Financial Management

I M Pandey

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Author's Profile

I M Pandey holds a Ph.D from Delhi School of Economics, University of Delhi. He served as Vice President & Chair Professor at Asian Institute of Technology (AIT), Thailand, and later as Acting President till March 2013. He was also Dean of School of Management at AIT. Earlier, he served as Dean of Faculty of Business & Head of Department of Financial Studies at University of Delhi. He joined the Indian Institute of Management, Ahmedabad (IIM-A), in 1980 where he was a Professor of Finance until 2007. He also served as Dean at IIM-A during 1991–94. His research interests are focussed on strategic financial management, financial decision-making processes, comparative financial systems, capital markets and financial services, with a focus on emerging markets. A prolific writer, he is an author/co-author of ten books, five monographs and more than 100 articles and management cases. He was the editor of IIM-A's journal 'Vikalpa-The Journal for Decision-Makers' and is on the editorial board of several Indian and international financial journals.

He has conducted several management development programmes for practicing executives and administrators. He has also undertaken consulting assignments for several organizations, including the Asian Develoment Bank, the World Bank and the European Union. He is currently on the Board of Indorama Polymer Limited, Thailand, and has also been on the Board of Directors of Hindustan Petroleum Company Limited, Industrial Finance Corporation of India and Cochin Shipyard Company.

Reviewer's Profile

Dr Satish Mahadeo Inamdar is the director at D Y Patil Vidya Prathisthan Institute of Management and Research in Pune. He has completed his Ph.D in urban co-operative banks. He has got around 25 years of teaching experience in the field of cost and management accounting, financial management and income tax. Dr. Inamdar is also an able practitioner as chartered accountant for various nationalized and co-operative banks, private and public limited companies, software companies, etc. He has authored and co-authored various books in the field of financial management, management accounting and industrial management. He is a fellow member in the Institute of Chartered Accountants of India and an associate member of the Institute of Company Secretaries of India.

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Course Description

About three decades ago, the scope of financial management was confined to raising of 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 for raising funds and of major events like promotion, reorganization, readjustment, merger, and consolidation. In the mid-fifties, the 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 arranging 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. They are now responsible for shaping the fortunes of the enterprise 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. Consequent to these changes, the descriptive treatment of the subject of financial management is being replaced by growing analytical content and sound theoretical underpinnings.

Financial Management aims at assisting you to develop a thorough understanding of the concepts and theories underlying financial management in a systematic way.

Course Objectives

The course 'Financial Management' of BBA 5th Semester will help you gain the required knowledge in Financial Management, and learn the current finance-related techniques practiced in organizations.

After studying this course, you should be able to:

- demonstrate the functions of finance managers in practice
- describe the goals of the firm and to strike balance and reconcile the conflicting interests of various stakeholders
- develop budgetary control which is an essential tool for controlling costs and maximizing profits
- apply the basic valuation concepts
- evaluate the financial performance of top management using the cost of capital framework
- analyse the effects of operating and financial leverage on EPS
- compare and contrast various investment rules of different capital budgeting techniques, so as to measure and analyse the economic worth of an investment project
- interpret the capital structure theories and decide on the debt equity mix that enhances the market value of the firm
- appraise and deploy various sources of finance for a firm or company
- design the different financing alternatives related to the asset side of the balance sheet which helps to lower the cost and reduce risk
- estimate the amount of earnings to be distributed to shareholders as dividend and the amount to be retained in the firm under the dividend policy
- assess the firm's working capital efficiently and effectively
- construct cash planning techniques, cash forecasting and budgeting
- formulate the credit policy and collection procedures inventory techniques

The Self Learning Material (SLM) for this course is divided into 14 units. A brief description of all the 14 units is given below:

Unit 1: Evolution, Scope and Functions of Finance Managers

This unit discusses the scope of finance, the financial management system, finance functions and the role of a finance manager.

Unit 2: Objectives of a Firm

This unit discusses the concept of profit maximization and the idea behind the goal of maximizing the shareholders' wealth.

Unit 3: Financial Planning

This unit explains the meaning of a budget, types of budgets and responsibility accounting.

Unit 4: Time Value of Money

This unit discusses the concept of time value of money and the methods that help in accounting for the time value of money—the compounding method and the discounting method.

Unit 5: Cost of Capital

This unit discusses cost of capital, cost of debt, cost of preference capital, and equity. It also discusses the approaches to derive cost of equity, weighted average cost of capital and weighted marginal cost of capital.

Unit 6: Financial and Operating Leverage

This unit explain the concepts of leverage—financial and operating. It also explains the calculation used to derive Earnings Per Share (EPS) and Return On Equity (ROE).

Unit 7: Capital Budgeting Decisions

This unit discusses the methods of capital budgeting, methods to evaluate investment proposals and capital rationing.

Unit 8: Capital Structure Theories

This unit discusses the concepts of Net Income (NI), Net Income Approach (NIA), the tradition approach, the net operating income approach and the MM Hypothesis.

Unit 9: Sources of Finance

This unit discusses source of finance—short-term and long-term finance.

Unit 10: Asset-Based Financing

This unit discusses various types of asset based finacing—lease, hire purchase and infrastructure project financing.

Unit 11: Dividend Policy

This unit discusses dividend policy, financing and dividend decisions, and dividend relevance of a firm, in terms of Walter's model.

Unit 12: Working Capital Management

This unit discusses the concepts associated with working capital and the operating cycle of a firm.

Unit 13: Management of Cash

This unit discusses the facets of cash management, motives for holding cash, cash planning, cash forecasting and budgeting, determination of optimum cash balance and investing surplus cash in marketable securities.

Unit 14: Receivables and Inventory Management

This last unit discusses the credit policy, its nature and goals, collection procedures and the inventory management techniques.

(The case studies and caselets have been sourced from the books *Financial Management* and *Management Accounting* by I M Pandey)

Unit 1   Evolution, Scope and
Functions of Finance Managers

Structure

Caselet

Finance Manager Aruna Swamy Salvages the Ailing Airline – the Resurgence of the Flyhigh

The incredible ascent, and an equally incredible fall, of Flyhigh Airlines — once the toast of the growth story in the global ring — is a testimony of this truism. The Flyhigh Airline was the first of its kind to fly across capitals the world over. The company was running in profit till two years ago, but started making losses after the onset of recession. For a while it flapped its wings about and tried to stay airborne, however, very soon it seemed to run out of fuel and was heading for a belly landing. The government even served it a notice asking why its flying licence should not be cancelled on grounds of financial disorder.

The airline needed urgent funds to pay up dues to banks, employees and the government and to cover at least a part of its accumulated losses estimated which at that were estimated to be approximately ₹10,000 crore. The banks refuse to touch the company even with a bargepole. It was

heading for infamy as one more in a long list of badly-run private enterprises that bit the dust. For its shareholders, Flyhigh Airline story ended with this unfortunate twist.

Aruna Swamy joined the company at this juncture as the Finance Manager. She, with her financial expertise, changed the course of the Flyhigh Airlines. Swamy put the company on recovery trajectory – she suggested ways and means to expedite the release of resources locked up in the form of NPAs (Non-Performing Assets). She demonstrated full faith in the capacity and abilities of the employees of the airlines as well as in the resilience of the airline's reputation to overcome successfully the financial disorder challenges. Under her leadership, the airlines made swift recovery. She mitigated some of the extremity of the crisis in complex private enterprise, and this may prove to be a harbinger of times yet to come. Overhauled financial management made such a quick recovery possible. The general consensus then was that the airline would be in for a prolonged period of difficulty even if it manages to stay afloat, and recovery would become possible only with acquirement of fresh loans. Flyhigh surprised itself and the rest of the industry by its extraordinary, swift and robust recovery and, that too, with a financial management that was crafted and implemented as the rest of the industry was badly hit by recession. The actual loan that they obtained from the market was quite modest; less than one per cent of their gains. What made rapid recovery possible was that it was led by a proficient finance manager.

Source: Collated by Vikas editorial team.

1.1 Introduction

Under current global circumstances, innovative financial planning has become a *sine qua non* for governments, companies and organizations in order to be able to adapt to the changing business environment caused by liberalization, globalization, de-regulation and recession. In these competitive times, survival depends largely on a system/body's abilities to foresee and get ready for the sudden/unexpected change rather than just react to it. The role of the financial manager, thus, becomes crucial to meet these technological, economic and political changes.

The economic changes that effect the financial planning of a business enterprise are: direction of trade, GNP position, creation and distribution of wealth cost, price of material, etc. The changes in the distribution of wealth, raw material

prices and mergers and acquisitions also affect investment. The finance manager has to juggle several variables, such as the type, period, locations rate of return and other conditions.

The finance manager's role is undergoing an enormous change. They are transforming from being stewards of financial assets into venture capitalists because tomorrow's finance managers will be much more involved in deciding the future of their companies/nations. They will have to assess the risks in funding these opportunities and be prepared to justify investments based on the value they will create as options in the future.

In this unit, you will study about the evolution, scope and functions of finance managers.

Objectives

After studing this unit, you should be able to:

- interpret the scope of finance
- explain the finance management system
- discuss financial procedures and systems
- identify the role of a finance manager

1.2 Scope of Finance

What is finance? What are a firm's financial activities? How are they related to the firm's other activities? Firms manufacture goods or else are service providers. They sell their goods or services to earn profit. They raise funds to finance infrastructure facilities. Thus, the three most important activities of a business firm are:

- production
- marketing
- finance

A firm raises capital to meet its capital requirements. Then it uses the raised capital effectively and efficiently to generate profits from its investment (production and marketing costs).

1.2.1 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.

1.2.2 Equity and Borrowed Funds

There are two types of funds that a firm can raise: equity funds (simply called equity) and borrowed funds (called debt). A firm sells shares to raise capital. 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: ordinary and preference. Preference shareholders receive dividend at a fixed rate, and they have a priority over ordinary shareholders. Dividends is a sum of money paid regularly (usually once in year) by a company to its shareholders out of its profits. 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. Ordinary shareholders are paid their dividends if only any is available after dividends on preference shares have been paid. Therefore, they are called owners of the 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 provisions of Section 115-0 of the Income Tax Ad, a company paying the dividend is requoted to pay the tax, over and above normal income tax, at the rate of 15 per cent and education less at the rate of 3 per cent on the amount of tax and surcharge. This tax is called Tax on the 'Distributable Profits' or 'Dividend Tax'.

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 raise more 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 raising capital is through 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 is in the form of interest paid by the firm. Thus, interest is the money paid regularly at a particular rate for the use of money lent by the creditor to the company. It can also be for delay in the repayment of a debt. 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 capital. 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 production 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.

Though the finance function of raising and using money has a significant effect on other functions, yet it need not be 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 its financial constraint. On the other hand, management of a company, which has a reservoir of funds or a regular supply of funds, will be able to afford more flexibility in formulating its production

and marketing policies. In fact, financial policies are formulated to meet the production and marketing needs of a firm.

Self Assessment Questions

1. A company can also obtain equity funds by retaining earnings available for shareholders. (True/False)
2. _____shareholders receive dividend at a fixed rate.

