and (*b*) the measurement of a cut-off rate against that the prospective return of new investments could be compared. Future benefits of investments are difficult to measure and cannot be predicted with certainty. Risk in investment arises because of the uncertain returns. Investment proposals should, therefore, be evaluated in terms of both expected return and risk. Besides the decision to commit funds in new investment proposals, capital budgeting also involves replacement decisions, that is, decision of recommitting funds when an asset becomes less productive or non-profitable.

There is a broad agreement that the correct cut-off rate or the required rate of return on investments is the opportunity cost of capital. The **opportunity cost of capital** is the expected rate of return that an investor could earn by investing his money in financial assets of equivalent risk. However, there are problems in computing the opportunity cost of capital in practice from the available data and information. A decision-maker should be aware of these problems.

Financing decision

Financing decision is the second important function to be performed by the financial manager. Broadly, he must decide when, where from and how to acquire funds to meet the firm's investment needs. The central issue before him is to determine the appropriate proportion of equity and debt. The mix of debt and equity is known as the firm's capital structure. The financial manager must strive to obtain the best financing mix or the optimum capital structure for his firm. The firm's capital structure is considered optimum when the market value of shares is maximized.

In the absence of debt, the shareholders' return is equal to the firm's return. The use of debt affects the return and risk of shareholders; it may increase the return on equity funds, but it always increases risk. The change in the shareholders' return caused by the change in the profits is called the 'financial leverage'. A proper balance will have to be struck between return and risk. When the shareholders' return is maximized with given risk, the market value per share will be maximized and the firm's capital structure would be considered optimum. Once the financial manager is able to determine the best combination of debt and equity, he must

raise the appropriate amount through the best available sources. In practice, a firm considers many other factors such as control, flexibility, loan covenants, legal aspects etc., in deciding its capital structure.

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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. The proportion of profits distributed as dividends is called the 'dividend-payout ratio' and the retained portion of profits is known as the 'retention ratio'. 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 maximizes 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. Dividends are generally paid in cash. But a firm may issue bonus shares. **Bonus shares** are shares issued to the existing shareholders without any charge. The financial manager should consider the questions of dividend stability, bonus shares and cash dividends in practice.

Liquidity decision

Investment in current assets affects the firm's profitability and liquidity. Current assets management that affects a firm's liquidity is yet another important finance function. Current assets should be managed efficiently for safeguarding the firm against the risk of illiquidity. Lack of liquidity (or illiquidity) in extreme situations can lead to the firm's insolvency. 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 and therefore risky as it would lose profitability for the idle current assets would not earn anything. Thus, a proper trade-off must be achieved between profitability and liquidity. The profitability-liquidity trade-off requires that the financial manager should develop sound techniques of managing current assets. He should estimate firm's needs for current assets and make sure that funds would be made available when needed.

In sum, financial decisions directly concern the firm's decision to acquire or dispose of 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. Hence finance functions may affect the size, growth, profitability and risk of the firm, and ultimately, the value of the firm.

Financial Procedures and Systems

For the effective execution of the finance functions, certain other functions have to be routinely performed. They concern procedures and systems and involve a lot of paper work and time. They do not require specialized skills of finance. Some of the important routine finance functions are:

- supervision of cash receipts and payments and safeguarding of cash balances
- custody and safeguarding of securities, insurance policies and other valuable papers
- taking care of the mechanical details of new outside financing
- record keeping and reporting

The finance manager in the modern enterprises is mainly involved in the managerial finance functions; executives at lower levels carry out the routine finance functions. The financial manager's involvement in the routine functions is confined to setting up of rules of procedures, selecting forms to be used, establishing standards for the employment of competent personnel and to check the performance to see that the rules are observed and that the forms are properly used.

The involvement of the financial manager in the managerial financial functions is recent. About three decades ago, the scope of finance functions or the role of the financial manager was limited to routine activities. How the scope of finance function has widened or the role of the finance manager has changed is discussed in the following section.

1.3.1 Managerial Function

A **financial manager** is a person who is responsible, in a significant way, to carry out finance functions. It should be noted that, in a modern enterprise, the financial manager occupies a key position. He is one of the members of the top management team, and his role, day-by-day, is becoming more pervasive, intensive and significant in solving the complex funds management problems. Now his function is not confined to that of a scorekeeper maintaining records, preparing reports and raising funds when needed, nor is he a staff officer in a passive role of an adviser. The finance manager is now responsible for shaping the fortunes of the enterprise, and is involved in the most vital decision of the allocation of capital. In his new role, he needs to have a broader and far-sighted outlook, and must ensure that the funds of the enterprise are utilized in the most efficient manner. He must realize that his actions have far-reaching consequences for the firm because they influence the size, profitability, growth, risk and survival of the firm, and as a consequence, affect the overall value of the firm. The financial manager, therefore, must have a clear understanding and a strong grasp of the nature and scope of the finance functions.

The financial manager has not always been in the dynamic role of decision-making. About three decades ago, he was not considered an important person, as far as the top management decision-making was concerned. He became an important management person only with the advent of the modern or contemporary approach to the financial management. What are the main functions of a financial manager?

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Fund raising

The traditional approach dominated the scope of financial management and limited the role of the financial manager simply to funds raising. It was during the major events, such as promotion, reorganization, expansion or diversification in the firm that the financial manager was called upon to raise funds. In his day-to-day activities, his only significant duty was to see that the firm had enough cash to meet its obligations. Because of its central emphasis on the procurement of funds, the finance textbooks, for example, in the US, till the mid1950s covered discussion of the instruments, institutions and practices through which funds were obtained. Further, as the problem of raising funds was more intensely felt in the special events, these books also contained detailed descriptions of the major events like mergers, consolidations, reorganizations and recapitalizations involving episodic financing. The finance books in India and other countries simply followed the American pattern. The notable feature of the traditional view of financial management was the assumption that the financial manager had no concern with the decision of allocating the firm's funds. These decisions were assumed as given, and he was required to raise the needed funds from a combination of various sources.

The traditional approach did not go unchallenged even during the period of its dominance. But the criticism related more to the treatment of various topics rather than the basic definition of the finance function. The traditional approach has been criticised because it failed to consider the day-to-day managerial problems relating to finance of the firm. It concentrated itself to looking into the problems from management's—the insider's point of view. Thus the traditional approach of looking at the role of the financial manager lacked a conceptual framework for making financial decisions, misplaced emphasis on raising of funds, and neglected the real issues relating to the allocation and management of funds.

Fund allocation

The traditional approach outlived its utility in the changed business situation particularly after the mid-1950s. A number of economic and environmental factors, such as the increasing pace of industrialization, technological innovations and inventions, intense competition, increasing intervention of government on account of management inefficiency and failure, population growth and widened markets, during and after mid-1950s, necessitated efficient and effective utilization of the firm's resources, including financial resources. The development of a number of management skills and decision-making techniques facilitated the implementation of 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 the episodic financing to the financial management, from raising of funds to efficient and effective use of funds. The new approach is embedded in sound conceptual and analytical theories.

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 enough in achieving the firm's long-run objectives.

In his new role of using funds wisely, the financial manager must find a rationale 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?
- How should the funds required be raised?

As discussed earlier, the questions stated above relate to three broad decision areas of financial management: (a) investment (including both long and short-term assets), (b) financing and (c) dividend. The "modern" financial manager has to help making these decisions in the most rational way. They 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 managerial ability.

As discussed earlier, the financial decisions have a great impact on all other business activities. The concern of the financial manager, besides his traditional function of raising money, will be on determining the size and technology of the firm, 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 financing mix.

Profit planning

The functions of the financial manager may be broadened to include profit-planning function. **Profit planning** refers to the operating decisions in the areas of pricing, costs, volume of output and the firm's selection of product lines. Profit planning is, therefore, a prerequisite for optimizing investment and financing decisions. The cost structure of the firm, i.e., the mix of fixed and variable costs has a significant influence on a firm's profitability. Fixed costs remain constant while variable costs change in direct proportion to volume changes. Because of the fixed costs, profits fluctuate at a higher degree than the fluctuations in sales. The change in profits due to the change in sales is referred to as 'operating leverage'. Profit planning helps to anticipate the relationships between volume, costs and profits and develop action plans to face unexpected surprises.

Understanding capital markets

Capital markets bring investors (lenders) and firms (borrowers) together. Hence the financial manager has to deal with capital markets. He should fully understand the operations of capital markets and the way in which the capital markets value

securities. The financial manager should also know how risk is measured and how to cope with it in investment and financing decisions. For example, if a firm uses excessive debt to finance its growth, investors may perceive it as risky. The value of the firm's share may, therefore, decline. Similarly, investors may not like the decision of a highly profitable, growing firm to distribute dividend. They may like the firm to reinvest profits in attractive opportunities that would enhance their prospects for making high capital gains in the future. Investments also involve risk and return. It is through their operations in capital markets that investors continuously evaluate the actions of the financial manager.

Check Your Progress

3. What is the opportunity cost of capital?
4. State the routine finance functions.

1.4 ROLE OF FINANCIAL MANAGEMENT IN THE ORGANIZATION

The firm's investment and financing decisions are unavoidable and continuous. In order to make them rationally, the firm must have a goal. It is generally agreed in theory that the financial goal of the firm should be shareholders' wealth maximization (SWM), as reflected in the market value of the firm's shares. In this section, we show that the shareholders' wealth maximization is theoretically logical and operationally feasible normative goal for guiding the financial decision-making.

Profit Maximization

Firms, producing goods and services, may function in a market economy, or in a government-controlled economy. In a market economy, prices of goods and services are determined in competitive markets. Firms in the market economy are expected to produce goods and services desired by society as efficiently as possible.

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. Producers drop such goods and services 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.

A legitimate question may be raised: Would the price system in a free market economy serve the interests of the society? According to Adam Smith:

> "(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."

Following Smith's logic, it is generally held by economists 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 maximizing profits, society's resources are efficiently utilized.

In the economic theory, the behaviour of a firm is analysed in terms of profit maximization. Profit maximization implies that a firm either produces maximum output for a given amount of input, or uses minimum input for producing a given output. The underlying logic of profit maximization is efficiency. It is assumed that profit maximization causes 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 maximization

It is argued that profit maximization 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 maximization, 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 individual wealth and personal power, which could easily be satisfied by the profit maximization objective. The modern business environment is characterized by limited liability and a divorce between management and ownership. Shareholders and lenders today finance the business firm but it is controlled and directed by professional management. The other important stakeholders of the firm are customers, employees, government and society. In practice, the objectives of these stakeholders or constituents 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 maximization is regarded as unrealistic, difficult, inappropriate and immoral.

It is also feared that profit maximization 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 maximization principle may not work due to imperfections

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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-maximizing behaviour will lead to the optimum social welfare. However, it is not clear that abandoning profit maximization, as a decision criterion, would solve the problem. Rather, government intervention may be sought to correct market imperfections and to promote competition among business firms. A market economy, characterized by a high degree of competition, would certainly ensure efficient production of goods and services desired by society.

Is profit maximization an operationally feasible criterion? Apart from the aforesaid objections, profit maximization fails to serve as an operational criterion for maximizing the owner's economic welfare. It fails to provide an operationally feasible measure for ranking alternative courses of action in terms of their economic efficiency. It suffers from the following limitations:

- It is vague
- It ignores the timing of returns
- It ignores risk

Definition of profit: The precise meaning of the profit maximization objective is unclear. The definition of the term profit is ambiguous. Does it mean short- or long-term profit? Does it refer to profit before or after tax? Total profits or profit per share? Does it mean total operating profit or profit accruing to shareholders?

Time value of money: The profit maximization objective does not make an explicit distinction between returns received in different time periods. It gives no consideration to the time value of money, and it values benefits received in different periods of time as the same.

Uncertainty of returns: The streams of benefits may possess different degree of certainty. Two firms may have same total expected earnings, but if the earnings of one firm fluctuate considerably as compared to the other, it will be more risky. Possibly, owners of the firm would prefer smaller but surer profits to a potentially larger but less certain stream of benefits.

Maximizing profit after taxes

Let us put aside the first problem mentioned above, and assume that maximizing profit means maximizing profits after taxes, in the sense of net profit as reported in the profit and loss account (income statement) of the firm. It can easily be realized that maximizing this figure will not maximize 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 government

bonds. Profit after taxes would increase but earnings per share (EPS) would decrease. To illustrate, let us assume that a company has 10,000 shares outstanding, profit after taxes of ₹ 50,000 and earnings per share of ₹ 5. If the company sells 10,000 additional shares at ₹ 50 per share and invests the proceeds (₹ 500,000) at 5 per cent after taxes, then the total profits after taxes will increase to ₹ 75,000. However, the earnings per share will fall to ₹ 3.75 (i.e., ₹ 75,000/20,000). This example clearly indicates that maximizing profits after taxes does not necessarily serve the best interests of owners.

Maximizing EPS

If we adopt maximizing EPS as the financial objective of the firm, this will also not ensure the maximization 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, maximization of EPS has certain deficiencies as a financial objective. For example, note the following observation:

... For one thing, it implies that the market value of the company's shares is a function of earnings per share, which may not be true in many instances. If the market value is not a function of earnings per share, then maximization of the latter will not necessarily result in the highest possible price for the company's shares. Maximization of earnings per share further implies that the firm should make no dividend payment so long as funds can be invested internally at any positive rate of return, however, small. Such a dividend policy may not always be to the shareholders' advantage.

It is, thus, clear that maximizing profits after taxes or EPS as the financial objective fails to maximize the economic welfare of owners. Both methods do not take account of the timing and uncertainty of the benefits. An alternative to profit maximization, which solves these problems, is the objective of wealth maximization. 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 Maximization

Shareholders' wealth maximization (SWM) means maximizing the net present value of a course of action to shareholders. Net present value (NPV) or wealth of a course of action is the difference between the present value of its benefits and the present value of its costs. 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 mutually exclusive projects the one with the highest NPV should be adopted. NPVs of a firm's projects are addititive in nature. That is

$$\text{NPV}(A) + \text{NPV}(B) = \text{NPV}(A + B)$$

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This is referred to as the principle of value-additivity. Therefore, the wealth will be maximized if NPV criterion is followed in making financial decisions.

The objective of SWM 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 that is important, not the accounting profits.

The objective of SWM is an appropriate and operationally feasible criterion to choose among the alternative financial actions. It provides an unambiguous measure of what financial management should seek to maximize in making investment and financing decisions on behalf of shareholders.

Maximizing the shareholders' economic welfare is equivalent to maximizing the utility of their consumption over time. With their wealth maximized, shareholders can adjust their cash flows in such a way as to optimize 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 maximization principle implies that the fundamental objective of a firm is to maximize the market value of its shares. The value of the company's shares is represented by their market price that, in turn, is a reflection of shareholders' perception about quality 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

SWM requires a valuation model. The financial manager must know or at least assume the factors that influence the market price of shares, otherwise he would find himself unable to maximize 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.

Risk-return trade-off

Financial decisions incur different degree of risk. Your decision to invest your money in government bonds has less risk as interest rate is known and the risk of default is very less. On the other hand, you would incur more risk if you decide to invest your money in shares, as return is not certain. However, you can *expect* a

lower return from government bond and higher from shares. Risk and expected return move in tandem; the greater the risk, the greater the expected return. Figure 1.1 shows this risk-return relationship.

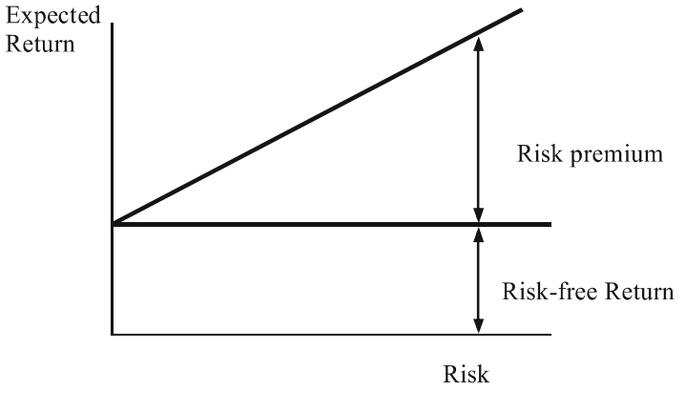

Fig. 1.1 *The Risk-Return Relationship*

Financial decisions of the firm are guided by the risk-return trade-off. These decisions are interrelated and jointly affect the market value of its shares by influencing return and risk of the firm. The relationship between return and risk can be simply expressed as follows:

Return = Risk-free rate + Risk premium

Risk-free rate is a rate obtainable from a default-risk free government security. An investor assuming risk from her investment requires a risk premium above the risk-free rate. Risk-free rate is a compensation for time and risk premium for risk. Higher the risk of an action, higher will be the risk premium leading to higher required return on that action. A proper balance between return and risk should be maintained to maximize the market value of a firm's shares. Such balance is called risk-return trade-off, and every financial decision involves this trade-off. The interrelation between market value, financial decisions and risk-return trade-off is depicted in Figure 1.2. It also gives an overview of the functions of financial management.

The financial manager, in a bid to maximize shareholders' wealth, should strive to maximize returns in relation to the given risk; he should seek courses of actions that avoid unnecessary risks. To ensure maximum return, funds flowing in and out of the firm should be constantly monitored to assure that they are safeguarded and properly utilized. The financial reporting system must be designed to provide timely and accurate picture of the firm's activities.

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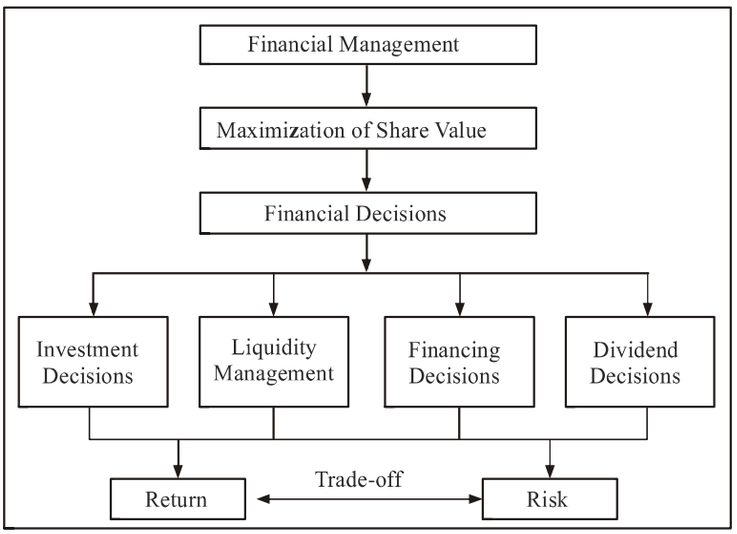

Fig. 1.2 *An Overview of Financial Management*

Check Your Progress

5. What does Shareholders' Wealth Maximization (SWM) imply?
6. State the relationship between return and risk.

1.5 INDIAN FINANCIAL SYSTEM

Financial institutions are an integral part of the structure of a financial system and play a crucial role in the growth and functioning of a stable, efficient, resilient and vibrant economy. The establishment of financial institutions in India has been a step in the right direction, setting a fresh tone and pace in step with the changing contours of our financial system. In this section, you will learn that the Indian financial system has witnessed a tremendous change in the post-liberalization era. This transformation is obvious from the developments that have taken place in the financial institutions, markets and products.

'Financial system' refers to a system that raises and allocates finance, organizes the settlement of payments and manages the risks associated with finance and exchange of finance. A well-developed financial system will have a secure and efficient system of making payments, security markets and financial intermediaries to arrange for finances and financial institutions to provide access to risk management instruments. The international financial system is a network of financial institutions and regulations functioning at the global level. The key players in the global financial system are financial set-ups like the World Bank; the International Monetary Fund (IMF); national agencies and government departments like central banks and finance ministries; and private financial institutions like private banks

and mutual funds. Financial institutions are an integral part of the structure of a financial system and thus play an important role in the growth and functioning of an economy.

The financial system in India has witnessed a significant transformation in the post-liberalization era. On the demand side, the drying up of guaranteed sources of long-term funds has intensified the competition for resources for financial institutions and banks. Similarly, the competition for the supply of funds has also increased with banks foraying into long-term financing and financial institutions getting into the disbursing of short-term loans. In spite of these developments, it is being widely recognized that until the long-term debt market in India witnesses an improvement in terms of both depth and liquidity the financial institutions will have a special role in meeting the capital requirements of large as well as medium-sized corporate houses. Importantly enough, given the comparative advantage of the financial institutions in project appraisal and other techniques associated with term financing, and of banks in assessing working capital requirements, it would take some time for each of them to specialize in the skills of the other. Judged thus, the role of financial institutions in the present financial setup and in the immediate future is critical from the viewpoint of financial and real sector development.

Structure of a Financial System

The financial system, also known as the financial sector of a country, is a well-framed structure, which consists of the following components:

- **Financial institutions:** In layman's terms, a financial institution can be defined as a private or public institution that invests the funds collected from the public or other institutions in financial assets. In more specific economic terms, a financial institution can be termed as an agent that provides financial services to its clients. Financial institutions generally fall under the financial regulation and purview of a government authority. Financial institutions commonly include credit unions, banks and stock brokerages.
- **Financial markets:** Financial market is a generic term for marketplaces where financial instruments are traded (bought/sold) or the transactions of financial assets take place. The key participants on the supply and demand sides of the financial markets are agents, financial institutions, brokers, savers, dealers, borrowers and lenders.
- **Financial instruments and services:** This phase is used to denote any form of funding medium that is used for borrowing finance in financial markets. A financial instrument is also referred to as a document having a monetary value or a record of some monetary transaction. Examples of financial instruments are cheques, drafts, bills of exchange and promissory notes.

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All the components of a financial system that constitute its structure are not mutually exclusive—they are interdependent and interrelated to each other. For example, financial institutions operate in a financial market and make use of various financial instruments and services to carry on their business. Here, it should also be kept in mind that various procedures, rules, regulations, policies and practices prevailing in the financial markets and adopted by the financial institutions are also part of a financial system.

Overview of Financial Institutions

Broadly, in an economy two types of business organizations exist—non-financial and financial organizations. Non-financial organizations manufacture products such as automobiles, technological equipment and food products and/or provide services that are not financial in nature such as legal services, electricity supply, and so on. However, financial organizations, better known as financial institutions, do not manufacture any goods but provide financial services. The various financial services provided by financial institutions are as follows:

- Acquisition of financial assets that are less preferred by the public through the market and converting them into more preferable assets. This service is generally provided by the most important type of financial institutions—financial intermediaries.
- Exchange of financial assets on the behalf of customers. For example, if an individual possessing shares of a company wants to sell his shares, he need not directly deal with the buyer of the shares. The stock exchange can sell and buy shares on behalf of its customers.
- Exchange of financial assets on behalf of their customers and also for their own accounts.
- Assistance to customers in creating financial assets and then selling these assets to other participants in the financial market.
- Investment advice such as how and where to invest money to other financial market participants.
- Management of portfolios of other market participants.

Classification of Financial Institutions

Financial institutions can be classified into the two following categories based on their field of specialization.

- Banking and non-banking institutions
- Intermediaries and non-intermediaries

Banking and non-banking institutions: Banking institutions are marked by the following three characteristics:

- They participate in or contribute to the payments mechanism of the economy, which means that they provide transaction services.
- Their deposit liabilities comprise a major part of the national money supply.
- They can create deposits or credit, which means that they actually create money in the financial market.

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The banking institutions in India function under the aegis of the Reserve Bank of India and mainly consist of commercial banks and co-operative banks. The non-banking institutions also carry out financial activities but their resources do not reach the depositors in the form of savings. Instead, they mobilize public savings for providing other financial services, including investments. Mutual fund companies and insurance companies such as the Life Insurance Corporation (LIC), Unit Trust of India (UTI) and General Insurance Corporation (GIC) are listed in this category. The non-banking institutions are actually financial intermediaries and when they lend money to the public, they are known as non-banking financial intermediaries (NBFIs) or investment institutions.

Intermediaries and non-intermediaries: Intermediaries, as the term suggests, act as a link between savers and investors. The main functions of intermediaries include lending money to the public and mobilizing public savings. Although they are liable towards the ultimate savers, their assets generally come from the investors and borrowers. All banking institutions are actually intermediaries and some non-banking institutions are also intermediaries. Non-intermediary institutions provide loans, but they do not acquire their resources directly from the savers. Major non-intermediary institutions like the National Bank for Agriculture and Rural Development (NABARD) and the Industrial Development Bank of India (IDBI) have been set up by the government to provide assistance to specific sectors and regions for specific causes. Because they are set up by the government, they are also known as non-banking statutory financial organizations (NBSFOs). The main idea behind setting up these non-intermediary institutions was to fulfil the credit needs of the borrowers, especially rural borrowers, who are not adequately assisted by the private financial institutions.

On the basis of another classification, financial institutions in India may be categorized into three broad categories—miscellaneous institutions, state-level institutions and all-India financial institutions. They are the most important of all Indian financial institutions in terms of range of operations and financial assets. They comprise specialized financial institutions, investment institutions, all-India development banks. The major AIFIs are IFCI Ltd., Infrastructure Development Finance Company of India Ltd. (IDFC), Industrial Development Bank of India (IDBI), ICICI Ltd., Industrial Investment Bank of India Ltd. (IIBI), Unit Trust of India (UTI), National Housing Bank (NHB), Export Import Bank of India (EXIM Bank), Small Industries Development Bank of India (SIDBI), National Bank for Agriculture and Rural Development (NABARD), Tourism Finance Corporation

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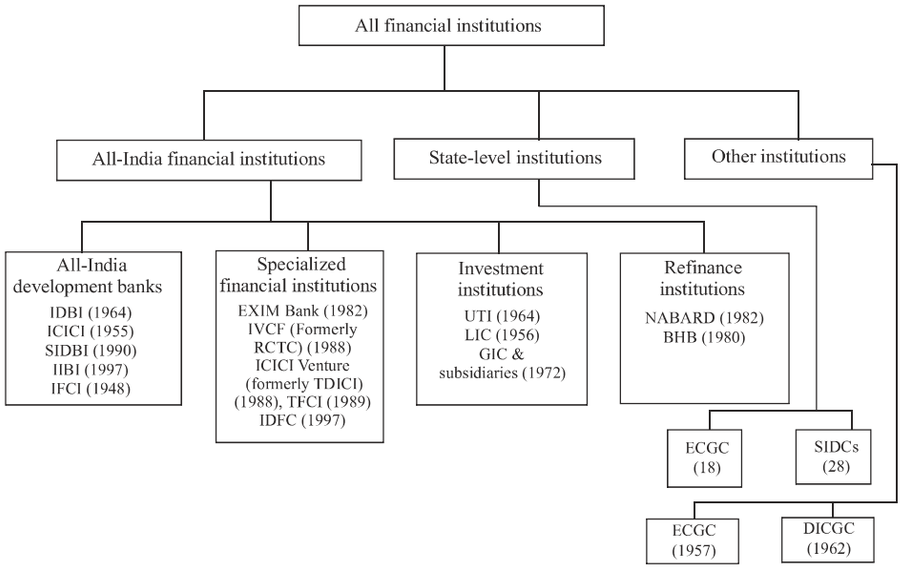
of India Ltd. (TFCI), Life Insurance Corporation of India (LIC) and General Insurance Corporation of India (GIC) and its subsidiaries. All these institutions operate on an all-India basis. Other institutions comprise Export Credit and Guarantee Corporation (ECGC) and Deposit Insurance and Credit Guarantee Corporation (DICGC). The state-level institutions comprise of state industrial development corporations (SIDCs) and state financial corporations (SFCs). SFCs, established under the SFCs Act, 1951, with the exception of the Tamil Nadu Industrial and Investment Corporation Ltd., set up in 1949 under the Companies Act as Madras Industrial Investment Corporation also functions as an SFC, are playing an important part in the growth and development of small- and medium-scale enterprises in their respective states in coordination and tandem with the nation's priorities. Currently, there are eighteen SFCs in the country.

Likewise, SIDCs were established under the Companies Act as wholly owned undertakings of state governments for the growth, promotion and development of medium- and large-scale industries in respective states in tandem with the nation's priorities. There are twenty-eight SIDCs in the country. Of these, those in Arunachal Pradesh, Andaman and Nicobar, Dadra and Nagar Haveli, Daman and Diu, Goa, Manipur, Mizoram, Meghalaya, Nagaland, Pondicherry, Sikkim and Tripura also function as SFCs and provide developmental assistance to small- and medium-scale enterprises and act as promotional agencies. The organizational structure of FIs is presented in Figure. 1.3.



Notes: 1. The erstwhile Industrial Reconstruction Bank of India (IRBD), established in 1985 under the IRBI Act, 1954, was renamed as Industrial Investment Bank of India Ltd. (HBI) with effect from March 27, 1997.
IVCF-IFCI Venture Capital Funds Ltd.
2. Figures in brackets under respective institutions indicate the year of establishment/year of incorporation.
3. Figures in the brackets under SFCs/SIDCs indicate the number of institutions in that category.

Fig. 1.3 *Organizational Structure of Financial Institutions*

Check Your Progress

7. Define financial system.
8. Mention the classification of financial institutions.

1.6 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The three most important activities of a business firm are the following:
   - Production
   - Marketing
   - Finance
2. The two kinds of funds that can be raised by a firm are the following:
   (i) Equity funds
   (ii) Borrowed funds
3. The opportunity cost of capital is the expected rate of return that an investor could earn by investing his money in financial assets of equivalent risk.
4. The routine finance functions are the following:
   - supervision of cash receipts and payments and safeguarding of cash balances
   - custody and safeguarding of securities, insurance policies and other valuable papers
   - taking care of the mechanical details of new outside financing
   - record keeping and reporting
5. Shareholders' wealth maximization (SWM) means maximizing the net present value of a course of action to shareholders.
6. The relationship between return and risk can be simply expressed as follows:

   Return = Risk-free rate + Risk premium
7. 'Financial system' refers to a system that raises and allocates finance, organizes the settlement of payments and manages the risks associated with finance and exchange of finance.
8. Financial institutions can be classified into the two following categories based on their field of specialization.
   (i) Banking and non-banking institutions
   (ii) Intermediaries and non-intermediaries

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1.7 SUMMARY

- A firm secures whatever capital it needs and employs it (finance activity) in activities, which generate returns on invested capital (production and marketing activities).
- There are two types of funds that a firm can raise: (a) equity funds (simply called equity), and (b) borrowed funds (called debt).
- There exists an inseparable relationship between finance on the one hand, and production, marketing and other functions on the other. Almost all business activities, directly or indirectly, involve the acquisition and use of funds.
- A capital budgeting decision involves the decision of allocation of capital or commitment of funds to long-term assets that would yield benefits (cash flows) in the future.
- Bonus shares are shares issued to the existing shareholders without any charge. The financial manager should consider the questions of dividend stability, bonus shares and cash dividends in practice.
- A financial manager is a person who is responsible, in a significant way, to carry out finance functions. It should be noted that, in a modern enterprise, the financial manager occupies a key position.
- The traditional approach dominated the scope of financial management and limited the role of the financial manager simply to funds raising.
- The firm's investment and financing decisions are unavoidable and continuous. In order to make them rationally, the firm must have a goal. It is generally agreed in theory that the financial goal of the firm should be shareholders' wealth maximization (SWM), as reflected in the market value of the firm's shares.
- It is also argued that profit maximization, 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.
- Financial institutions are an integral part of the structure of a financial system and play a crucial role in the growth and functioning of a stable, efficient, resilient and vibrant economy.
- Broadly, in an economy two types of business organizations exist—non-financial and financial organizations. Non-financial organizations manufacture products such as automobiles, technological equipment and food products

and/or provide services that are not financial in nature such as legal services, electricity supply, and so on.

- Mutual fund companies and insurance companies such as the Life Insurance Corporation (LIC), Unit Trust of India (UTI) and General Insurance Corporation (GIC) are listed in this category. The non-banking institutions are actually financial intermediaries and when they lend money to the public, they are known as non-banking financial intermediaries (NBFIs) or investment institutions.

1.8 KEY WORDS

- **Bonus shares:** These are shares issued to the existing shareholders without any charge.
- **Profit planning:** It refers to the operating decisions in the areas of pricing, costs, volume of output and the firm's selection of product lines.
- **Financial market:** It is a generic term for marketplaces where financial instruments are traded (bought/sold) or the transactions of financial assets take place.
- **Debenture:** It is a certificate acknowledging the amount of money lent by a bondholder to the company.

1.9 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. Mention the nature and concept of financial management.
2. Prepare an overview of financial institutions.
3. Briefly mention the structure of a financial system.

Long Answer Questions

1. Discuss the managerial and operative role of finance.
2. Examine the role of financial management in the organization.
3. 'The financial system in India has witnessed a significant transformation in the post-liberalization era. 'Explain the statement.

1.10 FURTHER READINGS

NOTES

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UNIT 2 LEGAL AND REGULATORY FRAMEWORK OF THE FINANCIAL SYSTEM

Structure

2.0 INTRODUCTION

The financial system of a country is an institutional framework which exists to assist in the movement of funds from the households (who save part of their income) to business houses for investment purposes. There are numerous regulatory bodies to ensure that the business organizations adhere to the established rules and regulations. In this unit, you will study about the meaning and scope of the finance function and the finance and tax management nexus.

2.1 OBJECTIVES

After going through this unit, you will be able to:

- State the meaning and scope of the finance function
- Examine the finance and tax management nexus

2.2 FINANCE FUNCTION: MEANING AND SCOPE

The vital importance of the financial decisions to a firm makes it imperative to set up a sound and efficient organization for the finance functions. The ultimate responsibility of carrying out the finance functions lies with the top management. Thus, a department to organize financial activities may be created under the direct control of the board of directors. The board may constitute a finance committee.

The executive heading the finance department is the firm's chief finance officer (CFO), and he may be known by different designations. The finance committee or CFO will decide the major financial policy matters, while the routine activities would be delegated to lower levels. For example, at BHEL a director of finance at the corporate office heads the finance function. He is a member of the board of directors and reports to the chairman and managing director (CMD). An executive director of finance (EDF) and a general manager of finance (GMF) assist the director of finance. EDF looks after funding, budgets and cost, books of accounts, financial services and cash management. The GMF is responsible for internal audit and taxation.

The reason for placing the finance functions in the hands of top management may be attributed to the following factors: *First*, financial decisions are crucial for the survival of the firm. The growth and development of the firm is directly influenced by the financial policies. *Second*, the financial actions determine solvency of the firm. At no cost can a firm afford to threaten its solvency. Because solvency is affected by the flow of funds, which is a result of the various financial activities, top management being in a position to coordinate these activities retains finance functions in its control. *Third*, centralization of the finance functions can result in a number of economies to the firm. For example, the firm can save in terms of interest on borrowed funds, can purchase fixed assets economically or issue shares or debentures efficiently.

Status and duties of finance executives

The exact organization structure for financial management will differ across firms. It will depend on factors such as the size of the firm, nature of the business, financing operations, capabilities of the firm's financial officers and most importantly, on the financial philosophy of the firm. The designation of the CFO would also differ within firms. In some firms, the financial officer may be known as the financial manager, while in others as the vice-president of finance or the director of finance or the financial controller. Two more officers—treasurer and controller—may be appointed under the direct supervision of CFO to assist him. In larger companies, with modern management, there may be vice-president or director of finance, usually with both controller and treasurer reporting to him.

Figure 2.1 illustrates the financial organization of a large (hypothetical) business firm. It is a simple organization chart, and as stated earlier, the exact organization for a firm will depend on its circumstances. The figure reveals that the finance function is one of the major functional areas, and the financial manager or director is under the control of the board of directors. Figure 2.2 shows the organization of the finance function of a large, multi-divisional Indian company.

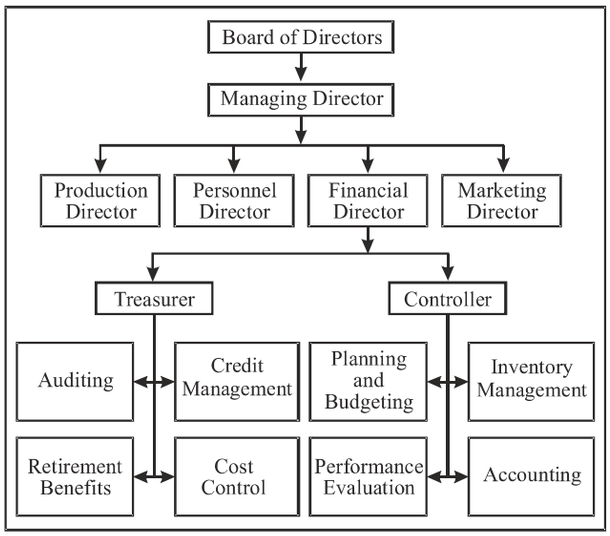

Fig. 2.1 *Organization of Finance Function*

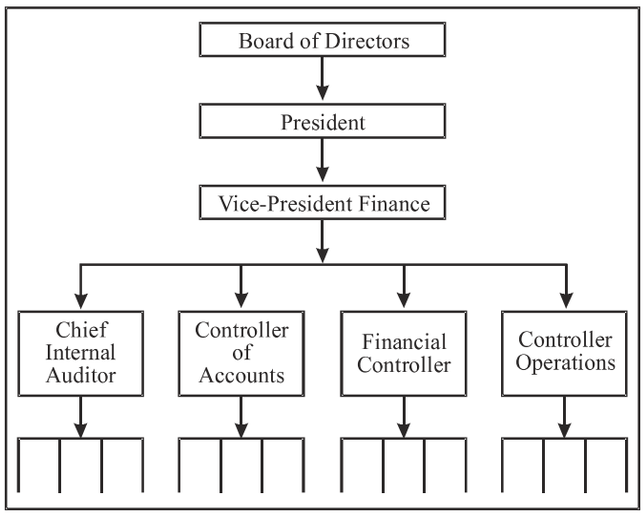

Fig. 2.2 *Organization for Finance Function in a Multi-Divisional Company*

The CFO has both line and staff responsibilities. He is directly concerned with the financial planning and control. He is a member of the top management, and he or she is closely associated with the formulation of policies and making decisions for the firm. The treasurer and controller, if a company has these executives, would operate under CFO's supervision. He must guide them and others in the effective working of the finance department.

The main function of the treasurer is to manage the firm's funds. His major duties include forecasting the financial needs, administering the flow of cash, managing credit, floating securities, maintaining relations with financial institution and protecting funds and securities. On the other hand, the functions of the controller relate to the management and control of assets. His duties include providing

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information to formulate accounting and costing policies, preparation of financial reports, direction of internal auditing, budgeting, inventory control, taxes etc. It may be stated that the controller's functions concentrate the asset side of the balance sheet, while treasurer's functions relate to the liability side.

Controller's and treasurer's functions in the Indian context

The controller and the treasurer are essentially American terms. 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.

The controllership functions, as stated by the Financial Executives' Institute of the USA, can prove to be useful under the Indian context. But at present, the Company Secretary in India performs some of these duties. His 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 should be realized that the financial controller *does not* control finances; he develops, uses and interprets information—some of which will be financial in nature—for management control and planning. For this reason, the financial controller may simply be called 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.

In the American business, the management of finance is treated as a separate activity and performed by the treasurer. The title of the treasurer has not found favour in India to the extent the controller has. The Company Secretary in India discharges some of the functions performed by the treasurer in the American context. 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 Indian capital markets and the increasing awareness among investors.

The general title, financial manager or finance director, 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. The financial duties may often be combined with others. But the significance of not combining the financial manager's

duties with others should be realised. The managing of funds—a very valuable resource—is a business activity requiring extraordinary skill on the part of the financial manager. He should ensure the optimum use of money under various constraints. The financial manager should, therefore, be allowed to devote his full energy and time in managing the money resources only.

Check Your Progress

1. What are the main duties of a treasurer in a financial organization?
2. What are the reasons responsible for placing the finance functions in the hands of the top management?

2.3 FINANCE AND TAX MANAGEMENT NEXUS

A nexus means a connection. Nexus is the extent of business activity that must be present before a state can tax an entity's income. If a taxpayer has nexus in a particular state, the taxpayer must pay and collect/remit taxes in that state.

2.3.1 Tax Avoidance and Tax Evasion

'Tax avoidance' means reduction in the tax liability by using some legal methods. It is a means whereby one works around the affairs in such a way that an individual or a firm is able to pay the lesser tax imposed by the IT Act as opposed to the greater amount. The example for tax avoidance is when a person forms a company and sells his products and pays 20 per cent tax by claiming the depreciation. However, he by selling the goods as an individual would have paid 30 per cent as the income tax. 'Tax evasion' means when one uses illegal means to reduce tax liabilities. The methods could be falsification of books, suppression of income and overstatement of deductions, etc., so that one has to pay less tax.

2.3.2 Tax Incentives and Business Decisions

It cannot be debated if tax incentives enhance spending or not. Nevertheless, tax incentives provide no assistance in spur spending and investment. Referring to the globally foremost IT and ITES industry as an indication, tax incentives have been closely associated with the growth of the industry since the last few decades. Thousands of R&D centres have been established by multinational companies, who have also invested billions of dollars in R&D in China. China has liberal provisions for tax incentives for R&D, just like several other developed countries like Australia, France, etc. Thus, worldwide, many leaderships promote R&D spending and provide parallel incentives in the form of tax credits, tax deductions and grants. These activities confirm that tax incentives are helpful. To be reasonable, India has always taken measures to constantly promote R&D, be it through provision of tax incentives or other schemes. Proficient organizations such as the Department of Scientific and Industrial Research and Council of Scientific and

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Industrial Research provide assistance on the same lines. According to tax experts at Ernst & Young, supply-chain improvements alone result in a 40 per cent increase in earnings, but the company actually nets less as these savings are subject to corporate taxes.

Check Your Progress

3. What do you understand by the term 'tax avoidance'?
4. Define the term 'tax incentive'?

2.6 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The main function of the treasurer is to manage the firm's funds. His major duties include forecasting the financial needs, administering the flow of cash, managing credit, floating securities, maintaining relations with financial institution and protecting funds and securities.
2. The reason for placing the finance functions in the hands of top management may be attributed to the following factors: *First*, financial decisions are crucial for the survival of the firm. The growth and development of the firm is directly influenced by the financial policies. *Second*, the financial actions determine solvency of the firm. At no cost can a firm afford to threaten its solvency. Because solvency is affected by the flow of funds, which is a result of the various financial activities, top management being in a position to coordinate these activities retains finance functions in its control. *Third*, centralization of the finance functions can result in a number of economies to the firm.
3. 'Tax avoidance' means reduction in the tax liability by using some legal methods. It is a means whereby one works around the affairs in such a way that an individual or a firm is able to pay the lesser tax imposed by the IT Act as opposed to the greater amount.
4. Tax incentive is defined as a government measure which motivates the people of the service class as well as the business class to save money by lessening the amount of tax that they have to pay.

2.7 SUMMARY

- The vital importance of the financial decisions to a firm makes it imperative to set up a sound and efficient organization for the finance functions. The ultimate responsibility of carrying out the finance functions lies with the top management.
- The exact organization structure for financial management will differ across firms. It will depend on factors such as the size of the firm, nature of the

business, financing operations, capabilities of the firm's financial officers and most importantly, on the financial philosophy of the firm.

- The CFO has both line and staff responsibilities. He is directly concerned with the financial planning and control. He is a member of the top management, and he or she is closely associated with the formulation of policies and making decisions for the firm.
- The main function of the treasurer is to manage the firm's funds. His major duties include forecasting the financial needs, administering the flow of cash, managing credit, floating securities, maintaining relations with financial institution and protecting funds and securities.
- The controller and the treasurer are essentially American terms. The American pattern of dividing the financial executive's functions into controllership and treasurership functions is not being widely followed in India.
- It should be realized that the financial controller *does not* control finances; he develops, uses and interprets information—some of which will be financial in nature—for management control and planning.
- 'Tax avoidance' means reduction in the tax liability by using some legal methods. It is a means whereby one works around the affairs in such a way that an individual or a firm is able to pay the lesser tax imposed by the IT Act as opposed to the greater amount.

2.8 KEY WORDS

- **Chief Financial Officer:** This term is used for an executive who is in charge of monitoring cash flow, financial planning and other financial activities within an organization.
- **Controller:** The functions of the controller relate to the management and control of assets. His duties include providing information to formulate accounting and costing policies, preparation of financial reports, direction of internal auditing, budgeting, inventory control, taxes and so forth.
- **Shareholder:** It refers to a person, company, or organization that holds stock or stocks in a given company.

2.9 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. Write a short note on the meaning and scope of the finance function.
2. What is the implication of the controller and treasurer's functions in the Indian context?

Long Answer Questions

1. Analyse the significance of the finance function in a business organization.
2. Explain the financial organization of a large business firm with the help of a diagram.
3. Critically evaluate the finance and tax management nexus.

2.10 FURTHER READINGS

Pandey, I M. 2009. *Financial Management*. Noida: Vikas Publishing House Pvt. Ltd.

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UNIT 3 MEANING AND SCOPE OF INVESTMENT FUNCTION

NOTES

Structure

3.0 INTRODUCTION

The word 'investment' has been defined in numerous ways by different theories and principles. In simple words, investment can be defined as the purchase of an asset with the objective of making gains from it. This is where the importance of time value of money needs to be understood. The global marketplace has become so competitive that players need to do management planning in order to sustain themselves in the marketplace. In this unit, you will study about the concept and applications of time value of money, management planning in the global market environment, risk-return relationship and dividend decision of managers.

3.1 OBJECTIVES

After going through this unit, you will be able to:

- State the concept of time value of money
- Analyse the significance of management planning in the global market environment
- Examine the risk-return relationship
- Discuss the dividend decision of managers

3.2 TIME VALUE OF MONEY: CONCEPT AND APPLICATIONS

NOTES

Most financial decisions, such as the purchase of assets or procurement of funds, affect the firm's cash flows in different time periods. For example, if a fixed asset is purchased, it will require an immediate cash outlay and will generate cash inflows during many future periods. Similarly, if the firm borrows funds from a bank or from any other source, it receives cash now and commits an obligation to pay cash for 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 receive or give up over a period of time, should be logically comparable. In fact, 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 recognition of the time value of money and risk is extremely vital in financial decision-making. If the timing and risk of cash flows is not considered, the firm may make decisions that may allow it to miss its objective of maximizing the owners' welfare. The welfare of owners would be maximized when wealth or net present value is created from making a financial decision. What is net present value? How is it computed?

Time Preference for Money

If an individual behaves rationally, he or she 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 periods to receive the same amount. Time preference for money or Time Value of Money (TVM) is an individual's preference for possession of a given amount of money now, rather than the same amount at some future time.

Three reasons may be attributed to the individual's time preference for money:

- risk
- preference for consumption
- investment opportunities

We live under risk or uncertainty. As an individual is not certain about future cash receipts, he or she 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 ₹100 now or ₹100 one year from now would prefer ₹100 now as he could earn on it an interest of, say, ₹5 by putting it in the savings account in a bank for one year. His total cash inflow in one year from now will be ₹105. Thus, if he wishes to increase his cash resources, the opportunity to earn interest would lead him to prefer ₹100 now, not ₹100 after one year.

In case of the firms as well, the justification for time preference for money lies simply in the availability of investment opportunities. In financial decision-making under certainty, the firm has to determine whether one alternative yields more cash or the other. In case of a firm, which is owned by a large number of individuals (shareholders), it is neither needed nor is it possible to consider the consumption preferences of owners. The uncertainty about future cash flows is also not a sufficient justification for time preference for money. We are not certain even about the usefulness of the present cash held; it may be lost or stolen. In investment and other decisions of the firm what is needed is the search for methods of improving decision-maker's knowledge about the future. In the firm's investment decision, for example, certain statistical tools such as probability theory, or decision tree could be used to handle the uncertainty associated with cash flows.

3.2.1 Management Planning in the Global Market Environment

A market is defined as a structure that permits individuals and business organizations to exchange goods and services. It is to be noted that a global market is not restricted to one geographic area but permits the trade of goods and services everywhere in the world. A company which intends to enter the global market will come across immense opportunities of increasing its sale and thereby revenue. Certainly, every marketing strategy has its own merits and demerits. However, the global market is definitely an excellent opportunity for any marketer.

It is vital for the business organization to understand that the steps intended to target the local market will be different for that of the overseas market. Also, the business organization will have to provide a customized experience to its overseas market. This is due to the reason that what works well in one country or region might not be applicable in another region or country. The business organization needs to understand the requirements of a specific geographical region and then market its product/service accordingly.

Likewise, the business organization needs to carefully create its marketing strategy to target the local audience. Here, the business organization needs to create personalized messages in order to woo the audience.

Check Your Progress

1. State the reasons attributed to the individual's time preference for money.
2. Define dividend yield.

3.3 RISK RETURN RELATIONSHIP

Risk and return are most important concepts in finance. In fact, they are the foundation of the modern finance theory. What is risk? How is it measured? What is return? How is it measured? Other related questions are: how are assets valued in capital markets? How do investors make their investment decisions? We attempt to answer these questions in this unit.

Return on a Single Asset

India Cements is a large company with several thousand shareholders. Suppose you bought 100 shares of the company, at the beginning of the year, at a market price of ₹225. The par value of each share is ₹10. Your total investment is cash that you paid out is:

Investment: ₹225 × 100 = ₹22,500

Rupee returns Suppose during the year, India Cements paid a dividend at 25 per cent. As the dividend rate applies to the par value of the share, your dividend per share would be: ₹10 × 25% = ₹2.50, and total dividend would be:

Dividend = (Dividend rate × Par value) × Number of shares

Dividend = Dividend per share × Number of shares

Dividend = ₹2.50 × 100 = ₹250

Further, suppose the price of the share at the end of the year turns out to be ₹267.50. Since the ending share price increased, you have made a capital gain:

Capital gain/loss = (Selling price – Buying price) × Number of shares

Capital gain/loss = (₹267.50 – ₹225) × 100

= ₹4,250

Your total return is:

Total return = Dividend + Capital gain

Total return = ₹250 + ₹4,250 = ₹4,500

If you sold your shares at the end of the year, your cash inflows would be the dividend income plus the proceeds from the sale of shares:

NOTES

Cash flow at the end of the year

= Dividends + Value of sold shares

= ₹250 + (₹267.50 × 100) = ₹27,000

This amount equals to your initial investment of

₹22,500 plus the total return of ₹4,500:

₹22,500 + ₹4,500 = ₹27,000.

Percentage returns: It is more common and convenient to express returns in percentage terms. You earned a total return of ₹4,500 on an investment of ₹22,500. You can express your return in percentage term as given below

$$\text{Return in percentage} = \frac{₹4,500}{₹22,500} = 0.20 \quad \text{or} \quad 20\%$$

Percentage returns are frequently calculated on per share basis. We have seen in the example above that returns from each share have two components: the dividend income and the capital gain. Hence, the rate of return on a share would consist of the dividend yield and the capital gain yield. The rate of return of a share held for one year is as follows:

Rate of return = Dividend yield + Capital gain yield

$$R_1 = \frac{DIV_1}{P_0} + \frac{P_1 - P_0}{P_0} = \frac{DIV_1 + (P_1 + P_0)}{P_0} \qquad (1)$$

R_1 is the rate of return in year 1, DIV_1 is dividend per share received in year 1, P_0 is the price of the share in the beginning of the year and P_1 is the price of the share at the end of the year. Dividend yield is the percentage of dividend income, and it is given by dividing the dividend per share at the end the year by the share price in the beginning of the year; that is, DIV_1/P_0. Capital gain is the difference of the share price at the end and the share price in the beginning divided by the share price in the beginning; that is, $(P_1 - P_0)/P_0$. If the ending price were less than the beginning price, there would be a negative capital gain or capital loss.

In the example of India Cements, your rate of return would be as follows:

$$R = \frac{2.5}{225} + \frac{(267.50 - 225)}{225} = 0.011 + 0.189 = 0.20 \text{ or } 20\%$$

The total return of 20 per cent on your investment is made up of 1.1 per cent dividend yield and 18.9 per cent capital gain. What would be your return if the market price of India Cements' share were '200 after a year? The expected rate of return would be:

$$R = \frac{2.5}{225} + \frac{200 - 225}{225} = 0.011 - 0.111 = -0.10 \text{ or } -10\%$$

You would earn a negative rate of return (–10 per cent) because of the capital loss (negative capital gain). The return of a share significantly depends on the change in its share price. The market price of a share shows wide fluctuations. Hence investment in shares is risky. The risk of a security depends on the volatility of its returns.

Unrealized capital gain or loss: If an investor holds a share and does not sell it at the end of a period, the difference between the beginning and ending share prices is the unrealized capital gain (or loss). The investor must consider the unrealized capital gain (or loss) as part of her total return. The fact of the matter is that if the investor so wanted, she could have sold the share and realized the capital gain (or loss).

Annual Rates of Return:

Example of Hindustan Unilever Limited: The rate of return of a company's shares may be calculated for a period longer than one year. Let us consider HUL's data of the market prices and dividend per share for the 11-year period from 2001 to 2012 to calculate the 10-year annual rates of return. Table 3.1 shows calculations.

Table 3.1 *HUL's Annual Rates of Return, 2001–2012*

Year	*Dividend per share, DIV (₹)*	*Dividend yield* $DIV./P_{t-1}$	*Shares price, P (₹)*	*Capital gain* $(P_t - P_{t-1})$	*Return ₹ (3+5)*
(1)	(2)	(3)	(4)	(5)	(6)
2000	3.50	–	206.35	–	–
2001	5.00	2.42	223.65	8.38	10.81
2002	5.50	2.46	181.75	-18.73	-16.28
2003	5.50	3.03	204.70	12.63	15.65
2004	5.00	2.44	143.50	-29.90	-27.45
2005	5.00	3.48	197.25	37.46	40.94
2006	6.00	3.04	216.55	9.78	12.83
2007	9.00	4.16	213.90	-1.22	2.93
2009	7.50	3.51	237.50	11.03	14.54
2010	6.50	2.74	238.70	0.51	3.24
2011	6.50	2.72	284.60	19.23	21.95
2012	7.50	2.64	409.90	44.03	46.66
Average	6.27	2.97	232.00	8.47	11.44

Note: Year ending on December 31, from 2000 to 2007; year ending on 31 March for the remaining years.

Figure 3.1 plots the histogram of the year-to-year total returns on HUL share shown in Table 3.1. The heights of the bars on the horizontal axis indicate the size of returns. The yearly returns show wide variations. During the 11-year period, the highest return of 46.66 per cent was obtained in 2012 and lowest return of –27.45 per cent was obtained in 2004.

Average Rate of Return

Given the yearly returns, we can calculate average or mean return. The average rate of return is the sum of the various one-period rates of return divided by the number of periods. The simple arithmatic average rate of return of HUL's shares for ten years, as given in Table 3.1, 11.44 per cent.

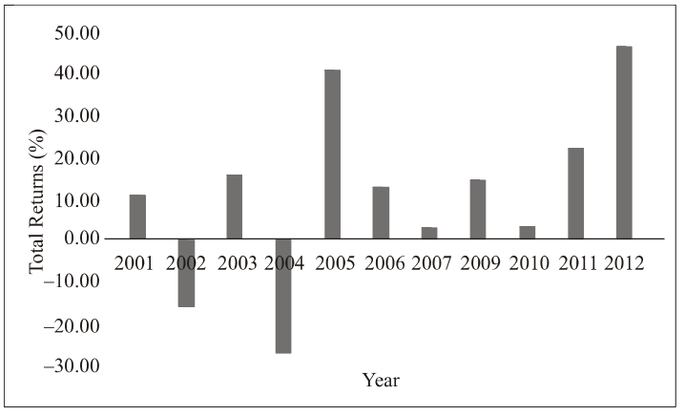

Fig. 3.1 *Year-to-year returns of HUL shares*

The formula for the average rate of return is as follows:

$$\bar{R} = \frac{1}{n}[R_1 + R_2 + ... + R_n] = \frac{1}{n}\sum_{t=1}^{n} R_t \qquad (2)$$

where $\bar{R}$ is the average rate of return; R_t the observed or realized rates of return in periods 1, 2... t and n the total number of periods.

Rates of Return and Holding Periods

Investors may hold their investment in shares for longer periods than for one year. How do we calculate holding-period returns? Suppose you invest '1 today in a company's share for five years. The rates of return are 18 per cent, 9 per cent, 0 per cent, –10 per cent and 14 per cent. What is the worth of your shares? You hold the share for five years; hence, you can calculate the worth of your investment assuming that each year dividends from the previous year are reinvested in shares. The worth of your investment after five years is:

Investment worth after five years

= (1 + 0.18) × (1 + 0.09) × (1 + 0.0) × (1 – 0.10) × (1 + 0.14)

= 1.18 × 1.09 × 1.00 × 0.90 × 1.14 = ‘1.32

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Your one rupee investment has grown to ‘1.32 at the end of five years. Thus your total return is: 1.32 – 1 = 0.32 or 32 per cent. Your total return is a five-year holding-period return. How much is the annual compound rate of return? We can calculate the compound annual rate of return as follows:

Compound annual rate of return

$$= \sqrt[5]{1.18 \times 1.09 \times 1.00 \times 0.90 \times 1.14} - 1$$

= 1.057 – 1 = 0.057 or 5.7%

This compound rate of return is the geometric mean return. You can verify that one rupee invested today at 5.7 per cent compound rate would grow to approximately ₹1.32 after five years: $(1.057)^5$ = ₹1.32. Let us take another example. Suppose you invest ‘1 in the beginning of 2002 in one share of HUL and hold it for two years. From Table 3.1 we see that returns for 2011 and 2012 are 21.95 per cent and 46.66 per cent. The worth of your investment at the end of two years is:

Investment worth after two years

= (1.2195) × (1.4666) = 1.7885

Your total return is:

= 1.7885 – 1.00 = .7885 or 78.85 %

This is a two-year holding-period return. If you hold your one rupee investment in HUL’s share at the end of 2000, for 11 years until the end of 2012, it would grow to ₹1.979 by the end of 2012. Your 11-year holding return is a whopping 169 per cent! You can calculate holding period returns for any number of years.

3.4 DIVIDEND DECISION OF MANAGERS

In large companies, there is a divorce between management and ownership. The decision-taking authority in a company lies in the hands of managers. Shareholders as owners of a company are the principals and managers are their agents. Thus there is a principal-agent relationship between shareholders and managers. In theory, managers should act in the best interests of shareholders; that is, their actions and decisions should lead to SWM. In practice, managers may not necessarily act in the best interest of shareholders, and they may pursue their own personal goals. Managers may maximize their own wealth (in the form of high salaries and perks) at the cost of shareholders, or may play safe and create satisfactory wealth for shareholders than the maximum. They may avoid

taking high investment and financing risks that may otherwise be needed to maximize shareholders' wealth. Such "satisfying" behaviour of managers will frustrate the objective of SWM as a normative guide. It is in the interests of managers that the firm survives over the long run. Managers also wish to enjoy independence and freedom from outside interference, control and monitoring. Thus their actions are very likely to be directed towards the goals of survival and self-sufficiency. Further, a company is a complex organization consisting of multiple stakeholders such as employees, debt-holders, consumers, suppliers, government and society. Managers in practice may, thus, perceive their role as reconciling conflicting objectives of stakeholders. This stakeholders' view of managers' role may compromise with the objective of SWM.

Exhibit 3.1: BHEL'S Mission and Objectives

BHEL defines its vision, mission, values and objectives as follows:

- ***Vision*** To become a world class, innovative, competitive and profitable engineering enterprise providing total business solutions.
- ***Business mission*** To be the leading Indian engineering enterprise providing quality products, systems and services in the fields of energy, transportation, industry, infrastructure and other potential areas.
- ***Values***
  - o Meeting commitments made to external and internal customers.
  - o Fostering learning, creativity and speed of response.
  - o Respect for dignity and potential of individuals.
  - o Loyalty and pride in the company.
  - o Team playing.
  - o Zeal to excel.
  - o Integrity and fairness in all matters.
- ***Objectives*** BHEL defines its objectives as follows:
  - o ***Growth*** To ensure a steady growth by enhancing the competitive edge of BHEL in existing business, new areas and international operations so as to fulfil national expectations for BHEL.
  - o ***Profitability*** To provide a reasonable and adequate return on capital employed, primarily through improvements in operational efficiency, capacity utilization and productivity, and generate adequate internal resources to finance the company's growth.
  - o ***Customer focus*** To build a high degree of customer confidence by providing increased value for his money through international standards of product quality, performance and superior customer service.
  - o ***People orientation*** To enable each employee to achieve his potential, improve his capabilities, perceive his role and responsibilities and participate and contribute positively to the growth and success of the company. To invest in human resources continuously and be alive to their needs.

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- ***Technology*** To achieve technological excellence in operations by development of indigenous technologies and efficient absorption and adaptation of imported technologies to sustain needs and priorities, and provide a competitive advantage to the company.
- ***Image*** To fulfil the expectations which shareholders like government as owner, employees, customers and the country at large have from BHEL.

Source : BHEL's Annual Reports.

Shareholders continuously monitor modern companies that would help them to restrict managers' freedom to act in their own self-interest at the cost of shareholders. Employees, creditors, customers and government also keep an eye on managers' activities. Thus the possibility of managers pursuing exclusively their own personal goals is reduced. Managers can survive only when they are successful; and they are successful when they manage the company better than someone else. Every group connected with the company will, however, evaluate management success from the point of view of the fulfilment of its own objective. The survival of management will be threatened if the objective of any of these groups remains unfulfilled. In reality, the wealth of shareholders in the long run could be maximized only when customers and employees, along with other stakeholders of a firm, are fully satisfied. The wealth maximization objective may be generally in harmony with the interests of the various groups such as owners, employees, creditors and society, and thus, it may be consistent with the management objective of survival.[15] There can, however, still arise situations where a conflict may occur between the shareholders' and managers' goals. Finance theory prescribes that under such situations, shareholders' wealth maximization goal should have precedent over the goals of other stakeholders.