1.3 Financial Management System

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 top management is responsible for the finance management of a company. Thus, a department to manage financial activities may be established 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). The finance committee or CFO will decide on 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 is responsible for financial planning, and record keeping, as well as for financial reporting to higher management. 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. 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 its financial policies. Second, the financial actions determine solvency of the firm. At no cost can a firm afford to threaten its solvency. Solvency is affected by the flow of funds, which is a result of the various financial activities. The top management being in a position to coordinate these activities retains finance functions in its control. Third, centralization of the finance functions makes it easier to implement common policies and practices for the business as a whole. 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 organizational 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 name/designation of the chief financial officer 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 or her. 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 1.1 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. Figure 1.1 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.

CFO has both line and staff responsibilities. He or she is directly concerned with the financial planning and control. He or she 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 or she must guide them and others for the effective working of the finance department.
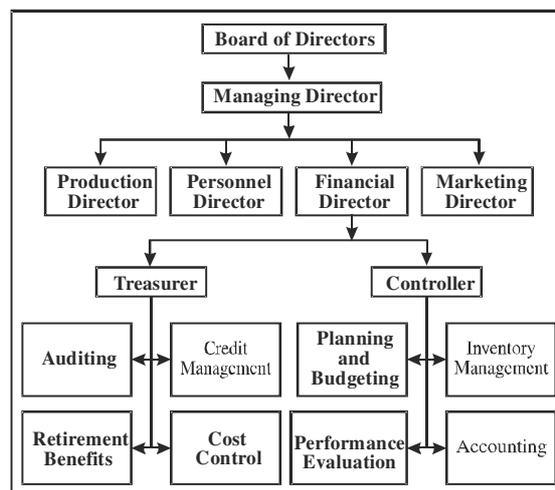
Figure 1.1 Organization for Finance Function

Source: Compiled by author

The main function of the treasurer is to manage the firm's funds. His or her 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 controller is responsible for the management and control of assets. His or her duties include providing information to formulate accounting and costing policies, preparation of financial reports, direction of internal auditing, budgeting, inventory control, taxes, and so on. It may be stated that the controller is responsible for the assets while treasurer's functions relate to the liabilities.

Activity 1

Suppose you have been promoted as the chief financial officer of your company. What would be your responsibilities?

Hint: A CFO has both line and staff responsibilities.

Self Assessment Questions

3. The exact organization structure for financial management will not be different across firms. (True/False)
4. The main function of the _____is to manage the firm's funds.

1.4 Finance Functions

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 specialised 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
- 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.

About three decades ago, the scope of finance functions or the role of the financial manager was limited to the above mentioned activities. How the scope of finance management has widened or the role of the finance manager has changed is discussed in the following section.

Self Assessment Questions

5. The involvement of the financial manager in the finance management is recent. (True/False)
6. The finance manager in the modern enterprises is mainly involved in the _____finance functions.

1.5 Role of a Finance Manager

Who is a finance manager? What is his or her role? A finance manager is a person who is responsible, in a significant way, to carry out financial planning. In a modern enterprise, the finance manager occupies a key position. He or she is one of the members of the top management team, and his or her role, day-by-day, is becoming more pervasive, intensive and significant in solving the complex funds management problems. Now, his or her function is not confined to that of a scorekeeper maintaining records, preparing reports and raising funds when needed, nor is he or she 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 or her new role, he or she needs to have a broader and far-sighted outlook, and must ensure that the funds of the enterprise are utilised in the most efficient manner. He or she must realize that his or her 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 finance manager today is required to plan to ensure that enough funding is available at the right time to meet the needs of the organization for short, medium and long-term capital requirements.

The finance manager has not always been in the dynamic role of decision-making. About three decades ago, he or she was not considered an important

person, as far as the top management decision-making was concerned. He or she 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 finance manager?

1.5.1 Funds Raising

The traditional approach dominated the scope of financial management and limited the role of the finance 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 or her day-to-day activities, his or her only significant duty was to see that the firm had enough cash to meet its obligations.

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.

1.5.2 Funds 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 episodic financing to financial management, from raising of funds to efficient and effective use of funds. The new approach is embedded in sound conceptual and analytical theories.

The new or modern approach to finance is an analytical way of looking into the financial problems of the firm. Financial management is considered a vital and an integral part of overall management.

Thus, in a modern enterprise, the basic finance function is to decide about the expenditure decisions and to determine the demand for capital for these expenditures. In other words, the finance manager, in his or her 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 or her new role of using funds wisely, the finance 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: investment (including both long and short-term assets), financing and 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.

1.5.3 Profit Planning

The functions of the finance 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.[8] 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.

1.5.4 Understanding Capital Markets

Capital markets bring investors (lenders) and firms (borrowers) together. Hence, the financial manager has to deal with capital markets. He or she should fully

understand the operations of capital markets and the way in which the capital markets value securities. He or she 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 finance manager.

Activity 2

Suppose you are working as finance manager in a firm. What are the main functions you will perform?

Self Assessment Questions

7. The finance manager has always been in the dynamic role of decision-making. (True/False)
8. Capital markets bring investors and _____together.

1.6 Summary

Let us recapitulate the important concepts discussed in this unit:

- A business firm is involved in production, marketing and financing activities.
- Usually every firm has finance department which is headed by the Chief Finance Officer and who is responsible for the financial management of the company.
- Chief Finance Officer is often assisted by a treasurer and controller.
- In India a finance manager is responsible for the interpretation of financial data as well as for financial planning.
- Traditionally a finance manager was responsible for fund raising to meet a company's short, medium and long term capital requirements, however this changed in 1950s owing to fast paced industrialization, technological innovation and government intervention.

- From 1950s onwards, a finance manager was made responsible for complete financial planning to accomplish the larger financial goals that an enterprise sets for itself.
- The finance manager in order to plan the growth of the company must take into consideration the risk factor while deciding the asset mix and financing mix.

1.7 Glossary

- **Capital expenditure:** When a business firm spends money either to buy tangible real assets or add value to its existing tangible real assets.
- **Debentures or bonds:** These are a type of certificates which a knowledge the amount of money lent by bond holder to the company.
- **Dividends:** This is a sum of money paid regularly (once in year) by a company to its shareholders out of its profits after corporate tax has been levied on it by the government.
- **Equity:** It is the value of the shares issued by a company.
- **Financial assets:** These are financial papers or instruments like shares, bonds, debentures, lease obligation and borrowings from various financial institutions, etc.
- **Operating leverage:** The change in profits due to the change in sales.
- **Right shares:** These are the shares which are offered by the company to its existing shareholders.
- **Solvency of a firm:** A firm is regarded as solvent if it have assets in excess of liabilities; able to pay one's debts
- **Tangible real assets and intangible real assets:** Tangible real assets comprise physical assets like plant, machinery, office, factory, furniture and building, while intangible real assets consist of technical know-how / collaborations and patents.
- **Treasurer:** A person appointed to administer or manage the financial assets and liabilities of a company.

1.9 Terminal Questions

1. Explain the term finance and discuss its scope.
2. How do companies meet their capital requirements?

3. What is the difference between preference shareholder and ordinary shareholder?

4. How does centralization of finance in the hands of the top management help in efficient functioning of a company?

5. Write a short note on the financial procedures and systems that are generally followed.

6. What are the functions of a finance manager?

1.9 Answers

Self Assessment Questions

1. True
2. Preference
3. False
4. Treasurer
5. True
6. Managerial
7. False
8. Firms

Terminal Questions

1. Firms provide goods or are service providers. For more details, refer section 1.2.

2. The companies raise capital by selling their financial assets to investors in the capital markets. For more details, refer section 1.2.1 and 1.2.2.

3. Preference shareholders receive dividends on a fixed rate while ordinary share holders don't. For more details, refer section 1.2.2.

4. Centralization of financial powers makes it easier for the management to implement common policies and practices for the business as a whole. For more details, refer section 1.3.

5. For the effective execution of the finance functions, certain other functions have to be routinely perfomed. For more details, refer section 1.4.

6. A finance manager is responsible for the following:

- finance planning
- finance control
- investment decisions
- cash and treasury management
- capital raising
- business valuation

For more details, refer section 1.5

1.10 Case Study

Rise Like a Phoenix

Tanisha Khanna, a young finance management graduate, was chosen in 2009 by the ailing company, Phoenix Computer Services, to undertake an impossible task. The company had approximately 53,000 employees on its payroll across the world and salaries had to be given to all. In other words, the total amount that the company had to pay was ₹500 crore. In addition, the company had to arrange for an amount of ₹2,000 crore which it owned to its clients and vendors. The finance manager consulted banks and other financial institutions and borrowed an amount of ₹135 million. This amount was utilized to clear outstanding dues, handed over the responsibility of internal audit to an external firm and others.

On the recommendation of the finance manager, a human resource management firm was appointed to examine the strong points of employees. This facilitated the management of the company to work on the weak points, identify the challenges and recognize the areas of improvement. The toughest challenge for the company was to convince its overseas clients to continue working with Phoenix Computer Services.

As a result of these measures, Phoenix Computer Services has made gradual development. Last month the share prices of the company jumped to ₹436.50 and ended at ₹6,677.80. The company's stock prices have been able to recover ₹1,000 in the past two months. The financial chaos made the company worn out. But now the company has exhibited recovery, as a result, the stocks of the company listed on the BSE have caught the attention of investors. The financial crisis led to decline in the performance of the company due to which investors had lost faith in the company. As per the

opinion expressed by the market experts, investors have shown enthusiasm with the improvement in the financial performance of the company exhibited in the last 12 months.

Discussion Questions

1. Do you think the finance manager has facilitated the recovery of the company?

2. List the functions performed by the financial manager.

Source: Adapted from http://www.thehindubusinessline.com/industry-and-economy/info-tech/article2647700.ece?css=print (Retrieved on 12 December 2012)

References

- Brigham, F. E. & Houston, F.J. (2013). *Fundamentals of Financial Management* (13th ed.). USA: South-West Cengage Learning.

- Ross, S., Westerfield, R. & Jaffe J. (2012). *Corporate Finance*. New Delhi: McGraw-Hill.

- Brigham, F.E. & Ehrhardt, C.M., *Financial Management: Theory & Practice* (2010). USA: South-West Cengage Learning.

- Berk, J., DeMarzo. P. & Thampy A. (2010). *Financial Management*. New Delhi: Pearson Education.

- Paramasivan, C. & Subramanian, T. (2009) *Financial Management*. New Delhi: New Age International Publishers.

- James C. Vanhorne. (2000). *Fundamentals of Financial Management*. New Delhi: Prentice Hall Books.

E-References

- http://vcmdrp.tums.ac.ir/files/financial/istgahe_mali/moton_english/financial_management_%5Bwww.accfile.com%5D.pdf (Retrieved on 28 May 2013)

Unit 2   Objectives of a Firm

Structure

Caselet

Liberal Bank Adopts an Extensive Policy to Enhance Earnings and Augment its Wealth

Jamnagar-based Liberal Bank, in an effort to enhance business, productivity and to make wealth has adopted an extensive strategy with the aim of focusing on maximization of wealth, enhancing the quality of assets and bringing down the cost of deposits. The net profit of the bank increased to ₹ 7.73 crore during 2009-2010. Total investments grew to ₹1,995 crore. The foreign exchange dealings yielded revenue of ₹ 5,640 crore. By revising its interest rates for deposits the bank could cut down its cost of deposits from 10.26 per cent to 9.34 per cent. The bank could boost up fee-based income during the year by 35 per cent and gross ₹10.31 crore from this action. The bank has outlined a plan for maximization of wealth and profit generation in the present year. The finance manager of the bank is concentrating on areas such as improvement in customer service, introduction of new technology, and increase in low-cost deposit among others. Approximately, 20 branches of the bank will now be open for seven days. In addition, computerized branches will now be working a few extra hours. The bank has branches spread all over the country but only 442 branches are computerized. It is planning to get the remaining branches computerized as well. As a result, the bank will be able to fulfil its aim of maximization of wealth and increasing profits.

Source: Collated by Vikas editorial team.

2.1 Introduction

In the previous unit, you studied about the scope of finance, the existing financial management system, financial functions and the role of a finance manager.

Competent financial management of a firm entails the existence of some objective or goal, because any decision as to whether or not the goal is financially sound must be made in light of some standard. Although various objectives are possible, we assume that the goal of the firm is to maximize profit and the wealth of the firm's present owners.

An efficient finance manager is also responsible for profit maximization. Profit maximization is commonly calculated as Profit = Revenue – Cost. The finance manager focuses on maximizing this difference.

Shares of common stock give evidence of ownership in a corporation. Shareholder wealth is represented by the market price per share of the firm's common stock. This is regarded as a reflection of the firm's investment, financing and asset management decisions. The idea is that the success of a finance manager of an enterprise will depend upon his business decision which enhance share price and augment profit.

The objectives of a firm are one of the key aspects of finance management. In this unit, you will identify the goal of the firm and understand why shareholders' wealth maximization is favoured over other goals.

Objectives

After studying this unit, you should be able to:
- explain the concept of profit maximization
- discuss shareholders' wealth maximization

2.2 Profit Maximization

The firm's investment and financing decisions are continuous. In order to make them rational 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.

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 by unimpeded and fair competition. 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 aspect 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.

2.2.1 Objections to Profit Maximization

The profit maximization objective has been criticized. 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 or her 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 separation of the management from the ownership. Shareholders and lenders today finance the business firm but it is controlled and managed 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 finance 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 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 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

It is vague: 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?

It ignores the timing of returns: 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.

It ignores risk: The streams of benefits may possess different degree of certainty. Two firms may have the 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.

2.2.2 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.

2.2.3 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 like 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:[1]

> 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 payments 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.

Self Assessment Questions

1. Price system is the most important aspect of a market economy indicating what goods and services society wants. (True/False)

2. An alternative to profit maximization is the objective of _____ _____.

2.3 Shareholders' Wealth Maximization (SWM)

What is meant by Shareholders' Wealth Maximization (SWM)? SWM means maximizing the net present value of shareholders. Net Present Value (NPV) or wealth 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

$$NPV(A) \; + \; NPV(B) \; = \; NPV(A + B)$$

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 emphasise 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?

2.3.1 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 or

she would find himself or herself 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 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.

(i) 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 2.1 shows this risk-return relationship.
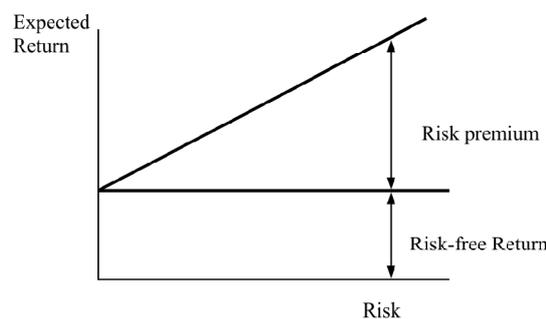
Figure 2.1 The Risk-return Relationship

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:

$$\text{Return} = \text{Risk-free rate} + \text{Risk premium} \qquad (1)$$

(ii) 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 2.2. 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 or she 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.
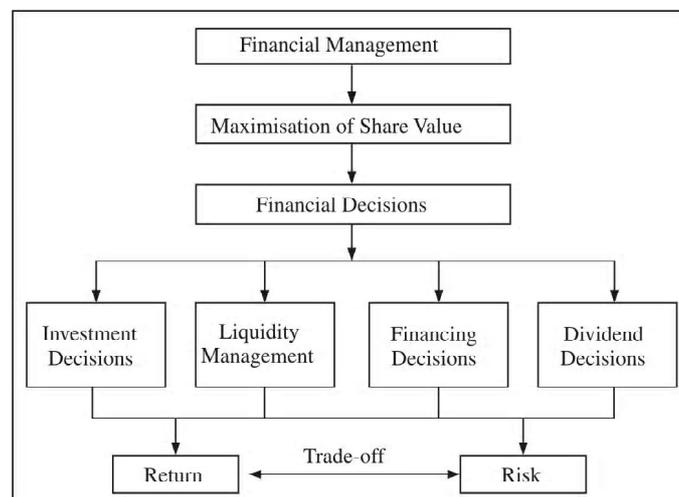
Figure 2.2 An Overview of Financial Management

Activity 1

Suppose you are a shareholder investing in firms that require capital. What is the principle that you would follow for shareholders' wealth maximization.

Self Assessment Questions

3. Financial decisions incur different degree of _____.

4. A proper balance between return and risk should be maintained to maximize the market value of a firm's shares. (True/False)

2.4 Summary

Let us recapitulate the important concepts discussed in this unit:

- In free market economy, price system indicates the goods and services demanded by society. This causes an intensification of completion which finally leads to price stabilization since the gap between demand and supply is reduced.
- According to, Adam Smith, enterprises thus perusing unintentionally also serve the interest of the society.
- In today's business environment, shareholders and lenders/creditors finance business but the business is controlled and managed by a professional management.
- Stakeholders' of a firm have different and conflicting interests; the finance manager is supposed to strike balance and reconcile these conflicting interests.

2.5 Glossary

- *Monopoly:* Existence of a firm which has exclusive control over a product or service.
- *Profit maximization:* It is defined as the process that companies undergo to determine the best output and price levels in order to maximize its return.
- *Shareholder's wealth maximization:* It means maximizing the net present value of shareholders. It is reflected in the market value of the firm's share.
- *Stakeholder of a firm:* Stakeholders of a firm comprises its shareholders, creditors, customers, employees, government and society.

2.6 Terminal Questions

1. How do companies determine their price of the goods and services?
2. What are the objections to profit maximization?
3. How can a company make more profit after tax deductions?
4. What are the flaws of maximizing earning per share?
5. How does Shareholder's Wealth Maximization (SWM) takes care of the timing and the risk of the expected benefits?
6. What factors determine the price of a company's share in the market?

2.7 Answers

Self Assessment Questions

1. True
2. Wealth maximization
3. Risk
4. True

Terminal Questions

1. Companies determine the price of their goods and services based on those of their competitors. For more details, refer section 2.2.
2. Profit maximization has been criticized since it assumes perfect competition, and in the face of imperfect market, it cannot be a legitimate objective. For more details, refer section 2.2.1.
3. 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. For more details, refer section 2.2.2.
4. Maximizing EPS has flaws, such as, it ignores timing and risk of the expected benefits. For more details, refer section 2.2.3.
5. SWM takes care of the questions of timing and risk of the expected benefits by deciding upon an appropriate rate (the shareholder's opportunity coast of capital) for discounting the expected flow of future benefits. For more details, refer section 2.3.
6. The value of a share depends on its risk and return. For more details, refer section 2.3.1.

2.8 Case Study

Objectives of Anandnagar Electricity Company

The Anandnagar Electricity Board (AEB) has been operating under the ownership and control of the state of Anandnagar since the creation of the state in 1961. The state government privatized AEB in 2010 by selling it to a local business house that has interests in pharmaceutical, financial service and energy. AEB came to be known as the Anandnagar Electricity Company

(AEC). Privatization was intended to pave way for the company to improve performance and raise much needed finances from the capital market. The demand for electricity always exceeded the supply, as the state government did not have enough funds to spend on capital expenditure to create the required power generation capacities. AEC would be now required to make sufficient investments to increase power generation capacity in order to meet ever increasing demand for electricity. AEC management stated that being a private sector company, it shall maximize shareholders' return. At the time of its privatization, a large private sector financial institution valued the company at ₹ 4,000 million. The issue of ordinary shares raised this money. The merchant bank division of the financial institution helped the public issue of ordinary shares, par value ₹ 10 each, sold at a premium of 100 per cent for ₹ 20 each. The issue was oversubscribed, and on the very first day of trading, the market price of share reached a value of ₹ 35. AEC has been in operation for three years as a private sector company. The Table 2.1 below provides select financial and operating data of the company's operations for the period 2010–2012. The financial data for 2010 are for the last year of the government ownership of the company. As a private sector company, AEC has paid dividend in accordance with the policy stated in the prospectus. The Central Electricity Board regulates the prices and oversees the activities of the privatized electricity companies. The demand for electricity in Anandnagar has grown at the rate of 4 per cent per annum.

Table 2.1 The Anandnagar Electricity Company: Key Financial and Operating Data for Year ending 31 March

(₹ million)

	2010 Pub. Sector	2011 Pvt. Sector	2012 Pvt. Sector	2013 Pvt. Sector
Revenues	13,500	14,250	17,500	19,500
Operating profit	810	1,100	1,790	2,730
Taxes	160	200	300	400
Profit before depreciation & tax	900	960	1,030	1,190
Profit after tax	650	900	1,490	2,330
Dividends	200	320	600	900
Wages and salaries	3,000	3,000	2,700	2,600
Total assets	3,000	3,600	4,500	5,750
Capital expenditure	500	900	1,750	2,250
Debtors	6,000	3,200	3,000	3,600

Creditors	4,500	2,400	2,300	2,400
Directors' emoluments	30	70	80	100
Employees (number)	32,000	31,400	30,500	30,100
P/E ratio	—	10.5	12.0	11.5
Consumer price index	100	102.7	105.8	107.4

Discussion Questions

1. What changes, if any, do you expect in the objectives of the company after privatization and why?

2. Who are the company's stakeholders? Has the company been able to fulfil their objectives? State the additional information that you may need to answer this question.

References

- Brigham, F. E. & Houston, F.J. (2013). *Fundamentals of Financial Management* (13th ed.). USA: South-West Cengage Learning.

- Ross, S., Westerfield, R. & Jaffe J. (2012). *Corporate Finance*. New Delhi: McGraw-Hill.

- Brigham, F.E. & Ehrhardt, C.M., *Financial Management: Theory & Practice* (2010). USA: South-West Cengage Learning.

- Berk, J., DeMarzo. P. & Thampy A. (2010). *Financial Management*. New Delhi: Pearson Education.

- Paramasivan, C. & Subramanian, T. (2009) *Financial Management*. New Delhi: New Age International Publishers.

- James C. Vanhorne. (2000). *Fundamentals of Financial Management*. New Delhi: Prentice Hall Books.

E-References

- http://vcmdrp.tums.ac.ir/files/financial/istgahe_mali/moton_english/ financial_management_%5Bwww.accfile.com%5D.pdf (Retrieved on 28 May 2013)

Endnote

[1] Porterfield, James C.T. (1965). Investment Decision and Capital Costs. New Jersey: Prentice-Hall.