The conflict between the interests of shareholders and managers is referred to as **agency problem** and it results into agency costs. Agency costs include the less than optimum share value for shareholders and costs incurred by them to monitor the actions of managers and control their behaviour. The agency problems vanish when managers own the company. Thus one way to mitigate the agency problems is to give ownership rights through stock options to managers. Shareholders can also offer attractive monetary and non-monetary incentives to managers to act in their interests. A close monitoring by other stakeholders, board of directors and outside analysts also may help in reducing the agency problems. In more capitalistic societies such as the US and the UK, the takeovers and acquisitions are used as means of disciplining managers.

Financial Goal and Firms' Mission and Objectives

In SWM, wealth is defined in terms of wealth or value of the shareholders' equity. This basis of the theory of financial management is the same as that of the classical theory of the firm: maximization of owners' welfare. In today's professionally managed firms, managers are the agents of owners and act on their behalf.

SWM is a criterion for financial decisions, and therefore, valuation models provide the basic theoretical and conceptual framework. Is wealth maximization the objective of the firm? Does a firm exist with the sole objective of serving the interests of owners? Firms do exist with the primary objective of maximizing the welfare of owners, but, in operational terms, they always focus on the satisfaction of its customers through the production of goods and services needed by them. As Drucker puts it:

"What is our business is not determined by the producer, but by the consumer. It is not defined by the company's name, statutes or articles of incorporation, but by the want the consumer satisfies when he buys a product or a service. The question can therefore be answered only by looking at the business from the outside, from the point of view of the customer and the market."

Firms in practice state their vision, mission and values in broad terms, and are also concerned about technology, leadership, productivity, market standing, image, profitability, financial resources, employees' satisfaction etc. For example, BHEL, a large Indian company with sales of ₹ 72.87 billion (₹ 7,287 crore), net assets of ₹ 92.97 billion (₹ 9,297 crore) and a profit after tax of ₹ 4.68 billion (₹ 468 crore) for the year 2001–02 and employing 47,729 employees states its multiple objectives in terms of leadership, growth, profitability, consumer satisfaction, employees needs, technology and image (see Exhibit 3.1). The stated financial goals of the firm are: (*a*) sales growth; (*b*) reasonable return on capital; and (*c*) internal financing.

Objectives vs decision criteria: Objectives and decision criteria should be distinguished. Wealth maximization is more appropriately a decision criterion, rather than an *objective or a goal*. Goals or objectives are missions or basic purposes – raison d'être of a firm's existence. They direct the firm's actions. A firm may consider itself a provider of high technology, a builder of electronic base, or a provider of best and cheapest transport services. The firm designs its strategy around such basic objectives and accordingly, defines its markets, products and technology. To support its strategy, the firm lays down policies in the areas of production, purchase, marketing, technology, finance and so on.

The first step in making a decision is to see that it is consistent with the firm's strategy and passes through the policy screening. The shareholders' wealth maximization is the second-level criterion ensuring that the decision meets the minimum standard of the economic performance. It is important to note that the management is not only the agent of owners, but also trustee for various stakeholders (constituents) of an economic unit. It is the responsibility of the management to harmonize the interests of owners with that of the employees, creditors, government, or society. In the final decision-making, the judgment of management plays the crucial role. The wealth maximization criterion would simply indicate whether an action is economically viable or not.

Check Your Progress

3. What are agency costs?
4. What do understand by the term 'agency problem'?

3.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Three reasons may be attributed to the individual's time preference for money:
   (i) risk
   (ii) preference for consumption
   (iii) investment opportunities
2. Dividend yield is the percentage of dividend income, and it is given by dividing the dividend per share at the end the year by the share price in the beginning of the year; that is, DIV1/P0.
3. Agency costs include the less than optimum share value for shareholders and costs incurred by them to monitor the actions of managers and control their behaviour.
4. The *agency problem* is a conflict of interest inherent in any relationship where one party is expected to act in another's best interests. In the financial scenario, the conflict between the interests of shareholders and managers is referred to as agency problem and it results into agency costs.

3.6 SUMMARY

- Most financial decisions, such as the purchase of assets or procurement of funds, affect the firm's cash flows in different time periods. For example, if a fixed asset is purchased, it will require an immediate cash outlay and will generate cash inflows during many future periods.
- Time preference for money or Time Value of Money (TVM) is an individual's preference for possession of a given amount of money now, rather than the same amount at some future time.
- Dividend yield is the percentage of dividend income, and it is given by dividing the dividend per share at the end the year by the share price in the beginning of the year; that is, DIV1/P0.
- If an investor holds a share and does not sell it at the end of a period, the difference between the beginning and ending share prices is the unrealized capital gain (or loss).

- Shareholders continuously monitor modern companies that would help them to restrict managers' freedom to act in their own self-interest at the cost of shareholders. Employees, creditors, customers and government also keep an eye on managers' activities.
- The conflict between the interests of shareholders and managers is referred to as agency problem and it results into agency costs. Agency costs include the less than optimum share value for shareholders and costs incurred by them to monitor the actions of managers and control their behaviour.
- Objectives and decision criteria should be distinguished. Wealth maximization is more appropriately a decision criterion, rather than an objective or a goal.
- The first step in making a decision is to see that it is consistent with the firm's strategy and passes through the policy screening. The shareholders' wealth maximization is the second-level criterion ensuring that the decision meets the minimum standard of the economic performance.

3.7 KEY WORDS

- **Time value of money:** It is an individual's preference for possession of a given amount of money now, rather than the same amount at some future time.
- **Inflation:** It means an increase in the cost of living as the price of goods and services rise.
- **Dividend:** It refers to the distribution of corporate earnings to company shareholders and usually take place in one of two forms — cash or stock.

3.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. Define capital gain.
2. State the formula for the calculation of average rate of return.
3. What does principal-agent relationship denote?
4. Write a short note on management planning in the global market environment.

Long Answer Questions

1. 'The recognition of the time value of money and risk is extremely vital in financial decision-making.' Explain the statement.
2. Explain the risk-return relationship with the help of an example.
3. Discuss the application of time value of money.

3.9 FURTHER READINGS

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UNIT 4 LONG-TERM CAPITAL RESOURCES

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Structure

4.0 INTRODUCTION

Capital comprises the funds accessible by a business for its operations and functions. With the growth of business, the need for capital also grows. Money can be obtained from many resources and venues. Deciding upon the appropriate source of additional money for any business is associated with the capital needs of the business.

Capital needs can be categorized into short-term and long-term. Short-term needs are usually those of duration less than a year. Long-term needs have a duration that exceeds a year. Long-term investment is commonly affiliated with the need for fixed assets like holdings, manufacturing units and accessories where the assets will be part of the business for many years. It is also a realistic option in a large number of situations where short-term sponsorship requirements persist regularly.

Two long-term sources that a company has access for increasing capital are shares and debentures. Shares comprise ordinary (common) shares and preference shares. Ordinary shares give possession rights to investors. Debentures or bonds offer loan capital to the firms and as a result investors become lenders. There is a direct availability of loan capital from financial institutions to the firms.

In this unit, you will study about equity and debt sources of finance.

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4.1 OBJECTIVES

After going through this unit, you will be able to:

- Discuss equity and debt sources of finance
- Explain the merits and demerits of preference shares and debentures
- State the types of debentures

4.2 EQUITY SOURCES

Ordinary shares (referred to as common shares in USA) represent the ownership position in a company. The holders of ordinary shares or equity, called shareholders (or stockholders in USA), are the legal owners of the company. Ordinary shares are the source of permanent capital since they do not have a maturity date. For the capital contributed by purchasing ordinary shares, the shareholders are entitled for dividends. The amount or rate of dividend is not fixed; the company's board of directors decides it. An ordinary share is, therefore, known as a variable income security. 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. Similarly, when the company is wound up, they can exercise their claims on assets after the claims of other suppliers of capital have been met.

Reporting of Ordinary Shares

The capital represented by ordinary shares is called 'share capital' or 'equity capital'. It appears on the left-hand side of a firm's account-form balance sheet or on the top of sources of capital in the step-form balance sheet. Details about share capital are generally contained in schedules attached to the balance sheet. Table 4.1 shows the details of share capital for the Tata Motors Company Limited.

Table 4.1 *Tata Motors' Share Capital as on 31 March 2008*

(₹ crore)

(*a*)	Authorized 45,00,00,000 equity shares of ₹ 10 each	450.00
(*b*)	Issued 38,55,03,954 equity shares of ₹ 10 each	385.54
(*c*)	Subscribed and paid-up 38,55,03,954 equity shares of ₹ 10, each fully paid up	385.54
(*d*)	Reserves and Surplus	7453.96
(*e*)	Net Worth (*c* + *d*)	7839.50

Shareholder's equity includes both ordinary shares and preference shares (if any). Therefore, the capital attributable to ordinary shares excludes preference shares capital. In Tata Motors' case, the ordinary shareholders' equity capital is: ₹

7839.50 crore. **Authorized share capital** represents the maximum amount of capital, which a company can raise from shareholders. A company can, however, change its authorized share capital by altering its Memorandum of Association (a charter of the company). The alteration of the memorandum involves somewhat complicated legal procedures. The portion of the authorized share capital, which has been offered to shareholders, is called **issued share capital**. **Subscribed share capital** represents that part of the issued share capital, which has been accepted by shareholders. The amount of subscribed share capital, actually paid up by shareholders to the company is called **paid-up share capital**. Often, subscribed and paid-up share capital may be the same.

The total paid-up share capital is equal to the issue price of an ordinary share multiplied by the number of ordinary shares. The *issue price* may include two components: the par value and the share premium. The par value is the price per ordinary share stated in the Memorandum of Association. Generally, the par value of an ordinary share is in the denomination of ₹ 100 or ₹ 10. Any amount in excess of the par value is called the share premium. In the case of new companies, the par value and the issue price may be the same. The existing, highly profitable companies may issue ordinary shares at a premium. The paid-up share capital is stated at the par value. The excess amount is separately shown as the share premium. The company's earnings, which have not been distributed to shareholders and have been retained in the business, are called reserves and surplus. They belong to owners—ordinary shareholders. Thus, the total shareholders' equity is the sum of: (*i*) paid-up share capital, (*ii*) share premium, and (*iii*) reserves and surplus. The total shareholders' equity or share capital is also called net worth.

The book value per ordinary share is calculated as follows:

$$\text{Book value per share} = \frac{\text{Net worth}}{\text{Number of ordinary shares}} \quad (1)$$

For Tata Motors', the book value per share as on 31 March 2008 is:

$$= \frac{7839.50}{45} = ₹\,174.21$$

Note that the book value is based on historical figures in the balance sheet. It is in no way related with the market value of an ordinary share. The market value of a share is the price at which it trades in the stock market. It is generally based on expectations about the performance of the economy, in general and the company, in particular. Tata Motors' market price per share on Bombay Stock Exchange has generally been higher than its book value. For example, on 24 April 2009, the market price of a Tata Motor share was ranging between ₹ 245 to ₹ 249. The market prices of many companies' shares trade at below their book values. Ordinary shares of all companies may not be traded on stock markets. Therefore, the market value of ordinary shares of all companies may not be available.

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4.2.1 Features of Ordinary Shares

Ordinary share has a number of special features which distinguish it from other securities. These features generally relate to the rights and claims of ordinary shareholders.

Claim on income

Ordinary shareholders have a residual ownership claim. They have a claim to the residual income, which is, earnings available for ordinary shareholders, after paying expenses, interest charges, taxes and preference dividend, if any. This income may be split into two parts: (a) dividends and (b) retained earnings. Dividends are immediate cash flows to shareholders. Retained earnings are reinvested in the business, and shareholders stand to benefit in future, in the form of the firm's enhanced value and earnings power and ultimately enhanced dividend and capital gain. Thus, residual income is either directly distributed to shareholders in the form of dividend or indirectly in the form of capital gains on the ordinary shares held by them.

Payable dividends depend on the discretion of the company's board of directors. A company is not under a legal obligation to distribute dividends out of the available earnings. Capital gains depend on future market value of ordinary shares. Thus, an ordinary share is a risky security from the investor's point of view. Dividends paid on ordinary shares are not tax deductible for the company.

Claim on assets

Ordinary shareholders also have a residual claim on the company's assets in the case of a liquidation. Liquidation can occur on account of business failure or sale of business. Out of the realized value of assets, first the claims of debt-holders and then preference shareholders are satisfied, and the remaining balance, if any, is paid to ordinary shareholders. In case of liquidation, the claims of ordinary shareholders may generally remain unpaid.

Right to control

Control in the context of a company means the power to determine its policies. The board of directors approves the company's major policies and decisions while managers appointed by the board carry out the day-to-day operations. Thus, control may be defined as the power to appoint directors. Ordinary shareholders have the legal power to elect directors on the board. If the board fails to protect their interests, then they can replace directors. Ordinary shareholders are able to control the management of the company through their voting rights and right to maintain proportionate ownership.

Voting rights

Ordinary 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

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authorized 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. Shareholders 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 for 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 shareholders' option to purchase a stated number of new shares at a specified price during a given period is 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. In the event of the insolvency of these firms, owners are required to bring in additional capital from their personal savings to pay claims of creditors. 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.

4.2.2 Pros and Cons of Equity Financing

Equity capital is the most important long-term source of financing. It offers the following advantages to the company:

- **Permanent capital:** Since ordinary shares are not redeemable, the company has no liability for cash outflow associated with its redemption. It is a permanent capital, and is available for use as long as the company goes.
- **Borrowing base:** The equity capital increases the company's financial base, and thus its borrowing limit. Lenders generally lend in proportion to the

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company's equity capital. By issuing ordinary shares, the company increases its financial capability. It can borrow when it needs additional funds.

- **Dividend payment discretion:** A company is not legally obliged to pay dividend. In times of financial difficulties, it can reduce or suspend payment of dividend. Thus, it can avoid cash outflow associated with ordinary shares. In practice, dividend cuts are not very common or frequent. A company tries to pay dividend regularly. It cuts dividend only when it cannot manage cash to pay dividends. For example, the Reliance Industries Limited experienced a sharp drop in its profits and had a severe liquidity problem in the year 1986. As a consequence, it had to cut its dividend rate from 50 per cent to 25 per cent. The company, however, increased the dividend rate next year when its performance improved.

Equity capital has some disadvantages to the firm compared to other sources of finance. They are as follows:

- **Cost:** Shares have a higher cost at least for two reasons: (a) dividends are not tax deductible as are interest payments, and the flotation costs on ordinary shares are higher than those on debt.
- **Risk:** 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.
- **Earnings dilution:** 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.
- **Ownership dilution:** 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. The issuance of ordinary shares can change the ownership.

Public issue of equity

Public issue of equity means raising of share capital directly from the public. For example, Riga Sugar Company Limited, a subsidiary of Belsund Sugar Limited, made a public issue of equity shares of ₹ 10 crore on 12 July 1994. The issue price per share is ₹ 50—representing a premium of ₹ 40 over its par value. The issue price is also higher than its book value of ₹ 26.35 per share. The company needs funds for expansion and modernization of its plant as well as for diversification into the manufacture of ethyl alcohol. The company expects to pay a dividend of 20 per cent in 1993–94 and 1994–95 and 25 per cent in 1995–96.

Consider another case. N.R. Agarwal Industries Limited is approaching the public for the first time to raise ₹ 3.20 crore on 7 July 1994. Incorporated as a public limited company in December 1993, the maiden issue of equity shares is

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intended to part-finance its project for manufacturing industrial paper in Vapi, Gujarat. The share is issued at par at ₹ 10.

One recent example of public issue is the proposal to issue 95 lakh equity shares of ₹ 10 each by CG Lifesciences. The issue price per share will be decided by the book building process.

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 (as compared to the par value).

Underwriting of issues

It is legally obligatory to underwrite a public and a rights issue. In underwriting, the underwriters—generally banks, financial institution, 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.

Private placement

Private placement involves sale of shares (or other securities) by the company to few selected investors, particularly the institutional investors like the Unit Trust of India (UTI), the Life Insurance Corporation of India (LIC), the Industrial Development Bank of India (IDBI), etc. Private placement has the following advantages:

- ***Size:*** It is helpful to issue small amount of funds.
- ***Cost:*** It is less expensive. In the case of public issue of securities, the issue costs, including both statutory and other costs, are quite high, ranging between 10 to 20 per cent of the size of issue. A substantial part of these costs can be avoided through private placement.
- ***Speed:*** It takes less time to raise funds through private placement, say, less than 3 months. Public issues involve a number of requirements to be fulfilled, and this requires a lot of time to raise capital.

Right issue of Equity Shares

A **rights issue** involves selling of ordinary shares to the existing shareholders of a company. The law in India requires that the new ordinary shares must be first issued to the existing shareholders on a *pro rata* basis. Shareholders through a special resolution can forfeit this pre-emptive right. Obviously, this will dilute their ownership.

Terms and procedures

A company can make rights offering to its shareholders after meeting the requirements specified by the Securities and Exchange Board of India (SEBI). Those shareholders who renounce their rights are not entitled for additional shares. Shares becoming available on account of non-exercise of rights are allotted to

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shareholders who have applied for additional shares on *pro rata* basis. Any balance of shares left after issuing the additional shares can be sold in the open market.

Let us assume that a company announces on 2 January 2009 that all shareholders whose names are in the register of members as on 25 February 2009 will be issued rights, which will expire on 10 March 2009. The company will mail the "letter of rights" on 5 April 2009. In the example, 2 January 2009 is the announcement date, 25 February 2009 is the *holder-of-the-register-of-members date*, 5 April 2009 is the *offer-of-rights date* and 10 March 2009 is the *expiration-of-rights date*. It may be possible that the share may be traded (bought and sold) a few days before the holder-of-the-register-of-members date (5 April 2009 in the example), and it may not be transferred and registered in the new name. The rights might then be wrongly sent to the old shareholder. If the share is traded within the *ex-rights date,* it will be duly registered in the name of purchaser. The ex-rights date occurs a few days prior to the holder-of-the-register-of-member date. This implies that after the ex-rights date the share sells without the rights. The price of a share before the ex-rights date is called, **right-on** or **cum-rights**, while the price after this date is referred to as the ex-rights price.

In India, along with the letter of rights, four forms may be sent. Form A is intended for accepting the rights and applying for additional shares. Form B is meant for the purpose of foregoing the rights in favour of other person. Form C has to be used by the person in whose favour the rights have been renounced for making application. Form D is for the purpose of requesting for the split forms.

When the rights are offered for raising funds, three issues are involved: (*i*) the number of rights needed to buy a new share, (*ii*) the theoretical value of a right, and (*iii*) the effect of rights offerings on the value of the ordinary shares outstanding. We shall consider an example to discuss these issues.

Sunshine Industries Limited has 900,000 shares outstanding, at current market price of ₹ 130 per share. The company needs ₹ 22.50 million (or ₹ 2.25 crore) to finance its proposed modernization-cum-expansion project. The board of the company has decided to issue rights for raising the required money. The subscription (issue) price (P_s) has been fixed at ₹ 75 per share. The subscription price has been set below the market price to ensure that the rights issue is fully subscribed. How many rights required purchasing a new share? What is the value of a right?

Value of a right

We can first determine the number of new shares to be issued to raise ₹ 22.50 million at ₹ 75 per share:

$$\text{No. of new shares} = \frac{\text{Desired funds}}{\text{Subscription price } (P_s)}$$

$$= \frac{22,500,000}{75} \qquad (2)$$

$$= 300,000 \text{ shares}$$

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We know that each ordinary share will get one right; therefore, there are a total number of 900,000 rights. The company wants to sell 300,000 new shares. The number of rights required to buy on new share will be equal to the number of existing shares outstanding (S_o) divided by new share(s) to be sold:

$$\text{No. of rights} = \frac{\text{Existing shares}}{\text{New shares}}$$

$$N = \frac{S_o}{s} \tag{3}$$

In our example, the number of rights required are:

$$= \frac{900,000}{300,000} = 3 \quad \text{rights}$$

This implies that to purchase a new share, an existing shareholder should have 3 rights and ₹ 75. What is the price of one share after rights offering? The price of the share after the rights issue is called *ex-rights price* (P_x). It is equal to the value of 3 rights plus ₹ 75.

Price of a share after rights issue (P_x) = Value of 3 rights + ₹ 75

The formula for the ex-rights issue (P_x) can be written as follows:

$$P_x = N \times R + P_s \tag{4}$$

Here, N is the number of rights needed to buy one share, R is the value of a right and P_s is the subscription price. In fact, this price can be found out directly. The price of a share after rights issue is equal to the sum of value of existing shares (900,000) at the current market-price (₹ 130) and the value of new shares (300,000) at subscription price (₹ 75) divided by total number of shares after the rights issue (900,000 + 300,000 = 1,200,000):

Price of share after right issue = (Existing shares × Current market price + New shares × Subscription price) ÷ (Existing shares + New shares)

$$P_x = \frac{S_o \times P_o + s \times P_s}{S_o + s} = \frac{S_o P_o + sP_s}{S} \tag{5}$$

Here, $S = S_o + s$. In the example, the price is:

$$= \frac{900,000 \times 130 + 300,000 \times 75}{900,000 + 300,000} = \frac{1,170,000 + 22,500,000}{1,200,000}$$

$$= ₹\ 116.25$$

In the case of the Sunshine rights issue, we know that a shareholder can buy one new share for ₹ 75 plus 3 rights. The company's share after the ex-rights date is theoretically worth ₹ 116.25. Therefore, the total value of 3 rights together is ₹ 41.25. (₹ 116.25 – ₹ 75), and the value of each right is ₹ 13.75 (₹ 41.25/3).

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Thus the share price on the ex-right date drops by ₹ 13.75 from the cum-rights (rights-on) price of ₹ 130 to the ex-rights price of ₹ 116.25. This drop is the value of one right. In fact, what has happened is that the cum-rights (rights-on) price (P_o = ₹ 130) has divided into the ex-rights price (P_x = ₹ 116.25) and the 'value of a right' (R = ₹ 13.75). Thus, $P_o = P_x + R$.

We can also use other formulae to determine the value of a right. We can combine Equations (4) and (5) to find out value of a right as follows:

$$P_x = \frac{S_o P_o + sP_s}{S} = NR + P_s$$

$$NR = P_x - P_s \quad (6)$$

$$R = \frac{P_x - P_s}{N}$$

Here, R is the value of a right, P_x is the ex-rights price which is given by Equation (4) and P_s is the subscription price. Applying Equation (6) to our example, R is equal to:

$$R = \frac{116.25 - 75}{3} = \frac{41.25}{3} = ₹\ 13.75$$

Notice that Equation (6) gives the value of a right when the share is selling ex-rights. What is the value of a right when the share is selling cum-rights (rights-on)? We know that the cum-rights price (P_o) is:

$$P_o = P_x + R \quad (7)$$

And, the ex-rights price (P_x) is:

$$P_x = P_o - R \quad (8)$$

The value of a right when share is selling ex-rights is:

$$R = \frac{P_x - P_s}{N}$$

Substituting $P_o - R$ for P_x from Equation (8) into Equation (6), we obtain:

$$R = \frac{P_o - R - P_s}{N}$$

$$NR = P_o - R - P_s$$

$$NR + R = P_o - P_s$$

$$R(N+1) = P_o - P_s$$

$$R = \frac{P_o - P_s}{N+1}$$

For the Sunshine Limited the 'value of a right' is:

$$R = \frac{130 - 75}{3+1} = \frac{55}{4} = ₹\ 13.75$$

This is the same value as found by Equation (6) under the assumption that the share was selling ex-rights.

Effect on shareholders' wealth

From the calculations of the value of a right, when the share is selling ex-rights, or cum-rights, it should be clear that the existing shareholder does not benefit or lose from a rights issue. What he receives in the form of the value of a right, he loses in the form of decline in the share price. His wealth remains unaffected when he exercises his rights. Of course, he will lose if he does not exercise his rights or sells them. Thus, the shareholder has three options: (*i*) he exercises his rights, (*ii*) he sells his rights, or (*iii*) he does not exercise or sell his rights. He will lose under the third option. Let us illustrate.

Suppose a shareholder in Sunshine owns 3 shares. At a current market price of ₹ 130, his total wealth is ₹ 390. Let us assume that he exercises his rights as offered by the company. After the exercise of his rights, he will own 4 shares at the ex-rights price of ₹ 116.25. Therefore, his total wealth is: ₹ 116.25 × 4 = ₹ 465. But he has spent ₹ 75 to obtain the additional share. So his net wealth is: ₹ 465 – ₹ 75 = ₹ 390 same as before the rights issue. Now assume that he does not exercise his rights rather sells them at ₹ 13.75 per right. He still own 3 shares but at a price of ₹ 116.25 per share (ex-rights price). So his total value of shares is: ₹ 116.25 × 3 = ₹ 348.75. But he also obtains: ₹ 13.75 × 3 = ₹ 41.25 by selling his rights. Therefore, his net wealth is: ₹ 348.75 + ₹ 41.25 = ₹ 390—once again same as before the rights issue. Let us now assume that he does nothing. This means that he would simply own 3 shares at a price of ₹ 116.25 after the expiry of rights issue. Thus his wealth would decline to ₹ 348.75 from ₹ 390.

Is the subscription price of any significance?

Is the subscription price (P_s) significant? It is irrelevant in terms of the impact on the shareholders' wealth. It can be fixed at any level below the current market price. What the shareholder gains in terms of the value of rights, he loses in terms of decline in the share price. The primary objective in setting the subscription price low is that after the rights offering, the market price should not fall below it.

Will the theoretical value of a right always equal its actual market value? The theoretical value could differ from the actual value for three reasons. *First,* the high transaction costs can limit the investor arbitrage that would otherwise push the market price of the right to its theoretical value. *Second,* speculation over the subscription period can push the market price above or below the theoretical value. *Third,* large flotation costs can also affect these two values.

Pros and cons of rights issue

There are three main advantages of the rights issue. *First,* the existing shareholders' control is maintained through the pro rata issue of shares. This is significant in the case of a closely held company or when a company is going into financial difficulties

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or is under a takeover threat. *Second*, raising funds through the sale of rights issue rather than the public issue involves less flotation costs as the company can avoid the underwriting commission. *Third*, in the case of profitable companies, the issue is more likely to be successful since the subscription price is set much below the current market price.

The main disadvantage is to the shareholders who fail to exercise their rights. 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.

Check Your Progress

1. What is paid-up share capital?
2. Define ordinary shares.

4.3 DEBT SOURCES: PREFERENCE SHARES

Preference share is often considered to be a hybrid security since it has many features of both ordinary shares and debentures. It is similar to ordinary shares in that (*a*) the non-payment of dividends does not force the company to insolvency, (*b*) dividends are not deductible for tax purposes, and (*c*) in some cases, it has no fixed maturity date. On the other hand, it is similar to debentures in that (*a*) dividend rate is fixed, (*b*) preference shareholders do not share in the residual earnings, (*c*) preference shareholders have claims on income and assets prior to ordinary shareholders, and (*d*) they usually do not have voting rights.

4.3.1 Types of Preference Shares

The types of preference shares are the following:

- Convertible and Non-Convertible Preference shares
- Redeemable and Irredeemable Preference shares
- Participating and Non-Participating Preference shares
- Cumulative and Non-Cumulative Preference shares
- Shares with callable option

Let us now study these preference shares along with their characteristics:

Claims on income and assets: Preference share is a senior security as compared to an ordinary share. It has a prior claim on the company's income in the sense that the company must first pay preference dividend before paying ordinary dividend. It also has a prior claim on the company's assets in the event of liquidation. The preference share claim is honoured after that of a debenture and before that

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of ordinary share. Thus, in terms of risk, preference share is less risky than ordinary share. There is a cost involved for the relative safety of preference investment. Preference shareholders generally do not have voting rights and they cannot participate in any extraordinary profits earned by the company. However, a company can issue preference share with voting rights (called participative preference shares).

Fixed dividend: The dividend rate is fixed in the case of a preference share, and preference dividends are not tax deductible. The preference dividend rate is expressed as a percentage of the par value. The amount of preference dividend will thus be equal to the dividend rate multiplied by the par value. Preference share is called fixed-income security because it provides a constant income to investors. The payment of preference dividend is not a legal obligation. Usually, a profitable company will honour its commitment of paying preference dividend.

Cumulative dividends: Most preference shares in India carry a cumulative dividend feature, requiring that all past unpaid preference dividend are to paid before any ordinary dividends are paid. This feature is a protective device for preference shareholders. The preference dividends could be omitted or passed without the cumulative feature. Preference shareholders do not have power to force company to pay dividends; non-payment of preference dividend also does not result into insolvency. Since preference share does not have the dividend enforcement power, the cumulative feature is necessary to protect the rights of preference shareholders.

Redemption: Theoretically, both redeemable and perpetual (irredeemable) preference shares can be issued. Perpetual or irredeemable preference share does not have a maturity date. Redeemable preference share has a specified maturity. In practice, redeemable preference shares in India are often not retired in accordance with the stipulation since there are no serious penalties for the violation of redemption feature.

Sinking fund: Like in the case of debentures, a sinking fund provision may be created to redeem preference share. The money set aside for this purpose may be used either to purchase preference share in the open market or to buy back (call) the preference share. Sinking funds for preference shares are not common.

Call feature: The call feature permits the company to buy back preference shares at a stipulated buy-back or call price. The call price may be higher than the par value. Usually, it decreases with the passage of time. The difference between call price and par value of the preference share is called 'call premium'.

Participation feature: Preference shares may, in some cases, have participation feature which entitles the preference shareholders to participate in extraordinary profit earned by the company. This means that a preference shareholder may get dividend amount in excess of the fixed dividend. The formula for determining extra dividend would differ. A company may provide for extra dividend to preference shareholders equal to the amount of ordinary dividend that is in excess of the

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regular preference dividend. Thus if the preference dividend rate is 10 per cent and the company pays an ordinary dividend of 16 per cent, then preference shareholders will receive extra dividend at 6 per cent (16–10 per cent). Preference shareholders may also be entitled to participate in the residual assets in the event of liquidation.

Voting rights: Preference shareholders ordinarily do not have any voting rights. They may be entitled to contingent or conditional voting rights. In India, if a preference dividend is outstanding for two or more years in the case of cumulative preference shares, or the preference dividend is outstanding for two or more consecutive preceding years or for a period of three or more years in the preceding six years, preference shareholders can nominate a member on the board of the company.

Convertibility: Preference shares may be convertible or non-convertible. A convertible preference share allows preference shareholders to convert their preference shares, fully or partly, into ordinary shares, at a specified price, during a given period of time. Preference shares, particularly when the preference dividend rate is low, may sometimes be converted into debentures. For example, the Andhra Cement converted its preference shares of ₹ 0.33 crore into debentures in 1985. To make preference shares attractive, the Government of India has introduced convertible cumulative preference share (CCPS). Unfortunately, companies in India have hardly used this security to raise funds.

4.3.2 Pros and Cons of Preference Shares

Preference share has a number of advantages to the company, which ultimately occur to ordinary shareholders.

- **Riskless leverage advantage:** Preference share provides financial leverage advantages since preference dividend is a fixed obligation. This advantage occurs without a serious risk of default. The non-payment of preference dividends does not force the company into insolvency.
- **Dividend postponability:** Preference share provides some financial flexibility to the company since it can postpone the payment of dividend.
- **Fixed dividend:** The preference dividend payments are restricted to the stated amount. Thus preference shareholders do not participate in excess profits as do the ordinary shareholders.
- **Limited voting rights:** Preference shareholders do not have voting rights except in case dividend arrears exist. Thus, the control of ordinary shareholders is preserved.

The following are the limitations of preference shares:

- **Non-deductibility of dividends:** The primary disadvantage of preference share is that preference dividend is not tax deductible. Thus, it is costlier than debenture.

- **Commitment to pay dividend:** Although preference dividend can be omitted, they may have to be paid because of their cumulative nature. Non-payment of preference dividends can adversely affect the image of a company, since equity holders cannot be paid any dividends unless preference shareholders are paid dividends.

Preference shares provide more flexibility and lesser burden to a company. The dividend rate is less than that on equity and it is fixed. Also, the company can redeem it when it does not require the capital. In practice, when a company reorganises its capital, it may convert preference capital into equity. Sometimes equity may be converted into preference capital. For example, IDBI in 1994 proposed to convert its equity capital into preference capital.

Check Your Progress

3. Name the types of preference shares.
4. State two limitations of preference shares.

4.4 DEBT SOURCES: DEBENTURES

A **debenture** is a long-term promissory note for raising loan capital. The firm promises to pay interest and principal as stipulated. The purchasers of debentures are called debenture holders. An alternative form of debenture in India is a bond. Mostly public sector companies in India issue bonds. In USA, the term 'debenture' is generally understood to mean unsecured bond.

4.4.1 Features of Debentures

A debenture is a long-term, fixed-income, financial security. Debenture holders are the creditors of the firm. The *par value* of a debenture is the face value appearing on the debenture certificate. Corporate debentures in India are issued in different denominations. The large public sector companies issue bonds in the denominations of ₹ 1,000. Some of the important features of debentures are discussed below.

- **Interest rate:** The interest rate on a debenture is fixed and known. It is called the 'contractual rate of interest'. It indicates the percentage of the par value of the debenture that will be paid out annually (or semi-annually or quarterly), in the form of interest. Thus, regardless of what happens to the market price of a debenture, say, with a 15 per cent interest rate, and a ₹ 1,000 par value, it will pay out ₹ 150 annually in interest until maturity. Payment of interest is legally binding on a company. Debenture interest is tax deductible for computing the company's corporate tax. However, it is taxable in the hands of a debenture holder as per the income tax rules. However, public sector companies in India are sometimes allowed by the

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government to issue bonds with tax-free interest. That is, the bondholder is not required to pay tax on his bond interest income.

- **Maturity:** Debentures are issued for a specific period of time. The *maturity* of a debenture indicates the length of time until the company redeems (returns) the par value to debenture holders and terminates the debentures. In India, a debenture is typically redeemed after 7 to 10 years in instalments.
- **Redemption:** As indicated earlier, debentures are mostly redeemable; they are generally redeemed on maturity. Redemption of debentures can be accomplished either through a sinking fund or buy-back (call) provision.
- **Sinking fund:** A sinking fund is cash set aside periodically for retiring debentures. The fund is under the control of the trustee, who redeems the debentures either by purchasing them in the market or calling them in an acceptable manner. In some cases, the company itself may handle the retirement of debentures using the sinking funds. The advantage of a sinking fund is that the periodic retirement of debt through the sinking funds reduces the amount required to redeem the remaining debt at maturity. Particularly, when the firm faces temporary financial difficulty at the time of debt maturity, the repayment of huge amount of principal could endanger the firm's financial viability. The use of the sinking fund eliminates this potential danger.
- **Buy-back (call) provision:** Debenture issues include buy-back provision. Buy-back provisions enable the company to redeem debentures at a specified price before the maturity date. The buy-back (call) price may be more than the par value of the debenture. This difference is called call or buy-back premium. In India, it is generally 5 per cent of the par value.
- **Indenture:** An **indenture** or 'debenture trust deed' is a legal agreement between the company issuing debentures and the debenture trustee who represents the debenture holders. It is the responsibility of the trustee to protect the interests of debenture holders by ensuring that the company fulfils the contractual obligations. Generally, a financial institution, or a bank, or an insurance company or a firm of attorneys is appointed as a trustee. The debenture trust deed (indenture) provides the specific terms of the agreement, including a description of debentures, rights of debenture holders, rights of the issuing company and responsibilities of the trustee.
- **Security:** Debentures are either secured or unsecured. A secured debenture is secured by a lien on the company's specific assets. If the company defaults, the trustee can seize the security on behalf of the debenture holders. In India, debentures are usually secured by a charge on the present and future immovable assets of the company. This is called 'equitable mortgage'. When debentures are not protected by any security, they are known as 'unsecured or naked debentures'. As stated earlier, in USA the term debenture always means unsecured bond while in India bond could be secured or unsecured. If the debentures are unsecured, it will generally be difficult for the firm to

attract investors to subscribe to them. Security, however, does not necessarily ensure the safety of a debenture/bond from the investor's point of view. Professional bodies rate bonds/debentures to indicate the degree of their safety. Credit rating of a bond/debenture shows the chances of timely payment of interest and principal by a borrower.

In India, the Credit Rating and Information Services of India Limited (CRISIL) provides rating for bonds/debentures, fixed deposits and commercial papers. Other rating companies include CARE and ICRA. Exhibit 4.1 explains the nature of debenture ratings given by CRISIL.

Exhibit 4.1: Credit Rating of Debentures in India

CRISIL provides the following ratings to bonds/debentures.

- **AAA (highest safety)** Triple A (AAA) rated debentures imply highest safety in the timely payment of interest and principal, even if changes take place in the circumstances subsequently.
- **AA (high safety)** Double A (AA) rated debentures ensure high safety—marginally less than the safety provided by triple A debentures.
- **A (adequate safety)** Single A rated debentures provide for timely payment of interest and principal, but the changed circumstances in future may affect such debentures as compared to the higher rated debentures.
- **BBB (low safety)** Triple B (BBB) debentures ensure sufficient safety with regard to the payment of interest and principal. But under the changed circumstances, later on, are more likely to weaken the capacity of the issuing company to pay interest and principal.
- **BB (inadequate safety)** Double B (BB) rated debentures do not provide adequate safety of timely payment of interest and principal. The uncertainties of future can lead to inadequate capacity to make timely payment of interest and principal.
- **B (high risk)** Single B rated debentures are likely to default. Adverse circumstances can render the ability or willingness of a borrower quite weak to pay interest or principal.
- **C (substantial risk)** C rated debentures have current factors that make them vulnerable to default. For no default on payment of interest or principal, favourable circumstances must continue.
- **D (in default)** D rated debentures are in default or are expected to be in default.

***Source*:** Information published by CRISIL.

- **Yield:** The yield on a debenture is related to its market price; therefore, it could be different from the coupon rate of interest. Two types of yields can be distinguished. The current yield on a debenture is the ratio of the annual interest payment to the debenture's market price. For example, the current yield of a 14 per cent, ₹ 1,000 debenture, currently selling at ₹ 750 is:

$$\text{Current yield} = \frac{\text{Annual interest}}{\text{Market price}} = \frac{140}{750}$$

$$= 0.187 \quad \text{or} \quad 18.7\%$$

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The yield-to-maturity takes into account the payments of interest and principal, over the life of the debenture. Thus, it is the internal rate of return of the debenture. Mathematically, the yield-to-maturity is the discount rate that equates the present value of the interest and principal payments with the current market price of the debentures.

- **Claims on assets and income:** Debenture holders have a claim on the company's earnings, prior to that of the shareholders. Debentures interest has to be paid before paying any dividends to preference and ordinary shareholders. A company can be forced into bankruptcy if it fails to pay interest to debenture holders. Therefore, in practice, the debenture holders' claim on income is generally honoured, except in the case of extreme financial difficulties faced by the company.

  In liquidation, the debenture holders have a claim on assets prior to that of shareholders. However, secured debenture holders will have priority over the unsecured debenture holders. Thus, different types of debt may have a hierarchy among themselves as their order of claim on the company's assets.

4.4.2 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.

(i) Non-convertible debentures (NCDs)

(ii) Fully convertible debentures (FCDs)

(iii) Partly convertible debentures (PCDs)

(i) **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. The erstwhile Industrial Credit and Investment Corporation of India (ICICI) issued debentures for ₹ 200 crore fully non-convertible bonds of ₹ 1,000 each, at 16 per cent rate of interest, payable half-yearly. The maturity period was five years. However, the investors had the option to be repaid fully or partly, the principal after 3 years, after giving due notice to ICICI.

Companies in practice also issue **zero-interest debentures** (ZID). These debentures are issued at a highly discounted issue price. The difference between the issue price and the maturity value is the implicit amount of interest. Zero-interest debentures are also called **deep-discount debentures** (bonds).

(ii) **Fully-convertible debentures (FCDs):** FCDs are converted into shares as per the terms of the issue, with regard to the price and time of conversion.

The pure FCDs carry 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. For example, Jindal Iron and Steel Company Limited raised FCDs at ₹ 111.2 each. After 12 months of allotment, each FCD was convertible into one share of ₹ 100 to ₹ 90 being the premium.

(iii) **Partly-convertible debentures (PCDs):** A number of debentures issued by companies in India have two parts: (a) a convertible part and (b) 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 a single debenture. For example, Proctor and Gamble Limited (P&G) issued 400,960 PCDs of ₹ 200 each to its existing shareholders in July 1991. Each PCD had two parts: convertible portion of ₹ 65 each to be converted into one equity share of ₹ 10 each, at a premium of ₹ 55 per share at the end of 18 months from the date of allotment and non-convertible portion of ₹ 135, payable in three equal instalments on the expiry of the 6th, 7th and 8th years from the date of allotment.

4.4.3 Pros and Cons of Debentures

Debenture has a number of advantages as a long-term source of finance:

- ***Less costly:*** It involves less cost to the firm than the equity financing because (*a*) 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.
- ***No ownership dilution:*** Debenture holders do not have voting rights; therefore, debenture issue does not cause dilution of ownership.
- ***Fixed payment of interest:*** Debenture holders do not participate in extraordinary earnings of the company. Thus the payments are limited to interest specified.
- ***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.

The limitations of the debenture are as follows:

- ***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, they involve substantial cash outflows.

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- ***Restricted covenants:*** Debenture indenture may contain restrictive covenants which may limit the company's operating flexibility in future.

Check Your Progress

5. What is a debenture?
6. What does maturity of a debenture indicate?

4.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The amount of subscribed share capital, actually paid up by shareholders to the company is called paid-up share capital.
2. *Ordinary shares* are shares that represent a normal equity ownership in a company.
3. The types of preference shares are the following:
   - Convertible and Non-Convertible Preference shares
   - Redeemable and Irredeemable Preference shares
   - Participating and Non-Participating Preference shares
   - Cumulative and Non-Cumulative Preference shares
   - Shares with callable option
4. Two limitations of preference shares are the following:
   i. Non-deductibility of dividends
   ii. Commitment to pay dividend
5. A debenture is a long-term promissory note for raising loan capital.
6. The maturity of a debenture indicates the length of time until the company redeems (returns) the par value to debenture holders and terminates the debentures.

4.6 SUMMARY

- Ordinary shares (referred to as common shares in USA) represent the ownership position in a company. The holders of ordinary shares or equity, called shareholders (or stockholders in USA), are the legal owners of the company.
- An ordinary share is, therefore, known as a variable income security. 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.

- The portion of the authorized share capital, which has been offered to shareholders, is called issued share capital. Subscribed share capital represents that part of the issued share capital, which has been accepted by shareholders.
- Ordinary share has a number of special features which distinguish it from other securities. These features generally relate to the rights and claims of ordinary shareholders.
- When management takeovers are threatened, proxy fights—battles between rival groups for proxy votes—occur.
- It is legally obligatory to underwrite a public and a rights issue. In underwriting, the underwriters—generally banks, financial institution, brokers, etc., guarantee to buy the shares if the issue is not fully subscribed by the public.
- Preference share is often considered to be a hybrid security since it has many features of both ordinary shares and debentures. It is similar to ordinary shares in that (*a*) the non-payment of dividends does not force the company to insolvency, (*b*) dividends are not deductible for tax purposes, and (*c*) in some cases, it has no fixed maturity date.
- A debenture is a long-term promissory note for raising loan capital. The firm promises to pay interest and principal as stipulated. The purchasers of debentures are called debenture holders.

4.7 KEY WORDS

- **Right issue:** A rights issue involves selling of ordinary shares to the existing shareholders of a company.
- **Sinking fund:** *It* is a *fund* containing money set aside or saved to pay off a debt or bond.
- **Indenture:** It is a legal contract between the two parties.

4.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. Define the term 'authorized share capital.
2. Mention the main advantages of right issue.
3. State the features of debentures.

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Long Answer Questions

1. Explain the features of ordinary shares.
2. Discuss the advantages and disadvantages of equity capital.
3. Summarize the types of preference shares.
4. What are the merits and demerits of debentures?

4.9 FURTHER READINGS

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Horne, Van. 2008. *Fundamentals of Financial Management*. USA: Prentice Hall.

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BLOCK - II
CAPITAL STRUCTURE

NOTES

UNIT 5 CAPITAL ISSUES

Structure

5.0 INTRODUCTION

Capital issue refers to bonds or stocks issued by the government or institution to its stakeholders. Term loan is a medium-term source financed primarily by banks and financial institutions. Bridge loans are often used for commercial real estate purposes to make a quick close on a property deal. This unit, will introduce you to the meaning, nature and purpose of capital issues, the concept of loan syndication, borrowing from term lending institutions and borrowings from international capital market.

5.1 OBJECTIVES

After going through this unit, you will be able to:

- Examine the meaning, nature and purpose of capital issues
- List the features of loan syndication
- Discuss the features of term loans
- Define loan amortization

- Explain bridge finance and book building
- Discuss borrowings from the term lending institutions and International capital market

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5.2 MEANING, NATURE AND PURPOSE OF CAPITAL ISSUES

Capital issue or issued capital refers to the number of shares issued by an organization to its shareholders. To put it another way, the shares allotted or subsequently held by the shareholders is called the issued capital. It represents that part of an authorized capital, which an organization is authorized to sell through the shares. An organization can either sell all its shares or a portion of it depending on the need for finance. It is also called as a subscribed capital, as the number of shares purchased by the shareholders represents the amount of money invested in the firm.

5.2.1 SEBI Guidelines for Issue of Fresh Share Capital

The Securities and Exchange Board of India was established on April 12, 1992 in accordance with the provisions of the Securities and Exchange Board of India Act, 1992. The Preamble of the Securities and Exchange Board of India describes the basic functions of the Securities and Exchange Board of India as "...to protect the interests of investors in securities and to promote the development of, and to regulate the securities market and for matters connected therewith or incidental thereto". SEBI's guidelines for issue of fresh share capital are as follows:

1. All applications should be submitted to SEBI in the prescribed form.
2. Applications should be accompanied by true copies of industrial license.
3. Cost of the project should be furnished with scheme of finance.
4. Company should have the shares issued to the public and listed in one or more recognized stock exchanges.
5. Where the issue of equity share capital involves offer for subscription by the public for the first time, the value of equity capital, subscribed capital privately held by promoters, and their friends shall be not less than 15% of the total issued equity capital.
6. An equity-preference ratio of 3:1 is allowed.
7. Capital cost of the projects should be as per the standard set with a reasonable debt-equity ratio.
8. New company cannot issue shares at a premium. The dividend on preference shares should be within the prescribed list.
9. All the details of the underwriting agreement.

10. Allotment of shares to NRIs is not allowed without the approval of RBI.
11. Details of any firm allotment in favour of any financial institutions.
12. Declaration by secretary or director of the company.

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5.3 DEBT SOURCES: LOAN SYNDICATION

Loan syndication is an arrangement where a group of banks consider loan to a borrower for larger amount. The following are the features of loan syndication:

- The borrower approaches a bank, known as the lead manager, to arrange credit and offers the credit terms.
- The lead manager prepares an information memorandum about the borrower and loan requirement after duly appraising the risk factors.
- The memorandum is circulated among the participating banks. The participating bank can decide and discuss about the arrangements and fix all the terms and conditions.
- The loan agreement is common and signed by all the member banks.
- The borrower informs about his loan requirement to lead bank, so that the lead bank can tie up with other banks.
- The syndicate members can have two types of groups i.e., senior and junior. The senior syndicate members are mainly the banks who act as lead banks. Junior banks are the banks that just participate and take the responsibilities for their share.
- Though it is not mandatory for lead bank to take share in credit disbursement, in practice lead bank takes due share in the credit also.
- The lead bank has two types of risk—(i) credit risk, and (ii) syndicated risk on account of under subscription by participating bank in the syndicate. For example, in case 100 per cent loan requirement is not met by the participating banks, the remaining share has to be contributed by the lead bank.
- This arrangement is very useful for larger projects which require heavy funds.
- In the international context, there are hybrid instruments which have the feature of relationship lending and also publically traded debt.
- The fee structure of syndicated loan involves arrangement fee, legal charges, underwriting commission, participating fee, facility fee, commitment fee, agency fee etc.
- The loan can run from 3 to 10 years as medium term and after 10 years as long term.

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- The arrangement is useful for the banks as it provides an opportunity for participation in credit and also earning income by way of fee and commission. The borrower is also benefited as they can get the best deal and meet their requirements.

5.3.1 Advantages of Loan Syndication

The advantages of loan syndication for both parties—borrower and banker—are as follows:

For borrower

(a) The borrower does not have to disclose financial information to the general public.

(b) Syndicated lending is quick and simple method of raising capital.

(c) Huge amounts can be borrowed.

(d) The negotiations are centralized.

(e) Single set of documents to be submitted to the lead bank.

For banker

(a) The lead bank can earn fee without committing capital.

(b) Enhancement of bank's reputation and relationship with the client.

(c) Access to lending opportunities without incurring marketing costs.

(d) Market exposure.

Check Your Progress

1. What is issued capital or capital issue?
2. Define the term 'loan syndication.'

5.4 BORROWINGS FROM TERM LENDING INSTITUTIONS

Debt capital of a company may consist of either debentures or bonds which are issued to public for subscription, or term loans, which are obtained directly from banks and financial institutions. Term loans are sources of long-term debt. In India, they are generally obtained for financing large expansion, modernization or diversification projects. Therefore, this method of financing is also called 'project financing'.

5.4.1 Features of Term Loans

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Term loans represent long-term debt with a maturity of more than one year. They are obtained from banks and specially created financial institutions (FIs) in India, by private placement rather than a public subscription, as is the case with most debenture issues. The purpose of term loans is mostly to finance the company's capital expenditures. Term loans have a number of basic features. They include the following: (*i*) maturity, (*ii*) direct negotiation, (*iii*) security, (*iv*) restrictive covenants, (*v*) convertibility, and (*vi*) repayment schedule.

(i) Maturity: Banks and specially created financial institutions (FIs) are the main sources of term loans in India. FIs provide term loans generally for a period of 6 to 10 years. In some cases, a grace period (moratorium) of 1 to 2 years is also granted. This is the period during which the company will not need to make any payment. Commercial banks advance term loans for a period of 3 to 5 years.

(ii) Direct negotiation: A firm negotiates term loans for project finance directly with a bank or FI. Thus, term loan is a private placement. Sometimes debentures *may* also be privately placed to FIs, but most debenture issues are placed for public subscription. The advantages of private placement are the ease of negotiation and low cost of raising loan. Unlike in the case of a public issue, the firm need not underwrite term loans. Thus, it avoids underwriting commission and other flotation costs.

(iii) Security: Term loans are always secured. Specifically, the assets acquired using term loan funds secure them. This is called 'primary security'. The company's current and future assets also generally secure term loans. This is called secondary or collateral security. Also, the lender may create either fixed or floating charge against the firm's assets. **Fixed charges** means legal mortgage of specific assets. For creating a fixed charge, the firm has to pay a heavy stamp duty which may be equal to 2.5 per cent of the amount of loan. **Floating charge** is a general mortgage (equitable mortgage), covering all assets. In this case, stamp duty is only 0.5 per cent. Floating charge provides the firm with relative flexibility as it can deal with its assets in the normal course of business without obtaining lender's approval.

(iv) Restrictive covenants: In addition to the asset security, a lender would like to protect itself further. Therefore, FIs add a number of restrictive covenants. A financially weak firm attracts stringent terms on loan from lenders. The borrowing firm has generally to keep the lender informed by furnishing financial statements and other information periodically. The restrictive covenants may be categorized as follows:

- ***Asset-related covenants:*** The lender would like the firm to maintain its minimum asset base. Therefore, restrictions may include conditions to

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maintain minimum working capital position, in terms of a minimum current ratio and not to sell fixed assets without the lender's approval. The firm may also be required to refrain from creating any additional charge on its assets.

- ***Liability-related covenants:*** The firm may be restrained from incurring additional debt or repay existing loan. It may be allowed to do so with the concurrence of the lender. The firm may also be required to reduce its debt-equity ratio by issuing additional equity and preference capital. The freedom of promoters to dispose of their shareholding may also be limited.
- ***Cash flow-related covenants:*** Lenders may restrain the firm's cash outflow by restricting cash dividends, capital expenditures, salaries and perks of managerial staff etc.
- ***Control-related covenants:*** Lenders expect that the firm's management will be competent enough to manage its operations. They may therefore provide for the effective organizational set-up and appointment of suitable staff and the broad-base Board of Directors. One special feature of term loans in this regard could be the provision for the appointment of nominee director by FIs. Nominee director may be appointed in case of those firms, which have been granted substantial financial help by FIs. His role is to safeguard the interests of FIs. The nominee director should keep himself well acquainted with the operations of the company without undue interference. He should contribute to the company's policies and sound financial management.

(v) Convertibility: FIs in India provide huge amount of loan assistance to the companies. Because of the substantial financial stake of these institutions, in the past they had the option to convert a part of the rupee loan into equity. FIs would state the terms and conditions of the conversion. FIs in India insist on the option of converting loans into equity.

(vi) Repayment schedule: Repayment schedule has been discussed at length in the next section.

5.4.2 Repayment Schedule

The repayment schedule or **loan amortization** specifies the time schedule for paying interest and principal. Payment of loan is a legal obligation. Interest charges are tax deductible, in the hands of the borrowing firm. The general rate of interest on term loans in India is above 14 or 15 per cent. For companies undertaking their projects in specified backward areas, loans at concessional interest rate (usually 1½ per cent lower) are available.

The common practice in India to amortize loan is to require repayment of principal in equal instalments (semi-annual or annual) and pay interest on the unpaid (outstanding) loan. Thus, interest payment will decline over the years, and the total

loan payment (interest plus principal) will not be equal in each period. Repayment of loan in instalments saves the company from repaying huge amount at the end of loan maturity. Such payments are called 'balloon payments'.

Consider an example. Suppose a company negotiates a ₹ 3 crore loan for eight years from FIs. The interest rate will be 14 per cent per annum on the outstanding balance. The principal will be repaid in 8 equal year-end instalments. What is the payment schedule?

The payment schedule will include both interest and principal payment. Interest will be calculated on the outstanding balance on loan. Note that ₹ 3 crore was borrowed in the beginning of first year; therefore, the interest charges at the end of the year will be: 0.14 × 3 = ₹ 0.42 crore. The instalments of principal will be: 3/8 = ₹ 0.375 crore. Thus, loan balance at the end of first year will be: 3.0 – 0.375 = ₹ 2.62. This balance will be the basis for calculating interest next year. Calculations are shown in Table 5.1.

Table 5.1 *Loan Amortization Schedule (Equal Principal Repayment)*

(₹' 000)

Year	Loan in the Beginning	Principal Repayment	Interest	Loan Payment (3 + 4)	Loan at the end (2 – 5)
(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
1	30,000	3,750	4,200	7,950	26,250
2	26,250	3,750	3,675	7,425	22,500
3	22,500	3,750	3,150	6,900	18,750
4	18,750	3,750	2,625	6,375	15,000
5	15,000	3,750	2,100	5,850	11,250
6	11,250	3,750	1,575	5,325	7,500
7	7,500	3,750	1,050	4,800	3,750
8	3,750	3,750	525	4,275	0

An alternative way for amortizing loan is to require to pay equal loan instalments including both interest and principal payments. If this is done, we find out the amount of instalment by using the concept of capital recovery. In our example, we want to find out the answer to the following question: What should be the annuity for 8 years at 14 per cent rate of return to obtain a present value of ₹ 3 crore? We can write it in the form of following equation:

$$3 = \text{Annuity} \times \text{Present value annuity factor, i.e., 8 years, 14\%}$$

$$3 = A \times \text{PVFA}_{8,0.14}$$

$$A = 3 \left[\frac{1}{4.6389} \right]$$

$$= 3 \times 0.21556$$

$$= ₹\ 0.6467 \text{ crore}$$

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From the present value table, we can find $PVAF_{8, 0.14}$ equal to 4.6389. Reciprocal of this factor, 0.21556, is the capital recovery factor. The repayment schedule is as given in Table 5.2.

Table 5.2 *Loan Amortization Schedule (Equal Loan Payment)*

(₹ 000)

Year	Loan in the Beginning	Loan Payment	Interest	Principal Repayment (3 – 4)	Loan at the end (2 – 5)
(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
1	30,000	6,467	4,200	2,267	27,7333
2	27,733	6,467	3,883	2,584	25,149
3	25,149	6,467	3,521	2,946	22,203
4	22,203	6,467	3,108	3,359	18,844
5	18,844	6,467	2,638	3,829	15,015
6	15,015	6,467	2,102	4,365	10,650
7	10,650	6,467	1,491	4,976	5,674
8	5,674	6,467	794	5,673	0

5.4.3 Bridge Finance and Book Building

Bridge finance

'Bridge finance' can be referred to as a short-term loan that provides the borrower with a time period before financing the loan again. This means that the borrower is given the advantage of a bridge. More significantly, a bridging loan is also provided in advance to the borrower in a short time period. On one hand, a conventional finance institution might take a few months to sanction a loan to a borrower, whereas on the other, it would only take a few days for an experienced bridging finance company to advance a loan.

While someone borrows a bridging loan in a comparatively lesser duration of time than a conventional bank loan, the majority of bridging finance companies will still have the same number of formalities as a bank. These will comprise getting hold of an independent assessment of the property and conducting due thoroughness on the borrower's state of affairs. A bridging loan will also usually be secured by a mortgage/charge, in the same way as a loan from a bank.

Bridging finance is usually termed simply as a 'short-term loan'; or a 'bridge loan', or a 'swing loan', based on the precautions and authority, a 'caveat loan'. In the US, bridging loans are generally called 'hard money' loans. Another term for bridging finance can also sometimes be referred to as 'mezzanine finance'. Although in technical terminology, a bridging loan is often not a mezzanine or subordinated loan. As a short-term loan, bridging finance is generally for less than one year duration.

There are many reasons a borrower might need a real estate bridging loan, inclusive of:

- Financing the purchase of a property being auctioned
- Capitalizing on a prospect which requires a speedy resolution (for instance, purchasing from a recipient)
- Raising short-term capital aligned with equity in a property
- Financially supporting the renovation of a property

Book building

'Book building' process is a widespread practice that majority of developed countries have adopted to market their public proposals of equity shares of a company. Nevertheless, it is a transparent and cooperative price recognition method of early public offerings (IPOs) in which, the price of securities is set by the issuing organization along with the Book Running Lead Manager (BRLM), based on the feedback from investors as well as market brokers during a specific period.

5.5 BORROWINGS FROM INTERNATIONAL CAPITAL MARKET

External Commercial Borrowings (ECBs) refer to loans from commercial banks, supplier's credit, buyer's credit, fixed rate bonds, floating rate notes, credit from authorized export credit agencies, and loans from institutions such as IFC (International Finance Corporation), ADB (Asian Development Bank) and CDC (Commonwealth Development Corporation).

Guidelines for ECBs were first liberalized in India in 1997. Ever since then, corporate firms have been allowed to raise capital for expanding existing capacity, making new investments and finance working capital. All infrastructure and Greenfield projects are allowed to make use of ECB up to 35 per cent of total project expenses. The average maturity time of ECBs ranges from three to 5 to 7 years. ECBs are mostly used for:

- Project related cost of infrastructure projects.
- License fee payments in the telecom sector.
- Foreign exchange cost of capital goods and services.

Those corporate firms which manage to acquire ECBs with maturity time of 10 to 20 years are able to use the capital for general corporate purposes. However, the funds acquired through ECBs cannot be invested in stock markets or for dabbling in real estate. How much an ECB can be mobilized depends on the relative value of current rates of interest in India and other countries. The cost of an ECB should ideally include the margin of depreciation/appreciation in the value of the rupee abroad. Also, if interest rates in India are low, the demand for the

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ECB would also be low. Commonly, it has been seen that when the value of the rupee falls, the value of the ECB increases. A corporate can only opt for an ECB only after they have obtained government approval. The government has specifies limits on the overall ECB that can be financed in a particular year.

5.5.1 Tax Considerations in Financing Decision Areas

Equity capital as a long term source has an advantage that dividends tax is exempt for investors. However, dividends are not tax deductible—hence cost of this capital is higher than other sources.

'Preference capital' is a hybrid form of financing, where dividends are not tax deductible, but there is no obligation to pay dividend either. It is an expensive source since dividends not tax deductible. 'Debt' is a long-term source of finance where the interest on debt is tax deductible. Therefore, this form of financing is relatively cheaper that equity.

Check Your Progress

3. What is the purpose of a term loan?
4. State the usage of External Commercial Borrowings (ECBs).

5.6 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Capital issue or issued capital refers to the number of shares issued by an organization to its shareholders.
2. Loan syndication is an arrangement where a group of banks consider loan to a borrower for larger amount.
3. The purpose of term loans is mostly to finance the company's capital expenditures.
4. External Commercial Borrowings (ECBs) are mostly used for :
   - Project related cost of infrastructure projects.
   - License fee payments in the telecom sector.
   - Foreign exchange cost of capital goods and services.

5.7 SUMMARY

- Capital issue or issued capital refers to the number of shares issued by an organization to its shareholders.
- An organization can either sell all its shares or a portion of it depending on the need for finance. It is also called as a subscribed capital, as the number

of shares purchased by the shareholders represents the amount of money invested in the firm.

- The Securities and Exchange Board of India was established on April 12, 1992 in accordance with the provisions of the Securities and Exchange Board of India Act, 1992.
- Loan syndication is an arrangement where a group of banks consider loan to a borrower for larger amount.
- Debt capital of a company may consist of either debentures or bonds which are issued to public for subscription, or term loans, which are obtained directly from banks and financial institutions.
- The repayment schedule or loan amortization specifies the time schedule for paying interest and principal.
- 'Bridge finance' can be referred to as a short-term loan that provides the borrower with a time period before financing the loan again. This means that the borrower is given the advantage of a bridge.
- Bridging finance is usually termed simply as a 'short-term loan'; or a 'bridge loan', or a 'swing loan', based on the precautions and authority, a 'caveat loan'. In the US, bridging loans are generally called 'hard money' loans.
- 'Book building' process is a widespread practice that majority of developed countries have adopted to market their public proposals of equity shares of a company.
- External Commercial Borrowings (ECBs) refer to loans from commercial banks, supplier's credit, buyer's credit, fixed rate bonds, floating rate notes, credit from authorized export credit agencies, and loans from institutions such as IFC (International Finance Corporation), ADB (Asian Development Bank) and CDC (Commonwealth Development Corporation).
- Equity capital as a long term source has an advantage that dividends tax is exempt for investors. However, dividends are not tax deductible—hence cost of this capital is higher than other sources.

5.8 KEY WORDS

- **Bridge finance:** It can be referred to as a short-term loan that provides the borrower with a time period before financing the loan again.
- **Book building:** It is a widespread practice that majority of developed countries have adopted to market their public proposals of equity shares of a company.
- **Loan amortization:** It specifies the time schedule for paying interest and principal.

5.9 SELF ASSESSMENT QUESTIONS AND EXERCISES

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Short Answer Questions

1. Write a short note on the nature and purpose of capital issues.
2. Mention the SEBI guidelines for issue of fresh share capital.
3. What are the advantages of loan syndication?

Long Answer Questions

1. Discuss the features of term loans.
2. What is a balloon payment? Explain with the help of an example.
3. Critically analyse the tax considerations in financing decision areas.

5.10 FURTHER READINGS

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UNIT 6 COST OF CAPITAL

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Structure

6.0 INTRODUCTION

The opportunity cost of capital (or simply, the cost of capital) for a project is the discount rate for discounting its cash flows. The project's cost of capital is the minimum required rate of return on funds committed to the project, which depends on the riskiness of its cash flows. Since the investment projects undertaken by a firm may differ in risk, each one of them will have its own unique cost of capital. It should be clear at the outset that the cost of capital for a project is defined by its risk, rather than the characteristics of the firm undertaking the project.

The firm represents the aggregate of investment projects undertaken by it. Therefore, the firm's cost of capital will be the overall, or average, required rate of return on the aggregate of investment projects. Thus the firm's cost of capital is not the same thing as the project's cost of capital. Can we use the firm's cost of capital for discounting the cash flows of an investment project? The firm's cost of capital can be used for discounting the cash flows of those investment projects, which have risk equivalent to the average risk of the firm. As a first step, however, the firm's cost of capital can be used as a standard for establishing the required rates of return of the individual investment projects. In the absence of a reliable formal procedure of calculating the cost of capital for projects, the firm's cost of capital can be adjusted upward or downward to account for risk differentials of investment projects. That is, an investment project's required rate of return may be equal to the firm's cost of capital plus or minus a risk adjustment factor, depending on whether the project's risk is higher or lower than the firm's risk. There does exist a methodology to calculate the cost of capital for projects.

In this unit, you will study about the significance of cost of capital, cost of preference capital, cost of equity capital, weighted average cost of capital, tax, capital structure and value nexus and EBIT –EPS analysis.

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6.1 OBJECTIVES

After going through this unit, you will be able to:

- Analyse the significance of cost of capital
- Define cost of preference capital
- Compute cost of equity capital
- Define weighted average cost of capital
- Examine tax, capital structure and value nexus
- Give examples of EBIT –EPS Analysis

6.2 SIGNIFICANCE OF COST OF CAPITAL

We should recognize that the cost of capital is one of the most difficult and disputed topics in the finance theory. Financial experts express conflicting opinions as to the correct way in which the cost of capital can be measured. Irrespective of the measurement problems, it is a concept of vital importance in the financial decision-making. It is useful as a standard for:

- evaluating investment decisions,
- designing a firm's debt policy, and
- appraising the financial performance of top management.

Investment Evaluation

The primary purpose of measuring the cost of capital is its use as a financial standard for evaluating the investment projects. In the NPV method, an investment project is accepted if it has a positive NPV. The project's NPV is calculated by discounting its cash flows by the cost of capital. In this sense, the cost of capital is the discount rate used for evaluating the desirability of an investment project. In the IRR method, the investment project is accepted if it has an internal rate of return greater than the cost of capital. In this context, the cost of capital is the minimum required rate of return on an investment project. It is also known as the cut-off rate or the hurdle rate.

An investment project that provides a positive NPV when its cash flows are discounted by the cost of capital makes a *net* contribution to the wealth of shareholders. If the project has zero NPV, it means that its cash flows have yielded a return just equal to the cost of capital, and the acceptance or rejection of the project will not affect the wealth of shareholders. The cost of capital is the minimum required rate of return on the investment project that keeps the present wealth of

shareholders unchanged. It may be, thus, noted that the cost of capital represents a financial standard for allocating the firm's funds, supplied by owners and creditors, to the various investment projects in the most efficient manner.

Designing debt policy

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The debt policy of a firm is significantly influenced by the cost consideration. As we shall learn later on, debt helps to save taxes, as interest on debt is a tax-deductible expense. The interest tax shield reduces the overall cost of capital, though it also increases the financial risk of the firm. In designing the financing policy, that is, the proportion of debt and equity in the capital structure, the firm aims at maximizing the firm value by minimizing the overall cost of capital.

The cost of capital can also be useful in deciding about the methods of financing at a point of time. For example, cost may be compared in choosing between leasing and borrowing. The other equally important considerations are control and risk.

Performance appraisal

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 profitability 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 section dealing with these decisions show their linkages with the cost of capital.

6.2.1 The Concept of the Opportunity Cost of Capital

Decision-making is a process of choosing among alternatives. In the investment decisions, an individual or a manager encounters innumerable competing investment opportunities to choose from. For example, you may invest your savings of ₹ 1,000 either in 7 per cent and 3-year postal certificates, or in 6.5 per cent 3-year fixed deposit in a nationalized bank. In both the cases, the government assures the payment, 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 7 per cent in case of your investment. The opportunity cost is the rate of return foregone on the next best alternative investment opportunity of comparable risk. Thus, the required rate of return on an investment project is an opportunity cost.

Shareholders' opportunities and values

In the case of companies, there is a divorce between management and ownership. In an all-equity financed company, management makes investment decisions, but

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shareholders supply the capital. Therefore, a question may be raised: whose opportunity cost (or the required rate of return) should be considered in evaluating the investment projects? Since the firm's objective is to maximize the shareholder's wealth, the investment projects should be analysed in terms of their values to shareholders. To appreciate this point, suppose you are the owner-manager of a firm. You make the investment decisions and you supply funds to finance the investment projects. You will use your required rate of return to evaluate the investment projects. Your required rate of return will depend on investment opportunities of equivalent risk available to you in the financial markets. Thus the required rate of return (or the opportunity cost of capital) is market-determined rate.

Suppose you appoint a manager to manage your business. He has the responsibility for the investment decisions. Whose opportunity cost should the manager use? Since you are the supplier of funds and you own the firm and the manager is acting on your behalf, you will require him to use your required rate of return in making investment decisions. If he is unable to earn returns equal to your required rate of return, you can ask him to return the money to you, which you can invest in securities in the financial markets and earn the required rate of return.

Assume that you convert your firm into a joint-stock company where you invite other shareholders to contribute the capital and share ownership with them. Now many shareholders own the firm. The manager should consider *all* owners' (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. Thus, management acts as an agent of shareholders. It should evaluate investment opportunities using the shareholders' opportunity cost; that is, the rate the shareholders would use if they were themselves appraising the investment opportunities. Hence, in an all-equity financed firm, the equity capital of ordinary shareholders is the only source to finance investment projects, the firm's cost of capital is equal to the opportunity cost of equity capital, which will depend only on the business risk of the firm.

Creditors' claims and opportunities

In practice, both shareholders and creditors (debt-holders) supply funds to finance a firm's investment projects. Investors hold different claims on the firm's assets and cash flows, and thus, they are exposed to different degrees of risk. Creditors have a priority claim over the firm's assets and cash flows. The firm is under a legal obligation to pay interest and repay principal. Debt holders are, however, exposed to the risk of default. Since the firm's cash flows are uncertain, there is a probability that it may default on its obligation to pay interest and principal. Preference shareholders hold claim prior to ordinary shareholders but after debt holders. Preference dividend is fixed and known, and the firm will pay it after paying interest but before paying any ordinary dividend. Because preference dividend is

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subordinated to interest, preference capital is more risky than debt. Ordinary shareholders supply capital, either in the form of retained earnings or by purchasing new shares. Unlike creditors, they are owners of the firm and retain its control. They delegate powers to management to make investment decisions on their behalf in such a way that their wealth is maximized. However, ordinary shareholders have claim on the residual assets and cash flows. The payment of ordinary dividend is discretionary. Ordinary shareholders may be paid dividends from cash remaining after interest and preference dividends have been paid. Also, the market price of ordinary share fluctuates more widely than that of the preference share and debt. Thus, ordinary share is more risky than both preference share and debt. Various forms of corporate debt can also be distinguished in terms of their differential riskiness. If we compare corporate bonds and government bonds, the latter are less risky since it is very unlikely that the government will default in its obligation to pay interest and principal.

Risk differences in shareholders' and creditor claims

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. Preference share is more risky than debt; therefore, its required rate of return will be higher than that of debt. The risk-return relationship for various securities is shown in Figure 6.1. It may be observed in the figure that the required rate of return of any security is composed of two rates—a risk-free rate and a risk-premium. A risk-free will require compensation for time value and its risk-premium will be zero. Government securities, such as the treasury bills and bonds, are examples of the risk-free securities. Investors expect higher rates of return on risky securities. The higher the risk of a security, the higher will be its risk-premium and therefore, a higher required rate of return.

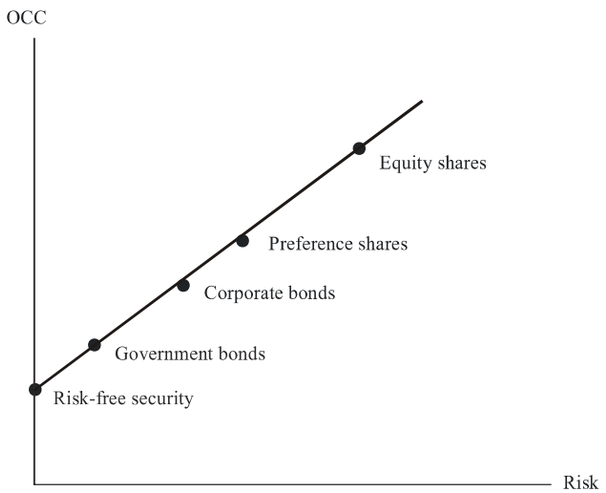

Fig. 6.1 *Risk-Return Relationships of Various Securities*

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Since the firm sells various securities to investors to raise capital for financing investment projects, it is, therefore, necessary that investment projects to be undertaken by the firm should generate *at least* sufficient net cash flow to pay investors—shareholders and debt holders—their required rates of return. In fact, investment projects should yield more cash flows than to just satisfy the investors' expectations, in order to make a net contribution to the wealth of ordinary shareholders. 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 emphasized that the rate of return required by all investors will be an overall rate of return—a weighted rate of return. Thus, the firm's cost of capital is the 'average' of the opportunity costs (or required rates of return) of various securities, which have claims on the firm's assets. This rate reflects both the business (operating) risk and the financial risk resulting from debt capital. Recall that the cost of capital of an all-equity financed firm is simply equal to the ordinary shareholders' required rate of return, which reflects only the business risk.

General formula for the opportunity cost of capital

How does a firm know about the required rates of return of investors? The required rates of return are market-determined. They are established in the capital markets by the actions of competing investors. The influence of market is direct in the case of new issue of ordinary and preference shares and debt. The market price of securities is a function of the return expected by investors. The demand and supply forces work in such a way that equilibrium rates are established for various securities. Thus, the opportunity cost of capital is given by the following formula:

$$I_0 = \frac{C_1}{(1+k)} + \frac{C_2}{(1+k)^2} + \cdots + \frac{C_n}{(1+k)^n} \quad (1)$$

Here, I_0 is the capital supplied by investors in period 0 (it represents a net cash inflow to the firm), C_n are returns expected by investors (they represent cash outflows to the firm) and k is the required rate of return or the cost of capital.

In terms of Equation (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 Equation (1) represent the returns that investors could earn on the alternative investment opportunities of equivalent risk in the financial markets.

In the case of retained earnings, firms are not required to pay any dividend; no cash outflow takes place. Therefore, retained earnings have no explicit cost of capital. But they have a definite opportunity cost. The opportunity cost of retained earnings is the rate of return, which the ordinary shareholders would have earned on these funds if they had been distributed as dividends to them. The firm must earn a rate of return on retained funds which is at least equal to the rate that shareholders could earn on these funds to justify their retention.

6.2.2 Weighted Average Cost of Capital vs Specific Costs of Capital

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A firm obtains capital from various sources. As explained earlier, because of the risk differences and the contractual agreements between the firm and investors, the cost of capital of each source of capital differs. The cost of capital of each source of capital is known as component, or specific, cost of capital. The combined cost of all sources of capital is called overall, or average, cost of capital. The component costs are combined according to the weight of each component capital to obtain the average costs of capital. Thus, the overall cost is also called the weighted average cost of capital (WACC).

Suppose a firm has the cost of equity of 11 per cent and cost of debt of 6 per cent. In the beginning of the year, the firm considers Project *A*, which has an expected rate of return of 10 per cent. The firm decides to finance this project by debt. If the component cost of capital is used to evaluate Project *A*, the firm will accept it since its IRR (10 per cent) is greater than the component cost (6 per cent). After some time, the company considers Project *B*, which has same risk as Project *A* and also has an expected rate of return of 10 per cent. The firm finds that Project *A* has exhausted its borrowings capacity, and hence, it will have to raise equity funds to finance Project *B*. Using the component cost of capital as the cut-off rate, the firm will reject Project *B* since its expected rate of return (10 per cent) is less than the component cost (11 per cent). Thus, out of two projects that are economically identical, the firm accepts one and rejects another simply because it associates the method of financing with the investment projects. What is wrong with this policy? It fails to consider the relationships between component costs. The various sources of capital are related to each other. The firm's decision to use debt in a given period reduces its future debt capacity as well as increases risk of shareholders. The shareholders will require a higher rate of return to compensate for the increased risk. Similarly, the firm's decision to use equity capital would enlarge its potential for borrowings in the future. Over the long run, the firm is expected to maintain a balance between debt and equity. The mix of debt and equity is called the firm's **capital structure**. Because of the connection between the sources of capital and the firm's desire to have a target capital structure in the long run, it is generally agreed that the cost of capital should be used in the composite, overall sense. That is, in terms of the weighted average cost of capital.

The overall cost of capital is the weighted average cost of the various sources of capital. For example, if the long-run proportions of debt and equity in the above mentioned example respectively are 60 per cent and 40 per cent, then the combined cost of capital is: $0.06 \times 0.60 + 0.11 \times 0.40 = 0.8$ or 8 per cent. Thus, both Projects *A* and *B* should be accepted since each of them is expected to yield a rate of return higher than the overall cost of capital. Accepting both Projects *A* and *B* will maximize the shareholders' wealth.

In practice, firms do not use the same debt-equity mix to finance their capital expenditures every year. They raise funds in 'lumps'. They may issue bonds at one

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time and at another time, they may either issue ordinary shares or may use retained earnings. The target capital structure is a policy decision. Firms may not hold the target capital structure in a particular year. But they maintain it in the long run. Therefore, in spite of 'lumpy' financing by firms at different points in time, the overall cost of capital, rather than the component cost of capital, should be used in evaluating investment projects. It is not correct to associate a particular source of financing with a particular investment project.

Like the firm's WACC, we can also calculate the project's WACC. The debt capacity of the project may be different from the firm's overall debt capacity. Therefore, the capital structure of the project should be considered in calculating its WACC. In practice, financial managers, for convenience, may use the firm's capital structure to estimate the project's WACC.

You must remember that the relevant cost in the investment decisions is the future cost or the marginal cost. Marginal cost is the new or the incremental cost that the firm incurs if it were to raise capital now, or in the near future. The historical cost that was incurred in the past in raising capital is not relevant in financial decision-making. Historical costs may be significant to the extent that they help in predicting the future costs and in providing an evaluation of the past performance when compared with standard, or predetermined, costs.

6.2.3 Determining Component Cost of Capital

Generally, the component cost of a specific source of capital is equal to the investors' required rate of return, and it can be determined by using Equation (1). But the investors' required rate of return should be adjusted for taxes in practice for calculating the cost of a specific source of capital to the firm. In the investment analysis, net cash flows are computed on an after-tax basis, therefore, the component costs, used to determine the discount rate, should also be expressed on an after-tax basis.

Cost of debt

A company may raise debt in a variety of ways. It may borrow funds from financial institutions or public either in the form of public deposits or debentures (bonds) for a specified period of time at a certain rate of interest. A debenture or bond may be issued at par or at a discount or premium as compared to its face value. The contractual rate of interest or the coupon rate forms the basis for calculating the cost of debt.

Debt issued at par

The before-tax cost of debt is the rate of return required by lenders. It is easy to compute before-tax cost of debt issued and to be redeemed at par; it is simply equal to the *contractual* (or *coupon*) *rate of interest*. For example, a company decides to sell a new issue of 7-year 15 per cent bonds of ₹ 100 each at par. If the

company realizes the full face value of ₹ 100 bond and will pay ₹ 100 principal to bondholders at maturity, the before-tax cost of debt will simply be equal to the rate of interest of 15 per cent. Thus:

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$$k_d = i = \frac{\text{INT}}{B_0} \tag{2}$$

Here, k_d is the before-tax cost of debt, i is the coupon rate of interest, B_0 is the issue price of the bond (debt) and in Equation (2) it is assumed to be equal to the face value (F), and INT is the amount of interest. The amount of interest payable to the lender is always equal to:

Interest = Face value of debt × Interest rate

The before-tax cost of bond in the example is:

$$k_d = \frac{₹\ 15}{₹\ 100} = 0.15 \text{ or } 15\%$$

We could arrive at same results as above by using Equation (1): cash outflow are ₹ 15 interest per year for 7 years and ₹ 100 at the end of 7th year in exchange for ₹ 100 now. Thus:

$$100 = \frac{15}{(1+k_d)} + \frac{15}{(1+k_d)^2} + \frac{15}{(1+k_d)^3} + \frac{15}{(1+k_d)^4} + \frac{15}{(1+k_d)^5} + \frac{15}{(1+k_d)^6} + \frac{15}{(1+k_d)^7} + \frac{100}{(1+k_d)^7}$$

$$100 = \sum_{t=1}^{n} \frac{15}{(1+k_d)^t} + \frac{100}{(1+k_d)^7}$$

$$100 = 15\ (\text{PVFA}_{7,\ k_d}) + 100\ (\text{PVF}_{7,\ k_d})$$

By trial and error, we find that the discount rate (k_d), which solves the equation, is 15 per cent:

$$100 = 15\ (4.160) + 100\ (0.376) = 62.40 + 37.60 = 100$$

Clearly, the before-tax cost of bond is the rate, which the investment should yield to meet the outflows to bondholders.

Debt Issued at Discount or Premium

Equations (1) and (2) will give identical results only when debt is issued at par and redeemed at par. Equation (1) can be rewritten as follows to compute the before-tax cost of debt:

$$B_0 = \sum_{t=1}^{n} \frac{\text{INT}_t}{(1+k_d)^t} + \frac{B_n}{(1+k_d)^n} \tag{3}$$

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Here, B_n is the repayment of debt on maturity and other variables as defined earlier. Equation (3) can be used to find out the cost of debt whether debt is issued at par or discount or premium, i.e., $B_0 = F$ or $B_0 > F$ or $B_0 < F$. Let us consider an example.

Illustration 6.1: Cost of a Bond Sold at Discount

Assume that in the preceding example of 7-year 15 per cent bonds, each bond is sold below par for ₹ 94. Using Equation (3), k_d is calculated as:

$$94 = \sum_{t=1}^{7} \frac{15}{(1+k_d)^t} + \frac{100}{(1+k_d)^7}$$

$$94 = 15(\text{PVF A}_{7,\,k_d}) + 100(\text{PVF}_{7,\,k_d})$$

By trial and error, k_d = 16.5 per cent. Let us try 17%:

$$15(3.922) + 100(0.333)$$

$$58.83 + 33.30 = 91.13 < 94$$

Since PV at 17% is less than the required PV (₹ 94), let us try 16%

$$= 15(4.038) + 100(0.354) = 60.57 + 35.40 = 95.97 > 94$$

The discount rate k_d should lie between 16 – 17%. By interpolation, we find:

PV required		94.00
PV at 16%		1.97
		95.97
PV at 17%		3.84
		92.13

$$k_d = 16\% + (17\% - 16\%)\frac{1.97}{3.84} = 16.5\%$$

$k_d = 16.5$ per cent, Equation (3) is satisfied

$$94 = 15(3.980) + 100(0.343) = 59.70 + 34.30 = 94$$

If the discount or premium is adjusted for computing taxes, the following short-cut method can also be used to calculate the before-tax cost of debt:

$$k_d = \frac{\text{INT} + \frac{1}{n}(F - B_0)}{\frac{1}{2}(F + B_0)} \qquad (4)$$

Thus, using data of Illustration 3.1, we obtain:

$$k_d = \frac{15 + \frac{1}{7}(100 - 94)}{\frac{1}{2}(100 + 94)} = \frac{15.86}{97} = 0.164 \quad \text{or} \quad 16.4\%$$

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Note that the short-cut method gives approximately the same result as Equation (3). The principal drawback of the method is that it does not consider the sinking fund payments or the annual compounding.

It should be clear from the preceding discussion that the before-tax cost of bond to the firm is affected by the issue price. The lower the issue price, the higher will be the before-tax cost of debt. The highly successful companies may sell bond or debenture at a premium ($B_0 > F$); this will pull down the before-tax cost of debt.

Tax adjustment

The interest paid on debt is tax deductible. The higher the interest charges, the lower will be the amount of tax payable by the firm. This implies that the government indirectly pays a part of the lender's required rate of return. As a result of the interest tax shield, the after-tax cost of debt to the firm will be substantially less than the investors' required rate of return. The before-tax cost of debt, k_d, should, therefore, be adjusted for the tax effect as follows:

$$\text{After-tax cost of debt} = k_d(1-T) \tag{5}$$

Here, T is the corporate tax rate. If the before-tax cost of bond in our example is 16.5 per cent, and the corporate tax rate is 35 assumed per cent, the after-tax cost of bond will be:

$$k_d(1-T) = 0.1650\ (1-0.35) = 0.1073 \quad \text{or} \quad 10.73\%$$

It should be noted that the tax benefit of interest deductibility would be available only when the firm is profitable and is paying taxes. An unprofitable firm is not required to pay any tax. It would not gain any tax benefit associated with the payment of interest, and its true cost of debt is the before-tax cost.

It is important to remember that in the calculation of the average cost of capital, the after-tax cost of debt must be used, not the before-tax cost of debt.

Illustration 6.2: Cost of a Bond Sold at Discount and Redeemable at Premium

A 7-year, ₹ 100 debenture of a firm can be sold for a net price of ₹ 97.75. The 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.

The annual interest will be: $F \times i$ = ₹ 100 × 0.15 = ₹ 15, and maturity price will be: ₹ 100 (1.05) = ₹ 105. We can use Equation (3) to compute the after-tax cost of debenture:

$$97.75 = \sum_{t=1}^{n} \frac{15}{(1+k_d)} + \frac{105}{(1+k_d)^7}$$

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:

$$k_d(1-T) = 0.16(1-0.35) = 0.104 \quad \text{or} \quad 10.4\%$$

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Cost of the existing debt

Sometimes a firm may like to compute the "current" cost of its existing debt. In such a case, the cost of debt should be approximated by the current market yield of the debt. Suppose that a firm has 11 per cent debentures of ₹ 100,000 (₹ 100 face value) outstanding at 31 December 2009 to be matured on 31 December 2014. If a new issue of debentures could be sold at a net realizable price of ₹ 80 in the beginning of 2010, the cost of the existing debt, using short-cut method (Equation 4), will be

$$k_d = \frac{11+1/5(100-80)}{1/2(100+80)} = \frac{15}{90} = 0.167 \quad \text{or} \quad 16.7\%$$

If $T = 0.35$, the after-tax cost of debt will be:

$$k_d(1-T) = 0.167(1-0.35) = 0.109 \text{ or } 10.9\%.$$

6.3 COST OF PREFERENCE CAPITAL

The measurement of the cost of preference capital poses some conceptual difficulty. In the case of debt, there is a binding legal obligation on the firm to pay interest, and the interest constitutes the basis to calculate the cost of debt. However, in the case of preference capital, payment of dividends is not legally binding on the firm and even if the dividends are paid, it is not a charge on earnings; rather it is a distribution or appropriation of earnings to preference shareholders. One may, therefore, be tempted to conclude that the dividends on preference capital do not constitute cost. This is not true.

The cost of preference capital is a function of the dividend expected by investors. Preference capital is never issued with an intention not to pay dividends. Although it is not legally binding upon the firm to pay dividends on preference capital, yet it is generally paid when the firm makes sufficient profits. The failure to pay dividends, although does not cause bankruptcy, yet it can be a serious matter from the ordinary shareholders' point of view. The non-payment 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 firm may find difficulty in raising funds by issuing preference or equity shares. Also, 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.

NOTES

Irredeemable 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:

$$k_p = \frac{\text{PDIV}}{P_0} \tag{6}$$

Here, k_p is the cost of preference share, PDIV is the expected preference dividend, and P_0 is the issue price of preference share.

Illustration 6.3: Cost of Irredeemable Preference Share

A company issues 10 per cent irredeemable preference shares. The face value per share is ₹ 100, but the issue price is ₹ 95. What is the cost of a preference share? What is the cost if the issue price is ₹ 105?

We can compute cost of a preference share as follows:

Issue price ₹ 95:

$$k_p = \frac{\text{PDIV}}{P_0} = \frac{10}{95} = 0.1053 \text{ or } 10.53\%$$

Issue price ₹ 105:

$$k_p = \frac{\text{PDIV}}{P_0} = \frac{10}{105} = 0.0952 \text{ or } 9.52\%$$

Redeemable preference share

Redeemable preference shares (that is, preference shares with finite maturity) are also issued in practice. A formula similar to Equation (3) can be used to compute the cost of redeemable preference share:

$$P_0 = \sum_{t=1}^{n} \frac{\text{PDIV}_t}{(1+k_p)^t} + \frac{P_n}{(1+k_p)^n} \tag{7}$$

The cost of preference share is not adjusted for taxes because preference dividend is paid after the corporate taxes have been paid. Preference dividends do not save any taxes. Thus, the cost of preference share is automatically computed on an after-tax basis. Since interest is tax deductible and preference dividend is not, the after-tax cost of preference share is substantially higher than the after-tax cost of debt.

Check Your Progress

1. What is the basis for calculation of cost of debt?
2. What is the primary purpose of measuring the cost of capital?

6.4 COST OF EQUITY CAPITAL

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Firms may raise equity capital internally by retaining earnings. Alternatively, they could distribute the entire earnings to equity shareholders and raise equity capital externally by issuing new shares. In both cases, shareholders are providing funds to the firms to finance their capital expenditures. Therefore, the equity shareholders' required rate of return would be the same whether they supply funds by purchasing new shares or by foregoing dividends, which could have been distributed to them. There is, however, a difference between retained earnings and issue of equity shares from the firm's point of view. The firm may have to issue new shares at a price lower than the current market price. Also, it may have to incur flotation costs. Thus, external equity will cost more to the firm than the internal equity.

Is equity capital free of cost?

It is sometimes argued that the equity capital is free of cost. The reason for such argument is that it is not legally binding for firms to pay dividends to ordinary shareholders. Further, unlike the interest rate or preference dividend rate, the equity dividend rate is not fixed. It is fallacious to assume equity capital to be free of cost. As we have discussed earlier, equity capital involves an *opportunity cost*; ordinary shareholders supply funds to the firm in the expectation of dividends and capital gains commensurate with their risk of investment. The market value of the shares, determined by the demand and supply forces in a well functioning capital market, reflects the return required by ordinary shareholders. Thus, the shareholders' required rate of return, which equates the present value of the expected dividends with the market value of the share, is the cost of equity. The cost of external equity would, however, be more than the shareholders' required rate of return if the issue price were different from the market price of the share.

In practice, it is a formidable task to measure the cost of equity. The difficulty derives from two factors: *first*, it is very difficult to estimate the expected dividends; *second*, the future earnings and dividends are expected to grow over time. Growth in dividends should be estimated and incorporated in the computation of the cost of equity. The estimation of growth is not an easy task. Keeping these difficulties in mind, the methods of computing the cost of internal and external equity are discussed below.

Cost of internal equity: The dividend-growth model

A firm's internal equity consists of its retained earnings. The opportunity cost of the retained earnings is the rate of return 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:

$$P_0 = \frac{\text{DIV}_1}{k_e - g} \tag{8}$$

where $\text{DIV}_1 = \text{DIV}_0(1 + g)$.

Equation (8) can be solved for calculating the cost of equity k_e as follows:

$$k_e = \frac{\text{DIV}_1}{P_0} + g \tag{9}$$

The cost of equity is, thus, equal to the expected dividend yield (DIV_1/P_0) plus capital gain rate as reflected by expected growth in dividends (g). It may be noted that Equation (9) is based on the following assumptions:

- The market price of the ordinary share, P_0, is a function of expected dividends.
- The dividend, DIV_1, is positive (i.e., $\text{DIV}_1 > 0$).
- The dividends grow at a constant growth rate g, and the growth rate is equal to the return on equity, ROE, times the retention ratio, b (i.e., g = ROE × b).
- The dividend payout ratio [i.e., $(1 - b)$] is constant.

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 emphasized again that the cost of retained earnings will be equal to the shareholders' required rate of return since no flotation costs are involved.

Illustration 6.4: Constant-Growth Model and the Cost of Equity

Suppose that the current market price of a company's share is ₹ 90 and the expected dividend per share next year is ₹ 4.50. If the dividends are expected to grow at a constant rate of 8 per cent, the shareholders' required rate of return is:

$$k_e = \frac{\text{DIV}_1}{P_0} + g$$

$$k_e = \frac{₹\ 4.50}{₹\ 90} + 0.08 = 0.05 + 0.08 = 0.13 \text{ or } 13\%$$

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If the company intends to retain earnings, it should at least earn a return of 13 per cent on retained earnings to keep the current market price unchanged.

Supernormal growth: A firm may pass through different phases of growth. Hence, dividends may grow at different rates in the 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:

$$P_0 = \sum_{t=1}^{n} \frac{\text{DIV}_0 (1 + g_s)^t}{(1 + k_e)^t} + \frac{P_n}{(1 + k_e)^n} \quad (10)$$

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:

$$P_n = \frac{\text{DIV}_{n+1}}{k_e - g_n} \quad (11)$$

When we multiply P_n by $1/(1 + k_e)^n$ we obtain the present value of P_n in year 0. Substituting Equation (11) in Equation (10), we get:

$$P_0 = \sum_{t=1}^{n} \frac{\text{DIV}_0 (1 + g_s)^t}{(1 + k_e)^t} + \frac{\text{DIV}_{n+1}}{k_e - g_n} \times \frac{1}{(1 + k_e)^n} \quad (12)$$

The cost of equity, k_e, can be computed by solving Equation (12) by trial and error.

Illustration 6.5: Cost of Equity: Two-Stage Growth

Assume that a company's share is currently selling for ₹ 134. Current dividends, DIV_0 are ₹ 3.50 per share and are expected to grow at 15 per cent over the next 6 years and then at a rate of 8 per cent forever. The company's cost of equity can be found out as follows:

$$134 = \sum_{t=1}^{6} \frac{3.50(1.15)^t}{(1+k_e)^t} + \frac{\text{DIV}_7}{(k_e - 0.08)} \times \frac{1}{(1+k_e)^6}$$

$$= \left[\frac{4.03}{(1+k_e)} + \frac{4.63}{(1+k_e)^2} + \frac{5.33}{(1+k_e)^3} + \frac{6.13}{(1+k_e)^4} + \frac{7.05}{(1+k_e)^5} + \frac{8.11}{(1+k_e)^6} \right] + \frac{8.11(1.08)}{(k_e - 0.08)} \times \frac{1}{(1+k_e)^6}$$

$$= 4.03(\text{PV A}_{1,\,k_e}) + 4.63(\text{PV A}_{2,\,k_e}) + 5.33(\text{PV A}_{3,\,k_e})$$
$$+6.13(\text{PV A}_{4,\,k_e}) \;\; +7.05(\text{PV A}_{5,\,k_e}) + 8.11(\text{PV A}_{6,\,k_e})$$
$$+\frac{8.76}{k_e - 0.08}(\text{PV A}_{6,\,k_e})$$

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By trial and error, we find that k_e = 0.12 or 12 per cent:

$$134 = 4.03(0.893) + 4.63(00.797) + 5.33(0.712) + 6.13(0.636)$$
$$+7.05(0.567) + 8.11(0.507) + \frac{8.76}{0.12 - 0.08}(0.507)$$

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:

$$k_e = \frac{\text{DIV}_1}{P_0} \tag{13}$$

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 (13) can also be written as:

$$k_e = \frac{\text{DIV}_1}{P_0} = \frac{\text{EPS}_1}{P_0} \quad (\text{since } g = 0) \tag{14}$$

This 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 external equity: The dividend-growth model

The firm's external equity consists of funds raised externally through public or right issues. The minimum rate of return, which the equity shareholders require on funds supplied by them by purchasing new shares to prevent a decline in the existing market price of the equity share, is the cost of external equity. The firm can induce the existing or potential shareholders to purchase new shares when it promises to earn a rate of return equal to:

$$k_e = \frac{\text{DIV}_1}{P_0} + g$$

Thus, the shareholders' required rate of return from retained earnings and external equity is the same. The cost of external equity is, however, greater than

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the cost of internal equity for one reason. The selling price of the new shares may be less than the market price. In India, the new issues of ordinary shares are generally sold at a price less than the market price prevailing at the time of the announcement of the share issue. Thus, the formula for the cost of new issue of equity capital may be written as follows:

$$k_e = \frac{\text{DIV}_1}{P_I} + g \qquad (15)$$

Here, P_I is the issue price of new equity. The cost of retained earnings will be less than the cost of new issue of equity if $P_0 > P_I$.

Illustration 6.6: Cost of Internal and External Equity

The share of a company is currently selling for ₹ 100. It wants to finance its capital expenditures of ₹ 100 million either by retaining earnings or selling new shares. If the company sells new shares, the issue price will be ₹ 95. The dividend per share next year, DIV_1, is ₹ 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 (9) can be used to calculate the cost of internal equity:

$$k_e = \frac{₹\ 4.75}{₹\ 100} + 0.06 = 0.0475 + 0.06 = 0.1075 \text{ or } 10.75\%$$

The cost of external equity can be calculated as follows:

$$k_e = \frac{₹\ 4.75}{₹\ 95} + 0.06 = 0.05 + 0.06 = 0.11 \text{ or } 11\%$$

It is obvious that the cost of external equity is greater than the cost of internal equity because of the under-pricing (cost of external equity = 11 per cent > cost of internal equity = 10.75 per cent).

Earnings–price ratio and the cost of equity

As a general rule, it is not theoretically correct to use the ratio of earnings to price as a measure of the cost of equity. The earnings–price (E/P) ratio does not reflect the true expectations of the ordinary shareholders. For example, if the current market price of a share is ₹ 500 (face value being ₹ 100) and the earning per share is ₹ 10, the E/P ratio will be: ₹ 10 ÷ ₹ 500 = 0.02 or 2 per cent. Does this mean that the expectation of shareholders is 2 per cent? They would, in fact, expect to receive a stream of dividends and a final price of the share that would result in a return significantly greater than the E/P ratio. Thus, the dividend valuation model gives the most of valid measure of the cost of equity.

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There are exceptions, however. One exception that we have already pointed out is the no-growth firms. The cost of equity in the case of the no-growth firms is equal to the expected E/P ratio:

$$k_e = \frac{DIV_1}{P_0} + g$$

$$= \frac{EPS_1(1-b)}{P_0} + br \qquad (\because g = br)$$

$$= \frac{EPS_1}{P_0} \qquad (\because b = 0)$$

Here, b is the earnings retention rate, EPS_1 is the expected earnings per share and r is the return investment (equity).

Another situation where the expected earnings–price ratio may be used as a measure of the cost of equity is expansion, rather than growth faced by the firm. A firm is said to be expanding, not growing, if the investment opportunities available to it are expected to earn a rate of return equal to the cost of equity. For example, Equation (9) may be written as follows:

$$P_0 = \frac{EPS_1(1-b)}{(k_e - rb)} \qquad (16)$$

If $r = k_e$, then

$$P_0 = \frac{EPS_1(1-b)}{(k_e - k_e b)} = \frac{EPS_1(1-b)}{k_e(1-b)} = \frac{EPS_1}{k_e}$$

and solving for k_e, we get $\qquad k_e = \frac{EPS_1}{P_0}$

Illustration 6.7: Earnings–Price Ratio and the Cost of Equity

A firm is currently earning ₹ 100,000 and its share is selling at a market price of ₹ 80. The firm has 10,000 shares outstanding and has no debt. The earnings of the firm are expected to remain stable, and it has a payout ratio of 100 per cent. What is the cost of equity? If the firm's payout ratio is assumed to be 60 per cent and that it earns 15 per cent rate of return on its investment opportunities, then what would be the firm's cost of equity?

In the first case, since expected growth rate is zero, we can use expected earnings–price ratio to compute the cost of equity. Thus:

$$k_e = \frac{₹\ 10}{₹\ 80} = 0.125 \text{ or } 12.5\%$$

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The earnings per share are ₹ 100,000 ÷ 10,000 = ₹ 10. If the firm pays out 60 per cent of its earnings, the dividends per share will be: ₹ 10 × 0.6 = ₹ 6, and the retention ratio will be 40 per cent. If the expected return on internal investment opportunities is 15 per cent, then the firm's expected growth is 0.40 × 0.15 = 0.06 or 6 per cent. The firm's cost of equity will be:

$$k_e = \frac{₹\ 6}{₹\ 80} + 0.06 = 0.075 + 0.06 = 0.135 \text{ or } 13.5\%$$

Cost of equity and the capital asset pricing model (CAPM)

CAPM provides an alternative approach for the calculation of the cost of equity. As per the CAPM, the required rate of return on equity is given by the following relationship:

$$k_e = R_f + (R_m - R_f)\beta_j \quad (17)$$

Equation (17) requires the following three parameters to estimate a firm's cost of equity:

- ***The risk-free rate*** **(R_f):** The yields on the government treasury securities are used as the risk-free rate. You can use returns either on the short-term or the long-term treasury securities. It is a common practice to use the return on the short-term treasury bills as the risk-free rate. Since investments are long-term decisions, many analysts prefer to use yields on long-term government bonds as the risk-free rate. You should always use the current risk-free rate rather than the historical average.
- ***The market risk premium*** **($R_m - R_f$):** The market risk premium is measured as the difference between the long-term, historical arithmetic averages of market return and the risk-free rate. Some people use a market risk premium based on returns of the most recent years. This is not a correct procedure since the possibility of measurement errors and variability in the short-term, recent data is high. The variability (standard deviation) of the estimate of the market risk premium will reduce when you use long series of market returns and risk-free rates. The historical market risk premium on shares in India was about 12 per cent when we use return on the long-term government bonds as the risk-free rate. If you use the current long-term government bonds as the risk-free rate, then the market risk premium should also be based on the historical average return of the long-term bond. On the other hand, if you use the current yield on long-term government bonds as the risk-free rate, then the market risk premium should also be based on the historical average yield of long-term government bonds. You should be consistent; you should match the estimation of the market risk premium with the maturity of the security used as the risk-free rate.
- ***The beta of the firm's share:*** Beta (β) is the systematic risk of an ordinary share in relation to the market. The share returns are regressed to the market

returns to estimate beta. A broad-based index like the BSE's Sensitivity Index (Sensex) is used as a proxy for the market.

Suppose in the year 2002 the risk-free rate is 6 per cent, the market risk premium is 9 per cent and beta of L&T's share is 1.54. The cost of equity for L&T is:

$$k_{L\&T} = 0.06 + 0.09 \times 1.54 = 0.1986 \approx 20\%$$

Cost of Equity: CAPM *vs* Dividend-Growth Model

The dividend-growth approach has limited application in practice because of its two assumptions. First, it assumes that the dividend per share will grow at a constant rate, g, forever. Second, the expected dividend growth rate, g, should be less than the cost of equity, k_e, to arrive at the simple growth formula. That is:

$$k_e = \frac{\text{DIV}_1}{P_0} + g$$

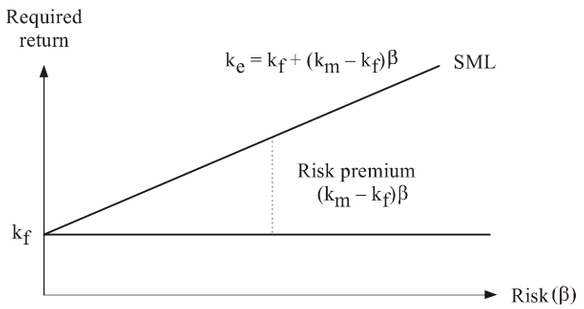

Fig. 6.1 *Cost of Equity under CAPM*

These assumptions imply that the dividend-growth approach cannot be applied to those companies, which are not paying any dividends, or whose dividend per share is growing at a rate higher than k_e, or whose dividend policies are highly volatile. The dividend-growth approach also fails to deal with risk directly. In contrast, the CAPM has a wider application although it is based on restrictive assumptions. The only condition for its use is that the company's share is quoted on the stock exchange. Also, all variables in the CAPM are market determined and except the company specific share price data, they are common to all companies. The value of beta 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 normally remain stable over time.

Check Your Progress

3. Why is the measurement of cost of equity considered difficult?
4. How is the market risk premium measured?

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6.5 WEIGHTED AVERAGE COST OF CAPITAL

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Once the component costs have been calculated, they are multiplied by the proportions of the respective sources of capital to obtain the weighted average cost of capital (WACC). The proportions of capital must be based on target capital structure. WACC is the composite, or overall cost of capital. You may note 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 funds equally in the capital structure.

The following steps are involved for calculating the firm's WACC:

- Calculate the cost of specific sources of funds.
- Multiply the cost of each source by its proportion in the capital structure.
- Add the weighted component costs to get the WACC.

In financial decision-making, the cost of capital should be calculated on an after-tax basis. Therefore, the component costs should be the after-tax costs. If we assume that a firm has only debt and equity in its capital structure, then the WACC (k_0) will be:

$$k_0 = k_d(1-T)w_d + k_e w_e$$

$$k_0 = k_d(1-T)\frac{D}{D+E} + k_e \frac{E}{D+E} \quad (18)$$

Here, k_0 is the WACC, $k_d\,(1-T)$ and k_e are, respectively, the after-tax cost of debt and equity, D is the amount of debt and E is the amount of equity. In a general form, the formula for calculating WACC can be written as follows:

$$k_0 = k_1 w_1 + k_2 w_2 + k_3 w_3 + \cdots \quad (19)$$

where $k_1, k_2, \ldots$ are component costs and $w_1, w_2, \ldots$ weights of various types of capital, employed by the company.

Weighted marginal cost of capital (WMCC): Marginal cost is the new or the incremental cost of new capital (equity and debt) issued by the firm. We assume that new funds are raised at new costs according to the firm's target capital structure. Hence, what is commonly known as the WACC is in fact the weighted marginal cost of capital (WMCC); that is, the weighted average cost of new capital given, the firm's target capital structure.

Book Value *vs* Market Value Weights

You should always use the market value weights to calculate WACC. In practice, firms do use the book value weights. Generally, there will be difference between

the book value and market value weights, and therefore, WACC will be different. WACC, calculated using the book-value weights, will be understated if the market value of the share is higher than the book value and vice versa.

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Illustration 6.8: Weighted Average Cost of Capital

Lohia Chemicals Ltd. has the following book value capital structure on 31 March 2004:

Source of finance	Amount (₹ '000)	Proportion (%)
Share capital	450,000	45
Reserves and surplus	150,000	15
Preference share capital	100,000	10
Debt	300,000	30
	1,000,000	100

The expected after-tax component costs of the various sources of finance for Lohia Chemicals Ltd. are as follows:

Source	Cost (%)
Equity	18.0
Reserve and surplus	18.0
Preference share capital	11.0
Debt	8.0

The weighted average cost of capital of Lohia Chemicals Ltd., based on the existing capital structure, is computed in Table 6.1.

Table 6.1 *Computation of Weighted Average Cost of Capital*

Weighted (%) (2)	Amount Cost (%) (3)	Proportion Source Cost (%) (4)	(5 = 3 × 4)	After-tax (₹ '000) (1)
Equity capital	450,000	45	18	8.1
Reserves & surplus	150,000	15	18	2.7
Preference capital	100,000	10	11	1.1
Debt	300,000	30	8	2.4
	1,000,000	100	WACC	14.3

Suppose Lohia Chemicals Ltd. has 45,000,000 equity shares outstanding and that the current market price per share is ₹ 20. Assume that the market values and the book values of debt and the preference share capital are the same. If the

component costs were the same as before, the market value weighted average cost of capital would be about 15 per cent:

Table 6.2 *Computation of Weighted Average Cost of Capital (Market-value Weights)*

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Source	Amount (₹ '000)	Proportion (%)	Cost (%)	Weighted Cost (%)
	(1)	(2)	(3)	(4) = (2) × (3)
Equity capital	900,000	69.2	18	12.5
Preference capital	100,000	7.7	11	0.8
Debt	300,000	23.1	8	1.8
	1,300,000	100	WACC	15.1

It should be noticed that the equity capital for Lohia Chemicals Ltd. 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 (15.1%) is higher than the book value weighted cost of capital (14.3%), because the market value of equity share capital (₹ 900,000,000) is higher than its book value (₹ 600,000,000).

Why do managers prefer the book value weights for calculating WACC? Besides the simplicity of the use, managers claim following advantages for the book value weights:

- Firms in practice set their target capital structure in terms of book values.
- The book value information can be easily derived from the published sources.
- The book value debt-equity ratios are analysed by investors to evaluate the risk 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 rates 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 theoretically superior to book-value weights. They reflect economic values and 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. A market value based target capital structure means that the amounts of debt and equity are continuously adjusted as the value of the firm changes.

6.6 TAX, CAPITAL STRUCTURE AND VALUE NEXUS

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MM's hypothesis that the value of the firm is independent of its debt policy is based on the critical assumption that corporate income taxes do not exist. In reality, corporate income taxes exist, and interest paid to debt-holders is treated as a deductible expense. Thus, interest payable by firms saves taxes. This makes debt financing advantageous. In their 1963 article, MM show that the value of the firm will increase with debt due to the deductibility of interest charges for tax computation, and the value of the levered firm will be higher than of the unlevered firm.

Let us suppose the opportunity cost of capital of the unlevered firm U, $k_u = k_a$ is 12.5 per cent and the after-tax operating income is ₹ 1,250.

The value of the unlevered firm *U* will be ₹ 10,000:

$$\text{Value of the unlevered firm} = \frac{\text{After-tax net operating income}}{\text{Unleverd firm's cost of capital}}$$

$$V_u = \frac{\text{NOI}(1-\text{T})}{K_a} = \frac{1,250}{0.125}$$

$$= ₹\ 10,000$$

What is the total value of the levered firm *L*? The after-tax income of the levered firm includes the after-tax operating income, NOI(1 – T) plus the interest tax shield, Tk_dD. Therefore, the value of the levered firm is the sum of the present value of the after-tax net operating income and the present value of interest tax shield. The after-tax net operating income, NOI (1 – T), of the levered firm L is equal to the after-tax income of the pure-equity (the unlevered) firm U. Hence, the opportunity cost of capital of a pure-equity firm, k_u or k_a, should be used to discount the stream of the after-tax operating income of the levered firm. Thus, the value of the levered firm L is equal to the value of the unlevered firm U plus the present value of the interest tax shield:

$$\text{Value of levered firm} = \text{Value of unlevered firm} + \text{PV of tax shield}$$

$$= 10,000 + 2,500 = 12,500$$

We can write the formula for determining the value of the levered firm as follows:

$$V_1 = \frac{\bar{X}(1-T)}{k_a} + \frac{TK_dD}{k_d} \quad (20)$$

$$V_1 = V_u + TD \quad (21)$$

Equation (20) implies that when the corporate tax rate, T, is positive (T > 0), the value of the levered firm will increase continuously with debt. Thus,

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theoretically the value of the firm will be maximized when it employs 100 per cent debt. This is shown in Figure 6.2.

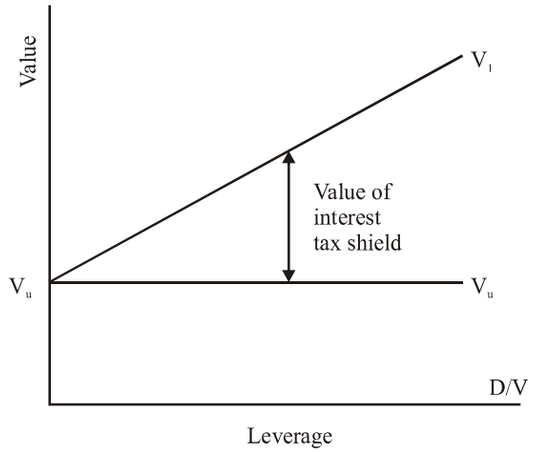

Fig. 6.2 *Value of the Levered Firm*

One significant implication of the MM hypothesis with the corporate tax in practice is that a firm without debt or with low debt can enhance its value if it exchanges debt for equity. We consider the example of Infosys Technologies Limited to illustrate this point.

Enhancing the Firm Value through Debt: Infosys Technologies Limited

Infosys is a highly regarded computer software company. The company's market value of equity is about ten times of its book value. It does not employ any debt. The summarized book and market value balance sheet of the company for year ending on 31 March 2008 is given in Table 6.3.

Table 6.3 *Infosys Technologies Limited: Balance Sheet as on 31 March 2008*

Book Value			**(₹ million)**
Equity	134,900	Total assets	134,900
Debt	0		
Total capital	134,900	Total assets	134,900
Market Value		**(₹ million)**	
Equity	823,620	Total assets	823,620
Debt	0		
Total capital	823,620	Total assets	823,620

What will happen to Infosys' market value if it decides to replace equity by debt? Suppose the company borrows ₹ 67,450 million at 10 per cent rate of interest and uses the money to buy back its shares (at the current market value). The book value total assets and capital will not show any changes; however, the

mix of capital will change. Debt will increase by ₹ 67,450 million and the book value equity will reduce to half by this amount. Suppose that debt is permanent and the corporate tax rate is 35 per cent. The company will save taxes on interest paid to debtholders: 0.35 × 0.10 × 67,450 = ₹ 2,361 million. The value of the tax saved is: 2,361/0.10 = ₹ 23,610 million. The firm is richer by this amount and other things remaining the same, the firm's market value should increase to ₹ 847,230 million. The increase in the firm's value is a gain to its shareholders. How? The market value of equity after recapitalization is: ₹ 823,620 – ₹ 67,450 + ₹ 23,610 = ₹ 779,780 million. Thus, the value of equity drops by ₹ 43,604 million (₹ 823,620 – ₹ 779,780 = ₹ 43,840 million). But remember that the shareholders received ₹ 67,450 million when the company bought back their shares. Hence, the net gain of shareholders is: ₹ 67,450 – ₹ 43,840 = ₹ 23,610 million—the value of interest tax shield.

Table 6.4 *Infosys Technologies Limited*

Book Value			**(₹ million)**
Equity	67,450	Total assets	134,900
Debt	67,450		
Total	134,900	Total	134,900

Market Value			**(₹ million)**
Equity	779,780	Total assets	823,620
Debt	67,450	Value of tax shield	23,610
Total	847,230	Total	847,230

Implications of the MM Hypothesis with Corporate Taxes

The MM's 'tax-corrected' view suggests that, because of the tax deductibility of interest charges, a firm can increase its value with leverage. Thus, the optimum capital structure is reached when the firm employs almost 100 per cent debt. But the observed experience does not entirely support this view. In practice, firms do not employ large amounts of debt, nor are lenders ready to lend beyond certain limits, which they decide. MM suggest that firms would adopt a target–debt ratio so as not to violate the limits of the debt level imposed by lenders. They state:

> …existence of a tax advantage for debt financing...does not necessarily mean that corporations should at all times seek to use the maximum possible amount of debt in their capital structures.... (T) here are, as we pointed out, limitations imposed by lenders, as well as many other dimensions in realworld 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.

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Why do companies not employ extreme level of debt in practice? There could be two possibilities: *First*, we need to consider the impact of both corporate and personal taxes for corporate borrowing. Personal income tax may offset the advantage of the interest tax shield. *Second*, borrowing may involve extra costs (in addition to contractual interest cost)—costs of financial distress—that may also offset the advantage of the interest shield. We examine these points in the following sections.

Check Your Progress

5. What is the difficulty in using market-value weights?
6. Mention the advantages of using book value weights.
7. State one significant implication of the MM hypothesis with the corporate tax in practice.

6.7 EBIT-EPS ANALYSIS

Suppose that Brightways Ltd may face any of the four possible economic conditions: very poor, poor, normal and good. The firm may have a 5 per cent chance of performing very poorly and earning a negative 5 per cent return on its total assets [EBIT = (–0.05) × ₹ 500,000 = –₹ 25,000]. If the economic condition is neither very poor nor normal, the firm may be able to manage a return of 10 or 15 per cent. It may have 10 per cent chance of earning 10 per cent return (EBIT = ₹ 50,000). Under normal economic conditions, the firm has a 35 per cent chance of earning 24 per cent return (EBIT = ₹ 120,000) and a 30 per cent chance of earning 32 per cent return (EBIT = ₹ 160,000). If the economic conditions are really favourable, the firm can earn as high as 60 per cent return (EBIT = ₹ 300,000). But there is only 5 per cent possibility that the economic conditions will prove to be so good. Brightways' possible levels of sales and operating expenses with their probability of occurrence are given in Table 6.5.

Table 6.5 *Expected Sales, EBIT, ROI with Associated Probabilities*

(*₹'000*)

	Economic Conditions					
	Very poor	*Poor*		*Normal*		*Good*
Probability	0.05	0.10	0.15	0.35	0.30	0.05
Sales (Rs)	510	660	710	800	880	1,160
Costs:						
Variable (Rs)	255	330	355	400	440	580
Fixed (Rs)	280	280	280	280	280	280
Total Costs (Rs)	535	610	635	680	720	860
EBIT (Rs)	– 25	50	75	120	160	300
ROI *(r)*	– 5%	10%	15%	24%	32%	60%

The behaviour of EPS (and ROE) with fluctuating EBIT (or return on assets) under the alternative financial plans is analyzed in Table 6.6. The summary of the

effect of the increasing financial leverage on EPS with changing EBIT (see Tables 6.7 and 6.8) provides interesting insights.

Table 6.6 *Impact of Financial Leverage: Varying EBIT*

(₹' 000)

	Economic Conditions					
	Very poor	*Poor*	*Normal*		*Good*	
Plan I: No debt						
EBIT	– 25.00	50.00	75.00	120.00	160.00	300.00
Less: Interest	0.00	0.00	0.00	0.00	0.00	0.00
PBT	– 25.00	50.00	75.00	120.00	160.00	300.00
Less:						
Tax, 50%	–12.50*	25.00	37.50	60.00	80.00	150.00
PAT	– 12.50	25.00	37.50	60.00	80.00	150.00
No. of shares ('000)	50.00	50.00	50.00	50.00	50.00	50.00
EPS (Rs)	– 0.25	0.50	0.75	1.20	1.60	3.00
ROE (%)	– 2.50	5.00	7.50	12.00	16.00	30.00
Plan II: 25% debt						
EBIT	– 25.00	50.00	75.00	120.00	160.00	300.00
Less:						
Interest	18.75	18.75	18.75	18.75	18.75	18.75
PBT	– 43.75	31.25	56.25	101.25	141.25	281.25
Less:						
Tax, 50%	– 21.88*	15.63	28.13	50.63	70.63	140.63
PAT	– 21.87	15.62	28.12	50.62	70.62	140.62
No. of shares ('000)	37.50	37.50	37.50	37.50	37.50	37.50
EPS (Rs)	– 0.58	0.42	0.75	1.35	1.88	3.75
ROE (%)	– 5.80	4.20	7.50	13.50	18.80	37.50
Plan III: 50% debt						
EBIT	– 25.00	50.00	75.00	120.00	160.00	300.00
Less:						
Interest	37.50	37.50	37.50	37.50	37.50	37.50
PBT	– 62.50	12.50	37.50	82.50	122.50	262.50
Less:						
Tax, 50%	– 31.25*	6.25	18.75	41.25	61.25	131.25
PAT	– 31.25	6.25	18.75	41.25	61.25	131.25
No. of shares ('000)	25.00	25.00	25.00	25.00	25.00	25.00
EPS (Rs)	– 1.25	0.25	0.75	1.65	2.45	5.25
ROE (%)	– 12.50	2.50	7.50	16.50	24.50	52.50
Plan IV: 75% debt						
EBIT	– 25.00	50.00	75.00	120.00	160.00	300.00
Less:						
Interest	56.25	56.25	56.25	56.25	56.25	56.25
PBT	– 81.25	– 6.25	18.75	63.75	103.75	243.75
Less:	– 40.63*	– 3.13	9.38	31.88	51.88	121.88
Tax, 60%						
PAT	– 40.62	– 3.12	9.37	31.87	51.87	121.87
No. of shares ('000)	12.50	12.50	12.50	12.50	12.50	12.50
EPS (Rs)	– 3.25	– 0.25	0.75	2.55	4.15	9.75
ROE (%)	– 32.50	– 2.50	7.50	25.50	41.50	97.50

* It is assumed that losses will be set off against other profits or tax credit will be available to the firm.

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Table 6.7 *Summary of the Behaviour of EPS with Fluctuating EBIT under Alternative Financial Plans*

		Financial Plan			
Economic Conditions	*EBIT*	*No debt I EPS*	*25% debt II EPS*	*50% debt III EPS*	*75% debt IV EPS*
Very poor	– 25,000	– 0.25	– 0.58	– 1.25	– 3.25
Poor	50,000	0.50	0.42	0.25	– 0.25
	75,000	0.75	0.75	0.75	0.75
Normal	1,20,000	1.20	1.35	1.65	2.55
	1,60,000	1.60	1.88	2.45	4.15
Good	3,00,000	3.00	3.75	5.25	9.75

Table 6.8 *Summary of the Behaviour of ROE with Fluctuating Return on Assets under Alternative Financial Plans*

		Financial Plan			
Economic Conditions	*Return on assets*	*No debt I*	*25% debt II*	*50% debt III*	*75% debt IV*
Very poor	– 5%	– 2.5%	– 5.8%	– 12.5%	– 32.5%
Poor	10%	5.0%	4.2%	2.5%	– 2.5%
	15%	7.5%	7.5%	7.5%	7.5%
Normal	24%	12.0%	13.5%	16.5%	25.5%
	32%	16.0%	18.8%	24.5%	41.5%
Good	60%	30.0%	37.5%	52.5%	97.5%

Financial Plan I does not employ any leverage. As EBIT increases, EPS also increases. In fact, EPS increases with improved EBIT under all financial plans (Table 6.7). What is important to note is that as the financial leverage is increased, EPS is further magnified. Take the example of normal and good years. When EBIT increases from ₹ 120,000 to ₹ 160,000—an increase by 33 per cent, EPS under no financial leverage plan increases proportionately (i.e., by 33 per cent). But EPS increases faster under the high financial leverage plans; it increases by 40 per cent when debt is 25 per cent, by 48 per cent when debt is 50 per cent and by 63 per cent when debt is 75 per cent. Same conclusions can be drawn from Table 14.7 for the behaviour of ROE in relation to return on assets (r). It may be worth repeating that the favourable effect of the increasing financial leverage during normal and good years is on account of the fact that the rates of return on assets (investment) exceed the cost on debt.

Financial leverage works both ways. It accelerates EPS (and ROE) under favourable economic conditions, but depresses EPS (and ROE) when the

procedings are not good for the firm. It can be seen from Tables 6.7 and 6.8 that EPS or ROE is lower with debt in the capital structure in the poor years. With no leverage plan, if the firm's return on assets is positive, although low, the shareholders do obtain positive EPS or ROE. For example, when the firm's return (r) is 10 per cent, EPS under no leverage plan is Re 0.40 (or ROE is 4 per cent). But it becomes lower with more debt used, and even turns negative under very high leverage plan, such as Financial Plan IV. The unfavourable effect on EPS (and ROE) is more severe with more debt in the capital structure when EBIT (or r) is negative.

The reason again lies in the relationship between the return on assets and the cost of debt. If the cost of debt were more than the return on assets, EPS (or ROE) would depress with more leverage. It is indicated from Table 6.7 or Table 6.8 that when the firm earns 15 per cent return on its assets, which is equal to the cost of debt, EPS (or ROE) is the same under all financial plans. Whatever the firm earns on the funds raised through debt is exactly paid to the suppliers of debt as interest charges.