Unit 3   Financial Planning

Structure

Caselet

Gama Engineering Limited manufactures two products X and Y. An estimate of the number of units expected to be sold in the first seven months of 19X1 is given below:

	Product X	Product Y
January	500	1,400
February	600	1,400
March	800	1,200
April	1,000	1,000
May	1,200	800
June	1,200	800
July	1,000	900

It is anticipated that: (a) there will be no work-in-progress at the end of any month; and (b) finished units equal to half the anticipated sales for the next month will be in stock at the end of each month (including December, 19X0).

The budgeted production and production costs for the year ending 31st December, 19X1 are as follows:

	Product X	Product Y
Production (units)	11,000	12,000
Direct materials per unit (₹)	12	19
Direct wages per unit (₹)	5	7
Other manufacturing charges apportionable to each type of product (₹)	33,000	48,000

Based on the above data of production and costs, a finance manager can prepare a production budget which can show the number of units to be manufactured each month as also a half yearly production cost budget.

3.1 Introduction

In the previous unit, you learnt that the main objectives of the finance manager are profit and wealth maximization. It is well recognized that an enterprise should be managed effectively and efficiently, if the goals are to be achieved. Managing implies coordination and control of the total enterprise efforts to achieve the organizational objectives. The process of managing is facilitated when the management charts its course of action in advance. The function of the management also includes decision-making facilitated by various managerial techniques, procedures and by utilizing the individual and group efforts in a coordinated and rational way. One systematic approach for attaining effective management performance is profit planning or budgeting. In this unit, you will learn about financial planning and budgeting since the finance manager is particularly interested in financial or profit planning as it helps to regulate flows of fund which is his primary concern. You will also understand how ratios help in financial analysis and the concept of responsibility accounting.

Objectives

After studying this unit, you should be able to:
- explain the meaning of budget
- discuss the types of budgets
- describe responsibility accounting

3.2 Meaning of Budget

Before we discuss the purposes of the budget or budgeting, let us define a budget in a more specific way. A budget is a comprehensive and coordinated plan, expressed in financial terms, for the operations and resources of an enterprise for some specific period in the future.[1]

It is a plan of the management's intentions of attaining specified objectives. The commitment of the management is key to the success in preparation and implementation of a budget.

The basic elements of a budget are:

  (i) It is a comprehensive and coordinated plan.

  (ii) It is expressed in financial terms.

 (iii) It is a plan for the firm's operations and resources.

 (iv) It is a future plan for a specified period.

Integrated plan: A budget is the plan of a firm's expectations in the future. Planning involves control and manipulation of relevant variables—controllable and non-controllable—and reduces the impact of uncertainty. It makes the management active to influence the environment in the interest of the enterprise. A budget expresses the plan in formal terms and helps to realize the firm's expectations, it is a comprehensive plan in the sense that all activities and operations are considered when it is prepared. It is a budget of the enterprise as a whole. Budgets are indeed prepared for various segments of the enterprise, but they are components of the total budget—the master budget. The comprehensive, or the master budget is prepared after coordinating budgets for various segments of the enterprise. If budgets for various segments of the enterprise are not prepared jointly and in harmony with each other, the master budget will lose much of its importance and may even prove to be harmful in realizing the firm's expectations.

Financial qualification: For operational purposes, a budget is always quantified in financial terms. Initially the budgets may be developed in terms of varieties of quantities, but finally they must be expressed in the money unit (rupees, dollars or pounds, etc.). For example, purchase and production budgets will involve units of raw material and finished products, respectively. The labour budget will involve men and labour-hours, or the sales budget may involve territories and customers to be served. But a coordinated and comprehensive budget can be

developed only when all these budgets are expressed in some common denominator; the money unit undoubtedly serves as the common de-nominator.

Operation and resources: A budget is a mechanism to plan for the firm's operations or activities. The two aspects of every operation are: revenues and expenses. The budget must plan for and quantify revenues and expenses related to a specific operation. Planning should not only be done for revenues and expenses, but the resources necessary to carry out operations should also be planned. The planning of resources will include planning for assets and sources of funds.

Time element: Time dimension must be added to a budget. A budget is meaningful only when it is related to a specified period of time; the budget estimates will be relevant only for some specific period. For example, a production target of 10,00,000 units or a profit target of ₹50,00,000 has no meaning unless it is stated when these targets have to be met. As we have stated previously, a firm may have its long-range, broad objectives, such as a long-run survival, maximum sales, maximum long-run profits, employee satisfaction, customer satisfaction, social responsibilities, etc., expressed in vague, qualitative terms. But to achieve these qualitative expectations of the firm, the short-term objectives or goals, expressed in quantitative terms, must be related to the time period within which they have to be achieved. A typical budget spans over a period of one year, which may be sub-divided into quarterly, or sometimes monthly budgets.

Budgeting and Forecasting

A budget is not the same thing as a forecast. A forecast is the likelihood of events happening, given the past data and expected changes. There is no assumption regarding the commitment of management for realizing the forecast. A budget is an expression of the management's intentions of achieving forecasts through positive and conscious actions and influencing the events. It embodies the managerial commitment of ensuring the attainment of stated objectives. It involves a process of negotiation, approval and review.

In contrast to a budget, a forecast has the following features:[2]

  (i) It does not involve any commitment on the part of the forecaster to attain the forecasts.

 (ii) It is based on historical information, and is revised whenever new data becomes available.

(iii) It need not necessarily be expressed in the financial terms.

(iv) It does not always confirm to one-year period.

(v) It does not involve negotiations, approval and review.

Purpose of Budgeting

The major purposes of budgets or budgeting are:[3]

(i) To state the firm's expectations (goals) in clear, formal terms to avoid confusion and to facilitate their attainability.

(ii) To communicate expectations to all concerned with the management of the firm so that they are understood, supported and implemented.

(iii) To provide a detailed plan of action for reducing uncertainty and for the proper direction of individual and group efforts to achieve goals.

(iv) To coordinate the activities and efforts in such a way that the use of resources is maximised.

(v) To provide a means of measuring and controlling the performance of individuals and units and to supply information on the basis of which the necessary corrective action can be taken.

Self Assessment Questions

1. A budget must plan for and quantify _____ and _____ related to a specific operation.

2. A _____ is the likelihood of events happening, given the past data and expected changes.

3.3 Types of Budgets

We have emphasized previously that a comprehensive budgeting involves the preparation of a master budget with a complete package of the component budgets. The three important components of the master budget are: (i) operating budgets, (ii) financial budgets, and (iii) capital budgets.

(i) Operating Budgets

Operating budgets relate to the planning of the activities or operations of the enterprise, such as production, sales and purchases. Operating budget is composed of two parts—a programme or activity budget and a responsibility budget. These represent two different ways of looking at the operations of the enterprise; but arriving at the same results.

- **Programme or activity budget** specifies the operations or functions to be performed during the next year. One logical way to prepare this kind of budget is to plan for each product the expected revenues and their associated costs. The programme budget exhibits the expected future in an impersonal manner and is helpful in ensuring balance among various operations or functions of an enterprise.

- **Responsibility budget** specifies plans in terms of individual responsibilities. The basic purpose of this kind of budget is to achieve control by comparing the actual performance of a responsible individual with the expected performance. Of course, an individual will be responsible only for the controllable activities. An individual should be involved to prepare those parts of the operating budget which relate to his area of responsibility.

These two ways of depicting the operating budget are significant, because the programme budget is primarily a planning process while the responsibility budget is a control device. The programme budget need not be tailored to the organizational structure of the enterprise, but the responsibility budget must be. Therefore, the plan (programme budget) must be converted into the control (responsibility budget) before the actual implementation, and communicated to the persons involved in the execution of the plan so that they may precisely know what is expected of them.

There are two ways in which the operating budget may be prepared;

(a) periodic budgeting and (b) continuous budgeting.

The method *of periodic budgeting* involves the preparation of the budget for the forthcoming year without providing for a comprehensive revision as the budget period passes. The budget period is generally divided into months; that is, the annual budget consists of the monthly estimates. *Continuous budgeting* provides for a system of revising the budget for the changing conditions continuously. The method involves the preparation of a tentative annual budget with the provision that the month or quarter just ended is dropped and a month or quarter in the future is added. Continuous (or rolling) budgeting forces the management constantly to think in concrete terms about its short-range planning.

In case of the stable firms, which can forecast with reasonable precision, periodic budgeting can be used. Continuous budgeting would, however, be desirable in case of those firms which operate under uncertainties of consumer demands and are exposed to a greater degree of cyclical fluctuations.

(ii) Financial Budgets

Financial budgets are concerned with the financial implications of the operating budgets—the expected cash inflows and cash outflows, financial position and the operating results. The important components of financial budgets are: cash budget, pro forma balance sheet and income statement and statements of changes in financial position.

- **Cash budget** is the most important component of the financial budgets. A good management would keep cash balance at optimum level; too little cash endangers the liquidity of a company, and too much cash tends to impair profitability. The major objective of the cash budget, therefore, is to plan cash in such a way that the company always maintains sufficient cash balance to meet its needs and uses the idle cash in the most profitable manner.

- **Pro forma financial statements.** In addition to a cash budget, it is also useful to prepare a projected, or pro forma, balance sheet and income statement. A cash budget reveals the expected cash position of an enterprise while pro forma financial statements give information as to the future assets, liabilities and income-statement items. The pro forma statements are prepared to identify the anticipated results of the budgeted operations. The analysis of the present and past financial statements indicates the direction of change in the financial position and performance of the enterprise. The future can be planned to follow the past direction or to change it The preparation of the cash budget and pro forma statements compels management to look ahead and balance its policies and activities.

The cause of the changes in the financial position of an enterprise is better revealed by the statement of changes in financial position. The statements have become quite significant now-a-days and is being prepared as a third financial statement by the firms. The statement very clearly shows the sources and uses of the firm's financial resources. The projected statement of changes in financial position can be prepared from the pro forma balance sheets and income statement to show the effect of the budgeted operations on the financial resources of the firm and, accordingly, the firm can plan its policies to pay dividends, refund debt, acquire fixed assets, borrow loans or issue share capital.

(iii) Capital Budgets

Capital budget involves the planning to acquire worthwhile projects, together with the timings of the estimated cost and cash flows of each project. Such projects require large sum of funds and have long-term implications for the

firm. Capital budgets are difficult to prepare because estimates of the cash flows over a long period have to be made which involve a great degree of uncertainty.

The capital budgets are generally prepared separately from the operating budgets. In many companies, there is a committee separate from the budget committee to appropriate funds for capital investment projects. In capital budgeting, the profitability of each project has to be carefully evaluated. Various techniques can be used to determine the profitableness of a project. The technique used should be objective—free from personal bias and capable of clearly indicating whether the project should be accepted or not.

Preparation of Budgets

A comprehensive budgetary system will generally include: (a) a sales budget, (b) a production budget, (c) a purchasing budget, (d) a cash budget, (e) pro forma statements, and (f) a capital expenditure budget.