Variability of EPS: Yet another significant point to be noted from Table 6.7 is that the higher the financial leverage, the wider the range over which EPS varies with fluctuating EBIT. For example, when no debt is used (Financial Plan I), EPS ranges between a negative Re 0.25 to a positive ₹ 3.00—a range of ₹ 3.25. Under Financial Plan II, where 25 per cent debt is introduced in the capital structure, EPS ranges from a negative Re 0.58 to a positive ₹ 3.75—a range of ₹ 4.33. The range of EPS increases to ₹ 6.50 and ₹ 13.00 when debt is respectively 50 per cent and 75 per cent. The range for ROE shows the similar behaviour (Table 6.8). Thus, for any given level of variability in EBIT (or r), the increased financial leverage increases the degree of variability in EPS (or ROE). The indiscriminate use of financial leverage without taking into account the uncertainty surrounding EBIT (or r) can lead a firm into financial difficulties. More about the risk of the financial leverage is explained in the next section.

EBIT–EPS chart: One convenient and useful way of showing the relationship between EBIT and EPS for the alternative financial plans is to prepare the EBIT–EPS chart. The chart is easy to prepare since, for any given level of financial leverage, EPS is linearly related to EBIT. As noted earlier, the formula for calculating EPS is:

$$\text{EPS} = \frac{(\text{EBIT} - \text{INT})(1-T)}{N}$$
$$= \frac{(1-T)}{N}[\text{EBIT} - \text{INT}] \qquad (22)$$

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Equation (22) can also be written as follows:

$$\text{EPS} = \frac{(1-T)}{N}\text{EBIT} - \frac{(1-T)}{N}\text{INT}$$
$$= -\frac{(1-T)}{N}\text{INT} + \frac{(1-T)}{N}\text{EBIT} \quad (23)$$

We assume that the level of debt, the cost of debt and the tax rate are constant. Therefore, in Equations (22) and (23), the terms $(1 - T)/N$ and INT (which is equal to interest rate times debt, iD) are constant; EPS will increase if EBIT increases and fall if EBIT declines.

Under the assumptions made, the first part of Equation (23) is a constant and can be represented by a. EBIT is a random variable since it can assume a value more or less than expected. The term $(1 - T)/N$ is also a constant and can be shown as b. Thus, the EPS formula can be rewritten as:

$$\text{EPS} = a + b \times \text{EBIT} \quad (24)$$

Equation (24) clearly indicates that EPS is a linear function of EBIT.

The EBIT–EPS analysis shown in Table 6.9 could be worked out with the help of Equation (24). As an illustration, we work out Equation (24) for Financial Plan IV: equity ₹ 125,000, 15 per cent debt ₹ 375,000, number of shares 12,500 and tax rate 50 per cent. The values of a and b ('000 eliminated) are:

$$a = -\frac{(1-T)}{N}\text{INT} = -\frac{0.5}{12.5} \times 56.25 = -2.25$$
$$b = \frac{(1-T)}{N} = \frac{0.5}{12.5} = 0.04$$

EPS for various levels of EBIT will be as shown in Table 6.9.

Table 6.9 *EPS Calculations for Financial Plan IV: EPS* = a + b *EBIT*

$(1-T)/N = b$	EBIT	=	b EBIT	+	a	=	EPS = a + b × EBIT
(0.04)	(– 25)	=	– 1.00	+	– 2.25	=	– 3.25
(0.04)	(50)	=	2.00	+	– 2.25	=	– 0.25
(0.04)	(75)	=	3.00	+	– 2.25	=	0.75
(0.04)	(120)	=	4.80	+	– 2.25	=	2.55
(0.04)	(160)	=	6.40	+	– 2.25	=	4.15
(0.04)	(300)	=	12.00	+	– 2.25	=	9.75

Because of the linear relation between EPS and EBIT, the EBIT–EPS chart can be drawn easily. We can use the following information of Financial Plans I and III in our example to draw EBIT– EPS chart in Figure 6.3.

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EBIT (Rs '000)	EPS	
	No debt	50% debt
– 25,000	– 0.25	– 1.25
0	0.00	– 0.75
25,000	0.25	– 0.25
50,000	0.50	0.25
75,000	0.75	0.75
1,00,000	1.00	1.25
1,25,000	1.25	1.75
1,50,000	1.50	2.25
1,75,000	1.75	2.75
2,00,000	2.00	3.25

In Figure 6.3, EBIT is shown on a horizontal line and EPS on a vertical line. If we identify any two points of EPS for two given levels of EBIT and join them in a straight line, we obtain EPS-line for a particular financial plan. For example, at EBIT of ₹ 50,000 and ₹ 75,000, two points of EPS are respectively Re 0.25 and Re 0.75 for Financial Plan III. If we join these two points in a straight line, we get EPS-line for Financial Plan III. The EPS-line can be similarly drawn for 100 per cent equity plan. We can see from Figure 6.3 that EPS-lines for all-equity and 50 per cent debt plans intersect at EBIT ₹ 75,000. EPS under both plans are same at this level of EBIT. Figure 6.4, drawn similarly as Figure 6.3, shows four financial plans together.

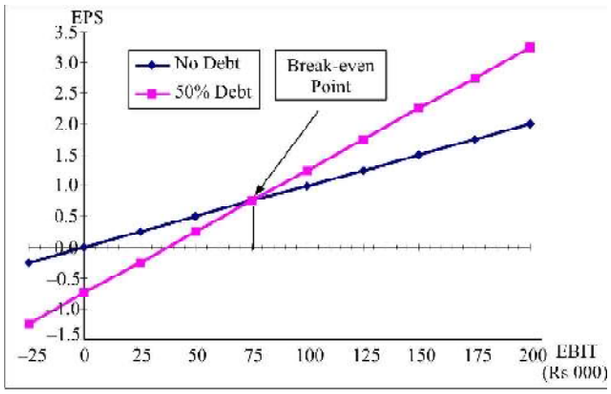

Fig. 6.3 *EBIT–EPS chart*

The steep solid lines in Figure 6.4 show the relation between EBIT and EPS. The line relating EBIT and EPS becomes steeper with more debt in the capital

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structure, and steeper the line, the more the profit potential to the shareholders with increasing EBIT. If EBIT is declining, the loss to the shareholders will be magnified. The point of intersection of four EBIT–EPS lines in Figure 6.4 indicates the **indifference point** or the **EBIT–EPS break-even point** at which EPS is same regardless of the level of the financial leverage. In the example (see Table 6.7), EPS is same for all financial plans when the firm earns a 15 per cent return on assets or EBIT of ₹ 75,000.

		EPS		
EBIT	*No debt*	*25% debt*	*50% debt*	*75% debt*
– 25,000	– 0.25	– 0.583	– 1.25	– 3.25
0	0.00	– 0.250	– 0.75	– 2.25
25,000	0.25	0.083	– 0.25	– 1.25
50,000	0.50	0.417	0.25	– 0.25
75,000	0.75	0.750	0.75	0.75
1,00,000	1.00	1.083	1.25	1.75
1,25,000	1.25	1.417	1.75	2.75
1,50,000	1.50	1.750	2.25	3.75
1,75,000	1.75	2.083	2.75	4.75
2,00,000	2.00	2.417	3.25	5.75

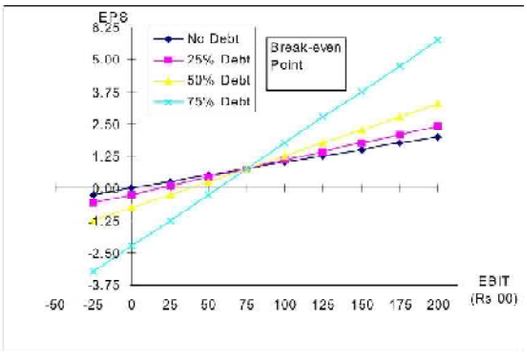

Fig. 6.4 *EBIT–EPS chart*

The 15 per cent return on assets is just equal to the cost of debt. It can also be noticed from Figure 6.4 that below the 'indifference point' the EBIT–EPS lines shift more towards the right when the level of financial leverage increases, indicating unfavourable effect because of a low rate of return on assets than the interest cost. The EBIT–EPS line shifts more towards the left beyond the 'indifference point' when the level of the financial leverage increases. This indicates a favourable effect of leverage because the return on assets exceeds the interest rate. We thus again reach the conclusion that the shareholders will benefit by the use of the financial leverage in terms of the increased EPS if return on assets is higher than the interest

cost, and will have reduced EPS if return on assets is lower than the interest cost; the shareholders' earnings will not be affected by the level of leverage if return on assets is just equal to the interest cost.

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Calculation of indifference point: The break-even, or indifference, point between two alternative methods of financing can be determined by a formula. In the earlier example, suppose the firm is considering only two financial plans—an all-equity plan (Financial Plan I) and a 25 per cent debt and 75 per cent equity plan (Financial Plan II). The firm wants to know the level of EBIT at which EPS would be the same under both the plans. To find out the break-even level of EBIT, we may set the EPS formulae of two plans equal. The EPS formula under **all-equity plan** is

$$\text{EPS} = \frac{(1-T)\,\text{EBIT}}{N_1}$$

where N_1 is number of ordinary shares under first plan and since the firm has no debt, no interest charges exist. The EPS formula under **debt–equity plan** is:

$$\text{EPS} = \frac{(1-T)\ (\text{EBIT} - \text{INT})}{N_2}$$

where INT is the interest charges on debt and N_2 is the number of ordinary shares under second plan. Setting the two formulae equal, we have:

$$\frac{(1-T)\ \text{EBIT}}{N_1} = \frac{(1-T)\ (\text{EBIT} - \text{INT})}{N_2} \tag{25}$$

Using the values for Financial Plans I and II given in the example, we can determine EBIT as follows:

$$\frac{(1-0.5)\text{EBIT}}{50{,}000} = \frac{(1-0.5)(\text{EBIT} - 18{,}750)}{37{,}500}$$

$$0.5\ \text{EBIT}\frac{37{,}500}{50{,}000} = 0.5\ \text{EBIT} - 9{,}375$$

$$9{,}375 = 0.5\ \text{EBIT} - 0.375\ \text{EBIT}$$

$$\text{EBIT} = \frac{9{,}375}{0.125} = \text{Rs } 75{,}000$$

We can simplify Equation (25) as follows:

$$\text{EBIT} = \frac{N_1}{N_1 - N_2} \times \text{INT} \tag{26}$$

Thus, in the example:

$$\text{EBIT} = \frac{50{,}000}{50{,}000 - 37{,}500} \times 18{,}750$$

$$= 4 \times 18{,}750 = \text{Rs } 75{,}000$$

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Sometimes a firm may like to make a choice between two levels of debt. Then, the indifference point formula will be:

$$\frac{(1-T)\,(\text{EBIT}-\text{INT}_1)}{N_1}=\frac{(1-T)\,(\text{EBIT}-\text{INT}_2)}{N_2} \tag{27}$$

where INT_1 and INT_2 represent the interest charges under the alternative financial plans. After simplifying Equation (27), we obtain:

$$\text{EBIT}=\frac{N_1\times\text{INT}_2-N_2\times\text{INT}_1}{N_1-N_2} \tag{28}$$

Many other combinations of the methods of financing may be compared. The firm may compare between an all-equity plan and an equity-and-preference share plan. Then the indifference point formula will be:

$$\frac{(1-T)(\text{EBIT})}{N_1}=\frac{(1-T)\text{EBIT}-\text{PDIV}}{N_2} \tag{29}$$

Equation (29) can be simplified as follows:

$$\text{EBIT}=\frac{N_1}{N_1-N_2}\times\frac{\text{PDIV}}{1-T} \tag{30}$$

6.8 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The contractual rate of interest or the coupon rate forms the basis for calculating the cost of debt.
2. The primary purpose of measuring the cost of capital is its use as a financial standard for evaluating the investment projects.
3. The measurement of cost of equity is considered difficult. The difficulty derives from two factors: *first*, it is very difficult to estimate the expected dividends; *second*, the future earnings and dividends are expected to grow over time. Growth in dividends should be estimated and incorporated in the computation of the cost of equity. The estimation of growth is not an easy task.
4. The market risk premium is measured as the difference between the long-term, historical arithmetic averages of market return and the risk-free rate.
5. The difficulty in using market-value weights is that the market prices of securities fluctuate widely and frequently. A market value based target capital structure means that the amounts of debt and equity are continuously adjusted as the value of the firm changes.

6. The advantages of using book value weights are the following:
   - Firms in practice set their target capital structure in terms of book values.
   - The book value information can be easily derived from the published sources.
   - The book value debt-equity ratios are analysed by investors to evaluate the risk of the firms in practice.
7. One significant implication of the MM hypothesis with the corporate tax in practice is that a firm without debt or with low debt can enhance its value if it exchanges debt for equity.

6.9 SUMMARY

- Financial experts express conflicting opinions as to the correct way in which the cost of capital can be measured. Irrespective of the measurement problems, it is a concept of vital importance in the financial decision-making.
- The primary purpose of measuring the cost of capital is its use as a financial standard for evaluating the investment projects.
- An investment project that provides a positive NPV when its cash flows are discounted by the cost of capital makes a *net* contribution to the wealth of shareholders.
- The debt policy of a firm is significantly influenced by the cost consideration. As we shall learn later on, debt helps to save taxes, as interest on debt is a tax-deductible expense.
- The cost of capital can also be useful in deciding about the methods of financing at a point of time.
- The cost of capital framework can be used to evaluate the financial performance of top management.
- In the case of companies, there is a divorce between management and ownership. In an all-equity financed company, management makes investment decisions, but shareholders supply the capital.
- In practice, both shareholders and creditors (debt-holders) supply funds to finance a firm's investment projects. Investors hold different claims on the firm's assets and cash flows, and thus, they are exposed to different degrees of risk.
- 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.

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- Since the firm sells various securities to investors to raise capital for financing investment projects, it is, therefore, necessary that investment projects to be undertaken by the firm should generate *at least* sufficient net cash flow to pay investors—shareholders and debt holders—their required rates of return.
- The market price of securities is a function of the return expected by investors. The demand and supply forces work in such a way that equilibrium rates are established for various securities.
- The opportunity cost of retained earnings is the rate of return, which the ordinary shareholders would have earned on these funds if they had been distributed as dividends to them.
- A firm obtains capital from various sources. As explained earlier, because of the risk differences and the contractual agreements between the firm and investors, the cost of capital of each source of capital differs.
- A debenture or bond may be issued at par or at a discount or premium as compared to its face value. The contractual rate of interest or the coupon rate forms the basis for calculating the cost of debt.
- The interest paid on debt is tax deductible. The higher the interest charges, the lower will be the amount of tax payable by the firm.
- The measurement of the cost of preference capital poses some conceptual difficulty. In the case of debt, there is a binding legal obligation on the firm to pay interest, and the interest constitutes the basis to calculate the cost of debt.
- It is sometimes argued that the equity capital is free of cost. The reason for such argument is that it is not legally binding for firms to pay dividends to ordinary shareholders.
- A firm's internal equity consists of its retained earnings. The opportunity cost of the retained earnings is the rate of return foregone by equity shareholders.
- The firm's external equity consists of funds raised externally through public or right issues. The minimum rate of return, which the equity shareholders require on funds supplied by them by purchasing new shares to prevent a decline in the existing market price of the equity share, is the cost of external equity.
- You should always use the market value weights to calculate WACC. In practice, firms do use the book value weights. Generally, there will be difference between the book value and market value weights, and therefore,

WACC will be different. WACC, calculated using the book-value weights, will be understated if the market value of the share is higher than the book value and vice versa.

- MM's hypothesis that the value of the firm is independent of its debt policy is based on the critical assumption that corporate income taxes do not exist.
- The MM's 'tax-corrected' view suggests that, because of the tax deductibility of interest charges, a firm can increase its value with leverage.

6.10 KEY WORDS

- **Debt policy:** It recognizes the factors responsible for issuing debt and managing the debt portfolio.
- **Opportunity cost of capital:** It can be defined as the expected return that is forgone by investing in a project rather than in comparable financial securities.
- **Capital structure:** It refers to a company's outstanding debt and equity.
- **Equity capital:** It the capital that a company gets from selling shares rather than from borrowing money.

6.11 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. State the general formula for the calculation of opportunity cost of capital.
2. Define Weighted Average Cost of Capital (WACC).
3. Write a short note on tax, capital structure and value nexus.

Long Answer Questions

1. Analyse the significance of cost of capital.
2. Explain the calculation of irredeemable preference share and redeemable preference share.
3. Discuss the calculation of cost of internal and external equity with the help of an example.
4. Compare and contrast the calculate of cost of equity through the following methods: (a) CAPM (b) Dividend-Growth Model.
5. Give examples of EBIT –EPS analysis.

6.12 FURTHER READINGS

NOTES

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UNIT 7 CAPITAL STRUCTURE

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Structure

7.0 INTRODUCTION

In financial management, capital structure theory refers to a systematic method to handle financing business enterprises through an arrangement of equities and liabilities. In this unit, you will be introduced to the concept of capital structure and its various theories. Moreover, you will get to study about management leverage, operating leverage and combined leverage.

7.1 OBJECTIVES

After going through this unit, you will be able to:

- Explain the concept of capital structure
- Discuss the theories of capital structure
- Define management leverage, operating leverage and financial leverage
- Differentiate between operating risk and financial risk

7.2 CAPITAL STRUCTURE: DETERMINATES, CONCEPT AND TYPES

The assets of a company can be financed either by increasing the owner claims or the creditor claims. The owner claims increase when the firm raises funds by issuing ordinary shares or by retaining the earnings; the creditors' claims increase by

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borrowing. The various means of financing represent the financial structure of an enterprise. The left-hand side of the balance sheet (liabilities plus equity) represents the financial structure of a company. Traditionally, short-term borrowings are excluded from the list of methods of financing the firm's capital expenditure, and therefore, the long-term claims are said to form the capital structure of the enterprise. The term capital structure is used to represent the proportionate relationship between debt and equity. Equity includes paid-up share capital, share premium and reserves and surplus (retained earnings).

The financing or capital structure decision is a significant managerial decision. As discussed later in this unit, it influences the shareholder's return and risk. Consequently, the market value of the share may be affected by the capital structure decision. The company will have to plan its capital structure initially, at the time of its promotion. Subsequently, whenever funds have to be raised to finance investments, a capital structure decision is involved. The process of the capital structure decision is shown in Figure 7.1. A demand for raising funds generates a new capital structure since a decision has to be made as to the quantity and forms of financing. This decision will involve an analysis of the existing capital structure and the factors, which will govern the decision at present. The dividend decision is, in a way, a financing decision. The company's policy to retain or distribute earnings affects the owners' claims. Shareholder equity position is strengthened by retention of earnings. Thus, the dividend decision has a bearing on the capital structure of the company. The new financing decision of the company may affect its debt-equity mix. The debt-equity mix has implications for the shareholders' earnings and risk, which in turn, will affect the cost of capital and the market value of the firm.

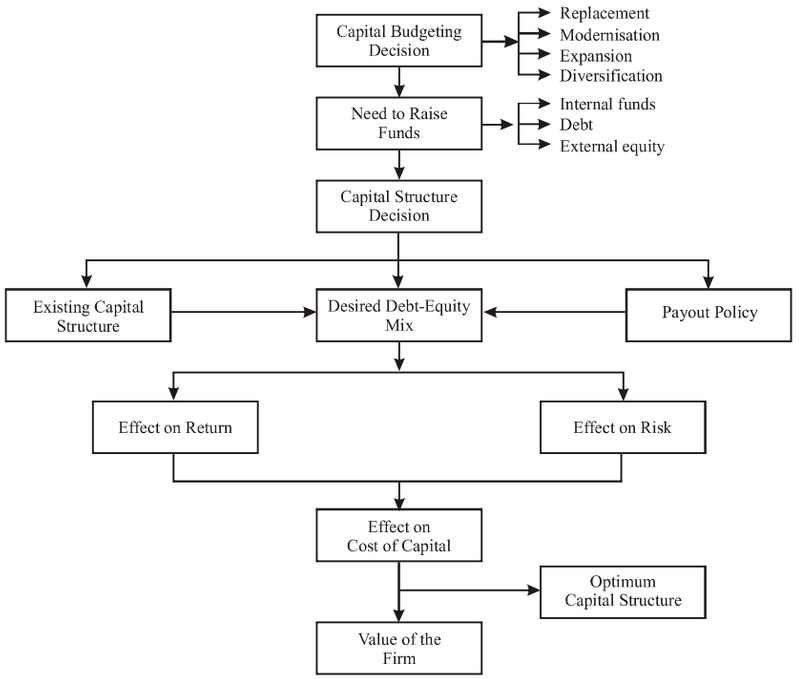

Fig. 7.1 *The Capital Structure Decision Process*

The management of a company should seek answers to the following questions while making financing decision:

- How should the investment project be financed?
- Does the way in which the investment projects are financed matter?
- How does financing affect the shareholders' risk, return and value?
- Does there exist an optimum financing mix in terms of the maximum value to the firm's shareholders?
- Can the optimum financing mix be determined in practice for a company?

Under favourable economic conditions, the earnings per share increase with financial leverage. But leverage also increases the financial risk of shareholders. As a result, it cannot be stated definitely whether or not the firm's value will increase with leverage. The objective of a firm should be directed towards the maximization of the firm's value. The capital structure or financial leverage decision should be examined from the point of its impact on the value of the firm. If capital structure decision can affect a firm's value, then it would like to have a capital structure, which maximizes its market value. However, there exist conflicting theories on the relationship between capital structure and the value of a firm. The traditionalists believe that capital structure affects the firm's value while Modigliani and Miller (MM), under the assumptions of perfect capital markets and no taxes, argue that capital structure decision is irrelevant. MM reverse their position when they consider corporate taxes. Tax savings resulting from interest paid on debt create value for the firm. However, the tax advantage of debt is reduced by personal taxes and financial distress. Hence, the trade-off between costs and benefits of debt can turn capital structure into a relevant decision. There are other views also on the relevance of capital structure. We first discuss the traditional theory of capital structure followed by MM theory and other views.

7.3 THEORIES OF CAPITAL STRUCTURE: ASSUMPTIONS, SIGNIFICANCE AND LIMITATONS

There are several variations of the traditional theory. But the thrust of all views is that capital structure matters. One earlier version of the view that capital structure is relevant is the net income (NI) approach. We will first discuss the NI approach, followed by other traditional views.

7.3.1 The Net Income Approach

A firm that finances its assets by equity and debt is called a **levered firm**. On the other hand, a firm that uses no debt and finances its assets entirely by equity is called an **unlevered firm**. Suppose firm *L* is a levered firm and it has financed its assets by equity and debt. It has perpetual expected EBIT or net operating income

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(NOI) of ₹ 1,000 and the interest payment of ₹ 300. The firm's cost of equity (or equity capitalization rate), k_e, is 9.33 per cent and the cost of debt, k_d, is 6 per cent. What is the firm's value? The value of the firm is the sum of the values of all of its securities. In this case, firm *L*'s securities include equity and debt; therefore the sum of the values of equity and debt is the firm's value. The value of a firm's shares (equity), *E*, is the discounted value of shareholders' earnings, called net income, NI. Firm *L*'s net income is: NOI – interest = 1,000 – 300 = ₹ 700, and the cost of equity is 9.33 per cent. Hence the value of *L*'s equity is: 700/0.0933 = ₹ 7,500:

Value of equity = discounted value of net income

$$E = \frac{\text{Net Income}}{\text{Cost of equity}} = \frac{\text{NI}}{k_e}$$
$$= \frac{700}{0.0933} = ₹\ 7{,}500 \quad (1)$$

Similarly the value of a firm's debt is the discounted value of debt-holders' interest income. The value of *L*'s debt is: 300/0.06 = ₹ 5,000:

Value of debt = discounted value of interest

$$D = \frac{\text{Interest}}{\text{Cost of debt}} = \frac{\text{INT}}{k_d}$$
$$= \frac{300}{0.06} = ₹\ 5{,}000 \quad (2)$$

The value of firm *L* is the sum of the value of equity and the value of debt:

Value of the firm = value of equity + value of debt

$$V = E + D$$
$$= 7{,}500 + 5{,}000 = ₹\ 12{,}500 \quad (3)$$

Firm's *L*'s value is ₹ 12,500 and its expected net operating income is ₹ 1,000. Therefore, the firm's overall expected rate of return or the cost of capital is:

$$\text{Firm's cost of capital} = \frac{\text{Net operating income}}{\text{Value of the firm}}$$
$$k_o = \frac{\text{NOI}}{V}$$
$$= \frac{1{,}000}{12{,}500} = 0.08 \text{ or } 8\% \quad (4)$$

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The firm's overall cost of capital is the **weighted average cost of capital** (WACC). There is an alternative way of calculating WACC. WACC is the weighted average of costs of all of the firm's securities. Firm *L*'s securities include debt and equity. Therefore, firm *L*'s WACC or k_o, is the weighted average of the cost of equity and the cost of debt. Firm *L*'s value is ₹ 12,500, value of its equity is ₹ 7,500 and value of its debt is ₹ 5,000. Hence, the firm's debt ratio (*D/V*) is: 5,000/12,500 = 0.40 or 40 per cent, and the equity ratio (*E/V*) is: 7,500/12,500 = 0.60 or 60 per cent. Firm *L*'s weighted average cost of capital is:

$$\begin{aligned}
&\text{WACC} = \text{cost of equity} \times \text{equity weight} \\
&\qquad + \text{cost of debt} \times \text{debt weight} \\
&k_o = k_e \times \frac{E}{V} + k_d \times \frac{D}{V} \\
&k_o = 0.0933 \times \frac{7,500}{12,500} + 0.06 \times \frac{5,000}{12,500} \\
&k_o = 0.0933 \times 0.60 + 0.06 \times 0.40 \\
&\quad = 0.056 + 0.025 = 0.08 \text{ or } 8\%
\end{aligned} \tag{5}$$

Suppose firm *L* operates in a *frictionless* world. There are no taxes and transaction costs and debt is risk-free and shareholders perceive no financial risk arising from the use of debt. Under these conditions, the cost of equity, k_e, and the cost of debt, k_d, will remain constant with financial leverage. Since debt is a cheaper source of finance than equity, the firm's weighted average cost of capital will reduce with financial leverage. Suppose firm *L*'s substitutes debt for equity and raises its debt ratio to 90 per cent. Its WACC will be: 0.0933 × 0.10 + 0.06 × 0.90 = 0.0633 or 6.33 per cent. Firm *L*'s WACC will be 6 per cent if it employs 100 per cent debt.

Rearranging Equation (24), we get

$$\begin{aligned}
&\text{WACC} = k_o = k_e \times \left(1 - \frac{D}{V}\right) + k_d \times \frac{D}{V} \\
&\text{WACC} = k_o = k_e - (k_e - k_d)\frac{D}{V}
\end{aligned} \tag{6}$$

You may note from Equation (6) that, given the constant cost of equity, k_e, and cost of debt, k_d, and k_d less than k_e, the weighted average cost of capital, k_o, will decrease continuously with financial leverage, measured by *D/V*. You may also notice that k_o equals the cost of equity, k_e, minus the spread between the cost of equity and the cost of debt multiplied by *D/V*. WACC, k_o, will be equal to the cost of equity, k_e, if the firm does not employ any debt (i.e. *D/V* = 0), and k_o will approach k_d, as *D/V* approaches one (or 100 per cent).

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Under the assumption that k_e and k_d remain constant, the value of the firm will be:

$$V = E + D = \frac{\text{NOI} - \text{INT}}{k_e} + \frac{\text{INT}}{k_d}$$
$$= \frac{\text{NOI} - k_d D}{k_e} + \frac{k_d D}{k_d} = \frac{\text{NOI} - k_d D}{k_e} + D \quad (7)$$
$$= \frac{\text{NOI}}{k_e} + D - \frac{k_d D}{k_e}$$
$$V = \frac{\text{NOI}}{k_e} + D\left(1 - \frac{k_d}{k_e}\right)$$

You may notice that for an unlevered firm, the second term on the right-hand side of Equation (7) will be zero. The unlevered firm's cost of equity is also its WACC and its expected net operating income is its expected net income. Hence, the value of an unlevered (an all-equity) firm is the discounted value of the net operating income. You may also notice from Equation (7) that as the firm substitutes debt for equity and so long as k_e and k_d are constant, the value of the firm, *V,* increases by debt multiplied by a constant rate, $(k_e - k_d)/k_e$.

Illustration 7.1: Firm Value Under Net Income Approach

Suppose that a firm has no debt in its capital structure. It has an expected annual net operating income of ₹ 100,000 and the equity capitalization rate, k_e, of 10 per cent. Since the firm is 100 per cent equity financed firm, its weighted cost of capital equals its cost of equity, *i.e.*, 10 per cent. The value of the firm will be: 100,000 ÷ 0.10 = ₹ 1,000,000.

Let us assume that the firm is able to change its capital structure replacing equity by debt of ₹ 300,000. The cost of debt is 5 per cent. Interest payable to debt-holders is: ₹ 300,000 × 0.05 = ₹ 15,000. The net income available to equity holders is: ₹ 100,000 – ₹ 15,000 = ₹ 85,000.

The value of the firm is equal to the sum of values of all securities:

$$\text{E} = \frac{\text{NOI - interest}}{k_e} = \frac{\text{NI}}{k_e} = \frac{85,000}{0.10} = ₹\,850,000$$
$$\text{D} = \frac{\text{Interest}}{k_d} = \frac{15,000}{0.05} = ₹\,300,000$$
$$\text{V} = \text{E} + \text{D} = 850,000 + 300,000$$
$$= ₹\,1,150,000$$

You can also calculate the value of the firm as follows:

$$\text{V} = \frac{100,000}{0.10} + 300,000\left(1 - \frac{0.05}{0.10}\right)$$
$$= 1,000,000 + 150,000 = ₹\,1,150,000$$

The weighted average cost of capital, k_o, is:

$$k_o = \frac{\text{NOI}}{V} = \frac{1,00,000}{1,150,000} = 0.087 \text{ or } 8.7 \text{ per cent}$$

$$k_o = k_d \frac{D}{V} + k_e \frac{S}{V} = 0.05\left(\frac{300,000}{1,150,000}\right) + 0.10\left(\frac{8,50,000}{1,150,000}\right)$$

$$= 0.013 + 0.074 = 0.087 \text{ or } 8.7 \text{ per cent}$$

Table 7.1 shows the calculations of the firm's value and weighted average cost of capital.

Suppose the firm uses more debt in place of equity and increases debt to ₹ 900,000. As shown in Table 7.1, the firm's value increases to ₹ 1,450,000, and the weighted average cost of capital reduces to 8.1 per cent. Thus, by increasing debt, the firm is able to increase the value of the firm and lower the WACC.

Table 7.1 *Value of the Firm (NI Approach)*

	Zero debt	**5% ₹ 300,000 debt**	**5% ₹ 900,000 debt**
Net operating income, NOI	100,000	100,000	100,000
Total cost of debt, INT = k_dD	0	15,000	45,000
Net income, NI: NOI – INT	100,000	85,000	55,000
Market value of equity, E: NI/k_e	1,000,000	850,000	550,000
Market value of debt, D: INT/k_d	0	300,000	900,000
Market value of the firm, $V = E + D$ = NOI/k_o	1,000,000	1,150,000	1,450,000
Debt/Total value, D/V	0.00	0.261	0.62
WACC, NOI ¸ V = $k_e \times E/V + k_d \times D/V$	0.100	0.087	0.081

We construct Table 7.2 to show the effect of financial leverage on the value of the firm and WACC under the NI approach. It is assumed that the net operating income is ₹ 100,000 and the debt-capitalization rate and the equity-capitalization rate respectively are 5 per cent and 10 per cent, and they remain constant with debt. It is noticeable from the table that the value of the firm increases steadily as the debt ratio, D/V, increases and WACC declines continuously, ultimately reducing to 5 per cent at 100 per cent debt ratio.

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Table 7.2 *Effect of Leverage on Value and Cost of Capital under NI Approach*

Leverage (D/V) %	**0.00**	**18.18**	**33.34**	**46.15**	**66.67**	**94.74**	**100**
NOI	₹100	₹100	₹100	₹100	₹100	₹100	₹100
Interest, INT	–	10	20	30	50	90	100
NI = NOI – INT	₹100	₹90	₹80	₹70	₹50	₹10	₹0
k_d (%)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
k_e (%)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
k_0 (%)	10.0	9.1	8.3	7.7	6.7	5.3	5.0
E = (NOI– INT)/k_e	₹1,000	₹900	₹800	₹700	₹500	₹100	₹0
D = INT/k_d	0	200	400	600	1,000	1,800	2,000
$V = E + D$	₹1,000	₹1,100	₹1,200	₹1,300	₹1,500	₹1,900	₹2,000

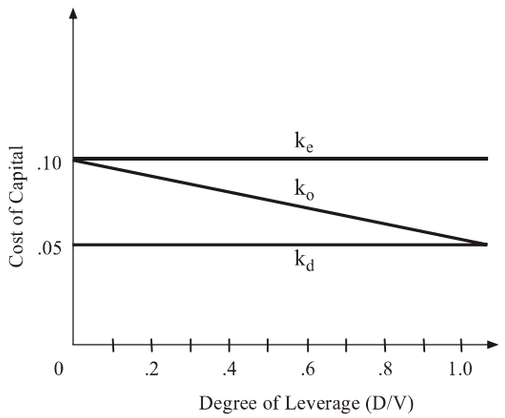

Fig. 7.2 *Effect of Leverage on the Cost of Capital under NI Approach*

Figure 7.2 plots WACC as a function of financial leverage. Financial leverage, D/V, is plotted along the horizontal axis and WACC, k_o, and the cost of equity, k_e, and the cost of debt, k_d, on the vertical axis. You may notice from Figure 7.1 that, under NI approach, k_e and k_d are constant. As debt is replaced for equity in the capital structure, being less expensive, it causes weighted average cost of capital, k_o, to decrease, so that it ultimately approaches the cost of debt with 100 per cent debt ratio (D/V). The optimum capital structure occurs at the point of minimum WACC. Under the NI approach, the firm will have the maximum value and minimum WACC when it is 100 per cent debt-financed.

7.3.2 The Traditional Approach

The traditional view has emerged as a compromise to the extreme position taken by the NI approach. Like the NI approach, it does not assume constant cost of equity with financial leverage and continuously declining WACC. According to this view, a judicious mix of debt and equity capital can increase the value of the firm by reducing the weighted average cost of capital (WACC or k_0) up to certain level of debt. This approach very clearly implies that WACC decreases only within the reasonable limit of financial leverage and after reaching the minimum level, it

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starts increasing with financial leverage. Hence, a firm has an optimum capital structure that occurs when WACC is minimum, and thereby maximizing the value of the firm. Why does WACC decline? WACC declines with moderate level of leverage since low-cost debt is replaced for expensive equity capital. Financial leverage, resulting in risk to shareholders, will cause the cost of equity to increase. But the traditional theory assumes that at moderate level of leverage, the increase in the cost of equity is more than offset by the lower cost of debt. The assertion that debt funds are cheaper than equity funds carries the clear implication that the cost of debt plus the increased cost of equity, together on a weighted basis, will be less than the cost of equity that existed on the equity before debt financing. For example, suppose the cost of capital for a totally equity-financed firm is 12 per cent. Since the firm is financed only by equity, 12 per cent is also the firm's cost of equity (k_e). The firm replaces, say, 40 per cent equity by a debt bearing 8 per cent rate of interest (cost of debt, k_d). According to the traditional theory, the financial risk caused by the introduction of debt may increase the cost of equity slightly, but not so much that the advantage of cheaper debt is taken off totally. Assume that the cost of equity increases to 13 per cent. The firm's WACC will be:

$$\text{WACC} = \text{Cost of equity} \times \text{Weight of equity} + \text{Cost of debt} \times \text{Weight of debt}$$

$$\begin{aligned}\text{WACC} = k_o &= k_e \times w_e + k_d \times w_d \\ &= 0.13 \times 0.6 + 0.08 \times 0.4 = 0.078 + 0.032 \\ &= 0.11 \text{ or } 11\%\end{aligned}$$

Thus, WACC will decrease with the use of debt. But as leverage increases further, shareholders start expecting higher risk premium in the form of increasing cost of equity until a point is reached at which the advantage of lower-cost debt is more than offset by more expensive equity. Let us consider an example as given in Illustration 7.2.

Illustration 7.2: The Traditional Theory of Capital Structure

Suppose a firm is expecting a perpetual net operating income of ₹ 150 crore on assets of ₹ 1,500 crore, which are entirely financed by equity. The firm's equity capitalization rate (the cost of equity) is 10 per cent. It is considering substituting equity capital by issuing perpetual debentures of ₹ 300 crore at 6 per cent interest rate. The cost of equity is expected to increase to 10.56 per cent. The firm is also considering the alternative of raising perpetual debentures of ₹ 600 crore and replace equity. The debt-holders will charge interest of 7 per cent, and the cost of equity will rise to 12.5 per cent to compensate shareholders for higher financial risk.

Notice that at higher level of debt (₹ 600 crore), both the cost of equity and cost of debt increase more than at lower level of debt. The calculations for the value of the firm, the value of equity and WACC are shown in Table 7.3.

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Table 7.3 *Market Value and the Cost of Capital of the Firm (Traditional Approach)*

	No Debt (₹ in crore)	6% Debt (₹ in crore)	7% Debt (₹ in crore)
Net operating income, NOI	150	150	150
Total cost of debt, INT = k_d D	0	18	42
Net income, NOI – INT	150	132	108
Cost of equity, k_e	0.1000	0.1056	0.1250
Market value of equity, E = (NOI– INT)/ k_e	1,500	1,250	864
Market value of debt, D	0	300	600
Total value of firm, $V = E + D$	1,500	1,550	1,464
Equity-to-total value, $w_e = E/V$	1.00	0.806	0.590
Debt-to-total value, $w_d = D/V$	0.00	0.194	0.410
WACC, k_o = NOI/V = $k_e \times w_e + k_d \times w_d$	0.1000	0.0970	0.1030

When the firm has no debt, WACC and the cost of equity are the same (10 per cent). We assume that the expected net operating income, the net income and interest are perpetual flows. We also assume that the expected net income is distributed entirely to shareholders. Therefore, the value of equity is:

$$\text{Value of equity} = \frac{\text{Net income}}{\text{Cost of equity}} = \text{E} = \frac{\text{NI}}{\text{k}_e}$$

The value of debt is interest income to debt-holders divided by the cost of debt:

$$\text{Value of debt} = \frac{\text{Interest income}}{\text{Cost of debt}} = D = \frac{INT}{k_d}$$

The sum of values of debt and equity is the firm's total value, and is directly given by net operating income divided by WACC:

$$\text{Value of firm} = \frac{\text{Net operating income}}{\text{WACC}} = S + D = \frac{NOI}{k_o}$$

You may notice from the above discussion that, according to the traditional theory, the value of the firm may first increase with moderate leverage, reach the maximum value and then start declining with higher leverage. This is so because WACC first decreases and after reaching the minimum, it starts increasing with leverage. Thus, the traditional theory on the relationship between capital structure and the firm value has three stages.

First stage: Increasing value: In the first stage, the cost of equity, k_e, the rate at which the shareholders capitalize their net income, either remains constant or rises slightly with debt. The cost of equity does not increase fast enough to offset the advantage of low-cost debt. During this stage, the cost of debt, k_d, remains constant since the market views the use of debt as a reasonable policy. As a result, the

overall cost of capital, WACC or k_o, decreases with increasing leverage, and thus, the total value of the firm, V, also increases.

Second stage: Optimum value: Once the firm has reached a certain degree of leverage, any subsequent increases in leverage have a negligible effect on WACC and hence, on the value of the firm. This is so because the increase in the cost of equity due to the added financial risk just offsets the advantage of low-cost debt. Within that range or at the specific point, WACC will be minimum, and the maximum value of the firm will be obtained.

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Third stage: Declining value: Beyond the acceptable limit of leverage, the value of the firm decreases with leverage as WACC increases with leverage. This happens because investors perceive a high degree of financial risk and demand a higher equity-capitalization rate, which exceeds the advantage of low-cost debt.

The overall effect of these three stages is to suggest that the cost of capital (WACC) is a function of leverage. It first declines with leverage and after reaching a minimum point or range, starts rising. The relation between costs of capital and leverage is graphically shown in Figure 7.3 wherein the overall cost of capital curve, k_o, is saucer-shaped with a horizontal range. This implies that there is a range of capital structures in which the cost of capital is minimized. k_e, is assumed to increase slightly in the beginning and then at a faster rate. In Figure 7.4, the cost of capital curve is shown as U-shaped. The U-shaped cost of capital implies that there is a precise point at which the cost of capital is minimum. This precise point defines the optimum capital structure.

As stated earlier, many variations of the traditional view exist (Figures 7.3 and 7.4). Whether the cost of equity function is horizontal or slightly rising is not very pertinent from the theoretical point of view, as a number of different costs of equity curves can be consistent with a declining average cost of capital curve. The relevant issue is whether or not the average cost of capital curve declines at all, as debt is used. All supporters of the traditional view agree that the cost of capital declines with debt.

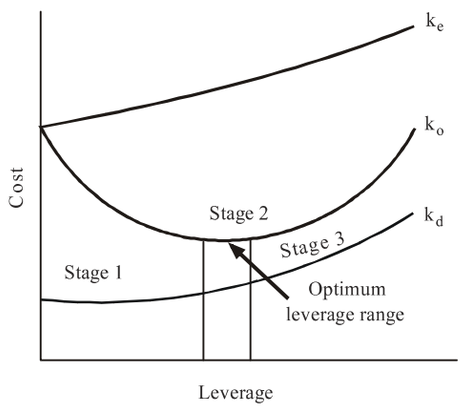

Fig. 7.3 *The Cost of Capital (Saucer-Shaped)*

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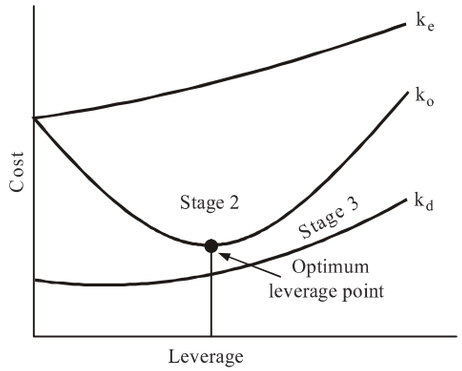

Fig. 7.4 *Cost of Capital (U-shaped)*

Criticism of the Traditional View

The traditional theory implies that investors value levered firms more than unlevered firm. This means that they pay a premium for the shares of levered firms. The contention of the traditional theory, that moderate amount of debt in 'sound' firms does not really add very much to the 'riskiness' of the shares, is not defensible. There does not exist sufficient justification for the assumption that investors' perception about risk of leverage is different at different levels of leverage. However, as we shall explain later, the existence of an optimum capital structure can be supported on two counts: the tax deductibility of interest charges and other market imperfections.

7.3.3 Net Operative Income and MM Hypothesis

Modigliani and Miller (MM) do not agree with the traditional view. They argue that in perfect capital markets without taxes and transaction costs, a firm's market value and the cost of capital remain invariant to the capital structure changes. The value of the firm depends on the earnings and risk of its assets (business risk) rather than the way in which assets have been financed. The MM hypothesis can be best explained in terms of their two propositions.

Proposition I

Consider two pharmaceutical firms, Ultrafine and Lifeline, which have identical assets, operate in same market segments and have equal market share. These two firms belong to the same industry and they face similar competitive and business conditions. Hence, they are expected to have same net operating income and exposed to similar business risk. Since the two firms have identical business risk, it is logical to conclude that investors' expected rates of return from assets, k_a, or the opportunity cost of capital of the two firms, would be identical. Suppose both firms are totally equity financed and both have assets of ₹ 225 crore each. Both expect to generate net operating income of ₹ 45 crore each perpetually. Further, suppose the opportunity cost of capital or the capitalization rate for both firms is 15 per cent. Let us assume that there are no taxes so that the

before- and after-tax net operating income is the same. Capitalizing NOI (₹ 45 crore) by the opportunity cost of capital (15 per cent), you can find the value of the firms. The two firms would have the same value: 45/0.15 = ₹ 300 crore.

Let us now change the assumption regarding the financing. Suppose Ultrafine is an unlevered firm with 100 per cent equity and Lifeline a levered firm with 50 per cent equity and 50 per cent debt. Should the market values of two firms differ? Debt will not change the earnings potential of Lifeline as it depends on its investment in assets. Debt also cannot affect the business conditions and therefore, the business (operating) risk of Lifeline—the levered firm. You know that the value of a firm depends upon its expected net operating income and the overall capitalization rate or the opportunity cost of capital. Since the form of financing (debt or equity) can neither change the firm's net operating income nor its operating risk, the values of levered and unlevered firms ought be the same. Financing changes the way in which the net operating income is distributed between equity holders and debt-holders. Firms with identical net operating income and business (operating) risk, but differing capital structure, should have same total value. MM's Proposition I is that, for firms in the same risk class, the total market value is independent of the debt-equity mix and is given by capitalizing the expected net operating income by the capitalization rate (i.e., the opportunity cost of capital) appropriate to that risk class:

$$\text{Value of levered firm} = \text{Value of unleverd firm}$$

$$V_l = V_u$$

$$\text{Value of the firm} = \frac{\text{Net operating income}}{\text{Firm's opportunity cost of capital}} \qquad (8)$$

$$V = V_l = V_u = \frac{\text{NOI}}{k_d}$$

Here, V is the market value of the firm and it is sum of the value of equity, E, and the value of debt, D; NOI = EBIT = $\overline{X}$, the expected net operating income; and k_a = the firm's opportunity cost of capital or the capitalization rate appropriate to the risk class of the firm.

MM's approach is a net operating income approach because the value of the firm is the capitalized value of net operating income. Both net operating income and the firm's opportunity cost of capital are assumed to be constant with regard to the level of financial leverage. For a levered firm, the expected net operating income is sum of the income of shareholders and the income of debt-holders. Debt-holders' income is interest and shareholders' income, called net income, is the expected net operating income less interest. The levered firm's value is the sum of the value of equity and value of debt. The levered firm's expected rate of return is the ratio of the expected operating income to the value of all its securities. This is an average expected rate of return that the levered firm's all security-holders

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would require the firm to earn on total investments. The average rate of return required by all security-holders in a levered firm is the firm's weighted average cost of capital; i.e., WACC = k_o or k_l . Thus:

$$V_l = \frac{\text{NOI}}{k_l = k_o}$$

$$\text{or,} \quad k_o = k_l = \frac{\text{NOI}}{V_l} \tag{9}$$

In the case of an unlevered firm, the entire net operating income is the shareholders net income. Therefore, the unlevered firm's WACC or k_u is equal to its opportunity cost of capital:

$$k_a = k_u = \frac{\text{NOI}}{V_u} \tag{10}$$

Since the values of the levered and unlevered firms and the expected net operating income (NOI) do not change with financial leverage, the weighted average cost of capital would also not change with financial leverage. Hence, MM's Proposition I also implies that the weighted average cost of capital for two identical firms, one levered and another unlevered, will be equal to the opportunity cost of capital (Figure 7.5):

Levered firm's cost of capital (k_l) = Unlevered firm's cost of capital (k_u)

$k_l = k_o = k_a = k_u$

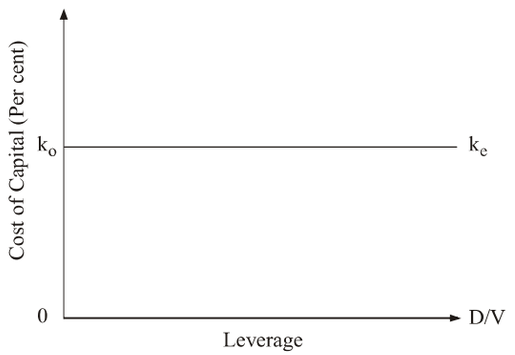

Fig. 7.5 *Cost of Capital under MM Proposition I*

Arbitrage Process

Why should MM's Proposition I work? As stated earlier, the simple logic of Proposition I is that two firms with identical assets, irrespective of how these assets have been financed, cannot command different market values. Suppose this were not true and two identical firms, except for their capital structures, have different market values. In this situation, arbitrage (or switching) will take place to

enable investors to engage in the personal or homemade leverage as against the corporate leverage, to restore equilibrium in the market.

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Key Assumption

MM's Proposition I is based on certain assumptions. These assumptions relate to the behaviour of investors and capital markets, the actions of the firm and the tax environment.

- ***Perfect capital markets:*** Securities (shares and debt instruments) are traded in the perfect capital market situation. This specifically means that (*a*) investors are free to buy or sell securities; (*b*) they can borrow without restriction at the same terms as the firms do; and (*c*) they behave rationally. It is also implied that the transaction costs, i.e., the cost of buying and selling securities, do not exist. The assumption that firms and individual investors can borrow and lend at the same rate of interest is a very critical assumption for the validity of MM Proposition I. The homemade leverage will not be a substitute for the corporate leverage if the borrowing and lending rates for individual investors are different from firms.
- ***Homogeneous risk classes:*** Firms operate in similar business conditions and have similar operating risk. They are considered to have similar operating risk and belong to homogeneous risk classes when their expected earnings have identical risk characteristics. It is generally implied under the MM hypothesis that firms within same industry constitute a homogeneous class.
- ***Risk:*** The operating risk is defined in terms of the variability of the net operating income (NOI). The risk of investors depends on both the random fluctuations of the expected NOI and the possibility that the actual value of the variable may turn out to be different than their best estimate.
- ***No taxes:*** There do not exist any corporate taxes. This implies that interest payable on debt do not save any taxes.
- ***Full payout:*** Firms distribute all net earnings to shareholders. This means that firms follow a 100 per cent dividend payout.

Proposition II

We have explained earlier that the value of the firm depends on the expected net operating income and the opportunity cost of capital, k_a, which is same for both levered and unlevered firms. In the absence of corporate taxes, the firm's capital structure (financial leverage) does not affect its net operating income. Hence, for the value of the firm to remain constant with financial leverage, the opportunity cost of capital, k_a, must also stay constant with financial leverage. The opportunity cost of capital, k_a depends on the firm's operating risk. Since financial leverage does not affect the firm's operating risk, there is no reason for the opportunity cost of capital, k_a to change with financial leverage.

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Financial leverage does not affect a firm's net operating income, but it does affect shareholders' return (EPS and ROE). EPS and ROE increase with leverage when the interest rate is less than the firm's return on assets. Financial leverage also increases shareholders' financial risk by amplifying the variability of EPS and ROE. Thus, financial leverage causes two opposing effects: it increases the shareholders' return but it also increases their financial risk. Shareholders will increase the required rate of return (i.e., the cost of equity) on their investment to compensate for the financial risk. The higher the financial risk, the higher the shareholders' required rate of return or the cost of equity. This is MM's Proposition II.

An all-equity financed or unlevered firm has no debt; its opportunity cost of capital is equal its cost of equity; that is, unlevered firm's $k_e = k_a$. MM's Proposition II provides justification for the levered firm's opportunity cost of capital remaining constant with financial leverage. In simple words, it states that the cost of equity, k_e, will increase enough to offset the advantage of cheaper cost of debt so that the opportunity cost of capital, k_a, does not change. A levered firm has financial risk while an unlevered firm is not exposed to financial risk. Hence, a levered firm will have higher required return on equity as compensation for financial risk. The cost of equity for a levered firm should be higher than the opportunity cost of capital, k_a; that is, the levered firm's $k_e > k_a$. It should be equal to constant k_a, plus a financial risk premium. How is this financial risk premium determined? You know that a levered firm's opportunity cost of capital is the weighted average of the cost of equity and the cost of debt:

$$k_a = k_e \times \frac{E}{E+D} + k_d \frac{D}{E+D}$$

You can solve this equation to determine the levered firm's cost of equity, k_e:

$$k_e = k_a + \left(k_a - k_d\right) \frac{D}{E} \tag{11}$$

You may note from the equation that for an unlevered firm, D (debt) is zero; therefore, the second part of the right-hand side of the equation is zero and the opportunity cost of capital, k_a equals the cost of equity, k_e. We can see from the equation that financial risk premium of a levered firm is equal to debt-equity ratio, D/E, multiplied with the spread between the constant opportunity cost of capital and the cost of debt, $(k_o - k_d)$. The required return on equity is positively related to financial leverage, because the financial risk of shareholders increases with financial leverage. The cost of equity, k_e, is a linear function of financial leverage, D/E. It is noteworthy that the functional relationship given in Equation (11) is valid, irrespective of any particular valuation theory. For example, MM assume the levered firm's opportunity cost of capital or WACC to be constant, while according to the traditional view, WACC depends on financial leverage.

Let us consider the following example to understand the implications of MM's Proposition II.

Limitations of the MM Hypothesis

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The arbitrage process is the behavioural foundation for MM's hypothesis. The shortcomings of this hypothesis lie in the assumption of perfect capital market in which arbitrage is expected to work. Due to the existence of imperfections in the capital market, arbitrage may fail to work and may give rise to discrepancy between the market values of levered and unlevered firms. The arbitrage process may fail to bring equilibrium in the capital market for the following reasons:

(i) **Lending and borrowing rates discrepancy:** The assumption that firms and individuals can borrow and lend at the same rate of interest does not hold in practice. Because of the substantial holding of fixed assets, firms have a higher credit standing. As a result, they are able to borrow at lower rates of interest than individuals. If the cost of borrowing to an investor is more than the firm's borrowing rate, then the equalization process will fall short of completion.

(ii) **Non-substitutability of personal and corporate leverages:** It is incorrect to assume that "personal (home-made) leverage" is a perfect substitute for "corporate leverage." The existence of limited liability of firms in contrast with unlimited liability of individuals clearly places individuals and firms on a different footing in the capital markets. If a levered firm goes bankrupt, all investors stand to lose to the extent of the amount of the purchase price of their shares. But, if an investor creates personal leverage, then in the event of the firm's insolvency, he would lose not only his principal in the shares of the unlevered company, but will also be liable to return the amount of his personal loan. Thus, it is more risky to create personal leverage and invest in the unlevered firm than investing directly in the levered firm.

(iii) **Transaction costs:** The existence of transaction costs also interferes with the working of arbitrage. Because of the costs involved in the buying and selling securities, it would become necessary to invest a greater amount in order to earn the same return. As a result, the levered firm will have a higher market value.

(iv) **Institutional restrictions:** Institutional restrictions also impede the working of arbitrage. The "home-made" leverage is not practically feasible as a number of institutional investors would not be able to substitute personal leverage for corporate leverage, simply because they are not allowed to engage in the "home-made" leverage.

(v) **Existence of corporate tax:** The incorporation of the corporate income taxes will also frustrate MM's conclusions. Interest charges are tax deductible. This, in fact, means that the cost of borrowing funds to the firm is less than the contractual rate of interest. The very existence of interest

charges gives the firm a tax advantage, which allows it to return to its equity and debt-holders a larger stream of income than it otherwise could have. Consider an example.

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Suppose a levered and an unlevered firm have NOI = ₹ 10,000. Further, the levered firm has: k_d = 0.06 and D_l = ₹ 20,000. Assume that the corporate income tax exists and the rate is 50 per cent. The unlevered firm's after tax operating income will be: NOI – tax on NOI, i.e., 10,000 – 10,000 × 0.50 = 10,000 – 5,000 = ₹ 5000. Interest is tax exempt. Therefore, levered firm's taxes will be less. The after-tax net operating income of the levered firm will be: NOI – tax on NOI minus interest, i.e., 10,000 – (10,000 – 1,200) × 0.50 = 10,000 – 4,400 = ₹ 5,600. Thus, the total after-tax operating earnings of debt-holders and equity holders is more in the case of the levered firm. Hence, the total market value of a levered firm should tend to exceed that of the unlevered firm for this very reason.

Check Your Progress

1. What is an unlevered firm?
2. Define net operating income.

7.4 MANAGEMENT LEVERAGE, OPERATING LEVERAGE AND COMBINED LEVERAGE

As stated earlier, a company can finance its investments by debt and equity. The company may also use preference capital. The rate of interest on debt is fixed irrespective of the company's rate of return on assets. The company has a legal binding to pay interest on debt. The rate of preference dividend is also fixed; but preference dividends are paid when the company earns profits. The ordinary shareholders are entitled to the residual income. That is, earnings after interest and taxes (less preference dividends) belong to them. The rate of the equity dividend is not fixed and depends on the dividend policy of a company.

The use of the fixed-charges sources of funds, such as debt and preference capital along with the owners' equity in the capital structure, is described as financial leverage or gearing or trading on equity. The use of the term trading on equity is derived from the fact that it is the owner's equity that is used as a basis to raise debt; that is, the equity that is traded upon. The supplier of debt has limited participation in the company's profits and, therefore, he will insist on protection in earnings and protection in values represented by ownership equity.

The financial leverage employed by a company is intended to earn more return on the fixed-charge funds than their costs. The surplus (or deficit) will increase (or decrease) the return on the owners' equity. The rate of return on the owners' equity is levered above or below the rate of return on total assets. For example, if

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a company borrows ₹ 100 at 8 per cent interest (that is, ₹ 8 per annum) and invests it to earn 12 per cent return (that is, ₹ 12 per annum), the balance of 4 per cent (₹ 4 per annum) after payment of interest will belong to the shareholders, and it constitutes the profit from financial leverage. On the other hand, if the company could earn only a return of 6 per cent on ₹ 100 (₹ 6 per annum), the loss to the shareholders would be ₹ 2 per annum. Thus, financial leverage provides the potentials of increasing the shareholders' earnings as well as creating the risks of loss to them. It is a double-edged sword. The following statement very well summarizes the concept of financial leverage:

This role of financial leverage suggests a lesson in physics, and there might be some point in considering the rate of interest paid as the fulcrum used in applying forces through leverage. At least it suggests consideration of pertinent variables; the lower the interest rate, the greater will be the profit, and the less the chance of loss; the less the amount borrowed the lower will be the profit or loss; also, the greater the borrowing, the greater the risk of unprofitable leverage and the greater the chance of gain.

Measures of Financial Leverage

The most commonly used measures of financial leverage are:

1. ***Debt ratio:*** The ratio of debt to total capital, i.e.,

$$L_1 = \frac{D}{D+E} = \frac{D}{V}$$

   Here, D is value of debt, E is value of shareholders' equity and V is value of total capital (i.e., $D + E$). D and E may be measured in terms of book value. The book value of equity is called 'net worth'. Shareholder's equity may be measured in terms of market value.

2. ***Debt–equity ratio:*** The ratio of debt to equity, i.e.,

$$L_2 = \frac{D}{E} \tag{12}$$

3. ***Interest coverage:*** The ratio of net operating income (or EBIT) to interest charges, i.e.,

$$L_3 = \frac{\text{EBIT}}{\text{Interest}} \tag{13}$$

The first two measures of financial leverage can be expressed either in terms of book values or market values. The market value to financial leverage is theoretically more appropriate because market values reflect the current attitude of investors. But it is difficult to get reliable information on market values in practice. The market values of securities fluctuate quite frequently.

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There is no difference between the first two measures of financial leverage in operational terms. They are related to each other in the following manner:

$$L_1 = \frac{L_2}{1+L_2} = \frac{D/E}{1+D/E} = \frac{D}{V} \quad (14)$$

$$L_2 = \frac{L_1}{1-L_1} = \frac{D/V}{1-D/V} = \frac{D}{E} \quad (15)$$

These relationships indicate that both these measures of financial leverage will rank companies in the same order. However, the first measure (i.e., *D/V*) is more specific as its value will range between zero to one. The value of the second measure (i.e., *D/E*) may vary from zero to any large number. The debt–equity ratio, as a measure of financial leverage, is more popular in practice. There is usually an accepted industry standard to which the company's debt-equity ratio is compared. The company will be considered risky if its debt-equity ratio exceeds the industry standard. Financial institutions and banks in India also focus on debt-equity ratio in their lending decisions.

The first two measures of financial leverage are also measures of capital gearing. They are static in nature as they show the borrowing position of the company at a point of time. These measures, thus, fail to reflect the level of financial risk, which is inherent in the possible failure of the company to pay interest and repay debt.

The third measure of financial leverage, commonly known as **coverage ratio**, indicates the capacity of the company to meet fixed financial charges. The reciprocal of interest coverage, that is, interest divided by EBIT, is a measure of the firm's income gearing. Again, by comparing the company's coverage ratio with an accepted industry standard, investors can get an idea of financial risk. However, this measure suffers from certain limitations. First, to determine the company's ability to meet fixed financial obligations, it is the cash flow information, which is relevant, not the reported earnings. During recessionary economic conditions, there can be wide disparity between the earnings and the net cash flows generated from operations. Second, this ratio, when calculated on past earnings, does not provide any guide regarding the future riskiness of the company. Third, it is only a measure of short-term liquidity rather than of leverage.

7.4.1 Financial Leverage and the Shareholders' Return

How much financial leverage do Indian companies employ? Companies differ in the use of financial leverage since it depends on a number of factors such as the size, nature of product, capital intensity, technology, market conditions, management attitude etc. In Table 7.4, we provide the measures of financial leverage for a few large companies in India for the financial year 2008. As you may observe, companies show wide variations in the use of financial leverage. Banks or finance companies employ very high amount of dent. Housing Development Finance Corporation

has the highest debt ratio of 91 per cent and its debt-equity ratio is 10 : 1. Infosys does not use any debt. Amongst manufacturing companies, Ranbaxy has the highest debt ratio followed by Tata Steel, Reliance Energy and Tata Motors. In spite of high debt, these companies have sufficient interest coverage due to their high profitability.