Ilustration: Glass Manufacturing Company requires you to calculate and present the budget for the year 19X1 from the following information:

Sales	
Toughened glass	₹3,00,000
Bent thoughened glass	₹5,00,000
Direct material cost	60% of sales
Direct wages	20 workers @ ₹150 p.m.
Factory overheads	
Indirect labour:	
Works manager ₹500 per month	
Foreman ₹400 per month	
Stores and spares	21/2% on sales
Depreciation on Mach	₹12,600
Light and power	₹5,000
Repairs etc.	₹8,000
Other sundries	10% on Daily Wages

Administration, Selling and Distribution expenses ₹14,000 per annum. (*C.A. adapted*)

Solution:

Master Budget for 19X1			
(A) (i) *Sales Budget*	₹		
Thoughened glass (Quantity)	3,00,000		
Bent thoughened glass (Quantity)	5,00,000		
	8,00,000		
(ii) Less: administrative, selling and distribution expenditure	14,000		
Net sales revenue	7,86,000		
(B) *Production Cost Budget*			
Direct material 60% of sales (Quantity)	4,80,000		
Direct wages (20 × 150 × 12)	36,000		
Prime cost			5,16,000
Factory Overheads			
Variable: stores and spares 21/2% of sales		20,000	
Light and Power		5,000	
Repairs		8,000	33,000
			5,49,000
Fixed:			
Indirect labour			
Works manager	6,000		
Foreman	4,800		
Depreciation	12,600		
Sundries	3,600		27,000
Works Cost			
(C) *Expected Profit (A–B)*			5,76,000
			2,10,000

Self Assessment Questions

3. The three important components of the master budget are: _____, _____ and _____.

4. Choose the correct option:

A comprehensive budgetary system will generally include:

(a) pro forma statements

(b) bank statements

(c) trial balance

(d) profit and loss accounts

Activity 1

Assume the role of the finance manager of a company and prepare a cash budget for a quarter.

3.4 Advantages of Budgeting

To reiterate, budgeting is a management tool; it is a way of managing. It predicts the future with reasonable precision and removes uncertainty to a great extent. The following are some of the more significant advantages of budgeting:[4]

1. **Forced planning:** Budgeting compels management to plan for future. The budgeting process forces management to look ahead and become more effective and efficient in administering the business operations. It instills into managers the habit of evaluating carefully their problems and related variables before making any decisions.

2. **Coordinated operations:** Budgeting helps to coordinate, integrate and balance the efforts of various departments in the light of the overall objectives of the enterprise. This results in goal congruency and harmony among the departments.

3. **Performance evaluation and control:** Budgeting facilitates control by providing definite expectations in the planning phase that can be used as a frame of reference for judging the subsequent performance. Undoubtedly, budgeted performance is a more relevant standard for comparison than past performance, since past performance is based on historical factors which are constantly changing.

4. **Effective communication:** Budgeting improves the quality of communication.

   The enterprise objectives, budget goals, plans, authority and responsibility and procedures to implement plans are clearly written and communicated

through budgets to all individuals in the enterprise. This results in better understanding and harmonious relations among managers and subordinates.

5. **Optimum utilization of resources:** Budgeting helps to optimize the use of the firm's resources—capital and human; it aids in directing the total efforts of the firm into the most profitable channels.

6. **Productivity improvement:** Budgeting increases the morale and thus, the productivity of the employees by seeking their meaningful participation in the formulation of plans and policies, bringing a harmony between individual goals and the enterprise objectives and by providing incentives to perform more effectively.

7. **Profit mindedness** Budgeting develops an atmosphere of profit-mindedness and cost-consciousness.

8. **Management by exception:** Budgeting permits to focus management attention on significant matters through budgetary reports; thus, it facilitates management by exception and thereby saves management time and energy considerably.

9. **Efficiency:** Budgeting measures efficiency, permits management self-evaluation and indicates the progress in attaining the enterprise objectives.

Problems and Disadvantages of Budgeting

Budgeting is a systemic approach to the solution of problems. But it is not fool-proof; it suffers from certain problems and limitations. The major problems in developing a budgeting system are:

1. Seeking the support and involvement of all levels of management.

2. Developing meaningful forecasts and plans, specially the sales plan

3. Educating all individuals to be involved in the budgeting process and gaining their full participation.

4. Establishing realistic objectives, policies, procedures and standards of desired performance.

5. Applying the budgeting system in a flexible manner.

6. Maintaining effective follow-up procedures and adapting the budgeting system whenever the circumstances change.

Management must consider the following limitations in using the budgeting system as a device to solve managerial problems:

1. **Management judgement:** Budgeting is not an exact science; its success hinges upon the precision of estimates. Estimates are based on facts and managerial judgement. Managerial judgement can suffer from subjectivism and personal biases. The adequacy of budgeting, thus, depends upon the adequacy of managerial judgement.

2. **Continuous adaptation:** The installation of a perfect system of budgeting is not possible in a short period. Business conditions change rapidly; therefore, budgeting programme should be continuously adapted. Budgeting has to be a continuous exercise; it is a dynamic process. Management should not lose patience; they should go on trying various techniques and procedures in developing and using the budgeting system. Ultimately, they will achieve success and reap the benefits of budgeting.

3. **Implementation:** A skillfully prepared budgetary programme will not itself improve the management of an enterprise unless it is properly implemented. For the success of the budgetary programme, it is essential that it is understood by all, and that the managers and subordinates put concerted effort for accomplishing the budget goals. All persons in the enterprise must have full involvement in the preparation and execution of budgets, otherwise budgeting will not be effective.

4. **Management complacency:** Budgeting is a management tool—a way of managing; not *the* management. The presence of a budgetary system should not make management complacent. To get the best results of managing, management should use budgeting with intelligence and foresight, along with other managerial techniques. Budgeting assists management; it cannot replace management.

5. **Unnecessary details:** Budgeting will be ineffective and expensive if it is unnecessarily detailed and complicated. A budget should be precise in format and simple to understand; it should be flexible, not rigid in application.

6. **Goal conflict:** The purpose of budgeting will be defeated if carelessly set budget goals conflict with enterprise objectives. This confuses means with the end results. Budget goals are the definite targets to achieve the overall enterprise objectives. They must be in harmony with enterprise aims.

Self Assessment questions

5. Budgeting improves the quality of_____.
6. Budgeting is a way of managing the management. (True/False)

3.5 Responsibility Accounting

Cost accounting is required to serve three major objectives: (1) cost determination for product or services, (2) valuation of inventory and (3) cost control. The first two objectives are well served by costing systems of most companies. Because of their orientation to product costing, costing systems most of the time fail to meet the objective of cost control. For product costing, costs are accumulated by cost functions, or product, or service. This way of accumulating costs is not at all helpful in controlling costs. When it comes to real cost control, it is naturally plausible to trace costs to persons who incur them. It would be easy for a company to control costs effectively when it evolves a system of placing responsibilities for the incurrence of costs on those who have authority to influence them. Such a system which identifies costs with responsible persons is called responsibility accounting.

Responsibility accounting is a system of accumulating and reporting both actual and budgeted costs (and revenues) by individuals responsible for them. The basic principles underlying responsibility accounting are:

1. Responsibility centres (decision units) within an organization are identified
2. For each responsibility centre, the extent of responsibility is defined.
3. Controllable and non-controllable activities at various levels of responsibility are specified.
4. Accounting system to accumulate information by areas of responsibility is specified.
5. Performance reports are prepared to provide information to those who will us them.

The central figure in responsibility accounting is people. In context of costs, the questions asked are: (a) Who incurred the costs? (b) Do the costs incurred deviate from what were planned? (c) What are the causes for deviations? (d) What actions are needed to ensure that costs incurred in future adhere to plans? Although there is difference of emphasis between responsibility accounting and product-costing methods, yet they are equally desirable. Costs

need to be accumulated for control purposes as well as for determining costs of goods or services. However, there is need to emphasize responsibility accounting over product costing. Costs accumulated by responsibility centres for control purposes can be easily recast for product costing purposes. The contrary is not true. Costs accumulated for product costing purposes are difficult to recast for control purposes.

Responsibility accounting is an important information system. It reports information on actual and planned performances, with variances, to managers at a time when they need it for effective control and improved future performance.

One important characteristic of responsibility accounting is that, since it focuses on people, it has a behavioural aspect It influences human behaviour and motivation. This dimension should be fully understood by management while introducing responsibility accounting and using it as a means of motivation.

Responsibility centres for planning and control purposes are classified into the following:

(i) cost centres, (ii) profit centres and (iii) investment centres.

Cost centre: A responsibility centre is called a cost centre when the manager is held accountable only for costs incurred. Output of cost centres are not measured in monetary terms. A number of centres in an organization produce services which cannot be given a monetary value. For instance, it is not possible to measure the money value of the services of the legal department, or the accounting department. Even the production departments, whose output can easily be measured, may be organized as cost centres. Even the production department manager is required to produce a budgeted quantity at the minimum cost; there is no necessity to measure the monetary value of his department's outputs. Thus, costs are the primary planning and control data in cost centres; a manager is not responsible for profit (revenue) and investments in assets. The performance of the responsibility centre managers is evaluated by comparing the costs incurred with the budgeted costs. Management focuses its attention on cost variances for control purposes.

Profit centre: A responsibility centre is called a profit centre when the manager is held responsible for both costs (inputs) and revenues (outputs), and thus, for profit. In profit centre, both inputs and outputs are capable of measurement in financial terms. The term revenue is not used in the strict accounting sense in a profit centre. A profit centre may sell its outputs to another responsibility centre. Management decides to make a responsibility centre as a profit centre when it thinks that outputs are capable to be measured in monetary terms and that it would be beneficial to do so.

Investment centre: A responsibility centre is called an investment centre, when its manager is responsible for costs and revenues as well as for the investment in assets used by his centre. In the investment centre, performance is assessed not by profit alone, rather profit is related to investment employed. The manager of an investment centre is required to earn a satisfactory return. Thus, Return On Investment (ROI) is used as the performance evaluation criterion in an investment centre. In a sense, investment centres may be treated as separate firms where the manager has overall responsibility of managing inputs, outputs and investment.

Responsibility accounting can benefit the management in a number of ways. It focuses on plans and budgets and helps in, clarifying organizational and individual goals; it emphasizes management by exception; it helps in close control of costs; it facilitates objective performance evaluation and decentralized decision-making; it fosters cost-consciousness in managers. It should be, however, noted that responsibility accounting is a management tool; it is not a substitute for good management. The system may not succeed if it is not supported by managers for whom it is meant.

Self Assessment Questions

7. The central figure in responsibility accounting is _____.

8. Responsibility centres for planning and control purposes are classified into _____, _____ and _____ centres.

Activity 2

Illustrate responsibility accounting of a manufacturing division of a car tyre making company.

3.6 Summary

Let us recapitulate the important concepts discussed in this unit:

- A budget is a comprehensive and coordinated plan, expressed in financial terms, for the operations and resources of an enterprise for some specific period in the future.

- A budget is not the same thing as a forecast. A forecast is the likelihood of events happening, given the past data and expected changes. A budget

is an expression of the management's intentions of achieving forecasts through positive and conscious actions and influencing the events.