Table 7.4 *Financial Leverage of Large Indian Companies, 2008*

Company	Balance Sheet Gearing		Income Gearing	
	Debt ***ratio***	**Debt-Equity** ***ratio***	**Interest** ***coverage***	**Interest to** ***EBIT ratio***
Bajaj Auto	0.223	0.288	321.569	0.003
BHEL	0.010	0.010	87.305	0.011
Bharti Airtel	0.291	0.410	17.772	0.056
Cipla	0.035	0.036	73.400	0.014
Dr. Reddy's	0.069	0.074	28.059	0.036
Grasim Industries	0.320	0.472	33.754	0.030
HDFC Bank	0.487	0.948	1.515	0.660
Hindalco Industries	0.371	0.589	15.787	0.063
HUL	0.025	0.025	203.926	0.005
Housing Dev. Fin. Corp.	**0.910**	10.078	1.536	0.651
ICICI Bank	**0.741**	2.865	1.223	0.818
ITC	0.018	0.019	245.400	0.004
Infosys	0.000	0.000	-	-
L&T	0.264	0.358	7.068	0.141
Mahindra	0.305	0.439	73.627	0.014
Maruti Suzuki India	0.095	0.106	61.777	0.016
NTPC	0.332	0.498	5.337	0.187
ONGC	0.006	0.006	7.544	0.133
Ranbaxy	**0.560**	1.273	8.502	0.118
Reliance Comm.	0.415	0.710	8.562	0.117
Reliance Energy	0.385	0.627	3.976	0.252
Reliance Industries	0.302	0.432	12.185	0.082
Satyam	0.002	0.002	207.732	0.005
SBI	0.641	1.785	1.324	0.755
TCS	0.006	0.006	1216.067	0.001
Tata Motors	0.365	0.574	6.834	0.146
Tata Steel	0.404	0.679	25.698	0.039
Wipro	0.025	0.025	442.139	0.002

* *Source:* CMIE database

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The primary motive of a company in using financial leverage is to magnify the shareholders' return under favourable economic conditions. The role of financial leverage in magnifying the return of the shareholders is based on the assumptions that the fixed-charges funds (such as the loan from financial institutions and banks or debentures) can be obtained at a cost lower than the firm's rate of return on net assets (RONA or ROI). Thus, when the difference between the earnings generated by assets financed by the fixed-charges funds and costs of these funds is distributed to the shareholders, the earnings per share (EPS) or return on equity (ROE) increases. However, EPS or ROE will fall if the company obtains the fixed-charges funds at a cost higher than the rate of return on the firm's assets. It should, therefore, be clear that EPS, ROE and ROI are the important figures for analysing the impact of financial leverage.

EPS and ROE Calculations

EPS is calculated by dividing profit after taxes (PAT) also called net income (NI), by the number of shares outstanding. PAT is found out in two steps. First, the interest on debt, INT, is deducted from the earnings before interest and taxes, EBIT, to obtain the profit before taxes, PBT. Then, taxes are computed on and subtracted from PBT to arrive at the figure of PAT. The formula for calculating EPS is as follows:

$$\text{Earnings per share} = \frac{\text{Profit after tax}}{\text{Number of shares}}$$

$$\text{EPS} = \frac{\text{PAT}}{N} = \frac{(\text{EBIT} - \text{INT})(1-T)}{N} \qquad (16)$$

Here, T is the corporate tax rate and N is the number of ordinary shares outstanding. If the firm does not employ any debt, then the formula is:

$$\text{EPS} = \frac{\text{EBIT}(1-T)}{N} \qquad (17)$$

ROE is obtained by dividing PAT by equity (E). Thus, the formula for calculating ROE is as follows:

$$\text{Return on equity} = \frac{\text{Profit after tax}}{\text{Value of equity}}$$

$$\text{ROE} = \frac{(\text{EBIT} - \text{INT})(1-T)}{E} \qquad (18)$$

For calculating ROE, either the book value or the market value equity may be used.

How does the financial leverage affect EPS and ROE? We shall describe two situations to illustrate the impact of the financial leverage on EPS and ROE. First, we shall analyse the impact of the alternative financial plans on EPS and

ROE assuming that EBIT is constant. Second, we shall assume that EBIT varies and shows the effect of the alternative financial plans on EPS and ROE under the conditions of varying EBIT.

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Analysing alternative financial plans: Constant EBIT

Suppose a new firm, Brightways Ltd, is being formed. The management of the firm is expecting a before-tax rate of return of 24 per cent on the estimated total investment of ₹ 500,000. This implies EBIT = ₹ 500,000 × 0.24 = ₹ 120,000. The firm is considering two alternative financial plans: (*i*) either to raise the entire funds by issuing 50,000 ordinary shares at ₹ 10 per share, or (*ii*) to raise ₹ 250,000 by issuing 25,000 ordinary shares at ₹ 10 per share and borrow ₹ 250,000 at 15 per cent rate of interest. The tax rate is 50 per cent. What are the effects of the alternative plans for the shareholders' earnings? Table 7.5 shows calculations.

Table 7.5 *Effect of Financial Plan on EPS and ROE: Constant EBIT*

	Financial Plan	
	Debt-equity	**All-equity**
	(₹)	***(₹)***
1. Earnings before interest and taxes, EBIT	120,000	120,000
2. *Less:* Interest, INT	0	37,500
3. Profit before taxes, PBT = EBIT – INT	120,000	82,500
4. *Less:* Taxes = *T* (EBIT – INT)	60,000	41,250
5. Profit after taxes, PAT = (EBIT – INT) (1 – *T*)	60,000	41,250
6. Total earnings of investors, PAT + INT	60,000	78,750
7. Number of ordinary shares, *N*	50,000	25,000
8. EPS = (EBIT – INT) (1 – *T*)/*N*	1.20	1.65
9. ROE = (EBIT – INT) (1 – *T*)/*E*	12.0%	16.5%

From Table 7.5, we see that the impact of the financial leverage is quite significant when 50 per cent debt (debt of ₹ 250,000 to total capital of ₹ 500,000) is used to finance the investment. The firm earns ₹ 1.65 per share, which is 37.5 per cent more than ₹ 1.20 per share earned with no leverage. ROE is also greater by the same percentage.

EPS is greater under the debt-equity plan for two reasons. First, under this plan, the firm is able to borrow half of its funds requirements at a cost (15 per cent) lower than its rate of return on total investment (24 per cent). Thus, it pays a 15 per cent (or 7.5 per cent after tax) interest on the debt of ₹ 250,000 while earns a return of 24 per cent (or 12 per cent after tax) by investing this amount. The difference of 9 per cent (or 4.5 per cent after tax) accrues to the shareholders

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as owners of the firm without any corresponding investment. The difference in terms of rupees is ₹ 22,500 before taxes and ₹ 11,250 after taxes. Thus, the gain from the financial leverage is as shown in Table 7.6.

Table 7.6 *Gain from Financial Leverage*

	₹
1. EBIT on assets financed by debt, ₹ 250,000 × 0.24	60,000
2. *Less:* Interest, ₹ 250,000 × 0.15	37,500
3. Surplus earnings to the shareholders, ₹ 250,000 × (0.24 – 0.15)	22,500
4. *Less:* Taxes at 50 per cent	11,250
5. After tax surplus earnings accruing to the shareholders (leverage gain)	11,250

Second, under the debt-equity plan, the firm has only 25,000 shares as against 50,000 shares under the all-equity plan. Consequently, the after-tax favourable leverage of ₹ 11,250 dividend by 25,000 shares increases EPS by ₹ 0.45 from ₹ 1.20 to ₹ 1.65.

7.4.2 Interest Tax Shield

Another important way of explaining the effect of debt is to see the impact of the interest charges on the firm's tax liability. The interest charges are tax deductible and, therefore, provide tax shield, which increases the earnings of the shareholders. See line 6 in Table 7.5 that compares the total earnings of all investors (shareholders as well debt holders) under two alternative financial plans. The total earnings are more by ₹ 18,750 under the debt-equity plan that is exactly the amount of tax saved (i.e., ₹ 60,000 – ₹ 41,250), on account of the tax deductibility of the interest charges. The interest tax shield under the second financial plan could be directly found out as:

$$\text{Interest tax shield} = \text{Tax rate} \times \text{Interest}$$
$$= 0.5 \times 37{,}500 = ₹\ 18{,}750$$

It is the fact of the tax deductibility of the interest charges, which makes the use of the debt in the capital structure beneficial to a firm.

Instead of following the long procedure discussed in Table 7.5, Equation 35 or 37 can be used to examine the effect of the alternative financial plans on the shareholders' return. Suppose that the management of the firm in the example is considering a third alternative. They want to use 75 per cent debt and 25 per cent equity to finance the assets. Under this financial plan, for raising equity investment

of ₹ 125,000, the firm will sell 12,500 shares and pay ₹ 56,250 interest on a debt of ₹ 375,000 at 15 per cent. EPS and ROE will be as follows:

$$\text{EPS} = \frac{(\text{EBIT} - \text{INT})(1 - T)}{N}$$

$$= \frac{(120{,}000 - 56{,}250)(1 - 0.50)}{12{,}500} = \frac{31{,}875}{12{,}500}$$

$$= ₹\ 2.55$$

$$\text{ROE} = \frac{(\text{EBIT} - \text{INT})(1 - T)}{E} = \frac{31{,}875}{125{,}000} = 25.5\%$$

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Under the third alternative financial plan of 75 per cent debt, EPS and ROE are more than double as compared with all-equity, no-leverage financial plan.

In the example, we assume that the firm earns EBIT of 24 per cent on its investment (or ₹ 500,000 × 0.24 = ₹ 120,000). Since the firm pays 15 per cent on debt and earns more (24 per cent) on these funds, the effect of leverage is favourable. The more debt the firm uses, the greater is the EPS or ROE. The 24 per cent overall return is an *expected* figure. Suppose that, for some reason, the firm may not be able to earn 24 per cent before-tax return on its total capital, rather it can earn only 12 per cent return (i.e., EBIT = ₹ 60,000). What would be the impact on EPS and ROE? We can use Equations 35 and 37 to calculate EPS and ROE:

No debt plan

$$\text{EPS} = \frac{(60{,}000 - 0)(1 - 0.5)}{50{,}000} = \frac{30{,}000}{50{,}000} = ₹\ 0.60$$

$$\text{ROE} = \frac{30{,}000}{500{,}000} = 6\%$$

50% debt plan

$$\text{EPS} = \frac{(60{,}000 - 37{,}500)(1 - 0.5)}{25{,}000} = \frac{11{,}250}{25{,}000}$$

$$= ₹\ 0.45$$

$$\text{ROE} = \frac{11{,}250}{250{,}000} = 4.5\%$$

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75% debt plan

$$\text{EPS} = \frac{(60{,}000 - 56{,}250)(1 - 0.5)}{12{,}500} = \frac{1{,}875}{12{,}500}$$

$$= ₹\ 0.15$$

$$\text{ROE} = \frac{1{,}875}{125{,}000} = 1.5\%$$

We can see from the calculations above that the effect of financial leverage is unfavourable. EPS and ROE decline as more debt is used. Why is the effect of financial leverage unfavourable? It is unfavourable because the firm's rate of return on total funds or assets is less than the cost of debt. The firm is paying 15 per cent on debt and earning a return of 12 per cent on funds employed. The shareholders will have to meet the deficit of 3 per cent. As a result, EPS and ROE decline. If the rate of return on assets were just equal to the cost of debt, it can be seen that financial leverage will have no impact on the shareholders' return. EPS and ROE would be the same under all plans. We are thus led to an important conclusion—the financial leverage will have a favourable impact on EPS and ROE only when the firm's return on investment (ROI) exceeds the interest cost of debt (i). The impact will be unfavourable if the return on investment is less than the interest cost. It is in this sense that the financial leverage is said to be a double-edged sword.

Effect of Leverage on ROE and EPS

Favourable	$ROI > i$
Unfavourable	$ROI < i$
Neutral	$ROI = i$

These conclusions become very clear if we rewrite the formula for ROE. Suppose r is the before-tax return on assets or investment i.e. EBIT divided by $V = E + D$, and i is the interest rate on debt. Equation 37 can be written as follows:

$$\text{ROE} = \frac{(rV - iD)(1 - T)}{E} = \frac{[r(E + D) - iD](1 - T)}{E}$$

$$\text{ROE} = \left[r + (r - i)\frac{D}{E}\right](1 - T) \tag{19}$$

For an all-equity capital structure firm, D/E will be zero. Therefore, ROE for such firm is simply the after-tax return on assets:

$$\text{ROE} = r(1 - T) \tag{20}$$

A comparison of Equations (19) and (20) clearly shows that ROE is more by $[(r - i)\ D/E]\ (1 - T)$ factor when the firm uses debt. It is also indicated that if

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the return on assets exceeds the interest rate ($r > i$), ROE will increase linearly with increase in the financial leverage (viz., *D/E*). The effect of leverage will depend on both *D/E* and the spread between the rate of return on assets (r) and interest cost (i). If the return on assets equals the interest rate ($r = i$), no benefit of the financial leverage will be obtained; that is, $(r - i)\ D/E\ (1 - T) = 0$. The leverage effect will be unfavourable when the return on assets is less than the interest rate [when $r < i$, then $(r - i)\ D/E\ (1 - T)$, would become negative]. Equation (38) also shows that for a given level of financial leverage with the interest rate and tax rate being constant, ROE will increase or decline with the increase or decline in the rates of return on assets. The following section illustrates the behaviour of EPS with varying EBIT.

Combining Financial and Operating Leverages

Operating leverage affects a firm's operating profit (EBIT), while financial leverage affects profit after tax or the earnings per share. The combined effect of two leverages can be quite significant for the earnings available to ordinary shareholders.

Degree of operating leverage

The **degree of operating leverage** (DOL) is defined as the percentage change in the earnings before interest and taxes relative to a given percentage change in sales. Thus:

$$\text{DOL} = \frac{\%\text{Change in EBIT}}{\%\text{Change in Sales}}$$

$$\text{DOL} = \frac{\Delta\text{EBIT/EBIT}}{\Delta\text{Sales/Sales}} \tag{21}$$

The following equation is also used for calculating DOL:

$$\text{DOL} = \frac{Q(s - v)}{Q(s - v) - F} \tag{22}$$

Here, Q is the units of output, s is the unit selling price, v is the unit variable cost and F is the total fixed costs. Equation (22) can also be written as follows:

$$\text{DOL} = \frac{\text{Contribution}}{\text{EBIT}} \tag{23}$$

Since contribution = EBIT + Fixed cost, Equation (23) can be expressed as follows:

$$\text{DOL} = \frac{\text{EBIT + Fixed Cost}}{\text{EBIT}} = 1 + \frac{F}{\text{EBIT}} \tag{24}$$

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Suppose that in the earlier example of Brightways Ltd. the management had developed the following income statement based on an expected sales volume of 100,000 units:

	₹
Sales (100,000 units at ₹ 8)	800,000
Less: Variable costs (100,000 at ₹ 4)	400,000
Contribution	400,000
Less: Fixed costs	280,000
EBIT	120,000

Applying Equation (41), DOL is:

$$\text{DOL} = \frac{100,000 \ (₹\ 8 - ₹\ 4)}{100,000 \ (₹\ 8 - ₹\ 4) - ₹\ 280,000}$$

$$= \frac{₹\ 400,000}{120,000} = 3.33$$

DOL of 3.33 implies that for a given change in Brightways' sales, EBIT will change by 3.33 times.

Let us suppose in the case of Brightways, a technical expert appointed by the management tells them that they can choose a more automated production processes which will reduce unit variable cost to ₹ 2 but will increase fixed costs to ₹ 480,000. If the management accepts the expert's advice, then the income statement will look as follows:

	₹
Sales (100,000 at ₹ 8)	800,000
Less: Variable costs (100,000 at ₹ 2)	200,000
Contribution	600,000
Less: Fixed costs	480,000
EBIT	120,000

With high fixed costs and low variable costs, DOL for Brightways will be:

$$\text{DOL} = \frac{₹\ 600,000}{₹\ 120,000} = 5.0$$

If Brightways Ltd. chooses the high-automated technology and if its actual sales happen to be more than expected, its EBIT will increase greatly; an increase of 100 per cent in sales will lead to a 500 per cent increase in EBIT.

Degree of financial leverage

We have seen earlier in this unit that financial leverage affects the earnings per share. When the economic conditions are good and the firm's EBIT is increasing,

its EPS increases faster with more debt in the capital structure. The **degree of financial leverage** (DFL) is defined as the percentage change in EPS due to a given percentage change in EBIT:

$$\text{DFL} = \frac{\%\ \text{Change in EPS}}{\%\ \text{Change in EBIT}}$$

or

$$\text{DFL} = \frac{\Delta\ \text{EPS/EPS}}{\Delta\ \text{EBIT/EBIT}} \tag{25}$$

In the case of Brightways Ltd., when EBIT increases from ₹ 120,000 to ₹ 160,000, EPS increases from ₹ 1.65 to ₹ 2.45, when it employs 50 per cent debt and pays interest charges of ₹ 37,500. Applying Equation (25), DFL at EBIT of ₹ 120,000 is:

$$\text{DFL} = \frac{(2.45 - 1.65)/1.65}{(160,000 - 120,000)/120,000}$$

$$= \frac{0.485}{0.333} = 1.456$$

This implies that for a given change in EBIT, EPS will change by 1.456 times.

The following equation can also be used to calculate DFL:

$$\text{DFL} = \frac{\text{EBIT}}{\text{EBIT} - \text{INT}} = \frac{\text{EBIT}}{\text{PBT}} = 1 + \frac{\text{INT}}{\text{PBT}} \tag{26}$$

We know that EBIT = $Q\ (p - v) - F$ (and EBIT – INT = PBT). Thus, Equation (26) can also be written as follows:

$$\text{DFL} = \frac{Q(s - v) - F}{Q(s - v) - F - \text{INT}} \tag{27}$$

The numerator of Equation (26) or (27) is earnings before interest and taxes and the denominator is profit before taxes.

In the example, Brightways Ltd. was considering four alternative debt levels. Applying Equation (26), DFL for those alternatives at EBIT of ₹ 120,000 is given in Table 7.7.

Table 7.7 *Degree of Financial Leverage of Alternative Financial Plans at EBIT of ₹120,000*

Debt Level	DFL
0	1.000
25%	1.185
50%	1.456
75%	1.882

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It is indicated from Table 7.7 that if the firm does not employ any debt, EPS will increase at the same rate at which EBIT increases. EPS increases faster for a given increase in EBIT when debt is introduced in the capital structure; more the debt in the capital structure, the greater the increase in EPS. The opposite will happen if EBIT declines—the greater will be the fall in EPS with more debt in the capital structure.

Combined effect of operating and financial leverages

Operating and financial leverages together cause wide fluctuation in EPS for a given change in sales. If a company employs a high level of operating and financial leverage, even a small change in the level of sales will have dramatic effect on EPS. A company with cyclical sales will have a fluctuating EPS; but the swings in EPS will be more pronounced if the company also uses a high amount of operating and financial leverage.

The degrees of operating and financial leverages can be combined to see the effect of total leverage on EPS associated with a given change in sales. The degree of combined leverage (DCL) is given by the following equation:

$$\begin{aligned} &= \frac{\%\text{ Change in EBIT}}{\%\text{ Change in sales}} \times \frac{\%\text{ Change in EPS}}{\%\text{ Change in EBIT}} \\ &= \frac{\%\text{ Change in EPS}}{\%\text{ Change in Sales}} \end{aligned} \tag{28}$$

Yet another way of expressing the degree of combined leverage is as follows:

$$\begin{aligned} \text{DCL} &= \frac{Q(s-v)}{Q(s-v)-F} \times \frac{Q(s-v)-F}{Q(s-v)-F-\text{INT}} \\ &= \frac{Q(s-v)}{Q(s-v)-F-\text{INT}} \end{aligned} \tag{29}$$

Since $Q(s-v)$ is contribution and $Q(s-v)-F-\text{INT}$ is the profit after interest but before taxes, Equation (29) can also be written as follows:

$$\begin{aligned} \text{DCL} &= \frac{\text{Contribution}}{\text{Profit before taxes}} \\ &= \frac{\text{EBIT+Fixed costs}}{\text{PBT}} \\ &= \frac{\text{PBT+INT+}F}{\text{PBT}} = 1 + \frac{\text{INT+}F}{\text{PBT}} \end{aligned} \tag{30}$$

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Financial Leverage and the Shareholders' Risk

We have seen that financial leverage magnifies the shareholders' earnings. We also find that the variability of EBIT causes EPS to fluctuate within wider ranges with debt in the capital structure. That is, with more debt, EPS rises and falls faster than the rise and fall in EBIT. Thus, financial leverage not only magnifies EPS but also increases its variability.

The variability of EBIT and EPS distinguish between two types of risk—operating risk and financial risk. The distinction between operating and financial risk was long ago recognized by Marshall in the following words:

> ... Let us suppose that two men are carrying on similar business, the one working with his own, the other chiefly with borrowed, capital. There is one set of risks common to both, which may be described as the trade risk of the particular business in which they are engaged.... But there is another set of risks, the burden of which has to be borne by the man working with borrowed capital, and not by another.

Operating risk

Operating risk can be defined as the variability of EBIT (or return on assets). The environment—internal and external—in which a firm operates, determines the variability of EBIT. So long as the environment is given to the firm, *operating risk is an unavoidable risk*. A firm is better placed to face such risk if it can predict it with a fair degree of accuracy.

The variability of EBIT has two components:

(a) ***Variability of sales:*** The variability of sales revenue is in fact a major determinant of operating risk. Sales of a company may fluctuate because of three reasons. First, the changes in general economic conditions may affect the level of business activity. Business cycle is an economic phenomenon, which affects sales of all companies. Second, certain events affect sales of companies belonging to a particular industry. For example, the general economic conditions may be good but a particular industry may be hit by recession. Other factors may include the availability of raw materials, technological changes, actions of competitors, industrial relations, shifts in consumer preferences and so on. Third, sales may also be affected by the factors, which are internal to the company. The change in management, the product-market decisions of the company and its investment policy, or strike in the company have a great influence on the company's sales.

(b) ***Variability of expenses:*** Given the variability of sales, the variability of EBIT is further affected by the composition of fixed and variable expenses. Higher the proportion of fixed expenses relative to variable expenses, higher the degree of operating leverage. We have seen in the previous section that

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operating leverage affects EBIT. High operating leverage leads to faster increase in EBIT when sales are rising. In bad times when sales are falling, high operating leverage becomes a nuisance; EBIT declines at a greater rate than fall in sales. Operating leverage causes wide fluctuations in EBIT with varying sales. Operating expenses may also vary on account of changes in input prices, and may also contribute to the variability of EBIT.

Financial risk

For a given degree of variability of EBIT, the variability of EPS (and ROE) increases with more financial leverage. The variability of EPS caused by the use of financial leverage is called **financial risk**. Firms exposed to same degree of operating risk can differ with respect to financial risk when they finance their assets differently. A totally equity financed firm will have no financial risk. But when debt is used, the firm adds financial risk. Financial risk is thus an avoidable risk if the firm decides not to use any debt in its capital structure.

Check Your Progress

3. State the formula for calculation of EPS.
4. Define Degree of Operating Leverage (DOL).

7.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. A firm that uses no debt and finances its assets entirely by equity is called an unlevered firm.
2. Net Operating Income (NOI) is simply the annual income generated by an income-producing property after taking into account all income collected from operations, and deducting all expenses incurred from operations.
3. The formula for calculation of EPS is as follows:

$$\text{Earnings per share} = \frac{\text{Profit after tax}}{\text{Number of shares}}$$

$$\text{EPS} = \frac{\text{PAT}}{N} = \frac{(\text{EBIT} - \text{INT})(1 - T)}{N}$$

4. The Degree of Operating Leverage (DOL) is defined as the percentage change in the earnings before interest and taxes relative to a given percentage change in sales.

7.6 SUMMARY

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- The assets of a company can be financed either by increasing the owner claims or the creditor claims. The owner claims increase when the firm raises funds by issuing ordinary shares or by retaining the earnings; the creditors' claims increase by borrowing.
- The term capital structure is used to represent the proportionate relationship between debt and equity. Equity includes paid-up share capital, share premium and reserves and surplus (retained earnings).
- A firm that finances its assets by equity and debt is called a levered firm. On the other hand, a firm that uses no debt and finances its assets entirely by equity is called an unlevered firm.
- The traditional view has emerged as a compromise to the extreme position taken by the NI approach. Like the NI approach, it does not assume constant cost of equity with financial leverage and continuously declining WACC.
- The traditional theory implies that investors value levered firms more than unlevered firm. This means that they pay a premium for the shares of levered firms.
- The arbitrage process is the behavioural foundation for MM's hypothesis. The shortcomings of this hypothesis lie in the assumption of perfect capital market in which arbitrage is expected to work.
- The financial leverage employed by a company is intended to earn more return on the fixed-charge funds than their costs. The surplus (or deficit) will increase (or decrease) the return on the owners' equity.
- The primary motive of a company in using financial leverage is to magnify the shareholders' return under favourable economic conditions.
- Another important way of explaining the effect of debt is to see the impact of the interest charges on the firm's tax liability.
- For a given degree of variability of EBIT, the variability of EPS (and ROE) increases with more financial leverage. The variability of EPS caused by the use of financial leverage is called financial risk.

7.7 KEY WORDS

- **Levered firm:** It refers to a firm that finances its assets by equity and debt.
- **Capital Market**: It is used to mean the market for long term investments that have explicit or implicit claims to capital.

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- **Coverage ratio: It** is the ability of an organization to meet its financial obligations and liabilities.
- **Net income:** It is the residual amount of earnings after all expenses have been deducted from sales.

7.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. Write a short note on the Net Income Approach of capital structure.
2. Briefly mention the limitations of the MM hypothesis.
3. What are the most commonly used measures of financial leverage?
4. State the differences between financial risk and operating risk.

Long Answer Questions

1. 'The financing or capital structure decision is a significant managerial decision.' Do you agree with this statement? Give reasons for your answer.
2. Explain the capital structure decision process with the help of an example.
3. Compare and contrast the Traditional Approach with the Net Income Approach.
4. Explain the computation of interest tax shield with the help of an example.

7.9 FURTHER READINGS

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UNIT 8 CAPITAL BUDGETING

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Structure

8.0 INTRODUCTION

Capital budgeting is defined as the procedure adopted by an organization for evaluating investments and huge expenses in order to ensure maximum returns from the same. There are numerous methods of appraisal under certainty conditions. This unit, will introduce you to the concept of capital investment, the various method of appraisal namely, PBP, ARR, IRR and NPV techniques, and basic and international capital budgeting.

8.1 OBJECTIVES

After going through this unit, you will be able to:

- State the significance of capital budgeting decision
- Identify the basics of international capital budgeting
- Explain the methods of appraisal

8.2 CAPITAL INVESTMENT: BASICS, MEANING, NATURE AND TYPES

The investment decisions of a firm are generally known as the capital budgeting, or capital expenditure decisions. A **capital budgeting decision** may be defined as a firm's decision to invest its current funds most efficiently in the long-term assets in anticipation of an expected flow of benefits over a series of years. The long-term

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assets are those that affect the firm's operations beyond the one-year period. The firm's investment decisions would generally include expansion, acquisition, modernization and replacement of the long-term assets. Sale of a division or business (divestment) is also an investment decision. Decisions like the change in methods of sales distribution, or an advertisement campaign or a research and development programme have long-term implications for the firm's expenditures and benefits, and therefore, they should also be evaluated as investment decisions. It is important to note that investment in the long-term assets invariably requires large funds to be tied up in the current assets such as inventories and receivables. As such, investment in fixed and current assets is one single activity.

The following are the features of investment decisions:

- The exchange of current funds for future benefits.
- The funds are invested in long-term assets.
- The future benefits will occur to the firm over a series of years.

It is significant to emphasize that expenditures and benefits of an investment should be measured in cash. In the investment analysis, it is cash flow, which is important, and not the accounting profit. It may also be pointed out that investment decisions affect the firm's value. The firm's value will increase if investments are profitable and add to the shareholders' wealth. Thus, investments should be evaluated on the basis of a criterion, which is compatible with the objective of the Shareholder Wealth Maximization. An investment will add to the shareholders' wealth if it yields benefits in excess of the minimum benefits, as per the opportunity cost of capital. In this unit, we assume that the investment project's opportunity cost of capital is known. We also assume that the expenditures and benefits of the investment are known with certainty.

Importance of investment decisions

Investment decisions require special attention because of the following reasons:

- They influence the firm's growth in the long run.
- They affect the risk of the firm.
- They involve commitment of large amount of funds.
- They are irreversible, or reversible at substantial loss.
- They are among the most difficult decisions to make.

Growth: The effects of investment decisions extend into the future and have to be endured for a longer period than the consequences of the current operating expenditure. A firm's decision to invest in long-term assets has a decisive influence on the rate and direction of its growth. A wrong decision can prove disastrous for the continued survival of the firm; unwanted or unprofitable expansion of assets will result in heavy operating costs to the firm. On the other hand, inadequate investment in assets would make it difficult for the firm to compete successfully and maintain its market share.

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Risk: A long-term commitment of funds may also change the risk complexity of the firm. If the adoption of an investment increases average gain but causes frequent fluctuations in its earnings, the firm will become more risky. Thus, investment decisions shape the basic character of a firm.

Funding: Investment decisions generally involve large amount of funds, which make it imperative for the firm to plan its investment programmes very carefully and make an advance arrangement for procuring finances internally or externally.

Irreversibility: Most investment decisions are irreversible. It is difficult to find a market for such capital items once they have been acquired. The firm will incur heavy losses if such assets are scrapped.

Complexity: Investment decisions are among the firm's most difficult decisions. They are an assessment of future events, which are difficult to predict. It is really a complex problem to correctly estimate the future cash flows of an investment. Economic, political, social and technological forces cause the uncertainty in cash flow estimation.

Types of investment decision

There are many ways to classify investments. As per the basic classification, there are two types of investment decision:

(i) Expansion and diversification

A company may add capacity to its existing product lines to expand existing operations. For example, the Gujarat State Fertilizer Company (GSFC) may increase its plant capacity to manufacture more urea. It is an example of related diversification. A firm may expand its activities in a new business. Expansion of a new business requires investment in new products and a new kind of production activity within the firm. If a packaging manufacturing company invests in a new plant and machinery to produce ball bearings, which the firm has not manufactured before, this represents expansion of new business or unrelated diversification. Sometimes a company acquires existing firms to expand its business. In either case, the firm makes investment in the expectation of additional revenue. Investments in existing or new products may also be called 'revenue-expansion investments'.

(ii) Replacement and modernization

The main objective of modernization and replacement is to improve operating efficiency and reduce costs. Cost savings will reflect in the increased profits, but the firm's revenue may remain unchanged. Assets become outdated and obsolete with technological changes. The firm must decide to replace those assets with new assets that operate more economically. If a cement company changes from semi-automatic drying equipment to fully automatic drying equipment, it is an example

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of modernization and replacement. Replacement decisions help to introduce more efficient and economical assets and therefore, are also called 'cost-reduction investments'. However, replacement decisions that involve substantial modernization and technological improvements expand revenues as well as reduce costs.

Another useful ways to classify investments are as follows:

(a) Mutually exclusive investments: Mutually exclusive investments serve the same purpose and compete with each other. If one investment is undertaken, others will have to be excluded. A company may, for example, either use a more labour-intensive, semi-automatic machine, or employ a more capital-intensive, highly automatic machine for production. Choosing the semi-automatic machine precludes the acceptance of the highly automatic machine.

(b) Independent investments: Independent investments serve different purposes and do not compete with each other. For example, a heavy engineering company may be considering expansion of its plant capacity to manufacture additional excavators and addition of new production facilities to manufacture a new product—light commercial vehicles. Depending on their profitability and availability of funds, the company can undertake both investments.

(c) Contingent investments: Contingent investments are dependent projects; the choice of one investment necessitates undertaking one or more other investments. For example, if a company decides to build a factory in a remote, backward area, it may have to invest in houses, roads, hospitals, schools, etc., for the employees to attract the workforce. Thus, building of factory also requires investment in facilities for employees. The total expenditure will be treated as one single investment.

8.3 BASIC AND INTERNATIONAL CAPITAL BUDGETING

The basic principles applicable to an international investment decision are similar to a domestic investment decision. The incremental cash flow of the investment should be discounted at an opportunity cost of capital appropriate to the risk of the investment. The investment should be accepted if the net present value is positive. One factor that distinguishes the international investment decisions from the domestic investment decisions is that cash flows are earned in foreign currency. This fact should be considered while estimating the incremental cash flows. Let us consider an example to illustrate the evaluation of an international investment project.

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Suppose a Taiwanese toy manufacturing firm is thinking of an investment for making toys in Thailand. It is estimated that the initial project cost will be 12.5 million in Thai baht. The project will have a target debt ratio of 40 per cent. It is expected to generate the following free cash flows (net cash flows after tax) in baht for the next eight years:

Year	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
NCF (baht in million)	2.50	2.73	2.97	3.24	3.53	3.85	4.19	4.57

The following are the key assumptions about the project:

Table 8.1 *Key Assumptions about the Project in Thailand*

	Taiwan (T$)	*Thailand (baht)*
Inflation rate	12.9%	6.1%
Government bond yield	12.3%	9.4%
Risk premium	11.0%	8.0%
Interest rate	15.5%	12.4%
Tax rate	35.0%	30.0%
Spot exchange rate		

1 baht = 0.8160 Taiwanese dollar (T$)

How should the project be evaluated? Should it be undertaken? As we stated earlier, we can discount the free cash flows of the project by its WACC to determine its NPV. We should accept the project if NPV is positive.

There are two alternative ways to state the free cash flows and the discount rate. We can either use the Taiwanese dollar cost of capital to discount free cash flows in Taiwanese dollars or the Thai baht cost of capital to discount free cash flows in Thai baht.

Check Your Progress

1. What is the importance of investment decisions?
2. State one important factor which distinguishes the international investment decisions from the domestic investment decisions.

8.4 METHODS OF APPRAISAL UNDER CERTAINTY CONDITIONS

Three steps are involved in the evaluation of an investment:

(i) Estimation of cash flows

(ii) Estimation of the required rate of return (the opportunity cost of capital)

(iii) Application of a decision rule for making the choice

Our discussion in this unit is confined to the third step. Specifically, we focus on the merits and demerits of various decision rules.

Investment decision rule

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The investment decision rules may be referred to as capital budgeting techniques, or investment criteria. A sound appraisal technique should be used to measure the economic worth of an investment project. The essential property of a sound technique is that it should maximize the shareholders' wealth. The following other characteristics should also be possessed by a sound investment evaluation criterion:

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

8.4.1 Net Present Value

The **net present value (NPV) method** is the classic economic method of evaluating investment proposals. It is a DCF technique that explicitly recognizes the time value of money. It correctly postulates that cash flows arising at different time periods differ in value and are comparable only when their equivalents—present values—are found out. The following steps are involved in the calculation of NPV:

- Cash flows of the investment project should be forecasted based on realistic assumptions.
- Appropriate discount rate should be identified to discount the forecasted cash flows. The appropriate discount rate is the project's opportunity cost of capital, which is equal to the required rate of return expected by investors on investments of equivalent risk.
- Present value of cash flows should be calculated using the opportunity cost of capital as the discount rate.
- Net present value should be found out by subtracting present value of cash outflows from present value of cash inflows. The project should be accepted if NPV is positive (i.e., NPV > 0).

Let us consider an example.

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Illustration 8.1: Calculating Net Present Value

Assume that Project *X* costs ₹ 2,500 now and is expected to generate year-end cash inflows of ₹ 900, ₹ 800, ₹ 700, ₹ 600 and ₹ 500 in years 1 through 5. The opportunity cost of the capital may be assumed to be 10 per cent.

The net present value for Project *X* can be calculated by referring to the present value table. The calculations are shown below:

$$\text{NPV} = \left[\frac{₹\ 900}{(1+0.10)^1} + \frac{₹\ 800}{(1+0.10)^2} + \frac{₹\ 700}{(1+0.10)^3} + \frac{₹\ 600}{(1+0.10)^4} + \frac{₹\ 500}{(1+0.10)^5}\right] - ₹\ 2{,}500$$

$$= [₹\ 900(\text{PVF}_{1,\,0.10}) + ₹\ 800(\text{PVF}_{2,\,0.10}) + ₹\ 700(\text{PVF}_{3,\,0.10}) + ₹\ 600(\text{PVF}_{4,\,0.10}) + ₹\ 500(\text{PVF}_{5,\,0.10})] - ₹\ 2{,}500$$

$$= [₹\ 900 \times 0.909 + ₹\ 800 \times 0.826 + ₹\ 700 \times 0.751 + ₹\ 600 \times 0.683 + ₹\ 500 \times 0.620] - ₹\ 2{,}500$$

$$= ₹\ 2{,}725 - ₹\ 2{,}500 = + ₹\ 225$$

Project *X*'s present value of cash inflows (₹ 2,725) is greater than that of cash outflow (₹ 2,500). Thus, it generates a positive net present value (NPV = + ₹ 225). Project *X* adds to the wealth of owners; therefore, it should be accepted.

The formula for the net present value can be written as follows:

$$\text{NPV} = \left[\frac{C_1}{(1+k)^1} + \frac{C_2}{(1+k)^2} + \frac{C_3}{(1+k)^3} + \cdots + \frac{C_n}{(1+k)^n}\right] - C_0$$

$$= \sum_{t=1}^{n} \frac{C_t}{(1+k)^t} - C_0 \qquad (1)$$

Here, C_1, C_2... represent net cash inflows in year 1, 2..., *k* is the opportunity cost of capital, C_0 is the initial cost of the investment and *n* is the expected life of the investment. It should be noted that the cost of capital, *k*, is assumed to be known and is constant.

Importance of NPV

A question may be raised: Why should a financial manager invest ₹ 2,500 in Project *X*? Project *X* should be undertaken if it is best for the company's shareholders; they would like their shares to be as valuable as possible. Let us assume that the total market value of a hypothetical company is ₹ 10,000, which includes ₹ 2,500 cash that can be invested in Project *X*. Thus the value of the company's other assets must be ₹ 7,500. The company has to decide whether it should spend cash and accept Project *X* or to keep the cash and reject Project *X*. Clearly Project *X* is desirable since its *PV* (₹ 2,725) is greater than the ₹ 2,500 cash. If Project *X* is

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accepted, the total market value of the firm will be: ₹ 7,500 + *PV* of Project *X* = ₹ 7,500 + ₹ 2,725 = ₹ 10,225; that is, an increase by ₹ 225. The company's total market value would remain only ₹ 10,000 if Project *X* was rejected.

Why should the Present Value of Project *X* reflect in the company's market value? To answer this question, let us assume that a new company *X* with Project *X* as the only asset is formed. What is the value of the company? The market value of a company's shares is equal to the present value of the expected dividends. Since Project *X* is the only asset of Company *X*, the expected dividends would be equal to the forecasted cash flows from Project *X*. Investors would discount the forecasted dividends at a rate of return expected on securities equivalent in risk to company *X*. The rate used by investors to discount dividends is exactly the rate, which we should use to discount cash flows of Project *X*. The calculation of the PV of Project *X* is a replication of the process, which shareholders will be following in valuing the shares of company *X*. Once we find out the value of Project *X*, as a separate venture, we can add it to the value of other assets to find out the portfolio value.

The difficult part in the calculation of the PV of an investment project is the precise measurement of the discount rate. Funds available with a company can either be invested in projects or given to shareholders. Shareholders can invest funds distributed to them in financial assets. Therefore, the discount rate is the opportunity cost of investing in projects rather than in capital markets. Obviously, the opportunity cost concept makes sense when financial assets are of equivalent risk as compared to the project.

An alternate interpretation of the positive net present value of an investment is that it represents the maximum amount a firm would be ready to pay for purchasing the opportunity of making investment, or the amount at which the firm would be willing to sell the right to invest without being financially worse-off. The net present value (₹ 225) can also be interpreted to represent the amount the firm could raise at the required rate of return (10%), in addition to the initial cash outlay (₹ 2,500), to distribute immediately to its shareholders and by the end of the projects' life, to have paid off all the capital raised and return on it. The point is illustrated by the calculations shown in Table 8.2.

Table 8.2 *Interpretation of NPV*

Year	Amount outstanding in the beginning (₹)	Return on outstanding amount at 10% (₹)	Total outstanding flows (₹)	Repayment from cash at the end (₹)	Balance outstanding (₹)
1	2,725.00	272.50	2,997.50	900	2,097.50
2	2,097.50	209.75	2,307.25	800	1,507.25
3	1,507.25	150.73	1,657.98	700	957.98
4	957.98	95.80	1,053.78	600	453.78
5	453.78	45.38	499.16	500	(0.84)*

* Rounding off error.

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The calculations in Table 8.2 are based on the assumption that the firm chooses to receive the cash benefit resulting from the investment in the year it is made. Any pattern of cash receipts, such that the net present value is equal to ₹ 225, can be selected. Thus, if the firm raises ₹ 2,500 (the initial outlay) instead of ₹ 2,725 (initial outlay *plus* net present value) at 10 per cent rate of return, at the end of fifth year after having paid the principal sum together with interest, it would be left with ₹ 363, whose present value at the beginning of the first year at 10 per cent discount rate is ₹ 225. It should be noted that the gain to shareholders would be more if the rate of raising money is less than 10 per cent. Why?

Acceptance rule

It should be clear that the acceptance rule using the NPV method is to accept the investment project if its net present value is positive (NPV > 0) and to reject it if the net present value is negative (NPV < 0). Positive NPV contributes to the net wealth of the shareholders, which should result in the increased price of a firm's share. The positive net present value will result only if the project generates cash inflows at a rate higher than the opportunity cost of capital. A project with zero NPV (NPV = 0) may be accepted. A zero NPV implies that project generates cash flows at a rate just equal to the opportunity cost of capital. The NPV acceptance rules are:

- Accept the project when NPV is positive NPV > 0
- Reject the project when NPV is negative NPV < 0
- May accept the project when NPV is zero NPV = 0

The NPV method can be used to select between mutually exclusive projects; the one with the higher NPV should be selected. Using the NPV method, projects would be ranked in order of net present values; that is, first rank will be given to the project with highest positive net present value and so on.

Evaluation of the NPV method

NPV is the true measure of an investment's profitability. It provides the most acceptable investment rule for the following reasons:

- ***Time value:*** It recognizes the time value of money—a rupee received today is worth more than a rupee received tomorrow.
- ***Measure of true profitability:*** It uses *all* cash flows occurring over the entire life of the project in calculating its worth. Hence, it is a measure of the project's true profitability. The NPV method relies on estimated cash flows and the discount rate rather than any arbitrary assumption or subjective consideration.
- ***Value-additivity:*** The discounting process facilitates measuring cash flows in terms of present values; that is, in terms of equivalent, current rupees. Therefore, the NPVs of projects can be added. For example, NPV (*A* + *B*) = NPV (*A*) + NPV (*B*). This is called the 'value-additivity principle'.

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It implies that if we know the NPVs of individual projects, the value of the firm will increase by the *sum* of their NPVs. We can also say that if we know values of individual assets, the firm's value can simply be found by adding their values. The value-additivity is an important property of an investment criterion because it means that each project can be evaluated, independent of others, on its own merit.

- ***Shareholder value:*** The NPV method is always consistent with the objective of the shareholder value maximization. This is the greatest virtue of the method.

Are there any limitations in using the NPV rule? The NPV method is a theoretically sound method. In practice, however, it may pose some computational problems.

- ***Cash flow estimation:*** The NPV method is easy to use *if* forecasted cash flows are known. In practice, it is quite difficult to obtain the estimates of cash flows due to uncertainty.
- ***Discount rate:*** It is also difficult in practice to precisely measure the discount rate.
- ***Mutually exclusive projects:*** Further, caution needs to be applied in using the NPV method when alternative (mutually exclusive) projects with unequal lives, or under funds constraint are evaluated. The NPV rule may not give unambiguous results in these situations.
- ***Ranking of projects:*** It should be noted that the ranking of investment projects as per the NPV rule is *not* independent of the discount rates. Let us consider an example.

Suppose there are two projects—*A* and *B*—both costing ₹ 50 each. Project *A* returns ₹ 100 after one year and ₹ 25 after two years. On the other hand, Project *B* returns ₹ 30 after one year and ₹ 100 after two years. At discount rates of 5 per cent and 10 per cent, the NPV of projects and their ranking are as follows:

	NPV at 5%	*Rank*	*NPV at 10%*	*Rank*
Project *A*	67.92	II	61.57	I
Project *B*	69.27	I	59.91	II

It can be seen that the project ranking is reversed when the discount rate is changed from 5 per cent to 10 per cent. The reason lies in the cash flow patterns. The impact of the discounting becomes more severe for the cash flow occurring later in the life of the project; the higher is the discount rate, the higher would be the discounting impact. In the case of Project *B*, the larger cash flows come later in the life. Their present value will decline as the discount rate increases.

8.4.2 Internal Rate of Return

NOTES

The internal rate of return (IRR) method is another discounted cash flow technique, which takes account of the magnitude and timing of cash flows. Other terms used to describe the IRR method are *yield on an investment, marginal efficiency of capital, rate of return over cost, time-adjusted rate of internal return* and so on. The concept of internal rate of return is quite simple to understand in the case of a one-period project. Assume that you deposit ₹ 10,000 with a bank and would get back ₹ 10,800 after one year. The true rate of return on your investment would be:

$$\text{Rate of return} = \frac{10,800 - 10,000}{10,000}$$

$$= \frac{10,800}{10,000} - 10,000 = 1.08 - 1 = 0.08 \quad \text{or} \quad 8\%$$

The amount that you would obtain in the future (₹ 10,800) would consist of your investment (₹ 10,000) plus return on your investment (0.08 × ₹ 10,000):

$$10,000\ (1.08) = 10,800$$

$$10,000 = \frac{10,800}{(1.08)}$$

You may observe that the rate of return of your investment (8%) makes the discounted (present) value of your cash inflow (₹ 10,800) equal to your investment (₹ 10,000).

We can now develop a formula for the rate of return (r) on an investment (C_0) that generates a single cash flow after one period (C_1) as follows:

$$r = \frac{C_1 - C_0}{C_0}$$

$$r = \frac{C_1}{C_0} - 1 \qquad (2)$$

Equation (2) can be rewritten as follows:

$$\frac{C_1}{C_0} = 1 + r$$

$$C_0 = \frac{C_1}{(1+r)} \qquad (3)$$

From Equation (3), you may notice that the rate of return, r, depends on the project's cash flows, rather than any outside factor. Therefore, it is referred to as

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the internal rate of return. The **internal rate of return** (IRR) is the rate that equates the investment outlay with the present value of cash inflow received, after one period. This also implies that the rate of return is the discount rate which makes NPV = 0. There is no satisfactory way of defining the true rate of return of a long-term asset. IRR is the best available concept. We shall see that although it is a very frequently used concept in finance, yet at times it can be a misleading measure of an investment's worth. IRR can be determined by solving the following equation for *r*:

$$C_0 = \frac{C_1}{(1+r)} + \frac{C_2}{(1+r)^2} + \frac{C_3}{(1+r)^3} + \cdots + \frac{C_n}{(1+r)^n}$$

$$C_0 = \sum_{t=1}^{n} \frac{C_t}{(1+r)^t}$$

$$\sum_{t=1}^{n} \frac{C_t}{(1+r)^t} - C_0 = 0 \qquad (4)$$

It can be noticed that the IRR equation is the same as the one used for the NPV method. In the NPV method, the required rate of return, *k*, is known and the net present value is found, while in the IRR method the value of *r* has to be determined at which the net present value becomes zero.

Uneven cash flows: Calculating IRR by trial and error

The value of *r* in Equation (4) can be found out by trial and error. The approach is to select any discount rate to compute the present value of cash inflows. If the calculated present value of the expected cash inflow is lower than the present value of cash outflows, a lower rate should be tried. On the other hand, a higher value should be tried if the present value of inflows is higher than the present value of outflows. This process will be repeated unless the net present value becomes zero. Illustration 8.2 explains the procedure of calculating IRR.

Illustration 8.2: Trial and Error Method for Calculating IRR

A project costs ₹ 16,000 and is expected to generate cash inflows of ₹ 8,000, ₹ 7,000 and ₹ 6,000 at the end of each year for next 3 years. We know that IRR is the rate at which project will have a zero NPV. As a first step, we try (arbitrarily) a 20 per cent discount rate. The project's NPV at 20 per cent is:

$$\begin{aligned} \text{NPV} &= -₹\ 16{,}000 + ₹\ 8{,}000(\text{PVF}_{1,\,0.20}) + ₹\ 7{,}000(\text{PVF}_{2,\,0.20}) \\ &\quad + ₹\ 6{,}000(\text{PVF}_{3,\,0.20}) \\ &= -₹\ 16{,}000 + ₹\ 8{,}000 \times 0.833 + ₹\ 7{,}000 \times 0.694 \\ &\quad + ₹\ 6{,}000 \times 0.579 \\ &= -₹\ 16{,}000 + ₹\ 14{,}996 = -₹\ 1{,}004 \end{aligned}$$

A negative NPV of ₹ 1,004 at 20 per cent indicates that the project's true rate of return is lower than 20 per cent. Let us try 16 per cent as the discount rate. At 16 per cent, the project's NPV is:

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$$\begin{aligned}
\text{NPV} &= -₹\ 16{,}000 + ₹\ 8{,}000(\text{PVF}_{1,\,0.16}) + ₹\ 7{,}000(\text{PVF}_{2,\,0.16}) \\
&\quad + ₹\ 6{,}000(\text{PVF}_{3,\,0.16}) \\
&= -₹\ 16{,}000 + ₹\ 8{,}000 \times 0.862 + ₹\ 7{,}000 \times 0.743 \\
&\quad + ₹\ 6{,}000 \times 0.641 \\
&= -₹\ 16{,}000 + ₹\ 15{,}943 = -₹\ 57
\end{aligned}$$

Since the project's NPV is still negative at 16 per cent, a rate lower than 16 per cent should be tried. When we select 15 per cent as the trial rate, we find that the project's NPV is ₹ 200:

$$\begin{aligned}
\text{NPV} &= -₹\ 16{,}000 + ₹\ 8{,}000(\text{PVF}_{1,\,0.15}) + ₹\ 7{,}000(\text{PVF}_{2,\,0.15}) \\
&\quad + ₹\ 6{,}000(\text{PVF}_{3,\,0.15}) \\
&= -₹\ 16{,}000 + ₹\ 8{,}000 \times 0.870 + ₹\ 7{,}000 \times 0.756 \\
&\quad + ₹\ 6{,}000 \times 0.658 \\
&= -₹\ 16{,}000 + ₹\ 16{,}200 = ₹\ 200
\end{aligned}$$

The true rate of return should lie between 15–16 per cent. We can find out a close approximation of the rate of return by the method of linear interpolation as follows:

		Difference
PV required	₹ 16,000	
		200
PV at lower rate, 15%	16,200	
		257
PV at higher rate, 16%	15,943	

r = 15% + (16% – 15%)200/257

= 15% + 0.80% = 15.8%

Level cash flows

An easy procedure can be followed to calculate the IRR for a project that produces level or equal cash flows each period. To illustrate, let us assume that an investment would cost ₹ 20,000 and provide annual cash inflow of ₹ 5,430 for 6 years. If the opportunity cost of capital is 10 per cent, what is the investment's NPV? The ₹ 5,430 is an annuity for 6 years. The NPV can be found as follows:

$$NPV = -₹\ 20,000 + ₹\ 5,430(PVFA_{6,0.10})$$
$$= -₹\ 20,000 + ₹\ 5,430 \times 4.355 = ₹\ 3,648$$

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How much is the project's IRR? The IRR of the investment can be found out as follows:

$$NPV = -₹\ 20,000 + ₹\ 5,430(PVFA_{6,r}) = 0$$
$$₹\ 20,000 = ₹\ 5,430(PVFA_{6,r})$$
$$PVFA_{6,r} = \frac{₹\ 20,000}{₹\ 5,430} = 3.683$$

The rate, which gives a PVFA of 3.683 for 6 years, is the project's internal rate of return. Here, 16 per cent is the project's IRR that equates the present value of the initial cash outlay (₹ 20,000) with the constant annual cash inflows (₹ 5,430 per year) for 6 years.

8.4.3 NPV Profile and IRR

We again emphasize that NPV of a project declines as the discount rate increases, and for discount rates higher than the project's IRR, NPV will be negative. NPV profile of the project at various discount rates is shown in Table 8.3 and Figure 8.1. At 16 per cent, the NPV is zero; therefore, it is the IRR of the project.

Table 8.3 *NPV Profile*

Cash Flow	Discount rate	NPV
– 20000	0%	12,580
5430	5%	7,561
5430	10%	3,649
5430	15%	550
5430	16%	0
5430	20%	(1,942)
5430	25%	(3,974)

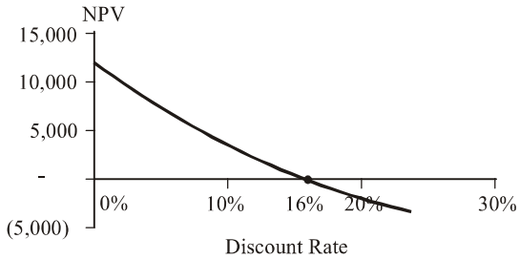

Fig. 8.1 *NPV Profile*

Acceptance rule

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The accept-or-reject rule, using the IRR method, is to accept the project if its internal rate of return is higher than the opportunity cost of capital ($r > k$). Note that k is also known as the required rate of return, or the cut-off, or hurdle rate. The project shall be rejected if its internal rate of return is lower than the opportunity cost of capital ($r < k$). The decision-maker may remain indifferent if the internal rate of return is equal to the opportunity cost of capital. Thus the IRR acceptance rules are:

- Accept the project when $r > k$
- Reject the project when $r < k$
- May accept the project when $r = k$

Excel Application 8.1: Calculation of IRR

We can easily calculate IRR using the Excel function for IRR. The spreadsheet below gives the cash flows of the project. We write the IRR formula in column C7: =IRR(C3:C6). The project cash flows, including the cash outlay in the beginning (C_0 in year 0) are contained in column C3 through column C6. It is optional to include the "guess" rate in the formula.

	A	B	C	D
1	**IRR of An Investment Project**			
2	Year	Cash Flow (₹)		
3	0	C_0	–16000	
4	1	C_1	8000	
5	2	C_2	7000	
6	3	C_3	6000	
7		IRR	15.8%	IRR(C3:C6)

The reasoning for the acceptance rule becomes clear if we plot NPVs and discount rates for the project given in Table 4.2 on a graph like Figure 4.1. It can be seen that if the discount rate is less than 16 per cent IRR, then the project has *positive* NPV; if it is equal to IRR, the project has a *zero* NPV; and if it is greater than IRR, the project has negative NPV. Thus, when we compare the IRR of the project with the opportunity cost of capital, we are in fact trying to ascertain whether the project's NPV is positive or not. In case of independent projects, IRR and NPV rules will give the same results if the firm has no shortage of funds.

Evaluation of IRR Method

IRR method is like the NPV method. It is a popular investment criterion since it measures profitability as a percentage and can be easily compared with the opportunity cost of capital. IRR method has following merits:

- ***Time value:*** The IRR method recognizes the time value of money.
- ***Profitability measure:*** It considers *all* cash flows occurring over the entire life of the project to calculate its rate of return.
- ***Acceptance rule:*** It generally gives the same acceptance rule as the NPV method.

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- ***Shareholder value:*** It is consistent with the Shareholder Wealth Maximization objective. Whenever a project's IRR is greater than the opportunity cost of capital, the shareholders' wealth will be enhanced.

Like the NPV method, the IRR method is also theoretically a sound investment evaluation criterion. However, IRR rule can give misleading and inconsistent results under certain circumstances. Here we briefly mention the problems that IRR method may suffer from.

- ***Multiple rates:*** A project may have multiple rates, or it may not have a unique rate of return. As we explain later on, these problems arise because of the mathematics of IRR computation.
- ***Mutually exclusive projects:*** It may also fail to indicate a correct choice between mutually exclusive projects under certain situations.
- ***Value additivity:*** Unlike in the case of the NPV method, the value additivity principle does not hold when the IRR method is used—IRRs of projects do not add. Thus, for Projects *A* and *B*, IRR(*A*) + IRR(*B*) need not be equal to IRR (*A* + *B*). Consider an example given below.

  The NPV and IRR of Projects *A* and *B* are given below:

Project	C_0 (₹)	C_1 (₹)	NPV @ 10% (₹)	IRR (%)
A	– 100	+ 120	+ 9.1	20.0
B	– 150	+ 168	+ 2.7	12.0
A + *B*	– 250	+ 288	+ 11.8	15.2

It can be seen from the example that NPVs of projects add:

$$\text{NPV}(A) + \text{NPV}(B) = \text{NPV}(A+B) = 9.1 + 2.7 = 11.8, \quad \text{while}$$

$$\text{IRR}(A) + \text{IRR}(B) \neq \text{IRR}(A+B) = 20\% + 12\% \neq 15.2\%$$

8.4.4 Payback Period

The payback (PB) is one of the most popular and widely recognized traditional methods of evaluating investment proposals. **Payback** is the number of years required to recover the original cash outlay invested in a project. If the project generates constant annual cash inflows, the payback period can be computed by dividing cash outlay by the annual cash inflow. That is:

$$\text{Payback} = \frac{\text{Initial Investment}}{\text{Annual Cash Inflow}} = \frac{C_0}{C} \tag{5}$$

Illustration 8.3: Payback (Constant Cash Flows)

Assume that a project requires an outlay of ₹ 50,000 and yields annual cash inflow of ₹ 12,500 for 7 years. The payback period for the project is:

$$\text{PB} = \frac{₹\ 50{,}000}{₹\ 12{,}000} = 4 \text{ years}$$

Unequal cash flows: In case of unequal cash inflows, the payback period can be found out by adding up the cash inflows until the total is equal to the initial cash outlay. Consider the following example.

Illustration 8.4: Payback (Uneven Cash Flows)

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Suppose that a project requires a cash outlay of ₹ 20,000, and generates cash inflows of ₹ 8,000; ₹ 7,000; ₹ 4,000; and ₹ 3,000 during the next 4 years. What is the project's payback? When we add up the cash inflows, we find that in the first three years ₹ 19,000 of the original outlay is recovered. In the fourth year cash inflow generated is ₹ 3,000 and only ₹ 1,000 of the original outlay remains to be recovered. Assuming that the cash inflows occur evenly during the year, the time required to recover ₹ 1,000 will be (₹ 1,000/₹ 3,000) × 12 months = 4 months. Thus, the payback period is 3 years and 4 months.

Acceptance rule

Many firms use the payback period as an investment evaluation criterion and a method of ranking projects. They compare the project's payback with a predetermined, standard payback. The project would be accepted if its payback period is less than the maximum or **standard payback** period set by management. As a ranking method, it gives highest ranking to the project, which has the shortest payback period and lowest ranking to the project with highest payback period. Thus, if the firm has to choose between two mutually exclusive projects, the project with shorter payback period will be selected.

Evaluation of payback

Payback is a popular investment criterion in practice. It is considered to have certain virtues.

- ***Simplicity:*** The most significant merit of payback is that it is simple to understand and easy to calculate. The business executives consider the simplicity of method as a virtue. This is evident from their heavy reliance on it for appraising investment proposals in practice.
- ***Cost effective:*** Payback method costs less than most of the sophisticated techniques that require a lot of the analysts' time and the use of computers.
- ***Short-term effects:*** A company can have more favourable short-run effects on earnings per share by setting up a shorter standard payback period. It should, however, be remembered that this may not be a wise long-term policy as the company may have to sacrifice its future growth for current earnings.
- ***Risk shield:*** The risk of the project can be tackled by having a shorter standard payback period as it may ensure guarantee against loss. A company has to invest in many projects where the cash inflows and life expectancies are highly uncertain. Under such circumstances, payback may become important, not so much as a measure of profitability but as a means of establishing an upper bound on the acceptable degree of risk.

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- ***Liquidity:*** The emphasis in payback is on the early recovery of the investment. Thus, it gives an insight into the liquidity of the project. The funds so released can be put to other uses.

In spite of its simplicity and the so-called virtues, the payback may not be a desirable investment criterion since it suffers from a number of serious limitations:

- ***Cash flows after payback:*** Payback fails to take account of the cash inflows earned after the payback period. For example, consider the following projects *X* and *Y*:

Cash Flows (₹)

Project	C_0	C_1	C_2	C_3	*Payback*	*NPV*
X	–4,000	0	4,000	2,000	2 years	+806
Y	–4,000	2,000	2.000	0	2 years	–530

As per the payback rule, both the projects are equally desirable since both return the investment outlay in two years. If we assume an opportunity cost of 10 per cent, Project *X* yields a positive net present value of ₹ 806 and Project *Y* yields a negative net present value of ₹ 530. As per the NPV rule, Project *X* should be accepted and Project *Y* rejected. The payback rule gave wrong results because it failed to consider ₹ 2,000 cash flow in the third year for Project *X*.

- ***Cash flows ignored:*** Payback is not an appropriate method of measuring the profitability of an investment project as it does not consider all cash inflows yielded by the project. Considering Project *X* again, payback rule did not take into account its entire series of cash flows.
- ***Cash flow patterns:*** Payback fails to consider the pattern of cash inflows, i.e., magnitude and timing of cash inflows. In other words, it gives equal weights to returns of equal amounts even though they occur in different time periods. For example, compare the following projects *C* and *D* where they involve equal cash outlay and yield equal total cash inflows over equal time periods:

Cash Flows (₹)

Project	C_0	C_1	C_2	C_3	***Payback***	***NPV***
C	–5,000	3,000	2,000	2,000	2 years	+881
D	–5,000	2,000	3,000	2,000	2 years	+798

Using payback period, both projects are equally desirable. But Project *C* *should be* preferable as larger cash inflows will come earlier in its life. This is indicated by the NPV rule; Project *C* has higher NPV (₹ 881) than Project *D* (₹ 798) at 10 per cent opportunity cost. It should be thus clear that payback is not a measure of profitability. As such, it is dangerous to use it as a decision criterion.

- ***Administrative difficulties:*** A firm may face difficulties in determining the maximum acceptable payback period. There is no rational basis for setting a maximum payback period. It is generally a subjective decision.
- ***Inconsistent with shareholder value:*** Payback is not consistent with the objective of maximizing the market value of the firm's shares. Share values do not depend on payback periods of investment projects.

Exhibit 8.1: Capital Budgeting Methods in Practice

- In a study of the capital budgeting practices of 14 medium to large size companies in India, it was found that all companies, except one, used payback. With payback and/or other techniques, about two-third of companies used IRR and about two-fifths NPV. IRR was found to be the second most popular method.
- The reasons for the popularity of payback in order of significance were stated to be its *simplicity to use and understand, its emphasis on the early recovery of investment* and *focus on risk.*
- It was also found that one-third of companies always insisted on the computation of payback for all projects, one-third for majority of projects and remaining for some of the projects. For about two-third of companies standard payback ranged between 3 and 5 years.
- Reasons for the secondary role of DCF techniques in India included *difficulty in understanding and using these techniques, lack of qualified professionals* and *unwillingness of top management* to use DCF techniques. One large manufacturing and marketing organization mentioned that conditions of its business were such that DCF techniques were not needed. Yet another company stated that replacement projects were very frequent in the company, and it was not considered necessary to use DCF techniques for evaluating such projects.

Source: Pandey, I.M., Capital Budgeting Practices of Indian Companies, *MDI Management Journal*, Vol. 2, No. 1 (January 1989).

Let us re-emphasize that the payback is not a valid method for evaluating the acceptability of the investment projects. It can, however, be used along with the NPV rule as a first step in screening the projects roughly. In practice, the use of DCF techniques has been increasing but payback continues to remain a popular and primary method of investment evaluation (Exhibit 8.1).

Payback reciprocal and the rate of return

Payback is considered theoretically useful in a few situations. One significant argument in favour of payback is that its reciprocal is a good approximation of the rate of return under certain conditions.

The payback period is defined as follows:

$$\text{Payback} = \frac{\text{Initial investment}}{\text{Annual cash inflow (annuity)}} = \frac{C_0}{C} \qquad (6)$$

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The formula for the present value of an annuity is given by the following equation (*i* in the original equation is being replaced by *r*, the internal rate of return.)

$$C_0 = C\left[\frac{1-\frac{1}{(1+r)^n}}{r}\right]$$

$$C_0 = \frac{C}{r} - \frac{C}{r}\left[\frac{1}{(1+r)^n}\right]$$

Multiplying both sides by *r*, we get

$$rC_0 = C - C\left[\frac{1}{(1+r)^n}\right]$$

Solving for *r*, we find

$$r = \frac{C}{C_0} - \frac{C}{C_0}\left[\frac{1}{(1+r)^n}\right] \quad (7)$$

Here, C_0 is the initial investment, *C* is annual cash inflow, *r* is rate of return and *n* is the life of investment.

In Equation (7), the first right-hand term is the reciprocal of the payback period. The second right-hand term is payback reciprocal multiplied by $1/(1 + r)^n$. If *n* is very large or extends to infinity, the second term becomes insignificant (almost equal to zero), and we are left with the term C/C_0. Thus, IRR becomes equal to the reciprocal of payback.

The reciprocal of payback will be a close approximation of the internal rate of return if the following two conditions are satisfied:

- The life of the project is large or at least twice the payback period.
- The project generates equal annual cash inflows.

The payback reciprocal is a useful technique to quickly estimate the true rate of return. But its major limitation is that every investment project does not satisfy the conditions on which this method is based. When the useful life of the project is not at least twice the payback period, the payback reciprocal will always exceed the rate of return. Similarly, it cannot be used as an approximation of the rate of return if the project yields uneven cash inflows.

Discounted payback

One of the serious objections to the payback method is that it does not discount the cash flows for calculating the payback period. We can discount cash flows

and then calculate the payback. The **discounted payback** period is the number of periods taken in recovering the investment outlay on the present value basis. The discounted payback period still fails to consider the cash flows occurring after the payback period.

Let us consider an example. Projects *P* and *Q* involve the same outlay of ₹ 4,000 each. The opportunity cost of capital may be assumed as 10 per cent. The cash flows of the projects and their discounted payback periods are shown in Table 8.4.

Table 8.4 *Discounted Payback Illustrated*

	Cash Flows (₹)					Simple	Dis.	NPV at
10%	C_0	C_1	C_2	C_3	C_4	P_B	P_B	
P	– 4,000	3,000	1,000	1,000	1,000	2 yrs	—	—
PV of cash flows	– 4,000	2,727	826	751	683	—	2.6 yrs	987
Q	– 4,000	0	4,000	1,000	2,000	2 yrs	—	—
PV of cash flows	– 4,000	0	3,304	751	1,366	—	2.9 yrs	1,421

The projects indicated are of same desirability by the simple payback period. When cash flows are discounted to calculate the discounted payback period, Project *P* recovers the investment outlay faster than Project *Q*, and therefore, it would be preferred over Project *Q*. Discounted payback period for a project will be always higher than simple payback period because its calculation is based on the discounted cash flows. Discounted payback rule is better as it discounts the cash flows until the outlay is recovered. But it does not help much. It does not take into consideration the entire series of cash flows. It can be seen in our example that if we use the NPV rule, Project *Q* (with the higher discounted payback period) is better.

8.4.5 Accounting Rate of Return

The **accounting rate of return** (ARR), also known as the return on investment (ROI), uses accounting information, as revealed by financial statements, to measure the profitability of an investment. The accounting rate of return is the ratio of the average after tax profit divided by the average investment. The average investment would be equal to half of the original investment if it were depreciated constantly. Alternatively, it can be found out by dividing the total of the investment's book values after depreciation by the life of the project. The accounting rate of return, thus, is an average rate and can be determined by the following equation:

$$\text{ARR} = \frac{\text{Average income}}{\text{Average investment}} \qquad (8)$$

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In Equation (8), average income should be defined in terms of earnings after taxes without an adjustment for interest, viz., EBIT $(1 - T)$ or net operating profit after tax. Thus:

$$\text{ARR} = \frac{\left[\sum_{t=1}^{n} \text{EBIT}_t (1-T)\right] / n}{(I_0 + I_n)/2} \tag{9}$$

where EBIT is earnings before interest and taxes, T tax rate, I_0 book value of investment in the beginning, I_n book value of investment at the end of n number of years.

Illustration 8.5: Accounting Rate of Return

A project will cost ₹ 40,000. Its stream of earnings before depreciation, interest and taxes (EBDIT) during first year through five years is expected to be ₹ 10,000, ₹ 12,000, ₹ 14,000, ₹ 16,000 and ₹ 20,000. Assume a 50 per cent tax rate and depreciation on straight-line basis. Project's ARR is computed in Table 8.5.

$$\text{Accounting Rate of Return} = \frac{3{,}200}{20{,}000} \times 100 = 16 \text{ per cent}$$

A variation of the ARR method is to divide average earnings after taxes by the original cost of the project instead of the average cost. Thus, using this version, the ARR in Illustration 8.5 would be: ₹ 3,200 ÷ ₹ 40,000 × 100 = 8 per cent. This version of the ARR method is less consistent as earnings are averaged but investment is not.

Table 8.5 *Calculation of Accounting Rate of Return*

(₹)

Period	1	2	3	4	5	Average
Earnings before depreciation, interest and taxes (EBDIT)	10,000	12,000	14,000	16,000	20,000	14,400
Depreciation	8,000	8,000	8,000	8,000	8,000	8,000
Earnings before interest and taxes (EBIT)	2,000	4,000	6,000	8,000	12,000	6,400
Taxes at 50%	1,000	2,000	3,000	4,000	6,000	3,200
Earnings before interest and after taxes [EBIT $(1-T)$]	1,000	2,000	3,000	4,000	6,000	3,200
Book value of investment:						
Beginning	40,000	32,000	24,000	16,000	8,000	
Ending	32,000	24,000	16,000	8,000	—	
Average	36,000	28,000	20,000	12,000	4,000	20,000

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Acceptance rule

As an accept-or-reject criterion, this method will accept all those projects whose ARR is higher than the minimum rate established by the management and reject those projects which have ARR less than the minimum rate. This method would rank a project as number one if it has highest ARR and lowest rank would be assigned to the project with lowest ARR.

Evaluation of ARR method

The ARR method may claim some merits:

- ***Simplicity:*** The ARR method is simple to understand and use. It does not involve complicated computations.
- ***Accounting data:*** The ARR can be readily calculated from the accounting data; unlike in the NPV and IRR methods, no adjustments are required to arrive at cash flows of the project.
- ***Accounting profitability:*** The ARR rule incorporates the entire stream of income in calculating the project's profitability.

The ARR is a method commonly understood by accountants, and frequently used as a performance measure. As a decision criterion, however, it has serious shortcomings.

- ***Cash flows ignored:*** The ARR method uses accounting profits, not cash flows, in appraising the projects. Accounting profits are based on arbitrary assumptions and choices and also include non-cash items. It is, therefore, inappropriate to rely on them for measuring the acceptability of the investment projects.
- ***Time value ignored:*** The averaging of income ignores the time value of money. In fact, this procedure gives more weightage to the distant receipts.
- ***Arbitrary cut-off:*** The firm employing the ARR rule uses an arbitrary cut-off yardstick. Generally, the yardstick is the firm's current return on its assets (book-value). Because of this, the growth companies earning very high rates on their existing assets may reject profitable projects (i.e., with positive NPVs) and the less profitable companies may accept bad projects (i.e., with negative NPVs).

The ARR method continues to be used as a performance evaluation and control measure in practice. But its use as an investment criterion is certainly undesirable. It may lead to unprofitable allocation of capital.

Check Your Progress

3. Mention the steps involved in the evaluation of an investment.
4. Define the Internal Rate of Return (IRR).

8.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

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1. Investment decisions require special attention because of the following reasons:
   - They influence the firm's growth in the long run.
   - They affect the risk of the firm.
   - They involve commitment of large amount of funds.
   - They are irreversible, or reversible at substantial loss.
   - They are among the most difficult decisions to make.
2. One factor that distinguishes the international investment decisions from the domestic investment decisions is that cash flows are earned in foreign currency.
3. The three steps involved in the evaluation of an investment are the following:
   (i) Estimation of cash flows
   (ii) Estimation of the required rate of return (the opportunity cost of capital)
   (iii) Application of a decision rule for making the choice
4. The Internal Rate of Return (IRR) is the rate that equates the investment outlay with the present value of cash inflow received after one period.

8.6 SUMMARY

- A capital budgeting decision may be defined as a firm's decision to invest its current funds most efficiently in the long-term assets in anticipation of an expected flow of benefits over a series of years.
- It is important to note that investment in the long-term assets invariably requires large funds to be tied up in the current assets such as inventories and receivables.
- It is significant to emphasize that expenditures and benefits of an investment should be measured in cash. In the investment analysis, it is cash flow, which is important, and not the accounting profit. I
- The basic principles applicable to an international investment decision are similar to a domestic investment decision.
- The investment decision rules may be referred to as capital budgeting techniques, or investment criteria.
- The Net Present Value (NPV) method is the classic economic method of evaluating investment proposals. It is a DCF technique that explicitly recognizes the time value of money.

- The Internal Rate of Return (IRR) method is another discounted cash flow technique, which takes account of the magnitude and timing of cash flows.
- Other terms used to describe the IRR method are yield on an investment, marginal efficiency of capital, rate of return over cost, time-adjusted rate of internal return and so on.
- IRR method is like the NPV method. It is a popular investment criterion since it measures profitability as a percentage and can be easily compared with the opportunity cost of capital.
- Payback is the number of years required to recover the original cash outlay invested in a project.
- The Accounting Rate of Return (ARR), also known as the return on investment (ROI), uses accounting information, as revealed by financial statements, to measure the profitability of an investment.

8.7 KEY WORDS

- **Payback:** It is the number of years required to recover the original cash outlay invested in a project.
- **Contingent investment:** These are dependent projects; the choice of one investment necessitates undertaking one or more other investments.
- **Liquidity:** *It* is a company's ability to convert its assets to cash in order to pay its liabilities when they are due.

8.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. State the significance of capital budgeting decision.
2. List the features of investment decisions.
3. Write a short note on the basics of international capital budgeting.
4. Mention the limitations of the Payback Period Method.
5. Briefly mention the Accounting Rate of Return (ARR).

Long Answer Questions

1. Discuss the types of investment decision.
2. Explain Net Present Value (NPV) method with the help of an example.
3. Give examples to highlight the use of trial and error method for calculating IRR.

8.9 FURTHER READINGS

NOTES

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BLOCK - III
SOURCES OF FINANCE

UNIT 9 OVERVIEW OF UNCERTAINTY AND RISK MODELS

Structure

9.0 INTRODUCTION

In financial management, uncertainty and risk models help an organization in anticipating the possibility and magnitude of the impact of unfavourable events on its finances. The risk adjusted return is the return on an investment adjusted for the risk taken in generating that return. This unit, will introduce you to uncertainty and risk models, certainty equivalent and risk-adjusted return measures.

9.1 OBJECTIVES

After going through this unit you will be able to:

- Define sensitivity analysis
- Discuss the steps involved in simulation analysis
- List the steps involved in decision tree approach
- Explain the tax considerations to be made in investment decisions

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9.2 UNCERTAINTY AND RISK MODELS

Risk is sometimes distinguished from uncertainty. **Risk** is referred to a situation where the probability distribution of the cash flow of an investment proposal is known. On the other hand, if no information is available to formulate a probability distribution of the cash flows the situation is known as 'uncertainty'. Most financial authors do not recognize this distinction and use the two terms interchangeably. We too follow this approach.

Expected net present value

Once the probability assignments have been made to the future cash flows, the next step is to find out the expected net present value. The expected net present value can be found out by multiplying the monetary values of possible events (cash flows) by their probabilities. The following equation describes the expected net present value.

Expected net present value = Sum of present values of expected net cash follows:

$$\text{ENPV} = \sum_{t=0}^{n} \frac{\text{ENCF}_t}{(1+k)^t} \tag{1}$$

Here, ENPV is the expected net present value, ENCF_t expected net cash flows (including both inflows and outflows) in period t and k is the discount rate. The expected net cash flow can be calculated as follows:

$$\text{ENCF}_t = \text{NCF}_{jt} \times P_{jt}$$

Here, NCF_{jt} is net cash flow for jth event in period t and P_{jt} probability of net cash flow for jth event in period t.

In the evaluation of an investment project, we work with the forecasts of cash flows. Forecasted cash flows depend on the expected revenue and costs. Further, expected revenue is a function of sales volume and unit selling price. Similarly, sales volume will depend on the market size and the firm's market share. Costs include variable costs, which depend on sales volume, and unit variable cost and fixed costs. The net present value or the internal rate of return of a project is determined by analysing the after-tax cash flows arrived at by combining forecasts of various variables. It is difficult to arrive at an accurate and unbiased forecast of each variable. We cannot be certain about the outcome of any of these variables.

The reliability of the NPV or IRR of the project will depend on the reliability of the forecasts of variables underlying the estimates of net cash flows. To determine the reliability of the project's NPV or IRR, we can work out how much difference it makes if any of these forecasts goes wrong. We can change each of the forecast, one at a time, to at least three values: pessimistic, expected and optimistic.

The NPV of the project is recalculated under these different assumptions. This method of recalculating NPV or IRR by changing each forecast is called 'sensitivity analysis'.

9.2.1 Sensitivity Analysis

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Sensitivity analysis is a way of analysing change in the project's NPV (or IRR) for a given change in one of the variables. It indicates how sensitive a project's NPV (or IRR) is to changes in particular variables. The more sensitive the NPV, the more critical is the variable. The following three steps are involved in the use of sensitivity analysis:

- Identification of all those variables, which have an influence on the project's NPV (or IRR).
- Definition of the underlying (mathematical) relationship between the variables.
- Analysis of the impact of the change in each of the variables on the project's NPV.

The decision-maker, while performing sensitivity analysis, computes the project's NPV (or IRR) for each forecast under three assumptions: (*a*) pessimistic, (*b*) expected and (*c*) optimistic. It allows him to ask 'what if' questions. For example, what (is the NPV) if volume increases or decreases? What (is the NPV) if variable cost or fixed cost increases or decreases? What (is the NPV) if the selling price increases or decreases? What (is the NPV) if the project is delayed or outlay escalates or the project's life is more or less than anticipated? A whole range of questions can be answered with the help of sensitivity analysis. It examines the sensitivity of the variables underlying the computation of NPV or IRR rather than attempting to quantify risk. It can be applied to any variable, which is an input for the after-tax cash flows.

Sensitivity analysis has the following advantages:

- It compels the decision-maker to identify the variables, which affect the cash flow forecasts. This helps him in understanding the investment project in totality.
- It indicates the critical variables for which additional information may be obtained. The decision-maker can consider actions, which may help in strengthening the 'weak spots' in the project.
- It helps to expose inappropriate forecasts, and thus guides the decision maker to concentrate on relevant variables.

Let us emphasize that sensitivity analysis is not a panacea for a project's uncertainties. It helps a decision-maker to understand the project better. It has the following limitations:

- It does not provide clear-cut results. The terms 'optimistic' and 'pessimistic' could mean different things to different persons in an organization. Thus, the range of values suggested may be inconsistent.

- It fails to focus on the interrelationship between variables. For example, sale volume may be related to price and cost. A price cut may lead to high sales and low operating cost.

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9.2.2 Simulation Analysis

We have explained in the previous sections that sensitivity analysis is quite useful to understand the uncertainty of the investment projects. But approach suffer from certain weaknesses. As we have discussed, if does not consider the interactions between variables and also, it does not reflect on the probability of the change in variables.

The Monte Carlo simulation or simply the **simulation analysis** considers the interactions among variables and probabilities of the change in variables. It does not give the project's NPV as a single number; rather it computes the probability distribution of NPV. In simulation analysis, a computer generates a very large number of scenarios according to the probability distributions of the variables. The simulation analysis involves the following steps:

- First, you should identify variables that influence cash inflows and outflows. For example, when a firm introduces a new product in the market, these variables are initial investment, market, size, market growth, market share, price, variable costs, fixed costs, product life cycle and terminal value.
- Second, specify the formulae that relate variables. For example, revenue depends on sales volume and price; sales volume is given by market size, market share and market growth. Similarly, operating expenses depend on production, sales, and variable and fixed costs.
- Third, indicate the probability distribution for each variable. Some variables will have more uncertainty than others. For example, it is quite difficult to predict price or market growth with confidence.
- Fourth, develop a computer programme that randomly selects one value from the probability distribution of each variable and uses these values to calculate the project's NPV. The computer generates a large number of such scenarios, calculates NPVs and stores them. The stored values are printed as a probability distribution of the project's NPVs along with the expected NPV and its standard deviation. The risk-free rate should be used as the discount rate to compute the project's NPV. Since simulation is performed to account for the risk of the project's cash flows, the discount rate should reflect only the time value of money.

9.2.3 Decision Tree Analysis

We have so far discussed simple accept-or-reject decisions, which view current investments in isolation of subsequent decisions. But in practice, the present investment decisions may have implications for future investment decisions, and

may affect future events and decisions. Such complex investment decisions involve a sequence of decisions over time. It is argued that 'since present choices modify future alternatives, industrial activity cannot be reduced to a single decision and must be viewed as a sequence of decisions extending from the present time into the future.' If this notion of industrial activity as a sequence of decisions is accepted, we must view investment expenditures not as isolated period commitments, but as links in a chain of present and future commitments. An analytical technique to handle the sequential decisions is to employ decision trees. In this section, we shall illustrate the use of decision trees in analysing and evaluating the sequential investments.

Steps in Decision Tree approach

At present, decision depends upon future events, and the alternatives of a whole sequence of decisions in future are affected by the present decision as well as future events. Thus, the consequence of each decision is influenced by the outcome of a chance event. At the time of taking decisions, the outcome of the chance event is not known, but a probability distribution can be assigned to it. A decision tree is a graphic display of the relationship between a present decision and future events, future decisions and their consequences. The sequence of events is mapped out over time in a format similar to the branches of a tree.

While constructing and using a decision tree, some important steps should be considered:

- ***Define investment:*** The investment proposal should be defined. Marketing, production or any other department may sponsor the proposal. It may be either to enter a new market or to produce a new product.
- ***Identify decision alternatives:*** The decision alternatives should be clearly identified. For example, if a company is thinking of building a plant to produce a new product, it may construct a large plant, a medium-sized plant or a small plant initially and expand it later on or construct no plant. Each alternative will have different consequences.
- ***Draw a decision tree:*** The decision tree should be graphed indicating the decision points, chance events and other data. The relevant data such as the projected cash flows, probability distributions, the expected present value, etc., should be located on the decision tree branches.
- ***Analyse data:*** The results should be analysed and the best alternative should be selected.

Usefulness of decision tree approach

The decision tree approach is extremely useful in handling the sequential investments. Working backwards—from future to present—we are able to eliminate

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unprofitable branches and determine optimum decision at various decision points. The *merits* of the decision tree approach are:

- ***Clarity:*** It clearly brings out the implicit assumptions and calculations for all to see, question and revise.
- ***Graphic visualization:*** It allows a decision maker to visualize assumptions and alternatives in graphic form, which is usually much easier to understand than the more abstract, analytical form.

However, the decision tree diagrams can become more and more complicated as the decision-maker decides to include more alternatives and more variables and to look farther and farther in time. It is complicated even further if the analysis is extended to include interdependent alternatives and variables that are dependent on one another; for example, sales volume depends on market share which depends on promotion expenses, etc. The diagram itself quickly becomes cumbersome and calculations become very time consuming or almost impossible.

9.3 CERTAINTY EQUIVALENT AND RISK-ADJUSTED RETURN MEASURES

Certainty equivalent is referred to a definite return that somebody would agree to, instead of taking a chance on a higher, but doubtful return. If we ever think of resigning from our jobs to start our own business and probably earn more profits, but if we make up our minds to wait and continue drawing a fixed salary instead, then the salary amount is our certainty equivalent. We might be required to come up with a business scheme that gives a more latent payoff to be influenced to leave the security of our present job.

Risk-adjusted return is a theory that improves an investment's return by assessing the amount of risk involved in fabricating that return, which is usually conveyed numerically or in the form of rating. Risk-adjusted returns are applicable in the case of personal securities, investment finances and portfolios.

9.3.1 Tax Considerations in Investment Decisions

The cash flows that are related to capital budgeting decisions are after tax cash flows only. The after tax cash flows that result from a project are the only relevant incremental cash flows. These after tax cash flows would not occur if the project is not undertaken. The annual cash flow from a project will result in increase in the taxable profit. Therefore, the cash flow from a project also affects the tax liability of the firm. The increase in tax liability will be equal to the cash inflow multiplied by the tax rate. Or, the net cash inflow will be equal to cash inflow before tax multiplied by tax rate (1– tax rate). Therefore, the relevant cash flow for a capital budgeting decision is the cash flow net of the incremental tax liability. Hence, capital budgeting analysis and decision-making should be done in after-tax terms.

This implies that all items that affect taxes, even non-cash item such as depreciation should be considered with equal importance.

Leasing *vs* Investment: Evaluation and Tax Implementations

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There are a large number of issues to take into consideration at the time of purchasing equipment, buildings or vehicles. The most primary question that arises is whether to lease or to buy? Both alternatives have benefits and drawbacks depending on a specific business scenario.

To be able to make the finest decision in any specified circumstances, we would have the following questions in mind:

For how long should the asset be retained? If the asset is to be kept for a short period, it can be concluded that it is better to lease it rather than buy it and then try to resell it when it is no longer required. One may want to check for a buyout option once the lease has expired, if one prefers to retain the asset after the original lease has expired.

Which is more suitable for one's needs—new or used equipment? Is new equipment required, or can the old equipment be used? Generally, the price of used equipment is low, as compared to a new one. On one hand, money can be saved on the cost price, but there may be no option to lease it. On the other hand, new equipment is easily available either for purchase or lease.

Analysis of the cost/benefit of the new *vs* used equipment is another significant task. This is particularly important at the time of a new beginning. Large investments on new equipment in the initial phase can put an excessive burden on the flow of money and funds. A small beginning might be better and can raise one's capital possessions as one's profits rise and can sustain growth.

What is the frequency of change in technology with this asset? In case of assets that turn obsolete within a short span of time, it is advisable to go for short leases instead of long ones. In this manner we have the most recent technology at our disposal, particularly if this technology is crucial for the business. If a company is not dependent on the most modern technology, it will often be more economical to modernize one's technology products a little less repeatedly, for instance, once in every three years.

What are our financing alternatives for purchasing *vs* leasing? Purchasing has a tendency to necessitate an elevated monetary expenditure initially in addition to having to finance our purchase by a lender. On the basis of our state of affairs, this might not be a practicable decision if the cash reserves are not adequate. Leasing in general requires less down payment and the monthly installments are also usually smaller.

What are the tax-related advantages of buying *vs* leasing? It is important to take into consideration every related tax consequences for both choices as they communicate about our exacting business circumstances. There is usually a tax benefit associated with leasing where one can take away the full lease

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payment with immediate effect. A tax professional should be consulted since every type of lease has a distinctive accounting for tax objectives as to how much one gets to subtract as an expenditure on one's profit/loss statement.

In cases of purchase and funding assets, it is only possible to subtract the interest in the form of an expense. The principal amount that is being paid on the loan is not regarded as a taxable deduction in the profit/loss statement—it is seen as a reduction of one's loan accountability.

The processes of leasing as well as purchasing are beneficial to companies. For making the right decisions it is important to know the company's specific needs and purpose of the asset. Answers to the questions above will help ensure that we make the best choice for our situations.

Cost of capital = cost of equity + cost of debt + cost of preference share (in proportion of their fund). Generally, financial managers use the cost of capital (refer as WACC) as a benchmark or a qualifying criterion for selecting the new projects of a company or evaluating the existing projects also.

It is to be noted that the concept of cost of capital has been discussed in detail in Unit 6. Also, the relevance of cost of capital in investment decisions has been highlighted in Unit 6.

Check Your Progress

1. State the formula for calculation of net present value.
2. Mention two advantages of sensitivity analysis.
3. If an asset is to be purchased for a short period, should it be leased or bought?

9.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Expected net present value = Sum of present values of expected net cash follows:

$$\text{ENPV} = \sum_{t=0}^{n} \frac{\text{ENCF}_t}{(1+k)^t}$$

2. Two advantages of sensitivity analysis are the following:
   (i) It compels the decision-maker to identify the variables, which affect the cash flow forecasts. This helps him in understanding the investment project in totality.
   (ii) It indicates the critical variables for which additional information may be obtained. The decision-maker can consider actions, which may help in strengthening the 'weak spots' in the project.

3. If an asset is to be purchased for a short period, it is better to lease it rather than buy it and then try to resell it when it is no longer required.

9.5 SUMMARY

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- Risk is sometimes distinguished from uncertainty. Risk is referred to a situation where the probability distribution of the cash flow of an investment proposal is known.
- Sensitivity analysis is a way of analysing change in the project's NPV (or IRR) for a given change in one of the variables. It indicates how sensitive a project's NPV (or IRR) is to changes in particular variables.
- The Monte Carlo simulation or simply the simulation analysis considers the interactions among variables and probabilities of the change in variables.
- The decision tree approach is extremely useful in handling the sequential investments. Working backwards—from future to present—we are able to eliminate unprofitable branches and determine optimum decision at various decision points.
- Certainty equivalent is referred to a definite return that somebody would agree to, instead of taking a chance on a higher, but doubtful return.
- Risk-adjusted return is a theory that improves an investment's return by assessing the amount of risk involved in fabricating that return, which is usually conveyed numerically or in the form of rating.
- In case of assets that turn obsolete within a short span of time, it is advisable to go for short leases instead of long ones.

9.6 KEY WORDS

- **Risk:** It is a term in accounting and finance used to describe the uncertainty that a future event with a favourable outcome will occur.
- **Sensitivity analysis:** It is a way of analysing change in the project's NPV (or IRR) for a given change in one of the variables.
- **Leasing:** It is defined as a written agreement under which one party agrees to let use one of its assets by another party.

9.7 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. Mention the steps involved in sensitivity analysis.
2. List the steps involved in decision tree approach.

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Long Answer Questions

1. Analyse the significance of simulation analysis.
2. Examine the tax considerations to be made in investment decisions.

9.8 FURTHER READINGS

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UNIT 10 WORKING CAPITAL MANAGEMENT

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Structure

10.0 INTRODUCTION

The management of current assets is similar to that of fixed assets in the sense that in both cases a firm analyses their effects on its return and risk. The management of fixed and current assets, however, differs in three important ways: First, in managing fixed assets, time is a very important factor; consequently, discounting and compounding techniques play a significant role in capital budgeting and a minor one in the management of current assets. Second, the large holding of current assets, especially cash, firm's liquidity position (and reduces riskiness), but also reduces the overall profitability. Thus, a risk-return trade-off is involved in holding current assets. Third, levels of fixed as well as current assets depend upon expected sales, but it is only the current assets which can be adjusted with sales fluctuations in the short run. Thus, the firm has a greater degree of flexibility in managing current assets.

In this unit, you will study about the concept, types, objectives and determinants of working capital, financing and conservative approaches, and long-term and short-term sources of finance.

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10.1 OBJECTIVES

After going through this unit, you will be able to:

- Define working capital
- Discuss the determinants of working capital
- Explain financing approaches and conservative approaches
- Describe the long-term and short-term sources of working capital finance

10.2 WORKING CAPITAL: DEFINITION, OBJECTIVES, CONCEPT AND TYPES

Working capital management refers to a company's managerial accounting strategy designed to monitor and utilize the two components of working capital, current assets and current liabilities, to ensure the most financially efficient operation of the company. The primary objective of working capital management is to ensure smooth operating cycle of the business. Secondary objectives are to optimize the level of working capital and minimize the cost of such funds.

There are two concepts of working capital—gross and net.

- ***Gross working capital*** refers to the firm's investment in current assets. **Current assets** are the assets which can be converted into cash within an accounting year and include cash, short-term securities, debtors (accounts receivable or book debts), bills receivable and stock (inventory).
- ***Net working capital*** refers to the difference between current assets and current liabilities. **Current liabilities** are those claims of outsiders which are expected to mature for payment within an accounting year and include creditors (accounts payable), bills payable, and outstanding expenses. Net working capital can be positive or negative. A positive net working capital will arise when current assets exceed current liabilities. A negative net working capital occurs when current liabilities are in excess of current assets.

The two concepts of working capital—gross and net—are not exclusive; rather, they have equal significance from the management viewpoint.

Focusing on Current Assets Management

The gross working capital concept focuses attention on two aspects of current assets management: (i) How to optimize investment in current assets? (ii) How should current assets be financed?

The consideration of the level of investment in current assets should avoid two danger points—excessive and inadequate investment in current assets. Investment in current assets should be just adequate to the needs of the business firm. Excessive investment in current assets should be avoided because it impairs

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the firm's profitability, as idle investment earns nothing. On the other hand, inadequate amount of working capital can threaten the solvency of the firm because of its inability to meet its current obligations. It should be realized that the working capital needs of the firm may be fluctuating with changing business activity. This may frequently cause excess or shortage of working capital. The management should be prompt to initiate an action and correct imbalances.

Another aspect of the gross working capital points to the need of arranging funds to finance current assets. Whenever a need for working capital funds arises due to the increasing level of business activity or for any other reason, financing arrangement should be made quickly. Similarly, if suddenly, some surplus funds arise they should not be allowed to remain idle, but should be invested in short-term securities. Thus, the financial manager should have knowledge of the sources of working capital funds as well as investment avenues where idle funds may be temporarily invested.

Focusing on Liquidity Management

Networking capital is a qualitative concept. It indicates the liquidity position of the firm and suggests the extent to which the working capital needs may be financed by permanent sources of funds. Current assets should be sufficiently in excess of current liabilities to constitute a margin or buffer for maturing obligations, within the ordinary operating cycle of a business. In order to protect their interests, short-term creditors always like a company to maintain current assets at a higher level than current liabilities. It is a conventional rule to maintain the level of current assets twice the level of current liabilities. However, the quality of current assets should be considered in determining the level of current assets *vis-à-vis* current liabilities. A weak liquidity position poses a threat to the solvency of the company and makes it unsafe and unsound. A negative working capital means a negative liquidity, and may prove to be harmful for the company's reputation. Excessive liquidity is also bad. It may be due to mismanagement of current assets. Therefore, prompt and timely action should be taken by the management to improve and correct the imbalances in the liquidity position of the firm.

The net working capital concept also covers the question of judicious mix of long-term and short-term funds for financing the current assets. For every firm, there is a minimum amount of net working capital which is permanent. Therefore, a portion of the working capital should be financed with the permanent sources of funds such as equity share capital, debentures, long-term debt, preference share capital or retained earnings. Management must, therefore, decide the extent to which current assets should be financed with equity capital and/or borrowed capital.

In summary, it may be emphasized that both gross and net concepts of working capital are equally important for the efficient management of working capital. There is no precise way to determine the exact amount of gross, or net working capital for any firm. The data and problems of each company should be analysed to determine the amount of working capital. There is no specific rule as

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to how current assets should be financed. It is not feasible in practice to finance current assets by short-term sources only. Keeping in view the constraints of the individual company, a judicious mix of long and short-term finances should be invested in current assets. Since current assets involve cost of funds, they should be put to productive use.

Permanent and Variable Working Capital

We know that the need for current assets arises because of the operating cycle. The operating cycle is a continuous process and, therefore, the need for current assets is felt constantly. But the magnitude of current assets needed is not always the same; it increases and decreases over time. However, there is always a minimum level of current assets which is continuously required by a firm to carry on its business operations. Permanent or **fixed working capital** is the minimum level of required current assets. It is permanent in the same way as the firm's fixed assets are. Depending upon the changes in production and sales, the need for working capital, over and above the permanent working capital, will fluctuate. For example, extra inventory of finished goods will have to be maintained to support the peak periods of sale, and investment in debtors (receivables), may also increase during such periods. On the other hand, investment in raw material, work-in-process and finished goods will fall if the market is slack.

Fluctuating or **variable working capital** is the extra working capital needed to support the changing production and sales activities of the firm. Both kinds of working capital—permanent and fluctuating (temporary)—are necessary to facilitate production and sale through the operating cycle. But the firm, to meet liquidity requirements that will last only temporarily, creates a temporary working capital. Figure 10.1 illustrates differences between permanent and temporary working capital. It is shown that permanent working capital is stable over time, while temporary working capital is fluctuating—sometimes increasing and sometimes decreasing. However, the permanent working capital line need not be horizontal if the firm's requirement for permanent capital is increasing (or decreasing) over a period. For a growing firm, the difference between permanent and temporary working capital can be depicted through Figure 10.1.

Balanced Working Capital Position

The firm should maintain a sound working capital position. It should have adequate working capital to run its business operations. Both excessive as well as inadequate working capital positions are dangerous from the firm's point of view. Excessive working capital means holding costs and idle funds which earn no profits for the firm. Paucity of working capital not only impairs the firm's profitability but also results in production interruptions and inefficiencies and sales disruptions.

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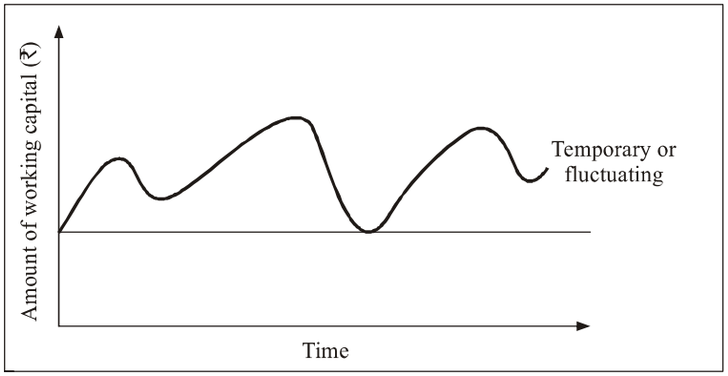

Fig. 10.1 *Permanent and Temporary Working Capital*

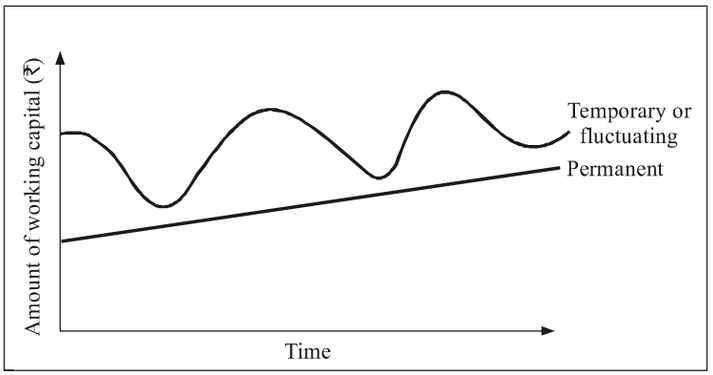

Fig. 10.2 *Permanent and Temporary Working Capital*

10.2.1 Determinants of Working Capital

There are no set rules or formulae to determine the working capital requirements of firms. A large number of factors, each having a different importance, influence working capital needs of firms. The importance of factors also changes for a firm over time. Therefore, an analysis of relevant factors should be made in order to determine total investment in working capital. The following is the description of factors which generally influence the working capital requirements of firms.

Nature of business

Working capital requirements of a firm are basically influenced by the nature of its business. Trading and financial firms have a very small investment in fixed assets, but require a large sum of money to be invested in working capital. Retail stores, for example, must carry large stocks of a variety of goods to satisfy varied and continuous demands of their customers. A large departmental store like Wal-Mart may carry, say, over 20,000 items. Some manufacturing businesses, such as tobacco manufacturers and construction firms, also have to invest substantially in working capital and a nominal amount in fixed assets. In contrast, public utilities may have limited need for working capital and have to invest abundantly in fixed assets. Their working capital requirements are nominal because they may have only cash

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sales and supply services, not products. Thus, no funds will be tied up in debtors and stock (inventories). For the working capital requirements, most of the manufacturing companies will fall between the two extreme requirements of trading firms and public utilities. Such companies have to make adequate investment in current assets depending upon the total assets structure and other variables.

Market and demand conditions

The working capital needs of a firm are related to its sales. However, it is difficult to precisely determine the relationship between volume of sales and working capital needs. In practice, current assets will have to be employed before growth takes place. It is, therefore, necessary to make advance planning of working capital for a growing firm on a continuous basis.

Growing firms may need to invest funds in fixed assets in order to sustain growing production and sales. This will, in turn, increase investment in current assets to support enlarged scale of operations. Growing firms need funds continuously. They use external sources as well as internal sources to meet increasing needs of funds. These firms face further problems when they retain substantial portion of profits, as they will not be able to pay dividends to shareholders. It is, therefore, imperative that such firms do proper planning to finance their increasing needs for working capital.

Sales depend on demand conditions. Large number of firms experience seasonal and cyclical fluctuations in the demand for their products and services. These business variations affect the working capital requirement, especially the temporary working capital requirement of the firm. When there is an upward swing in the economy, sales will increase; correspondingly, the firm's investment in inventories and debtors will also increase. Under the boom period, additional investment in fixed assets may be made by some firms to increase their productive capacity. This act of firms will require further additions of working capital. To meet their requirements of funds for fixed assets and current assets under the boom period, firms generally resort to substantial borrowing. On the other hand, when there is a decline in the economy, sales will fall and consequently, levels of inventories and debtors will also fall. Under a recession, firms try to reduce their short-term borrowings.

Seasonal fluctuations not only affect the working capital requirement but also create production problems for the firm. During periods of peak demand, increasing production may be expensive for the firm. Similarly, it will be more expensive during slack periods when the firm has to sustain its working force and physical facilities without adequate production and sales. A firm may, thus, follow a policy of level production, irrespective of seasonal changes in order to utilize its resources to the fullest extent. Such a policy will mean accumulation of inventories during off-season and their quick disposal during the peak season.

The increasing level of inventories during the slack season will require increasing funds to be tied up in the working capital for some months. Unlike

cyclical fluctuations, seasonal fluctuations generally conform to a steady pattern. Therefore, financial arrangements for seasonal working capital requirements can be made in advance. However, the financial plan or arrangement should be flexible enough to take care of some abrupt seasonal fluctuations.

Technology and manufacturing policy

The manufacturing cycle (or the inventory conversion cycle) comprises the purchase and use of raw materials and the production of finished goods. Longer the manufacturing cycle, larger will be the firm's working capital requirements. For example, the manufacturing cycle in the case of a boiler, depending on its size, may range between 6–24 months. On the other hand, the manufacturing cycle of products such as detergent powder, soaps, chocolate, etc., may be a few hours. An extended manufacturing time span means a larger tie-up of funds in inventories. Thus, if there are alternative technologies of manufacturing a product, the technological process with the shortest manufacturing cycle may be chosen. Once a manufacturing technology has been selected, it should be ensured that manufacturing cycle is completed within the specified period. This needs proper planning and coordination at all levels of activity. Any delay in manufacturing process will result in accumulation of work-in-process and wastage of time. In order to minimize their investment in working capital, some firms, specifically those manufacturing industrial products, have a policy of asking for advance payments from their customers. Non-manufacturing firms, service and financial enterprises do not have a manufacturing cycle.

A strategy of level or steady production may be maintained in order to resolve the working capital problems arising due to seasonal changes in the demand for the firm's product. A steady or level production policy will cause inventories to accumulate during the off-season periods and the firm will be exposed to greater inventory costs and risks. Thus, if costs and risks of maintaining a constant production schedule are high, the firm may adopt a variable production policy, varying its production schedules in accordance with changing demand. Those firms, whose productive capacities can be utilized for manufacturing varied products, can have the advantage of diversified activities and solve their working capital problems. They will manufacture the original product line during its increasing demand and when it has an off-season, other products may be manufactured to utilize physical resources and working force. Thus, production policies will differ from firm to firm, depending on the circumstances of individual firm.

Credit policy

The credit policy of the firm affects the working capital by influencing the level of debtors. The credit terms to be granted to customers may depend upon the norms of the industry to which the firm belongs. But a firm has the flexibility of shaping its credit policy within the constraint of the industry norms and practices. The firm should use discretion in granting credit terms to its customers. Depending upon the

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individual case, different terms may be given to different customers. A liberal credit policy, without rating the credit-worthiness of customers, will be detrimental to the firm and will create a problem of collection later on. The firm should be prompt in making collections. A high collection period will mean tie-up of large funds in debtors. Slack collection procedures can increase the chance of bad debts.

In order to ensure that unnecessary funds are not tied up in debtors, the firm should follow a rationalized credit policy, based on the credit standing of customers and other relevant factors. The firm should evaluate the credit standing of new customers and periodically review the creditworthiness of the existing customers. Any case of delayed payments should be thoroughly investigated.

Availability of credit from suppliers

The working capital requirements of a firm are also affected by credit terms granted by its suppliers. A firm will need less working capital if liberal credit terms are available to it from the suppliers. Suppliers' credit finances the firm's inventories and reduces the cash conversion cycle. In the absence of suppliers' credit the firm will have to borrow funds from a bank. The availability of credit at reasonable cost from banks is crucial. It influences the working capital policy of a firm. A firm without the suppliers' credit, but which can get bank credit easily, on favourable conditions, will be able to finance its inventories and debtors without much difficulty.

Operating efficiency

The operating efficiency of the firm relates to the optimum utilization of all its resources at minimum costs. The efficiency in controlling operating costs and utilizing fixed and current assets leads to operating efficiency. The use of working capital is improved and pace of cash conversion cycle is accelerated with operating efficiency. Better utilization of resources improves profitability and, thus, helps in releasing the pressure on working capital. Although it may not be possible for a firm to control prices of materials or wages of labour, it can certainly ensure efficient and effective use of its, labour and other resources.

Price level changes

The increasing shifts in price level make the functions of financial manager difficult. She should anticipate the effect of price level changes on working capital requirements of the firm. Generally, rising price levels will require a firm to maintain higher amount of working capital. Same levels of current assets will need increased investment when prices are increasing. However, companies that can immediately revise their product prices with rising price levels will not face a severe working capital problem. Further, firms will feel effects of increasing general price level differently as prices of individual products move differently. Thus, it is possible that some companies may not be affected by rising prices while others may be badly hit.

Check Your Progress

1. What is the primary objective of working capital management?
2. State any two determinants of working capital.

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10.3 FINANCING APPROACHES

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

(a) **Long-term financing:** The sources of long-term financing include ordinary 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 sources of short-term funds arising in 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 utilize these sources of finances to the fullest extent. The real choice of financing current assets, once the spontaneous sources of financing have been fully utilized, is between the long-term and short-term sources of finances.

What should be the mix of short and long-term 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

10.3.1 Matching Approach

The firm can adopt a financial plan which matches the expected life of assets with the expected life of the source of funds raised to finance assets. Thus, a 10-year loan may be raised to finance a plant with an expected life of 10 years; stock of goods to be sold in 30 days may be financed with a 30-day commercial paper or a bank loan. The justification for the exact matching is that, since the purpose of financing is to pay for assets, the source of financing and the asset should be

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relinquished simultaneously. Using long-term financing for short-term assets is expensive as funds will not be utilized for the full period. Similarly, financing long-term assets with short-term financing is costly as well as inconvenient, as arrangements for the new short-term financing will have to be made on a continuing basis.

When the firm follows a matching approach (also known as hedging approach), long-term financing will be used to finance fixed assets and permanent current assets and short-term financing to finance temporary or variable current assets. However, it should be realized that exact matching is not possible because of the uncertainty about the expected lives of assets.

Figure 10.3 is used to illustrate the matching plan over time. The firm's fixed assets and permanent current assets are financed with long-term funds and as the level of these assets increases, the long-term financing level also increases. The temporary or variable current assets are financed with short-term funds and as their level increases, the level of short-term financing also increases. Under a matching plan, no short-term financing will be used if the firm has a fixed current assets need only.

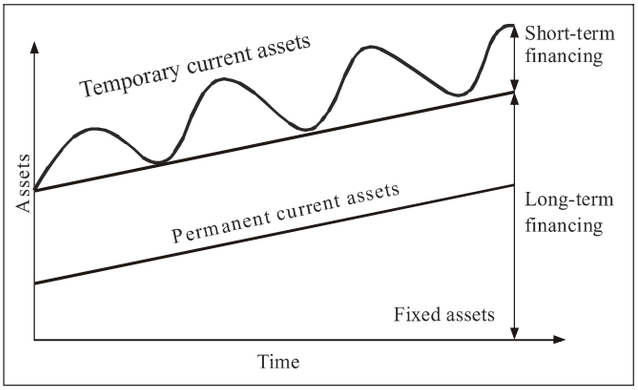

Fig. 10.3 *Financing under Matching Plan*

10.3.2 Conservative Approach

A firm in practice may adopt a conservative approach in financing its current and fixed assets. The financing policy of the firm is said to be conservative when it depends more on long-term funds for financing needs. Under a conservative plan, the firm finances its permanent assets and also a part of temporary current assets with long-term financing. In the periods when the firm has no need for temporary current assets, the idle long-term funds can be invested in the tradable securities to conserve liquidity. The conservative plan relies heavily on long-term financing and, therefore, the firm has less risk of facing the problem of shortage of funds. The conservative financing policy is shown in Figure 10.4. Note that when the firm has no temporary current assets [e.g., at (*a*) and (*b*)], the released long-term funds can be invested in marketable securities to build up the liquidity position of the firm.

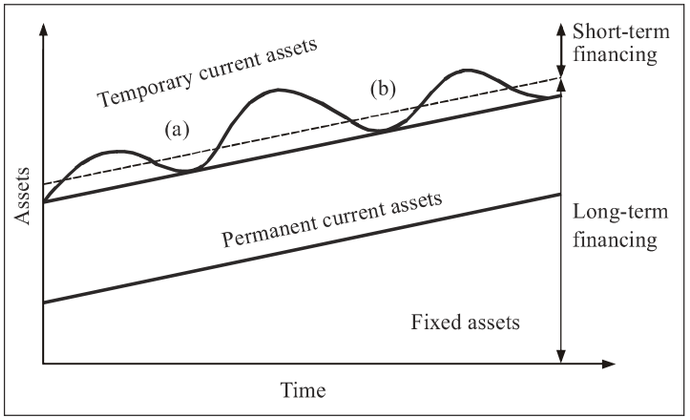

Fig. 10.4 *Conservative Financing*

Aggressive Approach

A firm may be aggressive in financing its assets. An aggressive policy is said to be followed by the firm when it uses more short-term financing than warranted by the matching plan. Under an aggressive policy, the firm finances a part of its permanent current assets with short-term financing. Some extremely aggressive firms may even finance a part of their fixed assets with short-term financing. The relatively large use of short-term financing makes the firm more risky. The aggressive financing is illustrated in Figure 10.5.

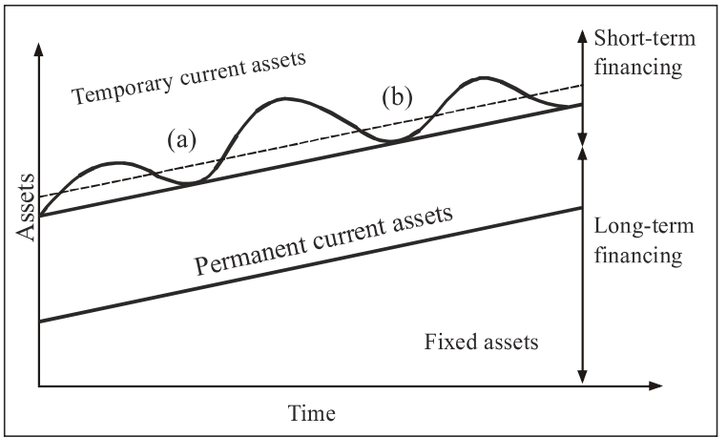

Fig. 10.5 *Aggressive Financing*

10.4 SOURCES OF WORKING CAPITAL FINANCE

Working capital financing is the cash of a business that is used in its day-to-day trading operations. There are different forms of working capital financing which can be divided into short-term and long-term sources.

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10.4.1 Short-Term Sources of Working Capital Finance

Factoring

Factoring is a conventional basis of short-term financial support. Factoring facility procedures have a tendency to be confined and enter into a complete turnover. Factoring facility can cause argumentative chasing of outstanding invoices from customers and a loss of control of a company's credit function.

Installment credit

Installment credit is a variety of finance to pay for merchandise or services over a period by way of paying principal and interest in standard payments.

Invoice discounting

Invoice discounting is a type of finance on the basis of assets, which make businesses discharge cash, corresponding to invoices. On the other hand, factoring facilitates a client to be in charge of the management of its debtors.

Income received in advance

Income received in advance is considered a responsibility since it is money that does not associate with that specific accounting or business year but rather for one that is still to come. In this case, the income account will be credited to income received in advance account and the income received in advance will be debited to the income account such as rent.

Advances inflow from customers

A liability account is used for recording an amount that comes in from a client prior to the provision of a service, or prior to the shipping of goods.

Bank overdraft

A bank overdraft is a bank balance wherein the sum withdrawn exceeds the sum in the account. The overdraft is restricted. A bank overdraft is also a type of loan as the money is borrowed in principal.

Commercial papers

A commercial paper is an unsecured promissory note. It is a money-market security given out by large businesses to get money to fulfil their short-term debts like, payroll. It is supported by an issuing bank or a corporation's promise to pay the face amount on the maturity date specified on the note. Only firms with commendable credit ratings are able to sell their commercial papers at a rational price.

Trade finance

An importer is required by an exporter to pay in advance for the goods shipped. It is normal that the importer tries to minimize risk by getting the exporter to give in writing that the goods have been shipped. Here, the importer's bank provides a letter of credit to the exporter (or the exporter's bank). This facilitates payment on presentation of certain papers, such as Bill of Lading, etc. The exporter can get a loan sanctioned from his bank, based on the export contract.

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Letter of Credit

A letter of credit is a paper that a financial establishment releases for a seller of goods or services. This letter makes the issuer liable to pay the seller for goods/ services delivered by the seller to a third-party buyer. The issuer then seeks compensation from the buyer or from the buyer's bank. The document is fundamentally an assurance to the seller that the payment will be made by the issuer of the letter of credit, even if the buyer finally is not able to pay. This is how the risk of the buyer's failure to pay is transferred from the seller to the issuer of the letter of credit.

10.4.2 Long-Term Sources of Working Capital Finance

Shares capital

Shares capital is that part of a company's equity that has been acquired (or will be acquired) by trading stock to a shareholder for cash or an equivalent item of capital value. Share capital encompasses the nominal values of all shares issued (that is, the sum of their 'par values'). Share capital can simply be referred to as the total of capital (cash or other assets) coming from the investors of a company, for its shares.

Debenture

A debenture is a document that either generates a debt or recognizes it. It is a debt that has no security attached to it. In corporate finance, the term is used for medium to long-term debt channels used by corporate giants for taking loans. A debenture is like a certificate of loan confirming the fact that a company is accountable to pay a specified amount with interest and even though the money comes through debentures, it becomes a part of the company's capital structure. It does not become share capital. Debentures are in general liberally transferable by the debenture holder.

10.4.3 Working Capital Financing by Commercial Banks: Types of Assistance

Bank credit is the most prominent way of financing current assets. Different types of bank credits comprise cash credit/overdrafts, bills purchased/discounted, short-term loans, letter of credit, straight loans, hypothecation loans, pledge loans, mortgage loans etc. Although other establishments like savings and loan associations and credit unions offer banking facilities, the majority of banking activities are carried out by commercial banks. They facilitate the company to work with minimum cash and still be able to confidently plan activities even in doubtful circumstances. Commercial banks prefer to give short-term loans because they prefer to recover their money in one year.

A loan is a kind of debt which involves the rearrangement of financial assets over time, between one who lends and one who borrows. In a loan, the borrower firstly receives or borrows an amount of money from the lender with a commitment

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to pay back the same at a later time. Ideally, the money is paid back in timely installments, or payment in parts; as a rule, every installment is of the same amount. The main task of any bank or financial institution is to provide loans. A safe loan is one in which the borrower guarantees an asset (e.g., a car or property) a security. Unsecured loans are financial credits that are not held against the borrower's assets.

Check Your Progress

3. Mention the sources of long-term finance.
4. Name the short-term sources of working capital finance.

10.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The primary objective of working capital management is to ensure smooth operating cycle of the business.
2. Two determinants of working capital are (i) nature of business and (ii) market and demand conditions.
3. The sources of long-term financing include ordinary share capital, preference share capital, debentures, long-term borrowings from financial institutions and reserves and surplus (retained earnings).
4. The short-term sources of working capital finance are the following:
   - Factoring
   - Installment credit
   - Invoice discounting
   - Income received in advance
   - Advances inflow from customers
   - Bank overdraft
   - Commercial papers

10.6 SUMMARY

- Working capital management refers to a company's managerial accounting strategy designed to monitor and utilize the two components of working capital, current assets and current liabilities, to ensure the most financially efficient operation of the company.
- The consideration of the level of investment in current assets should avoid two danger points—excessive and inadequate investment in current assets.

- The net working capital concept also covers the question of judicious mix of long-term and short-term funds for financing the current assets.
- The operating cycle is a continuous process and, therefore, the need for current assets is felt constantly.
- The firm should maintain a sound working capital position. It should have adequate working capital to run its business operations. Both excessive as well as inadequate working capital positions are dangerous from the firm's point of view.
- For the working capital requirements, most of the manufacturing companies will fall between the two extreme requirements of trading firms and public utilities. Such companies have to make adequate investment in current assets depending upon the total assets structure and other variables.
- The operating efficiency of the firm relates to the optimum utilization of all its resources at minimum costs.
- A firm can adopt different financing policies *vis-à-vis* current assets.
- A firm may be aggressive in financing its assets. An aggressive policy is said to be followed by the firm when it uses more short-term financing than warranted by the matching plan.
- Tax on remittances basically places a responsibility on the remitters (or the payers) to withhold a certain part of remittances towards tax liability. This is known as 'withholding tax'.
- Bank credit is the most prominent way of financing current assets. Different types of bank credits comprise cash credit/overdrafts, bills purchased/ discounted, short-term loans, letter of credit, straight loans, hypothecation loans, pledge loans, mortgage loans etc.

10.7 KEY WORDS

- **Current liabilities:** These are those claims of outsiders which are expected to mature for payment within an accounting year and include creditors (accounts payable), bills payable, and outstanding expenses.
- **Commercial paper:** It is an unsecured promissory note. It is a money-market security given out by large businesses to get money to fulfil their short-term debts like, payroll.
- **Fixed working capital:** It is the minimum level of required current assets. It is permanent in the same way as the firm's fixed assets are.
- **Letter of credit:** It is a paper that a financial establishment releases for a seller of goods or services. This letter makes the issuer liable to pay the seller for goods/services delivered by the seller to a third-party buyer.
- **Bank overdraft:** It is a bank balance wherein the sum withdrawn exceeds the sum in the account.

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10.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. Name the two main concepts of working capital.
2. State the differences between permanent and variable working capital.
3. Write short notes on the following:
   (a) Matching approach
   (b) Conservative approach

Long Answer Questions

1. Explain the determinants of working capital.
2. Discuss the long-term sources of working capital finance.
3. 'Bank credit is the most prominent way of financing current assets.' Explain the statement.

10.9 FURTHER READINGS

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UNIT 11 INVENTORIES AND RECEIVABLES MANAGEMENT

Structure

11.0 INTRODUCTION

Receivable, inventory and cash are the three main components of working capital. Here the management of these components becomes necessary in the functioning of a business organization. The importance of the operating cycle lies in categorizing current assets and current liabilities. This unit will introduce you to the concept of inventory management, concept of operating cycle and the planning of funds through the management of assets.

11.1 OBJECTIVES

After going through this unit, you will be able to:

- Analyse the significance of inventory management
- Examine inventories and receivables management under conditions of certainty and uncertainty
- Define operating cycle
- Discuss planning of funds through management of assets

11.2 INVENTORY MANAGEMENT

Inventories constitute the most significant part of current assets for a large majority of companies in India. On an average, inventories are approximately 60 per cent

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of current assets in public limited companies in India. Because of the large size of inventories maintained by firms, a considerable amount of funds is required to be committed to them. It is, therefore, absolutely imperative to manage inventories efficiently and effectively, in order to avoid unnecessary investment. A firm neglecting the management of inventories will be jeopardizing its long-run profitability and may fail ultimately. It is possible for a company to reduce its levels of inventories to a considerable degree, e.g., 10 to 20 per cent, without any adverse effect on production and sales, by using simple inventory planning and control techniques. The reduction in 'excessive' inventories carries a favourable impact on a company's profitability.

Nature of Inventories

Inventories are stock of the product a company is manufacturing for sale and components that make up the product. 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 material 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 levels of three kinds of inventories for a firm depend on the nature of its business. A manufacturing firm will have substantially high levels 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.

Firms also maintain a fourth kind of inventory, supplies or stores and spares. Supplies include office and plant maintenance 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 involve significant investment. Therefore, a sophisticated system of inventory control may not be maintained for them.

11.2.1 Inventory Management under Certainty and Uncertainty

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.

- **Transactions motive,** which emphasizes the need to maintain inventories to facilitate smooth production and sales operations.
- **Precautionary motive,** which necessitates holding of inventories to guard against the risk of unpredictable changes in demand and supply forces and other factors.
- **Speculative motive,** which influences the decision to increase or reduce inventory levels to take advantage of price fluctuations.

A company should maintain adequate stock of materials for a continuous supply to the factory for an uninterrupted production. It is not possible for a company to procure raw materials whenever it is needed. A time lag exists between demand for materials and its supply. Also, there exists uncertainty in procuring raw materials in time, on many occasions. The procurement of materials may be delayed because of factors such as strike, transport disruption or short supply. Therefore, the firm should maintain sufficient stock of raw materials at a given time to streamline production. Other factors which may necessitate purchasing and holding of raw material inventories are quantity discounts and anticipated price increase. The firm may purchase large quantities of raw materials than needed for the desired production and sales levels to obtain quantity discounts of bulk purchasing. At times, the firm would like to accumulate raw materials in anticipation of a price rise.

Work-in-process inventory builds up because of the production cycle. **Production cycle** is the time span between introduction of raw material into production and emergence of finished product at the completion of production cycle. Till the production cycle completes, stock of work-in-process has to be maintained. Efficient firms constantly try to make production cycle smaller by improving their production techniques.

Stock of finished goods has to be held because production and sales are not instantaneous. A firm cannot produce immediately when customers demand goods. Therefore, to supply finished goods on a regular basis, their stock has to be maintained. Stock of finished goods has also to be maintained for sudden demands from customers. In case the firm's sales are seasonal in nature, substantial finished goods inventories should be kept to meet the peak demand. Failure to supply products to customers, when demanded, would mean loss of the firm's sales to competitors. The level of finished goods inventories would depend upon the coordination between sales and production as well as on production time.

11.2.2 Objective of Inventory Management

In the context of inventory management, the firm is faced with the problem of meeting two conflicting needs:

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- To maintain a large size of inventories of raw material and work-in-process for *efficient and smooth production* and of finished goods for *uninterrupted sales operations*.
- To maintain a minimum investment in inventories to maximize profitability.

Both *excessive* and *inadequate* inventories are not desirable. These are two danger points within which the firm should avoid. The objective of inventory management should be to determine and maintain optimum level of inventory investment. The optimum level of inventory will lie between the two danger points of excessive and inadequate inventories.