- The three important components of the master budget are: (i) operating budgets, (ii) financial budgets, and (iii) capital budgets.

- A comprehensive budgetary system will generally include: (a) a sales budget, (b) a production budget, (c) a purchasing budget, (d) a cash budget, (e) pro forma statements, and (f) a capital expenditure budget.

- Cost accounting is required to serve three major objectives: (1) cost determination for product or services, (2) valuation of inventory and (3) cost control.

- Responsibility accounting is a system of accumulating and reporting both actual and budgeted costs (and revenues) by individuals responsible for them.

- Responsibility centres for planning and control purposes are classified into the following: (1) cost centres, (2) profit centres and (3) investment centres.

- A responsibility centre is called a cost centre when the manager is held accountable only for costs incurred.

- A responsibility centre is called a profit centre when the manager is held responsible for both costs (inputs) and revenues (outputs), and thus, for profit

- A responsibility centre is called an investment centre, when its manager is responsible for costs and revenues as well as for the investment in assets used by his centre.

3.7 Glossary

- **Budget:** A budget is a comprehensive and coordinated plan, expressed in financial terms, for the operations and resources of an enterprise for some specific period in the future.

- **Forecast:** A forecast is the likelihood of events happening, given the past data and expected changes.

- **Responsibility accounting:** Responsibility accounting is a system of accumulating and reporting both actual and budgeted costs (and revenues) by individuals responsible for them.

- *Cost centre:* A responsibility centre is called a cost centre when the manager is held accountable only for costs incurred.
- *Profit centre:* A responsibility centre is called a profit centre when the manager is held responsible for both costs (inputs) and revenues (outputs), and thus, for profit.
- *Investment centre:* A responsibility centre is called an investment centre, when its manager is responsible for costs and revenues as well as for the investment in assets used by his centre.

3.8 Terminal Questions

1. What are the basic elements of a budget? Elaborate.
2. What is the difference between budgeting and forecasting?
3. List the purpose of budgeting.
4. Describe the three important components of the master budget in details.
5. Discuss the advantages and limitations of budgeting.
6. Define responsibility accounting. What are the basic principles underlying responsibility accounting?

3.9 Answers

Self Assessment Questions

1. Revenues, expenses
2. Forecast
3. Operating, financial and capital
4. (a) Pro forma statements
5. Communication
6. False
7. People
8. Cost, profit and investment

Terminal Questions

1. The basic elements of a budget are:
   - It is a comprehensive and coordinated plan.
   - It is expressed in financial terms.
   - It is a plan for the firm's operations and resources.
   - It is a future plan for a specified period.

     For more details, refer section 3.2

2. A budget is not the same thing as a forecast. A forecast is the likelihood of events happening given the past data and expected changes. For more details, refer section 3.2

3. The major purposes of budgets or budgeting is to state the firm's expectations (goals) in clear, formal terms to avoid confusion and to facilitate their attainability. For more details, refer section 3.2

4. The three important components of the master budget are: (i) operating budgets, (ii) financial budgets, and (iii) capital budgets. For more details, refer section 3.3

5. Budgeting is a management tool; it is a way of managing. It predicts the future with reasonable precision and removes uncertainty to a great extent. For more details, refer section 3.4

6. Responsibility accounting is a system of accumulating and reporting both actual and budgeted costs (and revenues) by individuals responsible for them. For more details, refer section 3.5.

3.10 Case Study

Budget and Technology

Thrice in the last 12 years the government has come out with a policy package to attract companies to set up units to manufacture chips - the heart and mind of every electronic gadget.

Thrice it has come a cropper. Its fourth attempt, outlined by finance minister in Budget 2013, might end the drought, say industry experts, but in a small rather than big way, with high-end and large-scale manufacturers like Intel, Texas Instruments and Freescale still staying away. Budget 2013 has waived

the 5 per cent import duty on chip-making equipment and allowed companies a new tax deduction of 15 per cent on investments above ₹100 crore for two years, thus adding two more sweeteners to a 2011 package that includes the government buying one-third of production.

"It's a step forward and the country may finally see a fab (as such units are called) announced, as early as in March," says co-founder of HCL, the computer hardware company. Another senior industry official, who spoke on the condition of anonymity, adds: "Given the capital involved, you may not see a company but a consortium coming forward.

That could happen soon."To start with, it may be a slightly older technology, feels research director of Gartner India, a research firm. "You may not get a cutting-edge fab," he says. The smaller or closer the etching of electrical circuits on a chip, the more advanced it is.

According to India Electronics and Semiconductor Association (IESA), an industry grouping, chip-making is a $310 billion industry globally, led by Taiwan, China and Malaysia. Indian consumers bought chips worth $7 billion in 2012. This is expected to increase to $55-60 billion by 2020, driven by sales of smartphones and tablets.

Even as it struggles to start chip manufacturing, India has established strong credentials in designing of this vital industrial input. According to IESA, there are 120 companies doing chip-design work in India, including Intel, ST Microelectronics, Texas Instruments, Infineon and Freescale. They collectively employ 2,00,000 professionals and generate revenues of $10.3 billion; this expected to grow to $60 billion by 2020.

Texas Instruments, a US-based chipmaker that has been in India for more than two decades, says its focus in India is on R&D and design rather than manufacturing. "That has not changed," its country spokesperson said in response to the latest Budget proposal.

However, president of IESA feels that, with the latest policy change, "the government has created an enabling policy framework and the market is there. It is up to businesses to respond." While they might test the waters, companies are unlikely to dive in.

"It's the right step, but does not solve all the problems", says VP & country manager, Freescale Semiconductor India, the world leader in chips for the auto industry.

Discussion Questions

1. Referring to the aforementioned case study, what provision with regard to technology does the budget of 2013 have?

2. Who are the global leaders in chip-making?

Source: http://economictimes.indiatimes.com/news/news-by-industry/indl-goods/svs/engineering/budget-2013-measures-may-attract-small-chip-making-companies-to-set-up-units/articleshow/18785797.cms (Retrieved on 15 April 2013)

References

- Brigham, F. E. & Houston, F.J. (2013). *Fundamentals of Financial Management* (13th ed.). USA: South-West Cengage Learning.

- Ross, S., Westerfield, R. & Jaffe J. (2012). *Corporate Finance.* New Delhi: McGraw-Hill.

- Brigham, F.E. & Ehrhardt, C.M., *Financial Management: Theory & Practice* (2010). USA: South-West Cengage Learning.

- Berk, J., DeMarzo. P. & Thampy A. (2010). *Financial Management.* New Delhi: Pearson Education.

- Paramasivan, C. & Subramanian, T. (2009) *Financial Management.* New Delhi: New Age International Publishers.

- James C. Vanhorne. (2000). *Fundamentals of Financial Management.* New Delhi: Prentice Hall Books.

E-References

- http://vcmdrp.tums.ac.ir/files/financial/istgahe_mali/moton_english/financial_management_%5Bwww.accfile.com%5D.pdf (Retrieved on 28 May 2013)

Endnotes

[1] Fremgen, James M. (1973). Accounting for Managerial Analysis. Richard D. Irwin. Inc.

[2] Antony, R.N. et al. (1989). Management Control Systems. (6th ed). Irwin.

[3] See Welsch, op. cit., Chapter 1, and Fremgen, op. cit., and De Coster, D.T. and Schafer, E.L. (1976). Management Accounting: A Decision Emphasis. New York: John Wiley.

[4] See Welsch, op. cit., pp. 50-53, and Noll, P.A. and Radetsky, E.A. Values of Profit Planning, NAA Bulletin, Vol. XLV, No. 6, p. 36.

| Unit 4 | Time Value of Money |

Structure

Caselet

Understanding the Time Value of Money

Suppose Akansha is given a choice of receiving ₹100 today or ₹100 after a year, she would certainly like to have the money today instead of waiting for a year. The reason is that Akansha will be able to invest ₹100 today and earn some interest over the year. This example demonstrates a simple idea: the value of money changes with the passage of time. Even a single rupee received today will yield more value than that received after a year and will certainly be more worthy what is received five years from now. The essence of time value of money is well recognized in the personal and business areas. For instance, Akansha may have to select between receiving a heavy amount from a pension plan and receiving a string of payments in the coming years. Another example could be when Akansha decides to purchase a new machinery that will most likely bring in increased revenue in the coming years. In both of these circumstances, the time value of money can be assessed by comparing the value of present and future money.

Source: Adapted from http://www.swoknews.com/news-top/business/item/ 2927-understand-the-time-value-of-your-money (Retrieved on 4 December 2012)

4.1 Introduction

In the previous unit, you learnt about budget or budgeting, its various types and its advantages. You were also introduced to responsibility accounting.

Compounding and discounting are two ways in which the time value of money can be accounted for. Compounding implies receiving the principal plus interest at the maturity of the investment. Discounting values refers to the present value of the money before the investment period is over.

In this unit, you will study about the Discounted Cash Flow (DCF) criteria of investment evaluation which basically includes compounding and discounting of cash flows over a period of time.

Objectives

After studying this unit, you should be able to:

- interpret the time value of money
- analyse the compounding method
- discuss the discounting method

4.2 Concept of Time Value of 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-makers knowledge about the future.

There are basically two ways for accounting for the time value of money:

- Compounding
- Discounting

Self Assessment Questions

1. Time preference for money or _____ is an individual's preference for possession of a given amount of money now, rather than the same amount at some future date.

2. _____ and _____ are two ways of accounting for the time value of money.

4.3 Compounding Method

Suppose an investor can invest ₹100 today in a bank at an interest of 12 per cent for one year, how much amount would he receive after a year? He will receive his principal as well as interest on the principal. That is, $100 + 12\% \times 100 = 100 \times 112\% = 100 \times 1.12 = ₹112$. Notice that ₹112 is the compound or future value (F) of the present amount (P) of ₹100 at an interest rate of (i) of 12 per cent for a period (n) of one year. Thus,

$$F = P + iP = P (1 + i) = 100 (1.12) = ₹112.$$

If the investment is made for two years, the investor will receive interest on the interest amount earned during the first year:

$$F = P (1 + i) (1 + i) = P (1 + i)^2 = 100 (1.12)^2 = 100 (1.2544) = ₹125.44$$

Similarly the present amount of ₹100 invested at 12 per cent for 3 years will grow to: $F = 100 (1.12) (1.12) (1.12) = 100 (1.12)^3 = 100 (1.4049) = ₹140.49$; for 4 years: $100 (1.12) (1.12) (1.12) (1.12) = 100 (1.12)^4 = 100 (1.5735) = ₹157.35$ and so on.

Compound value of a lump sum: From the preceding discussion, we can write the formula for calculating the future value (F) of a lump sum today (P) at a given rate of interest (i) for given period of time (n) as follows:

$$F = P (1 + i)^n \qquad\qquad (1)$$

The term $(1 + i)^n$ is the compound (future) value factor, of ₹1 for a given rate of interest, i and time period, n, i.e. CVF, i, n. It always has a value greater than 1 for positive i, indicating that CVF increases with increase in either i or n or both.