The firm should always avoid a situation of over investment or under-investment in inventories. The major dangers of over investment are: (*a*) unnecessary tie-up of the firm's funds and loss of profit, (*b*) excessive carrying costs, and (*c*) risk of liquidity. The excessive level of inventories consumes funds of the firm, which then cannot be used for any other purpose, and thus, it involves an opportunity cost. The carrying costs, such as the costs of storage, handling, insurance, recording and inspection, also increase in proportion to the volume of inventory. These costs will impair the firm's profitability further. Excessive inventories, carried for long-period, increase chances of loss of liquidity. It may not be possible to sell inventories in time and at full value. Raw materials are generally difficult to sell as the holding period increases. There are exceptional circumstances where it may pay to the company to hold stocks of raw materials. This is possible under conditions of inflation and scarcity. Work-in-process is far more difficult to sell. Similarly, difficulties may be faced to dispose of finished goods inventories as time lengthens. The downward shifts in market and the seasonal factors may cause finished goods to be sold at low prices. Another danger of carrying excessive inventory is the physical deterioration of inventories while in storage. In case of certain goods or raw materials, deterioration occurs with the passage of time, or it may be due to mishandling and improper storage facilities. These factors are within the control of management; unnecessary investment in inventories can, thus, be cut down.

Maintaining an inadequate level of inventories is also dangerous. The consequences of under-investment in inventories are: (*i*) production hold-ups and (*ii*) failure to meet delivery commitments. Inadequate raw materials and work-in-process inventories will result in frequent production interruptions. Similarly, if finished goods inventories are not sufficient to meet the demand of customers regularly, they may shift to competitors, which will amount to a permanent loss to the firm.

The aim of inventory management, thus, should be to avoid excessive and inadequate levels of inventories and to maintain sufficient inventory for the smooth production and sales operations. Efforts should be made to place an order at the

right time with the right source to acquire the right quantity at the right price and quality. An effective inventory management should:

- ensure a continuous supply of raw materials, to facilitate uninterrupted production.
- maintain sufficient stocks of raw materials in periods of short supply and anticipate price changes.
- maintain sufficient finished goods inventory for smooth sales operation, and efficient customer service.
- minimize the carrying cost and time, and
- control investment in inventories and keep it at an optimum level.

11.3 OPERATING CYCLE

The need for working capital to run the day-to-day business activities cannot be overemphasized. We will hardly find a business firm which does not require any amount of working capital. Indeed, firms differ in their requirements of the working capital.

We know that a firm should aim at maximizing the wealth of its shareholders. In its endeavour to do so, a firm should earn sufficient return from its operations. Earning a steady amount of profit requires successful sales activity. The firm has to invest enough funds in current assets for generating sales. Current assets are needed because sales do not convert into cash instantaneously. There is always an operating cycle involved in the conversion of sales into cash.

There is a difference between current and fixed assets in terms of their liquidity. A firm requires many years to recover the initial investment in fixed assets such as plant and machinery or land and buildings. On the contrary, investment in current assets is turned over many times in a year. Investment in current assets such as inventories and debtors (accounts receivable) is realized during the firm's operating cycle that is usually less than a year. What is an operating cycle?

Operating cycle is the time duration required to convert sales, after the conversion of resources into inventories, into cash. The operating cycle of a manufacturing company involves three phases:

- Acquisition of resources such as raw material, labour, power and fuel, etc.
- Manufacture of the product which includes conversion of raw material into work-in-progress into finished goods.
- Sale of the product either for cash or on credit. Credit sales create accounts receivable for collection.

These phases affect cash flows, which most of the time, are neither synchronized nor certain. They are not synchronized because cash outflows usually occur before

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cash inflows. Cash inflows are not certain because sales and collections which give rise to cash inflows are difficult to forecast accurately. Cash outflows, on the other hand, are relatively certain. The firm is, therefore, required to invest in current assets for a smooth, uninterrupted functioning. It needs to maintain liquidity to purchase raw materials and pay expenses such as wages and salaries, other manufacturing, administrative and selling expenses and taxes, as there is hardly a match between cash inflows and outflows. Cash is also held to meet any future exigencies. Stocks of raw material and work-in-process are kept to ensure smooth production and to guard against non-availability of raw material and other components. The firm holds stock of finished goods to meet the demands of customers on continuous basis and sudden demand from some customers. Debtors (accounts receivable) are created because goods are sold on credit for marketing and competitive reasons. Thus, a firm makes adequate investment in inventories, and debtors, for smooth, uninterrupted production and sale.

How is the length of operating cycle determined? Figure 11.1 illustrates this. The length of the operating cycle of a manufacturing firm is the sum of: (i) inventory conversion period (ICP) and (ii) debtors (receivables) conversion period (DCP). The inventory conversion period is the total time needed for producing and selling the product. Typically, it includes: (a) raw material conversion period (RMCP), (b) work-in-process conversion period (WIPCP), and (c) finished goods conversion period (FGCP). The debtors conversion period is the time required to collect the outstanding amount from the customers. The total of inventory conversion period and debtors conversion period is referred to as gross operating cycle (GOC).

Table 11.1: *Statement of Cost of Sales*

(₹ lakh)

	Items	Actual *20X1*	Projected *20X2*
1.	Purchase of raw material (credit)	4,653	6,091
2.	Opening raw material inventory	523	827
3.	Closing raw material inventory	827	986
4.	Raw material consumed (1 + 2 – 3)	4,349	5,932
5.	Direct labour	368	498
6.	Depreciation	82	90
7.	Other mfg. expenses	553	704
8.	Total cost (4 + 5 + 6 + 7)	5,352	7,224
9.	Opening work-in-process inventory	185	325
10.	Closing work-in-process inventory	325	498
11.	Cost of production (8 + 9 – 10)	5,212	7,051
12.	Opening finished goods inventory	317	526
13.	Closing finished goods inventory	526	995
14.	Cost of goods sold (11 + 12 – 13)	5,003	6,582
15.	Selling, administrative and general expenses	3.4	457
16.	Cost of sales (14 + 15)	5,307	7,039

In practice, a firm may acquire resources (such as raw materials) on credit and may temporarily postpone payment of certain expenses. Payables, which the firm can defer, are spontaneous sources of capital to finance investment in current assets. The creditors (payables) deferral period (CDP) is the length of time the firm is able to defer payments on various resource purchases. The difference between (gross) operating cycle and payables deferral period is net operating cycle (NOC). If depreciation is excluded from expenses in the computation of operating cycle, the net operating cycle also represents the cash conversion cycle (CCC). It is the net time interval between cash collections from sale of the product and cash payments for resources acquired by the firm. It also represents the time interval over which additional funds, called working capital, should be obtained, in order to carry out the firm's operations. The firm has to negotiate working capital from sources such as commercial banks. The negotiated sources of working capital financing are called non-spontaneous sources. If the net operating cycle of a firm increases, it means further need for negotiated working capital.

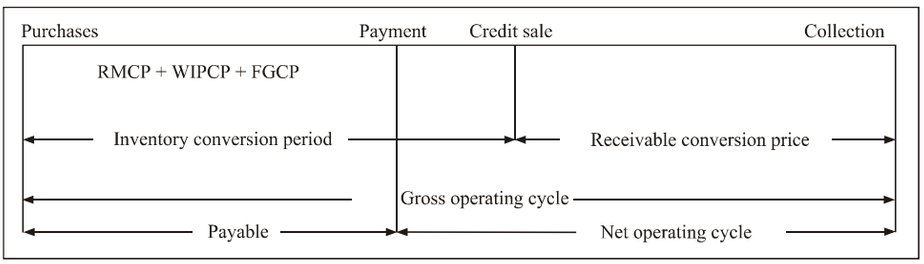

Fig. 11.1 *Operating cycle of a manufacturing firm*

11.3.1 Planning of Funds though the Management of Assets

Let us illustrate the computation of the length of an operating cycle. Consider the statement of costs of sales for a firm given in Table 11.1.

The firm's data for sales and debtors and creditors are given in Table 11.2.

Table 11.2: *Sales and Debtors*

(₹ lakh)

	20X1	**20X2**
Sales (credit)	6,087	8,006
Opening balance of debtors	545	735
Closing balance of debtors	735	1,040
Opening balance of creditors	300	454
Closing balance of creditors	454	642

Gross Operating Cycle (GOC)

The firm's gross operating cycle (GOC) can be determined as inventory conversion period (ICP) plus debtors conversion period (DCP). Thus, GOC is given as follows:

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Gross operating cycle = Inventory conversion period + Debtors conversion period

$$GOC = ICP + DCP \quad (1)$$

Inventory conversion period: What determines the inventory conversion period? The inventory conversion (ICP) is the sum of raw material conversion period (RMCP), work-in-process conversion period (WIPCP) and finished goods conversion period (FGCP):

$$ICP = RMCP + WIPCP + FGCP \quad (2)$$

- **Raw material conversion period (RMCP):** The raw material conversion period (RMCP) is the average time period taken to convert material in to work-in-process. RMCP depends on: (a) raw material consumption per day, and (b) raw material inventory. Raw material consumption per day is given by the total raw material consumption divided by the number of days in the year (using 30 days for 12 months, i.e., 360 days). The raw material conversion period is obtained when raw material inventory is divided by raw material consumption per day. Similar calculations can be made for other inventories, debtors and creditors. The following formula can be used:

$$\text{Raw material conversion period} = \frac{\text{Raw material inventory}}{\frac{\text{Raw material consumption}}{360}}$$

$$RMCP = RMI \div \frac{RMC}{360} = \frac{RMI \times 360}{RMC} \quad ...(3)$$

- **Work-in-process conversion period (WIPCP):** Work-in-process conversion period (WIPCP) is the average time taken to complete the semi-finished work or work-in-process. It is given by the following formula:

$$\text{Work - in - process conversion period} = \frac{\text{Work - in - process inventory}}{[\text{Cost of production}]/360}$$

$$WIPCP = WIPI \div \frac{COP}{360} = \frac{WIPI \times 360}{COP} \quad ...(4)$$

- **Finished goods conversion period (FGCP):** Finished goods conversion period (FGCP) is the average time taken to sell the finished goods. FGCP can be calculated as follows:

$$\text{Finished goods conversion period} = \frac{\text{Finished goods inventory}}{[\text{Cost of goods sold}]/360}$$

$$FGCP = FGI \div \frac{CGI}{360} = \frac{FGI \times 360}{CGS} \quad ...(5)$$

- **Debtors (receivables) conversion period (DCP):** Debtors conversion period (DCP) is the average time taken to convert debtors into cash. DCP represents the average collection period. It is calculated as follow:

$$\text{Debtors conversion period (DCP)} = \frac{\text{Debtors}}{\text{Credit sales}/360} = \frac{\text{Debtors} \times 360}{\text{Credit sales}} \quad ...(6)$$

- **Creditors (payables) deferral period (CDP):** Creditors (payables) deferral period (CDP) is the average time taken by the firm in paying its suppliers (creditors). CDP is given as follow:

$$\text{Creditors deferral period (CDP)} = \frac{\text{Creditors}}{\text{Credit purchases}/360} \quad ...(7)$$

$$= \frac{\text{Creditors} \times 360}{\text{Credit purchases}}$$

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Cash Conversion or Net Operating Cycle

Net operating cycle (NOC) is the difference between gross operating cycle and payables deferral period.

Net operating cycle = Gross operating cycle – Creditors deferral period

$$NOC = GOC - CDP \quad ...(8)$$

Net operating cycle is also referred to as cash conversion cycle. Some people argue that depreciation and profit should be excluded in the computation of cash conversion cycle since the firm's concern is with cash flows associated with conversion at cost; depreciation is a non-cash item and profits are not costs. A contrary view is that a firm has to ultimately recover total costs and make profits; therefore, the calculation of operating cycle should include depreciation, and even the profits. Also, in using the above-mentioned formulae, average figures for the period may be used.

For our example, Table 11.3 shows detained calculations of the components of a firm's operating cycle. Table 11.4 provides the summary of calculations.

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Table 11.3: *Operating Cycle Calculation*

(₹lakh)

Items	Actual 20X1	Projected 20X2
1. Raw Material Conversion Period		
(*a*) Raw material consumption	4,349	5,932
(*b*) Raw material consumption per day	12.1	16.5
(*c*) Raw material inventory	827	986
(*d*) Raw material inventory holding days	68d	60d
2. Work-in-Process Conversion Period		
(*a*) Cost of production*	5,212	7,051
(*b*) Cost of production per day	14.5	19.6
(*c*) Work-in-process inventory	325	498
(*d*) Work-in-process inventory holding days	22d	25d
3. Finished Goods Conversion Period		
(*a*) Cost of goods sold*	5,003	6,582
(*b*) Cost of goods sold per day	13.9	18.3
(*c*) Finished goods inventory	526	995
(*d*) Finished goods inventory holding days	38d	54d
4. Collection Period		
(*a*) Credit sales (at cost)**	6,087	8,006
(*b*) Sales per day	16.9	22.2
(*c*) Debtors	735	1,040
(*d*) Debtors outstanding days	43d	47d
5. Creditors Deferral Period		
(*a*) Credit purchases	4,653	6,091
(*b*) Purchase per day	12.9	16.9
(*c*) Creditors	454	642
(*d*) Creditors outstanding days	35d	38d

* Depreciation is included.

** All sales are assumed on credit.

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Table 11.4 *Summary of Operating Cycle Calculations*

(Number of Days)

		Actual		Projected
GROSS OPERATING CYCLE				
1. Inventory Conversion Period				
(*i*) Raw material	68		60	
(*ii*) Work-in-process	22		25	
(*iii*) Finished goods	38	128	54	139
2. Debtors Conversion Period		43		47
3. Gross Operating Cycle (*1 + 2*)		171		186
4. Payment Deferral Period		35		38
NET OPERATING CYCLE (3 – 4)		136		148

During 20X1, the daily raw material consumption was ₹12.1 lakh and the company held an ending raw material inventory of ₹827 lakh. If we assume that this is the average inventory held by the company, the raw material consumption period works out to be 68 days. You may notice that for 20X2, the projected raw material conversion period is 60 days. This has happened because both consumption (₹16.5 lakh per day) and level of inventory (₹986 lakh) have increased, but the consumption rate has increased (by 36.4 per cent) much more than the increase in inventory holding (by 19.2 per cent). Thus, the raw material conversion period has declined by 8 days. Raw material inventory is the result of daily raw material consumption and total raw material consumption during a period, raw material? given the company's production targets. Thus, raw material inventory is controlled through control over purchases and production. We can similarly interpret other calculations in Table 11.3.

We note a significant change in the company's policy for 20X2 with regard to the finished goods inventory. It is expected to increase to 54 days holding from 38 days in the previous year. One reason could be a conscious policy decision to avoid stock-out situations and carry more finished goods inventory to expand sales. But this policy has a cost; the company, in the absence of a significant increase in payables (creditors) deferral period, will have to negotiate higher working capital funds. In the case of the firm in our example, its net operating cycle is expected to increase from 136 days to 148 days (Table 11.4). How does a company manage its inventories, debtors and suppliers' credit? How can it reduce its operating cycle? We shall attempt to answer these questions in the next four chapters.

The operating cycle concept as shown in Figure 11.1 relates to a manufacturing firm. Non-manufacturing firms such as wholesalers and retailers will not have the manufacturing phase. They will acquire stock of finished goods and convert them into debtors (receivables) and those debtors into cash. Further, service and financial enterprises will not have inventory of goods (cash will be their inventory). Their operating cycles will be the shortest. They need to acquire cash, then lend (create debtors) and again convert the lending into cash.

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Check Your Progress

1. What are the major dangers of over investment?
2. State the formula for calculation of Finished Goods Conversion Period (FGCP).
3. Mention the main phases of an operating cycle.

11.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The major dangers of over investment are: (*a*) unnecessary tie-up of the firm's funds and loss of profit, (*b*) excessive carrying costs, and (*c*) risk of liquidity. The excessive level of inventories consumes funds of the firm, which then cannot be used for any other purpose, and thus, it involves an opportunity cost.
2. The formula for calculation of Finished Goods Conversion Period (FGCP) is given as follows:

   FGCP can be calculated as follows:

$$\text{Finished goods conversion period} = \frac{\text{Finished goods inventory}}{[\text{Cost of goods sold}]/360}$$

3. The operating cycle of a manufacturing company involves three phases:
   (i) Acquisition of resources such as raw material, labour, power and fuel, etc.
   (ii) Manufacture of the product which includes conversion of raw material into work-in-progress into finished goods.
   (iii) Sale of the product either for cash or on credit. Credit sales create accounts receivable for collection.

11.5 SUMMARY

- Inventories constitute the most significant part of current assets for a large majority of companies in India.
- A firm neglecting the management of inventories will be jeopardizing its long-run profitability and may fail ultimately.
- Inventories are stock of the product a company is manufacturing for sale and components that make up the product.

- A company should maintain adequate stock of materials for a continuous supply to the factory for an uninterrupted production. It is not possible for a company to procure raw materials whenever it is needed.
- Production cycle is the time span between introduction of raw material into production and emergence of finished product at the completion of production cycle.
- The major dangers of over investment are: (*a*) unnecessary tie-up of the firm's funds and loss of profit, (*b*) excessive carrying costs, and (*c*) risk of liquidity.
- Maintaining an inadequate level of inventories is also dangerous. The consequences of under-investment in inventories are: (*i*) production hold-ups and (*ii*) failure to meet delivery commitments.
- The need for working capital to run the day-to-day business activities cannot be overemphasized. We will hardly find a business firm which does not require any amount of working capital. Indeed, firms differ in their requirements of the working capital.
- Operating cycle is the time duration required to convert sales, after the conversion of resources into inventories, into cash.
- Cash is also held to meet any future exigencies. Stocks of raw material and work-in-process are kept to ensure smooth production and to guard against non-availability of raw material and other components.
- The firm's gross operating cycle (GOC) can be determined as inventory conversion period (ICP) plus debtors conversion period (DCP).
- Net operating cycle (NOC) is the difference between gross operating cycle and payables deferral period.

11.6 KEY WORDS

- **Inventory:** It is the term for the goods available for sale and raw materials used to produce goods available for sale.
- **Operating cycle:** It is the time duration required to convert sales, after the conversion of resources into inventories, into cash.
- **Production cycle:** It is the time span between introduction of raw material into production and emergence of finished product at the completion of production cycle.

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11.7 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. Write a short note on the nature of inventories.
2. Mention the objectives of inventory management.
3. What are the significant features of an efficient inventory management?

Long Answer Questions

1. How is the length of an operating cycle determined?
2. Discuss the concept of Net Operating Cycle.
3. Analyse the planning of funds through management of assets.

11.8 FURTHER READINGS

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BLOCK - IV
WORKING CAPITAL AND DIVIDEND POLICY

UNIT 12 OVERVIEW OF CASH AND LIQUIDITY MANAGEMENT

Structure

12.0 INTRODUCTION

Cash and liquidity management assist in maximizing liquidity by releasing and centralizing cash. Cash management deals with all aspects of working capital management and involves many different tasks. It helps in reducing the cost of shortfalls by means of careful investment. This unit, will help you understand the significance of credit management, an optimum credit policy, facets of cash management, cash planning, cash forecasting and budgeting.

12.1 OBJECTIVES

After going through this unit, you will be able to:

- Analyse the significance of credit management
- Examine an optimum credit policy
- Explain the facets of cash management
- Prepare an overview of cash planning
- Discuss cash forecasting and budgeting

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12.2 CREDIT MANAGEMENT AND EVALUATION

Trade credit happens when a firm sells its products or services on credit and does not receive cash immediately. It is an essential marketing tool, acting as a bridge for the movement of goods through the production and distribution stages to customers. A firm grants trade credit to protect its sales from the competitors and to attract the potential customers to buy its products at favourable terms. Trade credit creates accounts receivable or trade debtors (also referred to book debts in India) that the firm is expected to collect in the near future. The customers from whom receivables or book debts have to be collected in the future are called trade debtors or simply as debtors and represent the firm's claim or asset. A credit sale has three characteristics: *First,* it involves an element of risk that should be carefully analysed. Cash sales are totally riskless, but not the credit sales, as the cash payments are yet to be received. *Second*, it is based on economic value. To the buyer, the economic value in goods or services passes immediately at the time of sale, while the seller expects an equivalent value to be received later on. *Third*, it implies futurity. The buyer will make the cash payment for goods or services received by him, in a future period.

Debtors constitute a substantial portion of current assets of several firms. For example in India, trade debtors, after inventories, are the major components of current assets. They form about one-third of current assets in India. Granting credit and creating debtors amount to blocking of the firm's funds. The interval between the date of sale and the date of payment has to be financed out of working capital. This necessitates the firm to get funds from banks or other sources. Thus, trade debtors represent investment. As substantial amounts are tied-up in trade debtors, it needs careful analysis and proper management.

12.2.1 Credit Policy

A firm's investment in accounts receivable depends on: (*a*) the volume of credit sales, and (*b*) the collection period. For example, if a firm's credit sales are ₹ 30 lakh per day and customers, on an average, take 45 days to make payment, then the firm's average investment in accounts receivable is:

Daily credit sales × Average collection period

₹ 30 lakh × 45 = ₹ 1,350 lakh

The investment in receivables may be expressed in terms of costs of sales instead of sales value.

The volume of credit sales is a function of the firm's total sales and the percentage of credit sales to total sales. Total sales depend on market size, firm's market share, product quality, intensity of competition, economic conditions etc. The financial manager hardly has any control over these variables. The percentage of credit sales to total sales is mostly influenced by the nature of business and

industry norms. For example, car manufacturers in India, until recently, were not selling cars on credit. They required the customers to make payment at the time of delivery; some of them even asked for the payment to be made in advance. This was so because of the absence of genuine competition and a wide gap between demand for and supply of cars in India. This position changed after economic liberalization which led to intense competition. In contrast, the textile manufacturers sold two-third of their total sales on credit to the wholesale dealers. The textile industry is still going through a difficult phase.

There is one way in which the financial manager can affect the volume of credit sales and collection period and consequently, investment in accounts receivable. That is through the changes in credit policy. The term 'credit policy' is used to refer to the combination of three decision variables: (*i*) credit standards, (*ii*) credit terms, and (*iii*) collection efforts, on which the financial manager has influence.

(i) **Credit standards** are the criteria to decide the types of customers to whom goods could be sold on credit. If a firm has more slow-paying customers, its investment in accounts receivable will increase. The firm will also be exposed to higher risk of default.

(ii) **Credit terms** specify duration of credit and terms of payment by customers. Investment in accounts receivable will be high if customers are allowed extended time period for making payments.

(iii) **Collection efforts** determine the actual collection period. The lower the collection period, the lower will be the investment in accounts receivable and *vice versa*.

Goals of credit policy

A firm's credit policy aims at maximizing shareholders' wealth through increase in sales leading to net improvement in profitability. Increased sales will not only increase operating profits, but will also require additional investment and costs. Hence, a trade-off between incremental return and cost of incremental investment is involved.

A firm may follow a lenient or a stringent credit policy. The firm, following a lenient credit policy, tends to sell on credit to customers on very liberal terms and standards; credits are granted for longer periods even to those customers whose creditworthiness is not fully known or whose financial position is doubtful. In contrast, a firm following a stringent credit policy sells on credit on a highly selective basis, only to those customers who have proven creditworthiness and who are financially strong. In practice, firms follow credit policies ranging between stringent to lenient.

Marketing tool

Why at all do firms sell on credit? Firms use credit policy as a *marketing tool* for expanding sales. In a declining market, it may be used to maintain the market

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share. Credit policy helps to retain old customers and create new customers by weaning them away from competitors. In a growing market, it is used to increase the firm's market share. Under a highly competitive situation or recessionary economic conditions, a firm may loosen its credit policy to maintain sales or to minimize erosion of sales.

In practice, companies may grant credit for several other reasons such as the company position, buyer's status and requirement, dealer relationship, transit delays, industrial practice, etc.

Maximization of sales vs incremental profit: Is sales maximization the goal of the firm's credit policy? If it was so, the firm would follow a very lenient credit policy, and would sell on credit to everyone. Firms in practice do not follow very loose credit policy just to maximize sales. Sales do not expand without costs. The firm will have to evaluate its credit policy in terms of both return and costs of additional sales. Additional sales should add to the firm's operating profit. There are three types of costs involved:

- Production and selling costs
- Administration costs
- Bad-debt losses

Production and selling costs: These costs increase with expansion in sales. If sales expand within the existing production capacity, then only the variable production and selling costs will increase. If capacity is added for sales expansion resulting from loosening of credit policy, then the incremental production and selling costs will include both variable and fixed costs.

The difference between incremental sales revenue (D SALES) and the incremental production and selling costs (D COST) is the incremental contribution (D CONT) of the change in the credit policy. Note that a tight credit policy means rejection of certain types of accounts whose creditworthiness is doubtful. This results into loss of sales and consequently, loss of contribution. This is an opportunity loss to the firm. As the firm starts loosening its credit policy, it accepts all or some of those accounts which the firm had earlier rejected. Thus, the firm will recapture lost sales and thus, lost contribution. The opportunity cost of lost contribution declines with the loosening of credit policy.

Administration costs: Two types of administration costs are involved when the firm loosens its credit policy: (*a*) credit investigation and supervision costs and (*b*) collection costs. The firm is required to analyse and supervise a large number of accounts when it loosens its credit policy. Similarly, the firm will have to intensify its collection efforts to collect outstanding bills from financially less sound customers. The incremental costs of credit administration will be nil if the existing credit department, without any additional costs, can implement the new credit policy. This will be the case when the credit department has idle capacity.

Bad-debt losses: Bad-debt losses arise when the firm is unable to collect its accounts receivable. The size of bad-debt losses depends on the quality of accounts accepted by the firm. Thus a firm tends to sell to customers with relatively less credit standing when it loosens its credit policy. Some of these customers delay payments, and some of them do not pay at all. As a result, bad-debt losses increase. The firm can certainly avoid or minimize these losses by adopting a very tight credit policy. Is minimization of bad-debt losses a goal of credit policy? If it was so, no firm will ever sell on credit to anyone. If this happens, then the firm is not availing the opportunity of using credit policy as a marketing tool for expanding sales, and will incur opportunity cost in terms of lost contribution.

Thus, the evaluation of a change in a firm's credit policy involves analysis of:

- opportunity cost of lost contribution
- credit administration costs and bad-debt losses

These two costs behave contrary to each other. How should the firm determine its credit policy? The firm's credit policy will be determined by the trade-off between opportunity cost and credit administration costs and bad debts losses.

12.2.2 Optimum Credit Policy

The firm's operating profit is maximized when total cost is minimized for a given level of revenue. Credit policy represents the maximum operating profit (since total cost is minimum). But it is not necessarily the optimum credit policy. Optimum credit policy is one which maximizes the firm's value. The value of the firm is maximized when the incremental or marginal rate of return of an investment is equal to the incremental or marginal cost of funds used to finance the investment. The incremental rate of return can be calculated as incremental operating profit divided by the incremental investment in receivables. The incremental cost of funds is the rate of return required by the suppliers of funds, given the risk of investment in accounts receivable. Note that the required rate of return is *not* equal to the borrowing rate. Higher the risk of investment, higher the required rate of return. As the firm loosens its credit policy, its investment in accounts receivable becomes more risky because of increase in slow-paying and defaulting accounts. Thus the required rate of return is an upward sloping curve.

In sum, we may state that the goal of the firm's credit policy is to maximize the value of the firm. To achieve this goal, the evaluation of investment in accounts receivable should involve the following four steps:

(i) Estimation of incremental operating profit
(ii) Estimation of incremental investment in accounts receivable
(iii) Estimation of the incremental rate of return of investment
(iv) Comparison of the incremental rate of return with the required rate of return

Consider an example.

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Illustration 12.1: Marginal Cost–Benefit Analysis of Credit Policy

In 20 X 1, the Standard Furniture Mart has total sales of ₹ 600 lakh and after-tax profit of ₹ 69 lakh. Standard's profit margins have been declining over last 23 years. The proprietor of the company thought that this could be due to about 10 per cent of total sales to customers who are not financially very strong. He thought that perhaps the cost of maintaining these accounts is high which may be causing a decline in the firm's profit margin. He therefore asked his financial manager to analyse the impact of tightening the credit policy by discontinuing sales to these customers.

The financial manager should first calculate the incremental operating profit to be foregone by changing the credit policy. He should ascertain the behaviour of costs. Assume that after analysing past data, he has determined cost behaviour as given in Table 12.1. The financial manager, on investigation, found that bad-debt losses and collection costs are entirely attributable to the marginal accounts.

Table 12.1 *Standard Furniture Mart's Behaviour of Cost (Percentage)*

	Fixed Cost	*Variables Cost*	*Total Cost*
Cost of goods sold	–	82.00	82.00
Administrative costs	2.50	4.00	6.50
Selling costs	2.80	5.70	8.50
Bad-debt losses	–	0.05	0.05
Collection costs	–	0.02	0.02
	5.30	91.77	97.07

Standard's *variable* production, administrative and selling costs are 91.7 per cent of sales (bad-debt losses and collection costs excluded). Thus contribution is 8.3 per cent of sales: 100 – 91.7 = 8.3 per cent. By tightening its credit policy, Standard can expect to lose sales of ₹ 60 lakh (10 per cent of total sales of ₹ 600 lakh). Thus, the lost contribution will be ₹ 4.98 lakh:

Change in contribution = Change in sales × Contribution ratios

$$\Delta \text{ CONT} = \text{SALES} \times c = -60 \times 0.083 = -4.98 \text{ lakh} \quad (1)$$

Since bad-debt losses and collection costs were entirely attributable to the marginal accounts, with the discontinuance of sales to those customers, these costs will be avoided. We should subtract these avoidable costs from the contribution to find lost operating profit, which is equal to ₹ 4.56 lakh:

$$\begin{array}{c}\text{Change in} \\ \text{operating profit}\end{array} = \begin{array}{c}\text{Change in} \\ \text{contribution}\end{array} - \begin{array}{c}\text{Additional} \\ \text{cost}\end{array}$$

$$\begin{aligned} \Delta \text{ OP} &= \Delta \text{ CONT} - \text{SALES}\,(b + d) \\ &= -4.98 - [-60\,(0.0005 + 0.0002)] \\ &= -4.98 + 0.04 = -₹\ 4.94 \text{ lakh} \end{aligned} \quad (2)$$

Here, *b* is bad-debt losses ratio and *d* is collection–expense ratio.

The next step is to determine the investment in accounts receivable (arising on account of marginal accounts). The financial manager found out that the average collection period of marginal accounts was 60 days against 45 days of all other accounts, and 80 per cent of sales to marginal accounts are on credit. Thus the sales value tied down in accounts receivable is ₹ 8 lakh:

$$\text{Investment in accounts receivable} = \text{Credit sales per day} \times \text{Average collection period}$$

$$\text{INVST} = \frac{\text{SALES} \times f}{360} \times \text{ACP} = \frac{60(0.8)}{360} \times 60 = ₹\ 8 \text{ lakh} \quad (3)$$

In Equation (3), *f* is the fraction of credit sales in total sales. Note that not all of ₹ 8 lakh represent *out-of-pocket cash investment*; it includes profit margin. Therefore, one view is that investment in accounts receivable should be measured in terms of either variable cost or total cost. Considering only the variable costs, Standard's average investment in accounts receivable (including bad-debt losses and collection charges) is: ₹ 7.34 lakh.

$$8 \times 0.9177 = ₹\ 7.34 \text{ lakh}$$

We can now calculate the rate of return which the marginal accounts generate:

$$\text{Rate of return} = \frac{\text{Operating profit after tax}}{\text{Investment in accounts receivable}}$$

$$r = \frac{\Delta\text{OPAT}}{\Delta\text{INVST}} = \frac{\Delta\text{OP}(1-\text{T})}{\Delta\text{INVST}} \quad (4)$$

In our example, assuming tax rate (*T*) of 35 per cent, the rate of return is 43.8 per cent

$$r = \frac{4.941(1-0.35)}{7.34} = 0.438 \text{ or } 43.8 \text{ per cent}$$

If the sales value is used in determining the investment in accounts receivable, the rate of return works out as 40.1 per cent.

Given the risk of marginal accounts, is this an adequate return? Standard's required rate of return for average risk project is 20 per cent. The financial manager thought it appropriate to add additional 5 per cent for risk premium since marginal accounts are highly risky. Comparing the expected rate of return 40.1 per cent (or 43.8 per cent), with the required rate of return of 25 per cent, Standard should continue with its policy of selling to the marginal accounts. Marginal accounts make a net contribution to operating profits:

$$= \left(\begin{matrix}\text{Expected} \\ \text{return}\end{matrix} - \begin{matrix}\text{Required} \\ \text{return}\end{matrix}\right) \times \begin{matrix}\text{Investment in} \\ \text{receivables}\end{matrix}$$

$$= (0.401 - 0.25) \times 8 = ₹\ 1.21 \text{ lakh}$$

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In fact, there is a scope of further loosening the credit policy. If Standard does so, its administrative costs, bad debt losses and collection costs will increase. The expected rate of return will fall. Thus, loosening of credit policy causes return to fall. Where should Standard stop? The firm will obtain the maximum value for the credit policy when the incremental rate of return on investment in receivable is equal to the opportunity cost of capital (the incremental cost of funds).

As the investment in accounts receivable is increased two things happen: *First*, the marginal expected rate of return falls. *Second*, risk increases, so the required rate of return increases.

12.2.3 Credit Policy Variables

In establishing an optimum credit policy, the financial manager must consider the important decision variables which influence the level of receivables. As stated in the preceding section, the major controllable decision—variables—includes the following:

- Credit standards and analysis
- Credit terms
- Collection policy and procedures

The financial manager or the credit manager may administer the credit policy of a firm. It should, however, be appreciated that credit policy has important implications for the firm's production, marketing and finance functions. Therefore, it is advisable that a committee that consists of executives of production, marketing and finance departments formulates the firm's credit policy. Within the framework of the credit policy, as laid down by this committee, the financial or credit manager should ensure that the firm's value of share is maximized. He does so by answering the following questions:

- What will be the change in sales when a decision variable is altered?
- What will be the *cost* of altering the decision variable?
- How would the level of receivables be affected by changing the decision variable?
- How are expected rate of return and cost of funds related?

The most difficult part of the analysis of impact of change in the credit policy variables is the estimation of sales and costs. Even if sales and costs can be estimated, it would be difficult to establish an optimum credit policy, as the best combination of the variables of credit policy is quite difficult to obtain. For these reasons, the establishment of credit policy is a slow process in practice. A firm will change one or two variables at a time and observe the effect. Based on the actual experience, variables may be changed further, or the change may be reversed. It should also be noted that the firm's credit policy is greatly influenced by economic conditions. As economic conditions change, the credit policy of the firm may also

change. Thus, the credit policy decision is not one time static decision. The impacts of changes in the major decision variables of credit policy are discussed below.

12.2.4 Credit Standards

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Credit standards are the criteria which a firm follows in selecting customers for the purpose of credit extension. The firm may have tight credit standards; that is, it may sell mostly on cash basis, and may extend credit only to the most reliable and financially strong customers. Such standards will result in no bad-debt losses, and less cost of credit administration. But the firm may not be able to expand sales. The profit sacrificed on lost sales may be more than the costs saved by the firm. On the contrary, if credit standards are loose, the firm may have larger sales. But the firm will have to carry larger receivables. The costs of administering credit and bad-debt losses will also increase. Thus, the choice of optimum credit standards involves a trade-off between incremental return and incremental costs.

Credit analysis: Credit standards influence the quality of the firm's customers. There are two aspects of the quality of customers: (*i*) the time taken by customers to repay credit obligations and (*ii*) the default rate. The average collection period (ACP) determines the speed of payment by customers. It measures the number of days for which credit sales remain outstanding. The longer the average collection period, the higher is the firm's investment in accounts receivable. Default rate can be measured in terms of bad-debt losses ratio—the proportion of uncollected receivables. Bad-debt losses ratio indicates default risk. **Default risk** is the likelihood that a customer will fail to repay the credit obligation. On the basis of past practice and experience, the financial or credit manager should be able to form a reasonable judgment regarding the chances of default. To estimate the probability of default, the financial or credit manager should consider three *C* 's: (*a*) character, (*b*) capacity, and (*c*) condition.

- **Character:** It refers to the customer's willingness to pay. The financial or credit manager should judge whether the customers will make honest efforts to honour their credit obligations. The moral factor is of considerable importance in credit evaluation in practice.
- **Capacity:** It refers to the customer's ability to pay. Ability to pay can be judged by assessing the customer's capital and assets which he may offer as security. Capacity is evaluated by the financial position of the firm as indicated by analysis of ratios and trends in firm's cash and working capital position. The financial or credit manager should determine the real worth of assets offered as collateral (security).
- **Condition:** It refers to the prevailing economic and other conditions which may affect the customers' ability to pay. Adverse economic conditions can affect the ability or willingness of a customer to pay. An experienced financial or credit manager will be able to judge the extent and genuineness to which the customer's ability to pay is affected by the economic conditions.

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Information on these variables may be collected from the customers themselves, their published financial statements and outside agencies which may be keeping credit information about customers. A firm should use this information in preparing *categories of customers* according to their creditworthiness and default risk. This would be an important input for the financial or credit manager in formulating its credit standards. The firm may categorize its customers, at least, in the following three categories:

- **Good accounts**; that is, financially strong customers.
- **Bad accounts**; that is, financially very weak, high risk customers.
- **Marginal accounts**; that is, customers with moderate financial health and risk (falling between good and bad accounts).

The firm will have no difficulty in quickly deciding about the extension of credit to *good accounts* and rejecting the credit request of *bad accounts*. Most of the firm's time will be taken in evaluating *marginal accounts*; that is, customers who are not financially very strong but are also not so bad to be outrightly rejected. A firm can expand its sales by extending credit to marginal accounts. But the firm's costs and bad-debt losses may also increase. Therefore, credit standards should be relaxed till the point where incremental return equals incremental cost.

Credit Evaluation of Individual Accounts

For effective management of credit, the firm should lay down clear cut guidelines and procedures for granting credit to individual customers and collecting individual accounts. The firm need not follow the policy of treating all customers equal for the purpose of extending credit. Each case may be fully examined before offering any credit terms. Similarly, collection procedure will differ from customer to customer. With the permanent, but temporarily defaulting, customers, the firm may not be very strict in following the collection procedures.

The credit evaluation procedure of the individual accounts should involve the following steps: (1) credit information, (2) credit investigation, (3) credit limits, and (4) collection procedures.

Credit Information

In extending credit to customers, the firm would ensure that receivables will be collected in full and on due date. Credit should be granted to those customers who have the ability to make the payment on time. To ensure this, the firm should have credit information concerning each customer to whom the credit will be granted.

Little progress has been made in India in the matter of developing the sources of credit information in the name of secrecy and confidentiality. The sources of credit information in advanced countries include independent information service companies, banks, fellow business firms and associates, competitors, suppliers etc. In India, banks are sometimes used to collect information about potential customers.

Collecting credit information involves cost. The cost of collecting information should, therefore, be less than the potential profitability. For small accounts, comprehensive information may not be collected; the decision to grant credit may be made on the basis of limited information. In addition to cost, the time required to collect information should also be considered. The decision to grant credit cannot be delayed for long because of the time involved in collecting the credit information. Depending on these two factors of time and cost, any, or a combination of the following sources may be employed to collect the information.

Financial statement: One of the easiest ways to obtain information regarding the financial condition and performance of the prospective customer is to scrutinize his financial statements—balance sheet and the profit and loss account. The published financial statements of public limited companies are easily available. The real difficulty arises in obtaining the financial statements from partnership firms or individuals, particularly the audited accounts since they do not have legal obligation to audit their accounts. The credit granting firm must insist on the audited financial statements. In case of firms that have seasonal sales, data on monthly sales, inventory and cash flows ought to be sought and analysed.

Bank references: Another source of collecting credit information is the bank where the customer maintains his account. In advanced countries like USA, many banks have large credit departments which can provide detailed credit information. The firm should seek to obtain the information through its bank. A customer can also be requested to instruct his banker to provide information required by the firm. In India, banks as a source of information are not very useful because of their indifference in providing information. A bank does not provide unambiguous answers to the enquiries made by a firm. Even if it provides information to the firm about the conduct of the customer's account, it can not be taken as a complete basis for believing that the customer will be able to settle his dues in time. More information from other sources may be collected to supplement it.

Trade references: A firm can ask the prospective customer to give trade references. It may insist to give the names of such persons or firms with whom the customer has current dealings. This is a useful source to obtain credit information at no cost. The trade referees may be contacted personally to obtain all relevant information required by a firm. A customer can, however, furnish misleading references. To guard against this, the honesty and seriousness of the referees should be examined. The firm can insist on furnishing of the references of people or firms of repute.

Other sources: A firm can also obtain information about the prospective customer from the credit rating organizations (such as CRISIL, CARE or ICRA) and trade and industry associations. In advanced countries like USA, credit bureau reports are an important source of information about a customer.

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Credit Investigation and Analysis

After having obtained the credit information, the firm will get an idea regarding the matters which should be further investigated. The factors that affect the extent and nature of credit investigation of an individual customer are:

- The type of customer, whether new or existing.
- The customer's business line, background and the related trade risks.
- The nature of the product—perishable or seasonal.
- Size of customer's order and expected further volumes of business with him.
- Company's credit policies and practices.

Analysis of credit file: The firm should maintain a credit file for each customer. It should be updated with the information about the customer collected from the reports of salesmen, bankers and directly from the customer. The firm's trade experiences with the customer and his performance report based on financial statements submitted by him should also be recorded in his credit file. A regular examination of the customer's credit file will reveal to the firm the credit standing of the customer. Whenever the firm experiences a change in the customer's paying habit or receives a request for extended credit terms or large order on credit, his credit file should be thoroughly scrutinized. The intensity and depth of credit review on investigation will depend upon the quality of the customer's account and the amount of credit involved. A little review will be required in case of the customers who have had clear deals with the firm in the past. But a comprehensive investigation will be required in case of the customers whose quality of accounts is falling and who have not been able to honour the firm's credit terms regularly in the past.

Analysis of financial ratios: The evaluation of the customer's financial conditions should be done very carefully. The financial statements submitted by the prospective customer will form a basis to analyse the performance and trends of his business activities. Ratios should be calculated to determine the customer's liquidity position and ability to repay debts. The performance of the customer should be compared with industry average and his nearest competitors. This will be helpful in determining whether his relatively poor performance is due to some general economic condition affecting the whole industry, or it is due to the internal inefficiencies of the applicant.

Analysis of business and its management: Besides appraising the financial strength of the applicant, the firm should also consider the quality of management and the nature of the customer's business. The firm should conduct a management audit to identify the management weaknesses of the customer's business. An over-centralized structure of the customer's business, without proper management systems, can degenerate into mismanagement, over-trading and business failure.

If the nature of the customer's business is highly fluctuating, or he has financially weak buyers or his business depends on a few buyers, then it is relatively risky to

extend credit to him. The implications of these aspects should be fully understood before extending credit to customers.

Check Your Progress

1. List the characteristics of credit sale.
2. What are the main categories of customers for a firm?

12.3 CASH AND LIQUIDITY MANAGEMENT

Cash is the important current asset for the operations of the business. It is the basic input needed to keep the business running on a continuous basis; it is also the ultimate output expected to be realized by selling the service or product manufactured by the firm. The firm should keep sufficient cash, neither more nor less. Cash shortage will disrupt the firm's manufacturing operations while excessive cash will simply remain idle, without contributing anything towards the firm's profitability. Thus, a major function of the financial manager is to maintain a sound cash position.

Cash is the money which a firm can disburse immediately without any restriction. The term cash includes coins, currency and cheques held by the firm, and balances in its bank accounts. Sometimes near-cash items, such as marketable securities or bank term deposits, are also included in cash. The basic characteristic of near-cash assets is that they can readily be converted into cash. Generally, when a firm has excess cash, it invests it in marketable securities. This kind of investment contributes some profit to the firm.

12.3.1 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. It can be represented by a cash management cycle as shown in Figure 12.1. Sales generate cash which has to be disbursed. The surplus cash has to be invested while deficit has to be borrowed. Cash management seeks to accomplish this cycle at a minimum cost. At the same time, it also seeks to achieve liquidity and control. Cash management assumes more importance than other current assets because cash is the most significant and the least productive asset that a firm holds. It is significant because it is used to pay the firm's obligations. However, cash is unproductive. Unlike fixed assets or inventories, it does not produce goods for sale. Therefore, the aim of cash management is to maintain adequate control over cash position to keep the firm sufficiently liquid and to use excess cash in some profitable way.

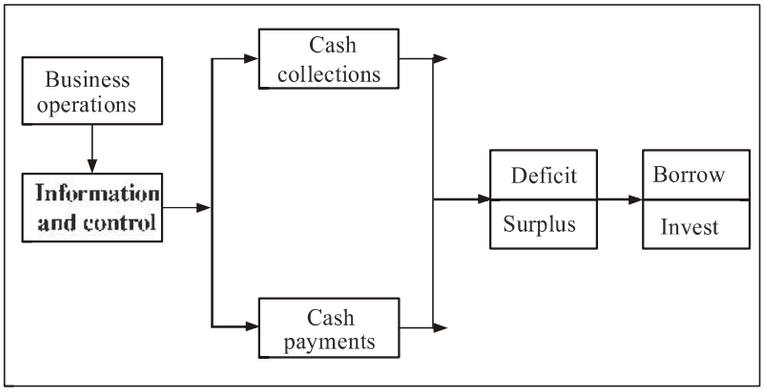

Fig. 12.1 *Cash Management Cycle*

Cash management is also 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 build up. 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. Further, cash management is significant 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 these days is to 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 synchronization 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:

- **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.
- **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.
- **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.
- **Investing surplus cash:** The surplus cash balances should be properly invested to earn profits. The firm should decide about the division of the cash balance between alternative short-term investment opportunities such as bank deposits, marketable securities, or inter-corporate lending.

The ideal cash management system will depend on the firm's products, organization structure, competition, culture and options available. The task is complex, and decisions taken can affect important areas of the firm. For example, to improve collections if the credit period is reduced, it may affect sales. However, in certain cases, even without fundamental changes, it is possible to significantly reduce cost of cash management system by choosing a right bank and controlling the collections properly.

12.3.2 Cash Planning

Cash flows are inseparable parts of the business operations of firms. A firm needs cash to invest in inventory, receivables and fixed assets and to make payment for operating expenses, in order to maintain growth in sales and earnings. It is possible that the 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. **Cash planning** is a technique to plan and control the use of cash. It helps 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 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.

Cash planning may be done on daily, weekly or monthly basis. The period and frequency of cash planning generally depends upon the size of the firm and philosophy of the management. Large firms prepare daily and weekly forecasts. Medium-size firms usually prepare weekly and monthly forecasts. Small firms may not prepare formal cash forecasts because of the non-availability of information and small-scale operations. But, if the small firms prepare cash projections, it is done on monthly basis. As a firm grows and business operations become complex, cash planning becomes inevitable for its continuing success.

12.3.3 Cash Forecasting and Budgeting

Cash budget is the most significant device to plan for and control cash receipts and payments. A cash budget is a summary statement of the firm's expected cash inflows and outflows over a projected time period. It gives information on the timing and magnitude of expected cash flows and cash balances over the projected period. This information helps the financial manager to determine the future cash needs of the firm, plan for the financing of these needs and exercise control over the cash and liquidity of the firm.

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The time horizon of a cash budget may differ from firm to firm. A firm whose business is affected by seasonal variations may prepare monthly cash budgets. Daily or weekly cash budgets should be prepared for determining cash requirements if cash flows show extreme fluctuations. Cash budgets for a longer intervals may be prepared if cash flows are relatively stable.

Cash forecasts are needed to prepare cash budgets. Cash forecasting may be done on short-or long-term basis. Generally, forecasts covering periods of one year or less are considered short-term; those extending beyond one year are considered long-term.

Short-Term Cash Forecasting

It is comparatively easy to make short-term cash forecasts. The important functions of carefully developed short-term cash forecasts are:

- To determine operating cash requirements.
- To anticipate short-term financing.
- To manage investment of surplus cash.

The short-term forecast helps in determining the cash requirements for a predetermined period to run a business. If the cash requirements are not determined, it would not be possible for the management to know how much cash balance is to be kept in hand, to what extent bank financing be depended upon and whether surplus funds would be available to invest in marketable securities.

To know the operating cash requirements, cash flow projections have to be made by a firm. As stated earlier, there is hardly a perfect matching between cash inflows and outflows. With the short-term cash forecasts, however, the financial manager is enabled to adjust these differences in favour of the firm.

It is well-known that, for their temporary financing needs, most companies depend upon banks. One of the significant roles of the short-term forecasts is to pinpoint when the money will be needed and when it can be repaid. With such forecasts in hand, it will not be difficult for the financial manager to negotiate short-term financing arrangements with banks. This in fact convinces bankers about the ability of the management to run its business.

The third function of the short-term cash forecasts is to help in managing the investment of surplus cash in marketable securities. Carefully and skilfully designed cash forecast helps a firm to: (*i*) select securities with appropriate maturities and reasonable risk, (*ii*) avoid over and under-investing and (*iii*) maximize profits by investing idle money.

Short-run cash forecasts serve many other purposes. For example, multi-divisional firms use them as a tool to coordinate the flow of funds between their various divisions as well as to make financing arrangements for these operations. These forecasts may also be useful in determining the margins or minimum balances to be maintained with banks. Still other uses of these forecasts are:

- Planning reductions of short and long-term debt
- Scheduling payments in connection with capital expenditures programmes
- Planning forward purchases of inventories
- Checking accuracy of long-range cash forecasts
- Taking advantage of cash discounts offered by suppliers
- Guiding credit policies.

Short-term Forecasting Methods

Two most commonly used methods of short-term cash forecasting are:

- Receipt and disbursements method.
- Adjusted net income method.

Receipts and disbursements method is generally employed to forecast for limited periods, such as a week or a month. The adjusted net income method, on the other hand, is preferred for longer durations ranging from a few months to a year. Both methods have their pros and cons. The cash flows can be compared with budgeted income and expense items if the receipts and disbursements approach is followed. On the other hand, the adjusted income approach is appropriate in showing a company's working capital and future financing needs.

Cash flows in and out in most companies on a continuous basis. The prime aim of receipts and disbursements forecasts is to summarize these flows during a predetermined period. In case of those companies where each item of income and expense involves flow of cash, this method is favoured to keep a close control over cash.

Three broad sources of cash inflows can be identified: (*i*) operating, (*ii*) non-operating, and (*iii*) financial. Cash sales and collections from customers form the most important part of the operating cash inflows. Developing a sales forecast is the first step in preparing a cash forecast. All precautions should be taken to forecast sales as accurately as possible. In case of cash sales, cash is received at the time of sale. On the other hand, cash is realized after sometime if sale is on credit. The time in realizing cash on credit sales depends upon the firm's credit policy reflected in the average collection period.

Long-Term Cash Forecasting

Long-term cash forecasts are prepared to give an idea of the company's financial requirements in the distant future. They are not as detailed as the short-term forecasts are. Once a company has developed a long-term cash forecast, it can be used to evaluate the impact of, say, new product developments or plant acquisitions on the firm's financial condition, for three, five, or more years in the future. The major uses of the long-term cash forecasts are:

- It indicates as company's future financial needs, especially its working capital requirements.

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- It helps to evaluate proposed capital projects. It pinpoints the cash required to finance these projects as well as the cash to be generated by the company to support them.
- It helps to improve corporate planning. Long-term cash forecasts compel each division to plan for the future and to formulate projects carefully.

Long-term cash forecasts may be made for two, three or five years. As with the short-term forecasts, the company's practices may differ on the duration of long-term forecasts to suit its particular needs.

The short-term forecasting methods, i.e., the receipts and disbursements method and the adjusted net income method, can also be used in long-term cash forecasting. Long-term cash forecasting reflects the impact of growth, expansion or acquisitions; it also indicates financing problems arising from these developments.

Managing Cash Collections and Disbursements

Once the cash budget has been prepared and appropriate net cash flow established, the financial manager should ensure that there does not exist a significant deviation between projected cash flows and actual cash flows. To achieve this, cash management efficiency will have to be improved through a proper control of cash collection and disbursement. The twin objectives in managing the cash flows should be to accelerate cash collections as much as possible and to decelerate or delay cash disbursements as much as possible.

Accelerating cash collections

A firm can conserve cash and reduce its requirements for cash balances if it can speed up its cash collections. The first hurdle in accelerating the cash collection could be the firm itself. It may take a long time to process the invoice. Days taken to get the invoice to buyers adds to order processing delay. In India, yet another problem is with regard to the extra time enjoyed by the buyers in clearing of bills; particularly, the government agencies take time beyond what is allowed by the sellers in paying bills. Cash collections can be accelerated by reducing the lag or gap between the time a customer pays bill and the time the cheque is collected and funds become available for the firm's use.

The amount of cheques sent by customer which are not yet collected is called collection or **deposit float**. Within this time gap, the delay is caused by the mailing time, i.e. the time taken by cheque in transit and the *processing time*, i.e., the time taken by the firm in processing cheque for internal accounting purposes. This also depends on the processing time taken by the bank as well as the inter bank system to get credit in the desired account. The greater the firm's deposit float, the longer the time taken in converting cheques into usable funds. In India, these floats can assume sizeable proportions as cheques normally take a longer time to get realized than in most countries. An efficient financial manager will attempt to reduce the firm's deposit float by speeding up the mailing, processing and

collection times. How can this be achieved? A firm can use decentralized collection system and lock-box system to speed up cash collections and reduce deposit float.

12.3.4 Tax Considerations in Remittances and Purchases

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a. Tax considerations on remittances

Tax on remittances basically places a responsibility on the remitters (or the payers) to withhold a certain part of remittances towards tax liability. This is known as 'withholding tax'. Withholding tax is defined as a government requirement for the payer of an item of income to withhold or deduct tax from the payment, and pay that tax to the government.

Chapter XVII-B of the Income Tax Act, 1961, provides for deduction of tax at source on payments made by any assessee. Section 195 casts an obligation on the person responsible for payment to non-resident to deduct tax at source at the time of payment or at the time of credit of the sum to the account of the non-resident.

Withholding tax rates for payments made to non-residents are determined by the Finance Act passed by the Indian Parliament for various years. The Indian law requires all foreign companies to file return of income, with respect to income being earned from India—even if the applicable taxes have been paid in India. It is so advisable for foreign companies to initiate the process for obtaining a PAN especially if they are receiving certain royalties/fees/interest from their Indian group companies/collaborators.

b. Tax considerations in purchases

As per section 92 (1) of the Income Tax Act, 1961, income from an international transaction shall be computed having regard to the arm's length price (correct market price). And it is not only the sale price that shall be determined as per arm's length price but even the allowances for any expenses and interest arising from an international transaction will be computed evenly. This rule applies even where the international transaction shall comprise only outgoings i.e., expenses and interest.

The arm's length price is critical for companies with international operations and subsidiaries trading with each other. There is often an incentive to reduce the overall tax burden by manipulation of inter-company prices.

The definition of international transaction under the transfer pricing regulations is very wide and in this scope it includes transaction between two associated enterprises in the nature of:

- Purchase, sale or lease of tangible or intangible property, or
- Provision of services, or

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- Lending or borrowing of money, or
- Any other transaction having a bearing on the profits, income, losses or assets of such enterprises.

It would also include a mutual agreement or arrangement between two or more enterprises for allocation of cost/expenses incurred in connection with a benefit, service, and facility provided or to be provided.

Check Your Progress

3. What is a cash budget?
4. Define the term 'deposit float'.

12.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. A credit sale has three characteristics: *First*, it involves an element of risk that should be carefully analysed. Cash sales are totally riskless, but not the credit sales, as the cash payments are yet to be received. *Second*, it is based on economic value. To the buyer, the economic value in goods or services passes immediately at the time of sale, while the seller expects an equivalent value to be received later on. *Third*, it implies futurity. The buyer will make the cash payment for goods or services received by him, in a future period.
2. The firm may categorize its customers, at least, in the following three categories:
   (i) **Good accounts**; that is, financially strong customers.
   (ii) **Bad accounts**; that is, financially very weak, high risk customers.
   (iii) **Marginal accounts**; that is, customers with moderate financial health and risk (falling between good and bad accounts).
3. A cash budget is a summary statement of the firm's expected cash inflows and outflows over a projected time period. It gives information on the timing and magnitude of expected cash flows and cash balances over the projected period.
4. The amount of cheques sent by customer which are not yet collected is called collection or deposit float.

12.5 SUMMARY

- Trade credit happens when a firm sells its products or services on credit and does not receive cash immediately. It is an essential marketing tool,

acting as a bridge for the movement of goods through the production and distribution stages to customers.

- Debtors constitute a substantial portion of current assets of several firms. For example in India, trade debtors, after inventories, are the major components of current assets
- A firm's investment in accounts receivable depends on: (*a*) the volume of credit sales, and (*b*) the collection period.
- A firm's credit policy aims at maximizing shareholders' wealth through increase in sales leading to net improvement in profitability.
- The firm's operating profit is maximized when total cost is minimized for a given level of revenue.
- Credit standards are the criteria which a firm follows in selecting customers for the purpose of credit extension.
- Credit standards influence the quality of the firm's customers. There are two aspects of the quality of customers: (*i*) the time taken by customers to repay credit obligations and (*ii*) the default rate.
- In extending credit to customers, the firm would ensure that receivables will be collected in full and on due date. Credit should be granted to those customers who have the ability to make the payment on time.
- After having obtained the credit information, the firm will get an idea regarding the matters which should be further investigated.
- Cash is the important current asset for the operations of the business. It is the basic input needed to keep the business running on a continuous basis; it is also the ultimate output expected to be realized by selling the service or product manufactured by the firm.
- Cash management is also 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.
- Cash flows are inseparable parts of the business operations of firms. A firm needs cash to invest in inventory, receivables and fixed assets and to make payment for operating expenses, in order to maintain growth in sales and earnings.
- Cash budget is the most significant device to plan for and control cash receipts and payments. A cash budget is a summary statement of the firm's expected cash inflows and outflows over a projected time period.
- Once the cash budget has been prepared and appropriate net cash flow established, the financial manager should ensure that there does not exist a significant deviation between projected cash flows and actual cash flows.
- The amount of cheques sent by customer which are not yet collected is called collection or deposit float.

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12.6 KEY WORDS

- **Default risk:** It is the likelihood that a customer will fail to repay the credit obligation.
- **Credit standards:** These are the criteria which a firm follows in selecting customers for the purpose of credit extension.
- **Trade credit:** It is the credit extended by one party to another when the goods and services are bought on credit and does not receive cash immediately.

12.7 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. What is a credit policy?
2. Write a short note on the variables of a credit policy.
3. What are the short-term and long-term cash forecasting methods?
4. How is cash collection and its disbursement managed by a business organization?

Long Answer Questions

1. Explain the goals of a credit policy.
2. Critically analyse an optimum credit policy.
3. 'Credit standards influence the quality of the firm's customers.' Explain the statement.
4. Discuss the facets of cash management.

12.8 FURTHER READINGS

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UNIT 13 DIVIDEND THEORIES

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Structure

13.0 INTRODUCTION

Dividend decisions occupy a significant place in corporate finance since it impacts the availability of earnings and the cost of capital. One of the major objectives of the dividend policy is that it assists in long-term financing decision and decision pertaining to maximization of wealth. In this unit, you will study about the dividend theories namely, Walter's dividend model, Gordon's dividend model and Miller and Modigliani (MM) hypothesis.

13.1 OBJECTIVES

After going through this unit, you will be able to:

- Analyse the significance of dividend in the financial decision-making process
- Explain Walter's dividend model and Gordon's dividend model
- Discuss the limitations of the MM hypothesis

13.2 DIVIDEND RELEVANCE, IMPLICATIONS AND CONTRIBUTION TO THE FINANCIAL DECISION MAKING PROCESS

Dividend decision of the firm is yet another crucial area of financial management. The important aspect of dividend policy is to determine the amount of earnings to be distributed to shareholders and the amount to be retained in the firm.

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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 current return. Dividends, however, constitute the use of the firm's funds. Dividend policy involves the balancing of the shareholders' desire for current dividends and the firm's needs for funds for growth.

Issues in Dividend Policy

In theory, the objective of a dividend policy should be to maximize a shareholder's return so that the value of his investment is maximized. Shareholders' return consists of two components: dividends and capital gains. Dividend policy has a direct influence on these two components of return.

Let us consider an example to highlight the issues underlying the dividend policy. Payout ratio—which is dividend as a percentage of earnings or dividend per share as a percentage of earnings per share—is an important concept vis-à-vis the dividend policy. Retention ratio is 100 per cent minus payout percentage. Suppose two companies, Low Payout Company and High Payout Company, both have a return on equity (ROE) of 20 per cent. Assume that both companies' equity consists of one share each of '100. High Payout Company distributes 80 per cent while Low Payout Company distributes 20 per cent of its earnings as dividends. As you may recall, growth rate is the product of return on equity (ROE) times retention ratio (b):

$$\text{Growth} = \text{ROE} \times \text{Retention ratio}$$

$$g = \text{ROE} \times b$$

For Low Payout Company, the growth rate is:

$$g = 0.20 \times 0.80 = 0.16 \text{ or } 16\%$$

For High Payout Company the growth rate will be:

$$g = 0.20 \times 0.20 = 0.04 \text{ or } 4\%$$

It may be seen from Table 13.1 that High Payout's dividend is initially four times that of Low Payout's. However, over a long period of time, Low Payout overtakes High Payout's dividend payments. As shown in Figure 13.1, in our example, fourteenth year onwards Low Payout's dividend exceeds that of High Payout. Note that Low Payout retains much more than High Payout, and as a consequence, Low Payout's earnings, dividends and equity investment are growing at 16 per cent while that of High Payout's at 4 per cent only.