In the earlier example, the values 1.12, 1.2544, 1.4049 and 1.5735 are CVF of ₹1 at 12 per cent rate of interest respectively for year 1, 2, 3 and 4. Using Eq. (1) CVFs can be calculated for any combination of interest rate and time period. Table A in Appendix at the end of the book provides precalculated CVFs for a range of periods and rates of interest.

Example 1

Jacob is considering investing of ₹15,000 in a public sector company's bonds at a rate of interest of 16 per cent per year for 7 years. How much amount would he get after 7 years? The compound value can be found as follows:

$$F = 15,000 (1.16)^7 = 15,000 \times CVF, .16, 7$$

The term $(1.16)^7$ gives CVF, which can be obtained from Table A in the Appendix. Reading through seventh row for 7 year period and 16 per cent column, we get CVF of 2.826. Thus, the compound half-yearly, for finding out the compound value of the lump sum of ₹15,000 invested today at 16 per cent per annum for 7 years is:

$$F = 15,000 \times 2.826 = ₹42,390$$

Multiperiod compounding: Let us assume in example1 that the company will compound interest half-yearly (semi-annually) instead of annually. Investor will gain as he will get interest on half-yearly interest. Since interest will be compounded half-yearly, for finding out the compound value in example 1, the half-yearly interest rate of 8 per cent and 14 half yearly periods will be considered:

$$F = P\left(1+\frac{i}{2}\right)^{n\times2} \tag{2}$$

$$= 15,000\left(1+\frac{.16}{2}\right)^{7\times2} = 15,000\,(1.08)^{14}$$

From Table A in the Annexure, we find that CVF at 8 per cent interest for 14 periods is 2.937. Thus, the compound value of ₹15,000 is:

$$F = 15,000 \times 2.937 = ₹44,055$$

Would the compound value of Jacob's investment of ₹15,000 be different if the company compounds interest quarterly? The quarterly rate of interest will be 4 per cent and number of quarterly periods will be 28. Thus

$$F = P\left(1+\frac{i}{4}\right)^{n\times4} = 15,000\left(1+\frac{.16}{4}\right)^{7\times4}$$

$$= 15,000\,(1.04)^{28} = 15,000\,(2.999) = ₹44.995$$

We can observe that the compound value increases further under quarterly compounding.

The phenomenon of compounding interest more than once in a year is called *multiperiod compounding*. The compound value increases as the frequency of compounding in a year increases. Eq. (1) can be modified as follows to find compound value under multiperiod compound:

$$F = P\left(1+\frac{i}{m}\right)^{n\times m}$$

where *m* is the number of compounding in a year.

Compound value of an annuity: An annuity is a fixed payment or receipt of each period for a specified number of periods. Let us assume that an investor decides to deposit ₹100 at the end of each for 4 years at 10 per cent rate of interest. Thus, ₹100 deposited at the end of first year will compound for 3 years, ₹100 at the end of second year for 2 years, ₹100 at the end of third year for one year and ₹100 at the end of fourth year would remain constant. Thus, the compound value will be as given below:

End of year $1F = 100\,(1.10)^3 = $ $100\,(1.331) = 331.1$

                $2F = 100\,(1.10)^2 = $ $100\,(1.210) = 121.0$

$$3F = 100\,(1.10)^1 = \quad 100\,(1.100) = 110.0$$

$$4F = 100\,(1.10)^0 = \quad 100\,(1.000) = 100.0$$

Total compound value $\qquad\qquad 100\,(4.641) = 464.1$

As we can observe from Table B, we can obtain the compound value of an annuity (A) by aggregating CVFs for the given periods and then multiplying by the amount of annuity. For example:

$$F = A\,(1+i)^3 + A\,(1+i)^2 + A\,(1+i) + A = A\,[(1+i)^3 + (1+i)^2 + (1+i) + 1]$$

$$= 100\,[(1.10)^3 + (1.10)^2 + (1.10)^1 + 1] = 100\,[1.331 + 1.210 + 1.100 + 1]$$

$$= 100\,(4.641) = ₹464.1$$

The factor 4.641 is the compound value factor of an annuity of ₹1 for 4 years at 10 per cent rate of interest. A short-cut formula for calculating the compound value of an annuity is as follows:

$$F = A \left[\frac{(1+i)^n - 1}{i} \right] \tag{3}$$

The expression $[(1+i)^n - 1]\,i$ gives the compound value factor for an annuity of ₹1 for a given rate of interest, i and time period, n, i.e., CVAF, i, n. Table B in the Appendix at the end of the book provides precalculated compound value factor for an annuity, CVFA, of ₹1 for a range of interest rates and periods of time.

Example 2

A person deposits ₹10,000 at the end of each year for 5 years at 12 per cent rate of interest. How much would the annuity accumulate to at the end of the fifth year?

Looking up the fifth row and 12 per cent column in Table B, we obtain CVAF of 6.353. Thus

$$F = A\,(CVAF, 12\%, 5) = 10,000 \times 6.353 = ₹63,530$$

If the interest is compounded quarterly, how much will be the compound value? For quarterly compounding, interest rate of 3 per cent and time period of 20 periods will be considered. Returning to Table B we find that:

$$F = 2,500 \times 26.870 = ₹67,175$$

Sinking fund: Suppose you want to accumulate ₹4,00,000 at the end of 10 years to pay for the acquisition of a flat. If the interest rate is 12 per cent, how much amount should you invest each year so that it grows to ₹4,00,000 at the end of 10 years? This is a sinking fund problem. A fund which is created out of fixed payments each year for a specified period of time is called sinking fund.

The desired sum of ₹4,00,000 is the compound value of an annuity, say, A, at 12 per cent rate of interest for 10 years. Thus,

$$F = A \text{ (CVAF, 12\%, 10)}$$

$$4,00,000 = A \text{ (17.549)}$$

$$A = 4,00,000 \text{ (1/17.549)}$$

$$= 4,00,000 \text{ (0.57)} = ₹22,800$$

It may be noticed that the future sum, ₹4,00,000, is multiplied by the reciprocal of the compound value annuity factor (CVAF, .057 = (1/17.549), to obtain the amount of annuity.

The reciprocal of CVAF is called the sinking fund factor (SFF).

Activity 1

Suppose you are an IT professional working in an IT company. You wish to double ₹10,000 - the amount of your savings in five years. What is the compound interest you will receive on your principal?

Hint: Apply the formula of compound interest [$F = P(I + i)^n$]

Self Assessment Questions

3. A fund created out of fixed payments each year for a specified time is called _____.

4. The phenomenon of compounding interest more than once in a year is called multiperiod compounding. (True/False)

4.4 Discounting Method

Suppose a bank offers an investor to return a sum of ₹115 in exchange for ₹100 to be deposited by the investor today, should he accept the offer? His decision will depend on the rate of interest which he can earn on his ₹100 from an alternative investment of similar risk. Suppose the investor's rate of interest is 11 per cent. The alternative investment opportunity will provide the investor ₹100 (1.11) = ₹111 after a year. Since the bank is offering more than this amount, the investor should accept the offer. Let us ask a different question. Between what amount today (P) and ₹115 after a year (F), will the investor be indifferent? He will be

indifferent to that amount of which ₹115 is exactly equal to 111 per cent or 1.11 times. Thus

$$P = \frac{F}{(1+i)}$$

$$F = P(1+i)$$

$$115 = P(1.11)$$

$$P = \frac{115}{1.11} = ₹103.60$$

Note that ₹103.60 invested today at 11 per cent grows to ₹115 after a year. ₹103.60 is the present or discounted value of ₹115. That is:

$$F = P(1+i)^2$$

$$115 = P(1.11)^2$$

therefore,

$$P = \frac{F}{(1+i)^2}$$

$$P = \frac{115}{(1.11)^2} = 115 \times 0.812$$

The formula for calculating the present value (P) of a lump sum in future (F) at a given rate of interest (i) for given periods of time is as follows:

$$F = P(1+i)^n$$

$$P = F\left[\frac{1}{(1+i)^n}\right] \qquad (4)$$

The term $1/(1+i)^n$ provides the present value factor of ₹1 for a given rate of interest, i and time period, n, i.e. PVF, i, n, (it may be written as PVF, i, n). It always has a value lesser than 1 for positive i, indicating that PVF decreases with increase in either i or n or both.

Present value of an annuity: Suppose Narsimham pays ₹10,000 at the end of each year for 5 years into a public provident fund. The interest rate being 12 per cent per year. What is the present value of the series of ₹10,000 paid each year for 5 years? We can treat each payment as a lump sum and calculate the present value as follows:

$$\text{End of year 1} \quad P = 10,000\left[\frac{1}{(1.12)^1}\right] = 10,000 \times 0.893 = ₹8,930$$

$$2P = 10,000\left[\frac{1}{(1.12)^2}\right] = 10,000 \times 0.797 = ₹6,360$$

$$3P = 10,000\left[\frac{1}{(1.12)^3}\right] = 10,000 \times 0.712 = ₹7,120$$

$$4P = 10,000\left[\frac{1}{(1.12)^4}\right] = 10,000 \times 0.636 = ₹6,360$$

$$5P = 10,000\left[\frac{1}{(1.12)^5}\right] = 10,000 \times 0.567 = ₹5,670$$

$$10,000 \times 3.605 = ₹36,050$$

Aggregating PVFs (of a lump sum of ₹1) for the given periods and then multiplying by the amount of annuity. Thus

$$P = \frac{A}{(1+i)} + \frac{A}{(1+i)^2} + \frac{A}{(1+i)^3} + \frac{A}{(1+i)^4} + \frac{A}{(1+i)^5}$$

$$= A\left[\frac{1}{(1+i)} + \frac{1}{(1+i)^2} + \frac{1}{(1+i)^3} + \frac{1}{(1+i)^4} + \frac{1}{(1+i)^5}\right]$$

$$= 10,000\left[\frac{1}{(1.12)} + \frac{1}{(1.12)^2} + \frac{1}{(1.12)^3} + \frac{1}{(1.12)^4} + \frac{1}{(1.12)^5}\right]$$

$$= 10,000\,[0.893 + 0.797 + 0.712 + 0.636 + 0.576]$$

$$= 10,000 \times 3.614 = ₹36,140$$

The factor 3.614 is the present value factor of an annuity of ₹1 for 5 years at 12 per cent rate of interest. A short-cut formula for calculating the present value of an annuity is as follows:

$$P = A\left[\frac{1 - \dfrac{1}{(1+i)^n}}{i}\right] \tag{5}$$

Table D in the Annexure at the end of the book provides precalculated present value factor for an annuity of ₹1 for a given rate of interest, i and time period, n, i.e. PVFA i, n, for a range of interest rates and periods of time.

Example 3

Anant Rao is considering paying ₹5,000 half-yearly into his public provident fund for 10 years. Suppose the interest rate is 12 per cent per annum. How much is the present value of his payment? Since the annuity is in terms of half-yearly payments, the number of periods to be considered is 20 and half-yearly interest to be 6 per cent. Referring to Table D of the Annexure, the present value may be calculated as follows:

$$P = 5,000 \times \text{PVAF, 6\%, 20} = 5,000 \times 11.470 = ₹57,350$$

Capital recovery: The reciprocal of the present value annuity factor is called the Capital Recovery Factor (CRF). It is useful in determining the income to be earned to recover an investment at a given rate of interest.