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Table 13.1 *Consequences of High and Low Payout Companies' Policies*

Year	*Equity (₹)*	*Earnings at 20% (₹)*	*Dividends (₹)*	*Retained Earnings (₹)*
High Payout Company				
1	100.00	20.00	16.00	4.00
2	104.00	20.80	16.64	4.16
3	108.16	21.63	17.31	4.32
4	112.48	22.50	18.00	4.50
5	116.98	23.40	18.72	4.68
10	142.33	28.47	22.77	5.69
15	173.17	34.63	27.71	6.92
20	210.68	42.14	33.71	8.43
Low Payout Company				
1	100.00	20.00	4.00	16.00
2	116.00	23.20	4.64	18.56
3	134.56	26.91	5.38	21.53
4	156.09	31.22	6.24	24.98
5	181.07	36.21	7.24	28.97
10	380.30	76.06	15.21	60.85
15	798.75	159.75	31.95	127.80
20	1,677.65	335.53	67.11	268.42

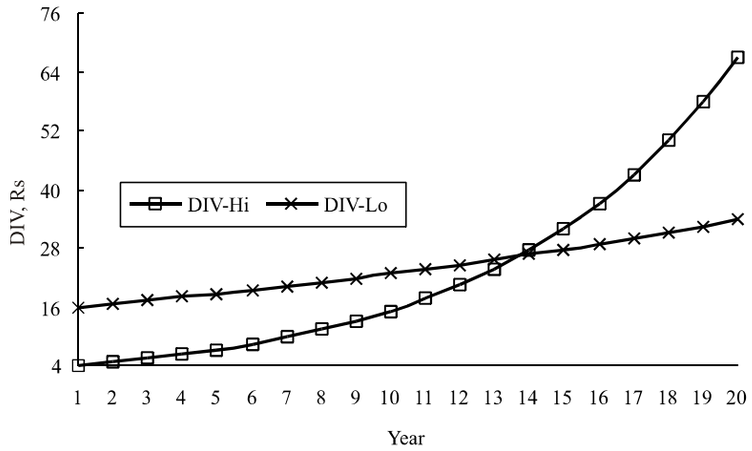

Fig. 13.1 *Dividend per share under High and Low Payout Companies' Policies*

A low payout policy might produce a higher share price because it accelerates earnings growth. Investors of growth companies will realize their return mostly in the form of capital gains (resulting from the appreciation in the share value). Dividend yield—dividend per share divided by the market price per share—will be low for such companies. The impact of dividend policy on future capital gains is, however,

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complex. Capital gains occur in distant future, and therefore, many people consider them uncertain. It is not sure that low-payout policy will necessarily lead to higher prices in reality. It is quite difficult to clearly identify the effect of payout on share price. Share price is a reflection of so many factors that the long-run effect of payout is quite difficult to isolate.

A high payout policy means more current dividends and less retained earnings, which may consequently result in slower growth and perhaps lower market price per share. As stated earlier, low payout policy means less current dividends, more retained earnings and higher capital gains, and perhaps higher market price per share. Capital gains are future earnings while dividends are current earnings. Dividends in most countries are taxed more than capital gains. Therefore, it is quite plausible that some investors would prefer high-payout companies while others may prefer low-payout companies.

What does dividend policy imply? Paying dividends involves outflow of cash. The cash available for the payment of dividends is affected by the firm's investment and financing decisions. A decision to incur capital expenditure implies that less cash will be available for the payment of dividends. Thus, investment decision affects dividend decision. If the firm's value is affected, is it because of the investment decision or the dividend decision? Given the firm's capital expenditure, and that it does not have sufficient internal funds to pay dividends, it can raise funds by issuing new shares. In this case, the dividend decision is not separable from the firm's financing decision.

The firm will have a given amount of cash available for paying dividends, given its investment and financing decisions. Thus, a dividend decision involves a trade-off between the retained earnings and issuing new shares. It is essential to separate the effect of dividend changes from the effects of investment and financing decisions. Do changes in the dividend policy alone affect the value of the firm? What factors are important in formulating a dividend policy in practice?

On the relationship between dividend policy and the value of the firm, different theories have been advanced. These theories can be grouped into two categories: (a) theories that consider dividend decision to be irrelevant and (b) theories that consider dividend decision to be an active variable influencing the value of the firm. In the latter, there are two extreme views, that is: (i) dividends are good as they increase the shareholder value; (ii) dividends are bad since they reduce the shareholder value. The following is the critical evaluation of some important theories representing these points of views.

13.2.1 Walter's Model

Professor James E. Walter argues that the choice of dividend policies almost always affect the value of the firm. His model, one of the earlier theoretical works, shows the importance of the relationship between the firm's rate of return, *r*, and its cost of capital, *k*, in determining the dividend policy that will maximize the wealth of shareholders. Walter's model is based on the following assumptions:

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- **Internal financing:** The firm finances all investment through retained earnings; that is, debt or new equity is not issued.
- **Constant return and cost of capital:** The firm's rate of return, r, and its cost of capital, k, are constant.
- **100 per cent payout or retention:** All earnings are either distributed as dividends or reinvested internally immediately.
- **Constant EPS and DIV:** Beginning earnings and dividends never change. The values of the earnings per share, EPS, and the dividend per share, DIV, may be changed in the model to determine results, but any given values of EPS or DIV are assumed to remain constant forever in determining a given value.
- **Infinite time:** The firm has a very long or infinite life.

Walter's formula to determine the market price per share is as follows:

$$P = \frac{\text{DIV}}{k} + \frac{r(\text{EPS} - \text{DIV})/k}{k} \quad (1)$$

where P = market price per share

DIV = dividend per share

EPS = earnings per share

r = firm's rate of return (average)

k = firm's cost of capital or capitalization rate

Equation (1) reveals that the market price per share is the sum of the present value of two sources of income: (*i*) the present value of the infinite stream of constant dividends, DIV/*k* and (*ii*) the present value of the infinite stream of capital gains, [*r* (EPS – DIV)/*k*]/*k*. When the firm retains a perpetual sum of (EPS – DIV) at *r* rate of return, its present value will be: *r* (EPS – DIV)/*k*. This quantity can be known as a capital gain which occurs when earnings are retained within the firm. If retained earnings occur every year, the present value of an infinite number of capital gains, *r* (EPS – DIV)/*k*, will be equal to: [*r* (EPS – DIV)/*k*]/*k*. Thus, the value of a share is the present value of all dividends plus the present value of all capital gains as shown in Equation (1) which can be rewritten as follows:

$$P = \frac{\text{DIV} + (r/k)\,(\text{EPS} - \text{DIV})}{k} \quad (2)$$

Illustration 13.1: Dividend Policy: Application of Walter's Model

To illustrate the effect of different dividend policies on the value of share respectively for the growth firm, normal firm and declining firm, Table 13.2 is constructed.

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Table 13.2 *Dividend Policy and the Value of Share (Walter's Model)*

Growth Firm, r > k	***Normal Firm, r = k***	***Declining Firm, r < k***
Basic Data		
r = 0.15 k = 0.10 EPS = ₹ 10	r = 0.10 k = 0.10 EPS = ₹ 10	r = 0.08 k = 0.10 EPS = ₹ 10
Payout Ratio 0%		
DIV = ₹ 0 P = 0 + (0.15/0.10) (10 – 0)/0.10 = ₹ 150	DIV = ₹ 0 P = 0 + [(0.10/0.10) (10 – 0)]/0.10 = ₹ 100	DIV = ₹ 0 P = 0 +[(0.08/0.10) (10 – 0)]/0.10 = ₹ 80
Payout Ratio 40%		
DIV = ₹ 4 P = [4 + (0.15/0.10) (10 – 4)]/0.10 = ₹ 130	DIV = ₹ 4 P = [4 + (0.10/0.10) (10 – 4)]/0.10 = ₹ 100	DIV = ₹ 4 P = [4+(0.08/0.10) (10 – 4)]/0.10 = ₹ 88
Payout Ratio 80%		
DIV = ₹ 8 P = [8 + (0.15/0.10) (10 – 8)]/0.10 = ₹ 110	DIV = ₹ 8 P = [8 + (0.10/0.10) (10 – 8)]/0.10 = ₹ 100	DIV = ₹ 8 P = [8 + (0.08/0.10) (10–8)]/0.10 = ₹ 96
Payout Ratio 100%		
DIV = ₹ 10 P = [10 +(0.15/0.10)(10 – 10)]/0.10 = ₹ 100	DIV = ₹ 10 P = [10 +(0.10/0.10)(10 – 10)]/0.10 = ₹ 100	DIV = ₹ 10 P = [10+(0.08/0.10)(10–10)]/0.10 = ₹ 100

Table 13.2 shows that, in Walter's model, the optimum dividend policy depends on the relationship between the firm's rate of return, r and its cost of capital, k.

Growth Firm: Internal Rate more than Opportunity Cost of Capital ($r > k$)

Growth firms are those firms which expand rapidly because of ample investment opportunities yielding returns higher than the opportunity cost of capital ($r > k$). These firms are able to reinvest earnings at a rate (r) which is higher than the rate expected by shareholders (k). They will maximize the value per share if they follow a policy of retaining all earnings for internal investment. It can be seen from Table 13.1 that the market value per share for the growth firm is maximum (i.e., ₹ 150) when it retains 100 per cent earnings and minimum (i.e., ₹ 100) if it distributes all earnings. Thus, the optimum payout ratio for a growth firm is zero. The market value per share P, increases as payout ratio declines when $r > k$.

Normal Firms: Internal Rate equals Opportunity Cost of Capital ($r = k$)

Most of the firms do not have unlimited surplus-generating investment opportunities. After exhausting super profitable opportunities, normal firms earn on their investments rate of return equal to the cost of capital, $r = k$. For normal firms with $r = k$, the dividend policy has no effect on the market value per share in Walter's model. It can be noticed from Table 13.2 that the market value per share for the normal firm is same (i.e., ₹ 100) for different dividend-payout ratios. Thus, there is no unique optimum payout ratio for a normal firm. One dividend policy is as good as the other. The market value per share is not affected by the payout ratio when $r = k$.

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Declining Firms: Internal Rate less than Opportunity Cost of Capital ($r < k$)

Declining firms do not have any profitable investment opportunities to invest the earnings. These firms would earn on their investments rates of return less than the minimum rate required (r < k) by investors. Investors of such firm would like earnings to be distributed to them so that they may either spend it or invest elsewhere to get a rate higher than earned by the declining firms. The market value per share of a declining firm with $r < k$ will be maximum when it does not retain earnings at all. It can be observed from Table 13.2 that, when the declining firm's payout ratio is 100 per cent (i.e., zero retained earnings) the market value per share is ₹ 100 and it is ₹ 80 when payout ratio is zero. Thus, the optimum payout ratio for a declining firm is 100 per cent. The market value per share, *P*, increases as payout ratio increases when $r < k$.

Thus, in Walter's model, the dividend policy of the firm depends on the availability of investment opportunities and the relationship between the firm's internal rate of return, *r* and its cost of capital, *k*. Thus:

- Retain all earnings when $r > k$
- Distribute all earnings when $r < k$
- Dividend (or retention) policy has no effect when $r = k$.

Thus, dividend policy in Walter's model is a financing decision. When dividend policy is treated as a financing decision, the payment of cash dividends is a 'passive residual'.

Criticism of Walter's Model

Walter's model is quite useful to show the effects of dividend policy on all equity firms under different assumptions about the rate of return. However, the simplified nature of the model can lead to conclusions that are not true in general, though true for the model. The following is a critical evaluation of some of the assumptions underlying the model.

No external financing: Walter's model of share valuation mixes dividend policy with investment policy of the firm. The model assumes that retained earnings finance the investment opportunities of the firm and no external financing—debt or equity—is used for the purpose. When such a situation exists, either the firm's investment or its dividend policy or both will be sub-optimum. This is shown graphically in Figure 13.2. The horizontal axis represents the amount of earnings, investment and new financing in rupees. The vertical axis shows the rates of return and the cost of capital. It is assumed that the cost of capital, *k*, remains constant, regardless of the amount of new capital raised.

Thus, the average cost of capital k_a is equal to the marginal cost of capital, k_m. The rates of return on investment opportunities available to the firm are assumed to be decreasing. This implies that the most profitable investments will be made

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first and the poorer investments made last. In Figure 13.2, I^* rupees of investment occurs where $r = k$. I^* is the optimum investment regardless of whether the capital to finance this investment is raised by selling shares, debentures, retaining earnings or obtaining a loan. If the firm's earnings are E_1, then $(I^* - E_1)$ amount should be raised to finance the investments. However, external financing is not included in Walter's simplified model. Thus for this situation, Walter's model would show that the owner's wealth is maximized by retaining and investing firm's total earnings of E_1 and paying no dividends. In a more comprehensive model allowing for outside financing, the firm should raise new funds to finance I^* investment. The wealth of the owners will be maximized only when this optimum investment is made.

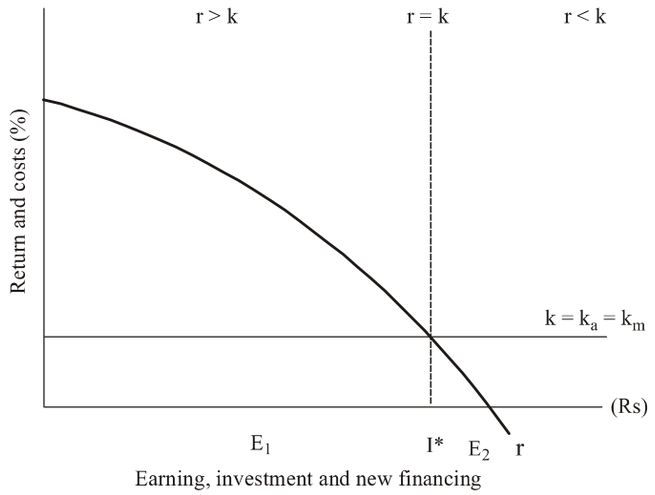

Fig. 13.2 *Industrial and Return Curve*

Constant return, r: Walter's model is based on the assumption that r is constant. In fact, r decreases as more and more investment is made. This reflects the assumption that the most profitable investments are made first and then the poorer investments are made. The firm should stop at a point where $r = k$. In Figure 13.2, the optimum point of investment occurs at I^* where $r = k$; if the firm's earnings are E_2 it should pay dividends equal to $(E_2 - I)^*$; on the other hand, Walter's model indicates that, if the firm's earnings are E_2, they should be distributed because $r < k$ at E_2. This is clearly an erroneous policy and will fail to optimize the wealth of the owners.

Constant opportunity cost of capital, k: A firm's cost of capital or discount rate, k, does not remain constant; it changes directly with the firm's risk. Thus, the present value of the firm's income moves inversely with the cost of capital. By assuming that the discount rate, k, is constant, Walter's model abstracts from the effect of risk on the value of the firm.

13.2.2 Gordon's Model

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Myron Gordon developed one very popular model explicitly relating the market value of the firm to dividend policy. Gordon's model is based on the following assumptions:

- **All-equity firm:** The firm is an all-equity firm, and it has no debt.
- **No external financing:** No external financing is available. Consequently, retained earnings would be used to finance any expansion. Thus, just as Walter's model, Gordon's model too confounds dividend and investment policies.
- **Constant return:** The internal rate of return, r, of the firm is constant. This ignores the diminishing marginal efficiency of investment as represented in Figure 6.1.
- **Constant cost of capital:** The appropriate discount rate, k for the firm remains constant. Thus, Gordon's model also ignores the effect of a change in the firm's risk class and its effect on *k*.
- **Perpetual earnings:** The firm and its stream of earnings are perpetual.
- **No taxes:** Corporate taxes do not exist.
- **Constant retention:** The retention ratio, b, once decided upon, is constant. Thus, the growth rate, $g = br$, is constant forever.
- **Cost of capital greater than growth rate:** The discount rate is greater than growth rate, $k = g$. If this condition is not fulfilled, we cannot get a meaningful value for the share.

According to Gordon's dividend-capitalization model, the market value of a share is equal to the present value of an infinite stream of dividends received by the shareholders as explained earlier. Thus:

$$P_0 = \frac{\text{DIV}_1}{(1+k)} + \frac{\text{DIV}_2}{(1+k)^2} + \cdots + \frac{\text{DIV}_\infty}{(1+k)^\infty} = \sum_{t=1}^{\infty} \frac{\text{DIV}_t}{(1+k)^t} \qquad (3)$$

However, the dividend per share is expected to grow when earnings are retained. The dividend per share is equal to the payout ratio, $(1 - b)$ times earnings per share, EPS; that is, $\text{DIV}_t = (1 - b)\,\text{EPS}_t$ where *b* is the fraction of retained earnings. It is assumed that the retained earnings are reinvested within the all-equity firm at the firm's internal rate of return, *r*. This allows earnings to grow at $g = br$ per period. When we incorporate growth in earnings and dividends, resulting from the retained earnings, in the dividend-capitalization model, the present value of a share is determined by the following formula:

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$$P_0 = \frac{\text{DIV}(1+g)}{(1+k)} + \frac{\text{DIV}(1+g)^2}{(1+k)^2} + \frac{\text{DIV}(1+g)^3}{(1+k)^3} + \cdots + \frac{\text{DIV}(1+g)^\infty}{(1+k)^\infty} = \sum_{t=1}^{\infty} \frac{\text{DIV}(1+g)^t}{(1+k)^t} \quad (4)$$

When Equation (4) is solved it becomes:

$$P_0 = \frac{\text{DIV}_1}{k-g} \quad (5)$$

Substituting $\text{EPS}_1 (1-b)$ for DIV_1 and br for g, Equation (5) can be rewritten as

$$P_0 = \frac{\text{EPS}_1(1-b)}{k-br} \quad (6)$$

Equation (6) explicitly shows the relationship of expected earnings per share, EPS_1, dividend policy as reflected by retention ratio, b, internal profitability, r, and the all-equity firm's cost of capital, k, in the determination of the value of the share. Equation (6) is particularly useful for studying the effects of dividend policy on the value of the share.

Let us consider the case of a normal firm where the internal rate of return of the firm equals its cost of capital, i.e., $r = k$. Under this situation, Equation (6) may be expressed as follows:

$$P_0 = \frac{\text{EPS}_1(1-b)}{k-br} = \frac{r\ A(1-b)}{k-br} \quad (7)$$

(since EPS = rA, A = assets per share)

If $r = k$, then

$$P_0 = \frac{\text{EPS}_1(1-b)}{k-br} = \frac{r\ A(1-b)}{k-br} = \frac{\text{EPS}}{k} = \frac{rA}{r} = A \quad (8)$$

Equation (8) shows that regardless of the firm's earnings per share, EPS_1, or risk (which determines k), the firm's value is not affected by dividend policy and is equal to the value of assets per share. That is, when $r = k$, dividend policy is irrelevant since b, completely cancels out of Equation (8). Interpreted in economic sense, this finding implies that, under competitive conditions, the opportunity cost of capital, k, must be equal to the rate of return generally available to investors in comparable shares. This means that any funds distributed as dividends may be invested in the market at the rate equal to the firm's internal rate of return.

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Consequently, shareholders can neither lose nor gain by any change in the company's dividend policy, and the market value of their shares must remain unchanged.

Considering the case of the declining firm where $r < k$, Equation (8) indicates that, if the retention ratio, b, is zero or payout ratio, $(1 - b)$, is 100 per cent the value of the share is equal to:

$$P_0 = \frac{rA}{k} \quad (b=0) \tag{9}$$

If $r < k$ then $r/k < 1$ and from Equation (9) it follows that P_0 is smaller than the firm's investment per share in assets, A. It can be shown that if the value of b increases, the value of the share continuously falls. These results may be interpreted as follows:

If the internal rate of return is smaller than k, which is equal to the rate available in the market, profit retention clearly becomes undesirable from the shareholders' standpoint. Each additional rupee (sic) retained reduces the amount of funds that shareholders could invest at a higher rate elsewhere and thus further depresses the value of the company's share. Under such conditions, the company should adopt a policy of contraction and disinvestment, which would allow the owner to transfer not only the net profit but also paid in capital (or a part of it) to some other, more remunerative enterprise.

Finally, let us consider the case of a growth firm where $r > k$. The value of a share will increase as the retention ratio, b, increases under the condition of $r > k$. However, it is not clear as to what the value of b should be to maximize the value of the share, P_0. For example, if $b = k/r$, Equation (6) reveals that denominator, $k - br = 0$, thus making P_0 infinitely large, and if $b = 1$, $k - br$ becomes negative, thus making P_0 negative. These absurd results are obtained because of the assumption that r and k are constant, which underlie the model. Thus, to get the meaningful value of the share, according to Equation (6), the value of b should be less than k/r. Gordon's model is illustrated in Illustration 13.2.

Illustration 13.2: Application of Gordon's Dividend Model

Let us consider the data in Table 13.3. The implications of dividend policy, according to Gordon's model, are shown respectively for the growth, the normal and the declining firms.

Table 13.3 *Dividend Policy and the Value of the Firm*

	Basic Data	
Growth Firm, r > k	***Normal Firm, r = k***	***Declining Firm, r < k***
$r = 0.15$	$r = 0.10$	$r = 0.08$
$k = 0.10$	$k = 0.10$	$k = 0.10$
$EPS_1 = ₹ 10$	$EPS_1 = ₹ 10$	$EPS_1 = ₹ 10$

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Payout Ratio 40%

$g = br = 0.6 \times 0.15 = 0.09$

$$P = \frac{10(1-0.6)}{0.10-0.09} = \frac{4}{0.01} = ₹\ 400$$

$g = br = 0.6 \times 0.10 = 0.06$

$$P = \frac{10(1-0.6)}{0.10-0.06} = \frac{4}{0.04} = ₹\ 100$$

$g = br = 0.6 \times 0.08 = 0.048$

$$P = \frac{10(1-0.6)}{0.10-0.048} = \frac{4}{0.052} = ₹\ 77$$

Payout Ratio 60%

$g = br = 0.4 \times 0.15 = 0.06$

$$P = \frac{10(1-0.4)}{0.10-0.06} = \frac{6}{0.04} = ₹\ 150$$

$g = br = 0.4 \times 0.10 = 0.04$

$$P = \frac{10(1-0.4)}{0.10-0.04} = \frac{6}{0.06} = ₹\ 100$$

$g = br = 0.4 \times 0.08 = 0.032$

$$P = \frac{10(1-0.4)}{0.10-0.032} = \frac{6}{0.068} = ₹\ 88$$

Payout Ratio 90%

$g = br = 0.10 \times 0.15 = 0.015$

$$P = \frac{10(1-0.1)}{0.10-0.015} = \frac{9}{0.085} = ₹\ 106$$

$g = br = 0.10 \times 0.10 = 0.01$

$$P = \frac{10(1-0.1)}{0.10-0.01} = \frac{9}{0.09} = ₹\ 100$$

$g = br = 0.10 \times 0.08 = 0.008$

$$P = \frac{10(1-0.1)}{0.10-0.008} = \frac{9}{0.092} = ₹\ 98$$

It is revealed that under Gordon's model:

- The market value of the share, P_0, increases with the retention ratio, b, for firms with growth opportunities, i.e., when $r > k$.
- The market value of the share, P_0, increases with the payout ratio, $(1 - b)$, for declining firms with $r < k$.
- The market value of the share is not affected by dividend policy when $r = k$.

Gordon's model's conclusions about dividend policy are similar to that of Walter's model. This similarity is due to the resemblance of assumptions that underlie both the models. Thus the Gordon model suffers from the same limitations as the Walter model.

13.3 DIVIDEND IRRELEVANCE: MM HYPOTHESIS

According to Miller and Modigliani (MM), under a perfect market situation, the dividend policy of a firm is irrelevant, as it does not affect the value of the firm. They argue that the value of the firm depends on the firm's earnings that result from its investment policy. Thus, when investment decision of the firm is given, dividend decision—the split of earnings between dividends and retained earnings—is of no significance in determining the value of the firm.

A firm, operating in perfect capital market conditions, may face one of the following three situations regarding the payment of dividends:

- The firm has sufficient cash to pay dividends.
- The firm does not have sufficient cash to pay dividends, and therefore, it issues new shares to finance the payment of dividends.
- The firm does not pay dividends, but shareholders need cash.

In the first situation, when the firm pays dividends, shareholders get cash in their hands, but the firm's assets reduce (its cash balance declines). What shareholders gain in the form of cash dividends, they lose in the form of their claims on the (reduced) assets. Thus, there is a transfer of wealth from one shareholders' pocket to another pocket. There is no net gain or loss. Since it is a fair transaction under perfect capital market conditions, the wealth of shareholders will remain unaffected.

In the second situation, when the firm issues new shares to finance the payment of dividends, two transactions take place. First, the existing shareholders get cash in the form of dividends, but they suffer an equal amount of capital loss since the value of their claim on assets reduces. Thus, the wealth of shareholders does not change. Second, the new shareholders part with their cash to the company in exchange for new shares at a fair price per share. The fair price per share is the share price before the payment of dividends less dividend per share to the existing shareholders. The existing shareholders transfer a part of their claim (in the form of new shares) to the new shareholders in exchange for cash. There is no net gain or loss. Both transactions are fair, and thus, the value of the firm will remain unaltered after these transactions.

In the third situation, if the firm does not pay any dividend a shareholder can create a home-made dividend by selling a part of his/her shares at the market (fair) price in the capital market for obtaining cash. The shareholder will have less number of shares. He or she has exchanged a part of his claim on the firm to a new shareholder for cash. The net effect is the same as in the case of the second situation. The transaction is a fair transaction, and no one loses or gains. The value of the firm remains the same, before or after these transactions. Consider an example.

Illustration 13.3: Dividend Irrelevance: The Miller–Modigliani Hypothesis

The Himgir Company Limited currently has 2 crore outstanding shares selling at a market price of ₹ 100 per share. The firm has no borrowing. It has internal funds available to make a capital expenditure (Capex) of ₹ 30 crore. The Capex is expected to yield a positive net present value of ₹ 20 crore. The firm also wants to pay a dividend per share of ₹ 15. Given the firm's Capex plan and its policy of zero borrowing, the firm will have to issue new shares to finance payment of dividends to its shareholders. How will the firm's value be affected (*i*) if it does not pay any dividend; (*ii*) if it pays dividend per share ₹ 15?

The firm's current value is: 2 × 100 = ₹ 200 crore. After the Capex, the value will increase to: 200 + 20 = ₹ 220 crore. If the firm does not pay dividends, the value per share will be: 220/2 = ₹ 110.

If the firm pays a dividend of ₹ 15 per share, it will entirely utilize its internal funds (15 × 2 = ₹ 30 crore), and it will have to raise ₹ 30 crore by issuing new shares to undertake Capex. The value of a share after paying dividend will be: 110

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– 15 = ₹ 95. Thus, the existing shareholders get a cash of ₹ 15 per share in the form of dividends, but incur a capital loss of ₹ 15 in the form of reduced share value. They neither gain nor lose. The firm will have to issue: 30 crore/95 = 31,57,895 (about 31.6 lakh) shares to raise ₹ 30 crore. The firm now has 2.316 crore shares at ₹ 95 each share. Thus, the value of the firm remains as: 2.316 × 95 = ₹ 220 crore.

The crux of the MM dividend hypothesis, as explained above, is that shareholders do not necessarily depend on dividends for obtaining cash. In the absence of taxes, flotation costs and difficulties in selling shares, they can get cash by devising "home-made dividend" without any dilution in their wealth. Therefore, firms paying high dividends (i.e., high-payout firms), need not command higher prices for their shares.

13.3.1 Assumptions of MM's Hypothesis of Irrelevance

- ***Perfect capital markets:*** The firm operates in perfect capital markets where investors behave rationally, information is freely available to all, and transactions and flotation costs do not exist. Perfect capital markets also imply that no investor is large enough to affect the market price of a share.
- ***No taxes:*** Taxes do not exist; or there are no differences in the tax rates applicable to capital gains and dividends. This means that investors value a rupee of dividend as much as a rupee of capital gains.
- ***Investment policy:*** The firm has a fixed investment policy.
- ***No risk:*** Risk of uncertainty does not exist. That is, investors are able to forecast future prices and dividends with certainty, and one discount rate is appropriate for all securities and all time periods. Thus, $r = k = k_t$ for all t.

Under the MM assumptions, r will be equal to the discount rate, k, and identical for all shares. As a result, the price of each share must adjust so that the rate of return, which is composed of the rate of dividends and capital gains, on every share will be equal to the discount rate and be identical for all shares. Thus, the rate of return for a share held for one year may be calculated as follows:

$$r = \frac{\text{Dividends} \quad + \quad \text{Capital gains} \quad \text{(or loss)}}{\text{Share price}}$$

$$r = \frac{\text{DIV} + (P_1 - P_0)}{P_0} \tag{10}$$

where P_0 is the market or purchase price per share at time 0, P_1 is the market price per share at time 1 and DIV_1 is dividend per share at time 1. As hypothesized by MM, r should be equal for all shares. If it is not so, the low-return yielding shares will be sold by investors who will purchase the high-return yielding shares. This process will tend to reduce the price of the low-return shares and increase the prices of the high-return shares. This switching or arbitrage will continue until

the differentials in rates of return are eliminated. The discount rate will also be equal for all firms under the MM assumptions since there are no risk differences.

From MM's fundamental principle of valuation described by Equation (10), we can derive their valuation model as follows:

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$$r = \frac{\text{DIV}_1 + (P_1 - P_0)}{P_0}$$

$$P_0 = \frac{\text{DIV}_1 + P_1}{(1+r)} = \frac{\text{DIV}_1 + P_1}{(1+k)} \tag{11}$$

since $r = k$ in the assumed world of certainty and perfect markets. Multiplying both sides of Equation (11) by the number of shares outstanding, n, we obtain the total value of the firm if no new financing exists:

$$V = n P_0 = \frac{n(\text{DIV}_1 + P_1)}{(1+k)} \tag{12}$$

If the firm sells m number of new shares at time 1 at a price of P_1, the value of the firm at time 0 will be:

$$\begin{aligned} n P_0 &= \frac{n(\text{DIV}_1 + P_1) + m P_1 - m P_1}{(1+k)} \\ &= \frac{n\,\text{DIV}_1 + n P_1 + m P_1 - m P_1}{(1+k)} \\ &= \frac{n\,\text{DIV}_1 + (n+m) P_1 - m P_1}{(1+k)} \end{aligned} \tag{13}$$

MM's valuation Equation (13) allows for the issue of new shares, unlike Walter's and Gordon's models. Consequently, a firm can pay dividends and raise funds to undertake the optimum investment policy. Thus, dividend and investment policies are not confounded in the MM model, like Walter's and Gordon's models. As such, MM's model yields more general conclusions.

The investment programmes of a firm, in a given period of time, can be financed either by retained earnings or the issue of new shares or both. Thus, the amount of new shares issued will be:

$$mP_1 = I_1 - (X_1 - n\,\text{DIV}_1) = I_1 - X_1 + n\,\text{DIV}_1 \tag{14}$$

where I_1 represents the total amount of investment during the first period and X_1 is the total net profit of the firm during the first period.

By substituting Equation (14) into Equation (13), MM showed that the value of the firm is unaffected by its dividend policy. Thus,

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$$n P_0 = \frac{n \text{DIV}_1 + (n+m) P_1 - m P_1}{(1+k)}$$

$$= \frac{n \text{DIV}_1 + (n+m) P_1 - (I_1 - X_1 + n \text{DIV}_1)}{(1+k)}$$

$$= \frac{(n+m) P_1 - I_1 + X_1}{(1+k)}$$

A firm which pays dividends will have to raise funds externally to finance its investment plans. MM's argument, that dividend policy does not affect the wealth of the shareholders, implies that when the firm pays dividends, its advantage is offset by external financing. This means that the terminal value of the share (say, price of the share at first period if the holding period is one year) declines when dividends are paid. Thus, the wealth of the shareholders—dividends plus terminal price—remains unchanged. As a result, the present value per share after dividends and external financing is equal to the present value per share before the payment of dividends. Thus, the shareholders are indifferent between payment of dividends and retention of earnings.

13.3.2 Limitations of MM Hypothesis

The MM hypothesis of dividend irrelevance is based on simplifying assumptions as discussed in the preceding section. Under these assumptions, the conclusion derived by them is logically consistent and intuitively appealing. But the assumptions underlying MM's hypothesis may not always be found valid in practice. For example, we may not find capital markets to be perfect in reality; there may exist issue costs; dividends may be taxed differently than capital gains; investors may encounter difficulties in selling their shares. Because of the unrealistic nature of the assumptions, MM's hypothesis is alleged to lack practical relevance. This suggests that internal financing and external financing are not equivalent. Dividend policy of the firm may affect the perception of shareholders and, therefore, they may not remain indifferent between dividends and capital gains. The following are the situations where the MM hypothesis may go wrong.

(a) Uncertainty and Shareholders' Preference for Dividends

Many believe that dividends are relevant under conditions of uncertainty. It is suggested that dividends resolve uncertainty in the minds of investors and, therefore, they prefer dividends than capital gains. As explained earlier, Gordon and others have referred to the argument that dividends are relevant under uncertainty as the bird-in-the-hand argument. Gordon asserts that uncertainty increases with the length of time period. Investors are risk averters and, therefore, prefer near dividends to future dividends. Thus, future dividends are discounted at a higher rate than near dividends. This implies that the discount rate increases with uncertainty. As a result, a firm paying dividends earlier will command a higher value than a firm which

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follows a policy of retention. This view implies that there exists a high-payout clientele who values shares of dividend paying more than those which do not pay dividends.

The uncertainty argument is not very convincing. MM argues that even if the assumption of perfect certainty is dropped from their hypothesis, dividend policy continues to be irrelevant. They contend that the market prices of two firms with identical investment and capital structure policies and risk cannot be different because they follow different dividend policies. These firms will have the same cash flows from their investments despite the differences in dividend policies. The risk (uncertainty) of the firms' shareholders is alike, given the similarities of their risk and investment and capital structure policies. Dividend policy does not change the amount and risk of cash flows from investments; it simply splits these cash flows into dividend payments and retained earnings.

The current receipt of money in the form of dividends is considered safer than the uncertain potential gain in the future. The reason for this safety is that it is cash in hand rather than that it is dividend income and not a capital gain. The shareholders can sell some of their shares to obtain current cash if a firm does not distribute dividends. The risk-return trade-off will make shareholders to expect lower returns from those firms that have high-payout ratios. Let us emphasize again that given a firm's investment and capital structure policies, paying dividends does not affect the firm's or shareholders' risk. Thus the difference between current dividends and the future capital gains does not alter the firm's value under the efficient market conditions. However, there may still exist a high-payout clientele, not because current dividends are safer, but because some shareholders need a steady source of income, or because some will prefer to receive dividends as early as possible since some firms do not provide reliable information about their investments and earnings.

Yet another reason for shareholders preferring current dividends maybe their desire to diversify their portfolios according to their risk preferences. Hence, they would like firms to distribute earnings. They will be able to invest dividends received in other assets keeping in mind their need for diversification. Under these circumstances, investors may discount the value of the firms that use internal financing.

(b) Transaction Costs and the Case against Dividend Payments

MM argues that internal financing (retained earnings) and external financing (issue of shares) are equivalent. This implies that when firms pay dividends, they can finance their investment plans by issuing shares. Whether the firm retains earnings or issues new shares, the wealth of shareholders would remain unaffected. This cannot be true since the issue of shares involve flotation or issue costs, including costs of preparing and issuing prospectus, underwriting fee, brokers' commission, etc. No flotation costs are involved if the earnings are retained. The presence of flotation or transaction costs makes the external financing costlier than the internal

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financing via retained earnings. Thus, if flotation costs are considered, the equivalence between retained earnings and new share capital is disturbed and the retention of earnings would be favoured over the payment of dividends. In practice, dividend decisions seem to be sticky. Companies continue paying same dividends, rather increasing it, unless earnings decline, in spite of need for funds.

Under the MM hypothesis, the wealth of a shareholder will be same whether the firm pays dividends or not. If a shareholder is not paid dividends and he desires to have current income, he can sell the shares held by him. When the shareholder sells him shares to satisfy him desire for current income, he will have to pay brokerage fee. This fee is more for small sales. Further, it is inconvenient to sell the shares, particularly for investors with small share holdings. Some emerging markets are not very liquid, and many shares are not frequently traded. Because of the transaction costs and inconvenience associated with the sale of shares to realize capital gains, shareholders may prefer dividends to capital gains.

(c) Information Asymmetry and Agency Costs and the Case for Dividend Payments

Managers in practice may not share complete information with shareholders. This gap between information available with managers and what is actually shared with shareholders is called **information asymmetry**. This leads to several agency problems, viz., conflicts between managers and shareholders. Managers may not have enough incentive to disclose full information to shareholders. They may act in their own self-interest and take away the firm's wealth in the form of non-pecuniary benefits. Shareholders incur agency costs to obtain full information about a company's investment plans, future earnings, expected dividend payments, etc. The shareholders—managers conflict can be reduced through monitoring which includes bonding contracts and limiting the power of managers vis-à-vis allocation of wealth and managerial compensation. However, monitoring involves costs that are referred to as agency costs. Payment of dividend allocates resources to shareholders, and thus, alleviates the need for monitoring and incurring agency costs.

The high-payout policy of a company helps to reduce the conflict arising out of information asymmetry. It is argued that companies which pay high dividends regularly may be raising capital more frequently from the primary markets. Therefore, the actors in primary markets like the financial institutions and banks would be monitoring the performance of these companies. If the professionals in the banks and financial institutions continuously do such monitoring, shareholders need not incur monitoring (agency) costs.

Dividend payout also allocates financial resources in favour of shareholders as against lenders. Lenders have prior claims over a company's cash flows generated internally. The payment of dividend changes this priority in favour of shareholders as they receive cash flows before the loan principals of lenders are redeemed. Thus, we observe that from the point of view of agency costs, shareholders would generally prefer payment of dividend.

Neutrality of Dividend Policy: The Black–Scholes Hypothesis

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We have just explained that the benefits of dividends for shareholders are that they satisfy their desire for current income, avoid the need to sell shares, and incur transaction costs and signal the firm's prospects and risk allowing them to make choices with regard to their investment portfolios. The cost of dividends is the higher tax on dividend. Black and Scholes argue that shareholders trade off the benefits of dividends against the tax loss. Based on the trade-offs that shareholders make, they could be classified into three clienteles: (*i*) a clientele that considers dividends are always good (*ii*) a clientele that considers dividends are always bad and (*iii*) a clientele that is indifferent to dividends. Shareholders in high tax brackets may belong to high-payout clientele since in their case the tax disadvantage may outweigh the benefits of dividends. On the other hand, shareholders in low tax brackets may fit in to low-payout clientele as they may suffer marginal tax disadvantage of dividends. Tax-exempt investors are indifferent between dividends and capital gains, as they pay no taxes on their income.

In a real-world situation, all three clienteles exist as tax status and need for current incomes of investors differ. There are several hundreds of companies that 'supply' dividends to meet the demand of the three types of clienteles. Black and Scholes argue that since the supply of dividends and demand for dividends match, there will be no gains if a firm changes its dividend policy; the investors have already made their choices or there already exist opportunities for shareholders to shift from one firm to another. How will companies determine whether change in dividend policy will affect their share prices? This is an empirical question and a difficult question to answer, given the problems with statistical techniques. However, the Black–Scholes hypothesis shows that the tax disadvantage of dividends is not so great as made out by some academicians.

Check Your Progress

1. What are growth firms?
2. Define information asymmetry.
3. What are the assumptions of MMs hypothesis of irrelevance?

13.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Growth firms are those firms which expand rapidly because of ample investment opportunities yielding returns higher than the opportunity cost of capital ($r > k$).
2. Managers in practice may not share complete information with shareholders. This gap between information available with managers and what is actually shared with shareholders is called information asymmetry.

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3. The assumptions of MMs hypothesis of irrelevance are the following:
   - **Perfect capital markets:** The firm operates in perfect capital markets where investors behave rationally, information is freely available to all, and transactions and flotation costs do not exist. Perfect capital markets also imply that no investor is large enough to affect the market price of a share.
   - **No taxes:** Taxes do not exist; or there are no differences in the tax rates applicable to capital gains and dividends. This means that investors value a rupee of dividend as much as a rupee of capital gains.
   - **Investment policy:** The firm has a fixed investment policy.
   - **No risk:** Risk of uncertainty does not exist. That is, investors are able to forecast future prices and dividends with certainty, and one discount rate is appropriate for all securities and all time periods. Thus, $r = k = k_t$ for all t.

13.5 SUMMARY

- Dividend decision of the firm is yet another crucial area of financial management. The important aspect of dividend policy is to determine the amount of earnings to be distributed to shareholders and the amount to be retained in the firm.
- Dividends, however, constitute the use of the firm's funds. Dividend policy involves the balancing of the shareholders' desire for current dividends and the firm's needs for funds for growth.
- In theory, the objective of a dividend policy should be to maximize a shareholder's return so that the value of his investment is maximized.
- A low payout policy might produce a higher share price because it accelerates earnings growth. Investors of growth companies will realize their return mostly in the form of capital gains (resulting from the appreciation in the share value).
- Professor James E. Walter argues that the choice of dividend policies almost always affect the value of the firm.
- Growth firms are those firms which expand rapidly because of ample investment opportunities yielding returns higher than the opportunity cost of capital ($r > k$).
- Myron Gordon developed one very popular model explicitly relating the market value of the firm to dividend policy.
- According to Miller and Modigliani (MM), under a perfect market situation, the dividend policy of a firm is irrelevant, as it does not affect the value of the firm.

- Many believe that dividends are relevant under conditions of uncertainty. It is suggested that dividends resolve uncertainty in the minds of investors and, therefore, they prefer dividends than capital gains.
- MM argues that internal financing (retained earnings) and external financing (issue of shares) are equivalent. This implies that when firms pay dividends, they can finance their investment plans by issuing shares.

13.6 KEY WORDS

- **Dividend:** A dividend is the distribution of reward from a portion of company's earnings and is paid to a class of its shareholders.
- **Earnings per share** (**EPS**): It is the portion of a company's profit allocated to each share of common stock.
- **Return on equity (ROE):** It is a measure of a company's annual return (net income) divided by the value of its total shareholders' equity, expressed as a percentage.

13.7 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. What is the difference between dividend and capital gains?
2. What does the dividend policy imply?
3. Mention the assumptions on which Gordon's dividend model is based.

Long Answer Questions

1. Give one example to illustrate the application of Walter's dividend model.
2. Discuss the limitations of MM hypothesis.
3. Critically analyse the Black-Scholes hypothesis.

13.8 FURTHER READINGS

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UNIT 14 DIVIDEND POLICY

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Structure

14.0 INTRODUCTION

Dividend decision of the firm is yet another crucial area of financial management. The important aspect of dividend policy is to determine the amount of earnings to be distributed to shareholders and the amount to be retained in 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 current return. Dividends, however, constitute the use of the firm's funds. Dividend policy involves the balancing of the shareholders' desire for current dividends and the firm's needs for funds for growth.

In this unit, you will study about the types of dividend policy, sharevaluation policies and practices, factors affecting dividend decision and the tax consideration in investment decision.

14.1 OBJECTIVES

After going through this unit, you will be able to:

- Discuss the share valuation practices
- Identify the factors affecting dividend decision
- Explain the tax considerations in investment decisions

14.2 DIVIDEND POLICY: TYPES AND SHAREVALUATION PRACTICES

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Dividend policy is the policy a company uses to structure its dividend pay-out to shareholders. There are three types of dividend policies: a stable dividend policy, a constant dividend policy, and a residual dividend policy. A stable dividend policy is the most common and easiest policy. Its objective is steady and predictable dividend payouts each year, which is what most investors seek. Whether earnings are up or down, investors receive a dividend. Under the constant dividend policy, an organization pays a percentage of its earnings as dividends every year. In this way, investors experience the full volatility of the organization's earnings. With a residual dividend policy, the organization pays out what dividends remain after the firm has paid for capital expenditures and working capital.

14.2.1 Policies and Practices

Policies

A firm's dividend policy has the effect of dividing its net earnings into two parts: (i) retained earnings and dividends. The retained earnings provide funds to finance the firm's long-term growth. It is the most significant source of financing a firm's investments in practice. Dividends are paid in cash. Thus, the distribution of earnings uses the available cash of the firm. A firm which intends to pay dividends and also needs funds to finance its investment opportunities will have to use external sources of financing, such as the issue of debt or equity. Dividend policy of the firm, thus, has its effect on both the long-term financing and the wealth of shareholders. As a result, the firm's decision to pay dividends may be shaped by the following two possible viewpoints.

- **Firm's need for funds:** When dividend decision is treated as a financing decision, the net earnings of the firm may be considered as a source of long-term funds. With this approach, dividends will be paid only when the firm does not have profitable investment opportunities. The firm grows at a faster rate when it accepts highly profitable investment projects. External equity could be raised to finance investments. But retained earnings are preferred because, unlike external equity, they do not involve any flotation costs. In addition, in India companies are required to pay dividend distribution tax on the distributed dividend. Thus, firms have more funds available to invest than what shareholders could invest if they received dividends. The distribution of cash dividends causes a reduction in internal funds available to finance profitable investment opportunities and consequently, either constrains growth or requires the firm to find other costly sources of financing. Thus, firms may retain their earnings as a part of long-term financing decision.

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The dividends will be paid to shareholders when a firm cannot profitably reinvest earnings. With this approach, dividend decision is viewed merely as a residual decision.

- **Shareholders' need for income:** One may argue that capital markets are not perfect; therefore, shareholders are not indifferent between dividends and retained earnings. Because of the market imperfections and uncertainty, shareholders may prefer near dividends to future dividends and capital gains. Thus, the payment of dividends may significantly affect the market price of the share. Higher dividends may increase the value of the shares and low dividends may reduce the value. It is believed by some that, in order to maximize wealth under uncertainty, the firm must pay enough dividends to satisfy investors. Investors in high tax brackets, on the other hand, may prefer to receive capital gains rather than dividends when dividends are taxed at higher rate than capital gains. Their wealth will be maximized if firms retain earnings rather than distributing them. The management of a firm, while evolving a dividend policy, must strike a proper balance between the abovementioned two approaches. When the firm increases the retained portion of the net earnings, shareholders' current income in the form of dividends, decreases. But the use of retained earnings to finance profitable investments will increase the future earnings. On the other hand, when dividends are increased, shareholders' current income will increase, but the firm may have to forego some investment opportunities for want of funds and consequently, the future earnings may decrease. Management should develop a dividend policy, which divides the net earnings into dividends and retained earnings in an optimum way to achieve the objective of maximizing the wealth of shareholders. The development of such policy will be greatly influenced by investment opportunities available to the firm and the value of dividends as against capital gains to the shareholders. The other possible aspects of the dividend policy relate to the stability of dividends, the constraints on paying dividends, and the forms of dividends.

Practices

The usual practice is to pay dividends in cash. Other options are payment of the bonus shares (referred to as stock dividend in USA) and shares buyback. The share (stock) split is not a form of dividend; but its effects are similar to the effects of the bonus shares.

- **Cash dividend:** Companies mostly pay dividends in cash. A company should have enough cash in its bank account when cash dividends are declared. If it does not have enough bank balance, arrangement should be made to borrow funds. When the company follows a stable dividend policy, it should prepare a cash budget for the coming period to indicate the necessary funds, which would be needed to meet the regular dividend payments of the

company. It is relatively difficult to make cash planning in anticipation of dividend needs when an unstable policy is followed. The cash account and the reserve account of a company will be reduced when the cash dividend is paid. Thus, both the total assets and the net worth of the company are reduced when the cash dividend is distributed. The market price of the share drops in most cases by the amount of the cash dividend distributed.

- **Bonus shares:** An issue of bonus shares is the distribution of shares free of cost to the existing shareholders. In India, bonus shares are issued in addition to the cash dividend and not in lieu of cash dividend. Hence companies in India may supplement cash dividend by bonus issues. Issuing bonus shares increases the number of outstanding shares of the company. The bonus shares are distributed proportionately to the existing shareholder. Hence, there is no dilution of ownership. For example, if a shareholder owns 100 shares at the time when a 10 per cent (i.e., 1 : 10) bonus issue is made, she will receive 10 additional shares. The declaration of the bonus shares will increase the paid-up share capital and reduce the reserves and surplus (retained earnings) of the company. The total net worth (paid-up capital plus reserves and surplus) is not affected by the bonus issue. In fact, a bonus issue represents a *recapitalization of reserves and surplus*. It is merely an accounting transfer from reserves and surplus to paid-up capital.

14.2.2 Factors Affecting Dividend Decision

The typical dividend policy of most firms is to retain between one-third to a half of the net earnings and distribute the remaining amount to shareholders. Companies in India specify dividends in terms of a dividend rate which is a percentage of the paid-up capital per share. Most of them also tend to increase dividend rate particularly when their profits increase substantially.

- **Firm's investment opportunities and financial needs:** Firms should tailor their dividend policies to their long-term investment opportunities to have maximum financial flexibility and avoid financial frictions and costs of raising external funds. Growth firms have a large number of investment opportunities requiring substantial amount of funds. Hence they will give precedence to the retention of earnings over the payment of dividends in order to finance its expanding activities. For matured firms, investment opportunities occur infrequently. These firms may distribute most of their earnings. The retained earnings of these firms during periods, when they do not have investment opportunities, may be invested in short-term securities yielding nominal returns. Some of these firms may follow the policy of paying 100 per cent dividends and raise external funds when investment opportunities occur.

  Generally, retained earnings should be used as a source of internal financing only when a company has profitable investment opportunities. If shareholders

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themselves have better investment opportunities, the earnings should be distributed to them so that they may be able to maximize their wealth. Theoretically, when the company has an internal rate of return greater than the return required by shareholders, it would be to the advantage of shareholders to allow the reinvestment of earnings by the company. When the company does not have highly profitable opportunities and earns a rate on investment, which is lower than the rate required by shareholders, it is not in the interest of shareholders to retain earnings. Thus, depending on the needs to finance their long term investment opportunities, companies may follow different dividend policies.

Mature companies that have fewer investment opportunities may generally have high payout ratios. Shareholders of these companies would be more interested in dividends, as they obtain higher return on their investments outside the company. The share prices of such companies are very sensitive to dividend changes. The directors of these companies retain only a small portion of the earnings to meet emergent financial needs and to finance the occasional investment opportunities and distribute the rest. Growth companies, on the other hand, have plenty of investment opportunities and hence, they may have low payout ratios. They are continuously in need of funds to finance their fast growing fixed assets. The distribution of earnings will reduce the funds of the company. Therefore, sometimes growth companies retain most of their earnings and issue bonus shares, regularly or from time to time, to satisfy the dividend needs of shareholders. These companies would slowly increase the amount of dividends as the profitable investment opportunities start fading.

- **Shareholders' expectations:** Legally, the board of directors has the discretion to decide the distribution of the earnings of a company. Shareholders are the legal owners of the company, and directors, appointed by them, are their agents. Therefore, directors should give due importance to the expectations of shareholders in the matter of dividend decision. Shareholders' preference for dividends or capital gains may depend on their economic status and the effect of tax differential on dividends and capital gains. In most countries, dividend income is taxed at a rate higher than the capital gains. A wealthy shareholder, in a high income tax bracket, may be interested in capital gains than current dividends. On the other hand, a retired person with small means, whose main source of income is dividend, would like to get regular dividend and may not be interested in capital gains. The ownership concentration in a firm may define the shareholders' expectations.

  In case of a closely held company, the body of the shareholders is small and homogeneous and management usually knows the expectations of shareholders. Therefore, they can easily adopt a dividend policy which

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satisfies most shareholders. If most of the shareholders are in high tax brackets and have a preference for capital gains to current dividend incomes, the company can establish a dividend policy of paying sufficient dividends and retaining the earnings within the company, subject to its growth opportunities. It is a formidable task to ascertain the preferences of shareholders in a widely held company. The number of shareholders is very large, they are dispersed and they may have diverse desires regarding dividends and capital gains. Hence it is not possible in case of widely held company to follow a dividend policy, which equally satisfies all shareholders. The firm may follow a dividend policy, which serves the purpose of the dominating group, but does not completely neglect the desires of others. Shareholders of a widely held company may be divided, for example, into four groups—(a) small, (b) retired, (c) wealthy, and (d) institutional shareholders.

14.2.3 Constraints on paying dividends

Most companies recognize that the shareholders have some desire to receive dividends, although shareholders are also interested in the capital gains. How much dividend should a company pay? The company's decision regarding the amount of earnings to be distributed as dividends depends on legal and financial constraints.

Legal restrictions: The dividend policy of the firm has to evolve within the legal framework and restrictions. The directors are not legally compelled to declare dividends. For example, the Indian Companies Act provides that dividend shall be declared or paid only out of the current profits or past profits after providing for depreciation.

Liquidity: The payment of dividends means cash outflow. Although a firm may have adequate earnings to declare dividend, it may not have sufficient cash to pay dividends. Thus, the cash position of the firm is an important consideration in paying dividends; the greater the cash position and overall liquidity of a company, the greater will be its ability to pay dividends.

Financial condition and borrowing capacity: The financial condition or capability of a firm depends on its use of borrowings and interest charges payable. A high degree of financial leverage makes a company quite vulnerable to changes in earnings, and also, it becomes quite difficult to raise funds externally for financing its growth. A highly levered firm is, therefore, expected to retain more to strengthen its equity base.

Access to the capital market: A company that is not sufficiently liquid can still pay dividends if it is able to raise debt or equity in the capital markets. If it is well established and has a record of profitability, it will not find much difficulty in raising funds in the capital markets. Easy accessibility to the capital markets provides flexibility to the management in paying dividends as well as in meeting the corporate obligations.

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Inflation: Inflation can act as a constraint on paying dividends. Our accounting system is based on historical costs. Depreciation is charged on the basis of original costs at which assets were acquired. As a result, when prices rise, funds equal to depreciation set aside would not be adequate to replace assets or to maintain the capital intact. Consequently, to maintain the capital intact and preserve their earnings power, firms' earnings may avoid paying dividends.

Control: The objective of maintaining control over the company by the existing management group or the body of shareholders can be an important variable in influencing the company's dividend policy. When a company pays large dividends, its cash position is affected. As a result, the company will have to issue new shares to raise funds to finance its investment programmes. The control of the existing shareholders will be diluted if they do not want or cannot buy additional shares. Under these circumstances, the payment of dividends may be withheld and earnings may be retained to finance the firm's investment opportunities.

14.3 TAX CONSIDERATIONS IN INVESTMENT DECISIONS

MM's assumption that taxes do not exist is far from reality. Investors have to pay taxes on dividends and capital gains. But different tax rates are applicable to dividends and capital gains. Dividend income is generally treated as the ordinary income, while capital gains are specially treated for tax purposes. In most countries, the capital gains tax rate is lower than the marginal tax rate for ordinary income. From the tax point of view, a shareholder in high tax bracket should prefer capital gains over current dividends for two reasons: (i) the capital gains tax is less than the tax on dividends, and (ii) the capital gains tax is payable only when the shares are actually sold. The effect of the favourable tax differential in case of capital gains will result in tax savings. As a consequence, the value of the share should be higher in the internal financing case than in the external financing one. Thus, the tax advantage of capital gains over dividends strongly favours a low dividend payout policy. This implies that investors will pay more for low-dividend yield shares. Tax differential should attract tax clienteles. Investors in high-tax brackets should own low-payout shares, and those in low-tax bracket should own high-payout shares. In reality, most investors may have marginal income tax rate higher than the capital gains tax rate. Thus, dividends, on an average, are considered bad since they will result in higher taxes and reduction in the wealth of shareholders.

Tax differential generally favour low-payout clientele. Consider an example. Two identical firms X and Y have different dividend policy. Both have after tax profit, P of ' 100. X pays 100 per cent dividend. Y does not pay any dividend and shareholders get capital gains. Assume further that capital gains from shares held at least for one year are taxed at 20 per cent and marginal income tax rate is 40 per cent. Suppose Y's shareholders are in highest tax bracket and pay tax on

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dividend income at 40 per cent. X's shareholders will receive dividends of ' 100 and their after-tax dividend income will be: 100 × (1 – 0.40) = ' 60.

Y's shareholders will realize capital gains of ' 100 and their after-tax capital gains will be: 100 × (1 – 0.20) = ' 80. Y's shareholders are better off as they have tax advantage. Since the after tax equity income of Y's shareholders is higher than X's shareholders and since both firms are identical in all other respects, Y's equity price will be higher. To match capital gain of ' 1 of Y's shareholders, X's shareholders should receive dividend of ' 1.33.

After-tax dividend = After-tax capital gain

(1 – 0.40) DIV = (1 – 0.20)

DIV = 0.80/0.60 = 1.33

If X's shareholders get dividend of ' 1.33 and Y's shareholders get capital gain of ' 1, both will have after-tax income of ' 0.80. If a tax system favours capital gains to dividend income, there may still be several investors who are in lower tax brackets. These investors investing in shares will prefer dividend income rather than capital gains. Thus, there may exist high-payout clientele. In a tax system that treats dividends more favourably than capital gains, shareholders in high tax brackets will also prefer receiving dividends rather than capital gains. Under this tax system, dividends will be considered good and it will generally attract high-payout clientele. This situation prevails currently in India. There is no tax on dividend income in the hands of shareholders (both individuals and companies), but companies are required to pay dividend distribution tax at 15 per cent on dividends paid to shareholders. Short-term capital gains are taxed at the hands of shareholders at 10 per cent. As a result of this system, shareholders in India will prefer to receive current dividends rather than capital gains. Since companies paying dividends are required to pay additional tax, this taxation system may create a conflict between shareholders and companies. Companies would like to pay no or low dividends to save additional tax while shareholders would like to have more dividends as they have no tax liability on the dividend income. If the objective of the companies is to maximize the wealth of shareholders, the tax system augurs for paying higher dividends. India is an exception where dividends are not taxed but capital gains are. In most countries, tax systems favour capital gains with no or low tax rates as compared to dividends. Thus, the preference for low-payout or high payout shares will depend on the tax status of the individual investors. (See Exhibit 14.1 for the different tax systems regarding dividends and capital gains.)

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Exhibit 14.1: *Taxes and Dividends*

Shareholders' earnings are taxed differently in different countries. We can identify the following four tax systems regarding the taxation of shareholders' earnings:

- **Double taxation:** Under this system, shareholders' earnings are taxed twice; first the corporate tax is levied on profits at the level of the company, and then, the after-tax profits distributed as dividends are taxed as ordinary income in the hands of shareholders. Most countries have a higher marginal tax rate for dividend income than capital gains. The wealthy shareholders with high personal tax rates will prefer capital gains to dividends. A number of countries such as USA follow the double (or two-tier) taxation system. India practised this system until the change in the tax laws in 1997.
- **Single taxation:** Under this system, shareholders' earnings are taxed only once at the corporate level. Dividends received by shareholders are exempt from tax. India currently follows this system. Companies in India pay tax on their profits at about 31 per cent, and they will have to pay additional tax at 15 per cent on the after-tax profits distributed as dividends to shareholders. Shareholders, both individuals and corporates, do not pay taxes on the dividend income. However, they do pay tax on short-term capital gains. The marginal personal tax rate ranges from 10 to 30 per cent (plus education cess) and short-term capital gain tax rate is 10 per cent. Under this system, all investors will prefer dividends. In India, long-term capital gains are also tax exempt. A capital gain is treated as long-term if the share was held for at least one year before it was sold.
- **Split-rate taxation:** Under this system, corporate profits are divided into retained earnings and dividends for the purpose of taxation. A higher tax rate is applied to retained earnings and a lower rate to earnings distributed as dividends. Shareholders pay tax on dividends and capital gains. This system, except for a lower tax rate on dividend, is similar to double taxation system. Tax-exempt and low-tax paying shareholders would prefer dividends while shareholders in high tax brackets will prefer capital gains.
- **Imputation taxation:** Under this system, shareholders' earnings are not subjected to double taxation. A company pays corporate tax on its earnings. Shareholders pay personal taxes on dividends but get full or partial tax relief for the tax paid by the company. In Australia, shareholders get full tax relief while in Canada they get partial relief. Under full tax relief, a tax-exempt shareholder or a shareholder, who has a personal tax rate lower than the corporate tax rate, will get a tax refund.

Check Your Progress

1. What is a dividend policy?
2. Mention any two constraints on paying dividends to shareholders.
3. Name the three types of dividend policies.

14.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

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1. Dividend policy is the policy a company uses to structure its dividend pay-out to shareholders.
2. Two constraints on paying dividends to shareholders are the following:
   (i) Legal restrictions
   (ii) Liquidity
3. There are three types of dividend policies: a stable dividend policy, a constant dividend policy, and a residual dividend policy.

14.6 SUMMARY

- Dividend policy is the policy a company uses to structure its dividend pay-out to shareholders.
- There are three types of dividend policies: a stable dividend policy, a constant dividend policy, and a residual dividend policy.
- A firm's dividend policy has the effect of dividing its net earnings into two parts: (i) retained earnings and dividends.
- The usual practice is to pay dividends in cash. Other options are payment of the bonus shares (referred to as stock dividend in USA) and shares buyback.
- The typical dividend policy of most firms is to retain one-third to a half of the net earnings and distribute the remaining amount to shareholders.
- Shareholders are the legal owners of the company, and directors, appointed by them, are their agents.
- MM's assumption that taxes do not exist is far from reality. Investors have to pay taxes on dividends and capital gains. But different tax rates are applicable to dividends and capital gains.
- The effect of the favourable tax differential in case of capital gains will result in tax savings. As a consequence, the value of the share should be higher in the internal financing case than in the external financing one.
- A higher tax rate is applied to retained earnings and a lower rate to earnings distributed as dividends. Shareholders pay tax on dividends and capital gains.

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14.7 KEY WORDS

- **Inflation:** It is the increase in the prices of goods and services over a period of time.
- **Capital market:** It is a financial market that works as a conduit for demand and supply of debt and equity capital.
- **Bonus share:** These are additional shares given to the current shareholders without any additional cost, based upon the number of shares that a shareholder owns.

14.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. State the significance of dividend policy.
2. Mention the factors affecting dividend decision of a firm.

Long Answer Questions

1. Discuss the policies and practices with reference to a firm's dividend's policy.
2. Analyse the tax considerations in investment decisions.

14.9 FURTHER READINGS

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