Suppose Priyan is considering investing ₹20,000 today for a period of 3 years. If he expects a return of 16 per cent per year, how much annual income should he earn? The amount of ₹20,000 is the present value of a 3-year annuity, A, given the rate of interest of 15 per cent. Thus

$$P = A\,(\text{PVAF}, 16\%, 3)$$
$$20,000 = A\,(2.246)$$
$$A = 20,000 \left[\frac{1}{2.246}\right] = 20,000 \times 0.445 = ₹8,900$$

It may be observed that the present sum, ₹20,000, is multiplied by the reciprocal of the present value annuity factor, PVAF, 0.445 = (1/2.246) to obtain the amount of annuity.

Activity 2

Suppose Akhilesh an engineer would like to invest ₹15,000 for ten years in his public provident fund. Assume the interest rate to be 10 per cent per year. Calculate the present value of the series of ₹15,000 paid each year for ten years?

Self Assessment Questions

5. The reciprocal of the present value annuity factor is called the _____.

6. CRF is useful in determining the income to be earned to recover an investment at a given rate of interest. (True/False)

4.5 Summary

Let us recapitulate the important concepts discussed in this unit:

- The time value for money can be assessed as the discounted value – the current actual before the money is invested ; the compounded value is the principal plus interested accumulated at the end of the investment period.
- The DCF criteria of investment evaluation are based on the concept of time value of money.
- The phenomenon of compounding interest more than once in a year is called multiperiod compounding.
- An annuity is a fixed payment or receipt of each period for a specified number of periods.
- A fund which is created out of fixed payments each year for a specified period of time is called *sinking fund*.
- The reciprocal of CVAF is called the sinking fund factor.

4.6 Glossary

- ***Annuity:*** An annuity is a fixed payment or receipt of each period for a specified number of periods.
- ***Capital recovery:*** The reciprocal of the present value annuity factor is called the capital recovery factor (CRF).
- ***Sinking fund:*** A fund which is created out of fixed payments each year for a specified period of time is called sinking fund.

4.7 Terminal Questions

1. What do you understand by the concept time value of money?
2. Illustrate, with an example, how compounded value of money is calculated.
3. Explain, with an example, how the compounded value of an annuity is calculated.
4. Explain with an example, the concept of sinking fund.

5. Give an example of capital recovery.

6. Interpret the concept of discounting, by giving an example.

4.8 Answers

Self Assessment Questions

1. Time value of money

2. Compounding, discounting

3. Sinking fund

4. True

5. CRF

6. True

Terminal Questions

1. 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. For more details, refer section 4.2.

2. Here is an example of calculating compound value of money. For more details, refer section 4.3.

3. An annuity is a fixed payment or receipt of each period for a specified number of periods. For more details, refer section 4.3.

4. A fund which is created out of fixed payments each year for a specified period of time is called sinking fund. For more details, refer section 4.3.

5. The reciprocal of the present value annuity factor is called the Capital Recovery Factor (CRF). It is useful in determining the income to be earned to recover an investment at a given rate of interest. For more details, refer section 4.3.

6. To illustrate discounting method, let us suppose a bank offers an investor to return ₹115 in exchange of ₹100 to be deposited by the investor today. Should the investor accept the offer? For more details, refer section 4.4.

4.9 Case Study

Value of Money handled by Divya Handtools Pvt Ltd (DHPL)

DHPL is a small-sized firm manufacturing hand tools. Its manufacturing plant is situated in Faridabad. The company's sales in the year ending on 31 March 2009 were ₹1,000 million (₹100 crore) on an asset base of ₹650 million. The net profit of the company was ₹76 million. The management of the company wants to improve profitability further. The required rate of return of the company is 14 per cent. The company is currently considering two investment proposals. One is to expand its manufacturing capacity. The estimated cost of the new equipment is ₹250 million. It is expected to have an economic life of 10 years. The accountant forecasts that net cash inflows would be ₹45 million per annum for the first three years, ₹68 million par annum from year four to year eight and for the remaining two years ₹30 million per annum. The plant can be sold for ₹55 million at the end of its economic life.

The second proposal before the management is to replace one of the old machines in the Faridabad plant to reduce the cost of operations. The new machine will involve a net cash outlay of ₹50 million. The life of the machine is expected to be 10 years without any salvage value. The company will go for the replacement only if it generates sufficient cost savings to justify the investment. If the company accepts both projects, it would need to raise external funds of ₹200 million, as about ₹100 million internal funds are available. The company has the following options of borrowing ₹200 million:

The company can borrow funds from the State Bank of India (SBI) at an interest rate of 14 per cent per annum for 10 years. It will be required to pay equal annual instalments of interest and repayment of principal. The managing director of the company was wondering if it were possible to negotiate with SBI to make one single payment of interest and principal at the end of 10 years (instead of annual instalments). A large financial institution has offered to lend money to DHPL at a lower rate of interest. The institution will charge 13.5 per cent per annum. The company will have to pay equal quarterly instalments of interest and repayment of principal.

Discussion Questions

1. What is the annual instalment of the SBI loan?
2. Would you recommend borrowing from the financial institution?

References

- Brigham, F. E. & Houston, F.J. (2013). *Fundamentals of Financial Management* (13th ed.). USA: South-West Cengage Learning.
- Ross, S., Westerfield, R. & Jaffe J. (2012). *Corporate Finance*. New Delhi: McGraw-Hill.
- Brigham, F.E. & Ehrhardt, C.M., *Financial Management: Theory & Practice* (2010). USA: South-West Cengage Learning.
- Berk, J., DeMarzo. P. & Thampy A. (2010). *Financial Management*. New Delhi: Pearson Education.
- Paramasivan, C. & Subramanian, T. (2009) *Financial Management*. New Delhi: New Age International Publishers.
- James C. Vanhorne. (2000). *Fundamentals of Financial Management*. New Delhi: Prentice Hall Books.

E-References

- http://vcmdrp.tums.ac.ir/files/financial/istgahe_mali/moton_english/ financial_management_%5Bwww.accfile.com%5D.pdf (Retrieved on 28 May 2013)

Unit 5   Cost of Capital

Structure

Caselet

Essar Steel Raising Funds through Various Debt Instruments

Essar Steel, which is currently under debt burden of ₹23,500 crore, has sought the intervention of its senior management for raising ₹3,000 crore through various debt instruments from both international and domestic markets. In order to overcome its high-cost debts, the company is looking at various options for raising long-term funds through equity, bond or any other form of hybrid securities. The management is considering this proposition. The company will be approaching several financial institutions, agencies and investors for the purpose of raising funds. In the financial year 2011-12, the company completed its extension of the Hazira steel plant to 10 million tonne per annum. However, the extension has resulted in severe loss for the company amounting to ₹1,251 crore. The company generated revenue of ₹16,056 crore. Since 1989, Essar Steel has invested ₹37,500 crore at its Hazira plant. This huge investment will enable the plant to produce 10 million tonnes of steel, and as a result, the company's revenue will increase to ₹40,000 crore. Earlier this year in 2012, the company got an authorization from the Reserve Bank of India to raise $430 million (approximately ₹2,338 crore) through external commercial borrowings.

Besides, the promoters of the company are ready to infuse ₹1,100 crore so that the company is able to meet its expenditure.

Source: Adapted from http://www.financialexpress.com/news/essar-steel-to-raise-r3000cr-convertible-debt/1038786 (Retrieved on 5 December 2012)

5.1 Introduction

In the previous unit, you studied about the concept of accounting for the time value money.

Before an enterprise accepts funds from financial institutions or shareholders, it needs to ascertain whether their returns anticipated in the future will yield sufficient revenue to pay back its investors. Hence, if enterprises seek to obtain additional revenue then they must first verify that the return on capital is greater than the cost of capital.

In this unit, you will study about the concept of cost of capital, cost of debt, cost of preference capital, the different models of cost of equity, weighted average cost of capital and weighted marginal cost of capital.

Objectives

After studying this unit, you should be able to:

- explain the application of cost of capital
- analyse the calculation of cost of debt
- interpret the concept of cost of preference capital
- describe the different models of cost of equity
- compute weighted average cost of capital and weighted marginal cost of capital

5.2 Cost of Capital

We should recognise 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 cutoff 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

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 maximising the firm value by minimising 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. Of course, 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.

Self Assessment Questions

1. The debt policy of a firm is significantly influenced by the cost consideration. (True/False)
2. The cost of capital framework can be used to evaluate the _____ of top management.

5.3 Cost of Debt

A company may raise debt in a variety of ways. It may borrow funds from financial institutions or the 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 realises 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:

$$k_d = i = \frac{INT}{B_0} \tag{1}$$

where 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 the subsequent equation 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:

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

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

We could arrive at same results as above by using Equation (2): cash outflow are ₹15 interest per year for 7 years and ₹100 at the end of seventh year in exchange for ₹100 now. Thus:

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

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

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

$$100 = 15(PVFA_{7,\ k_d}) + 100(PVF_{7,\ k_d})$$

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 debt:

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

where 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. Financial institutions generally require principal to be amortized periodically. The issue of bond or debenture by a company may also

provide for periodical amortization. When principal is repaid each period instead of a lump sum at maturity, cash outflows each period will include interest and principal, and interest each period will be calculated on the outstanding principal. The following formula can be used to calculate the before-tax cost of debt in this situation:

$$B_0 = \sum_{t=1}^{n} \frac{INT_t + B_t}{(1 + k_d)^t}$$

where INT_t and B_t are respectively the periodical payment of interest and principal.

Example 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:

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

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

$$94 = 15 \ (PVFA\ 7,\ k_d) + 100(PVF_{7,kd})$$

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	
		1.97
PV at 16%	95.97	
		3.84
PV at 17%	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:

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

Thus, using data of example 1, we obtain

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

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:

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

where 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 per cent, the after-tax cost of bond will be:

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

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 taxes. 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.

Example 2: Cost of a Bond Sold at Discount and Redeemable at Premimum

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:

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

Cost of the Existing Debt

Sometime 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 2011 to be matured on December 31, 2011. If a new issue of debentures could be sold at a net realisable price of ₹80 in the beginning of 2011, 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-cost of debt will be:

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

Self Assessment Questions

3. The before-tax cost of debt is the rate of return not required by lenders. (True/False)

4. The interest paid on debt is _____ deductible.

5.4 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.

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:

$$P_0 = \sum_{t=1}^{n} \frac{\text{PDIV}_t}{(1+k_p)^t} + \frac{P_n}{(1+k_p)^n} \tag{6}$$

In Equation (6), k_p is the cost of preference capital. Given the current price, expected preference dividend (PDIV$_t$), and maturity price k_t can be found by trial and error.

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. In fact, companies in India now will have to pay tax at 12.5 per cent on the amount of dividend distributed. Thus, the effective cost of preference capital to a company would be more than that shown by Equation (6). The same argument will be applicable to the equity capital.

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 is substantially higher than the after-tax cost of debt. As per the provisions of Section 115-O of the Income Tax Act, a company paying the dividend is required to pay the tax, over and above the normal income tax @ 15 per cent which is further increased by surcharge @ 5 per cent and education cess @ 3 per cent on the amount of tax and surcharge. This tax is known as 'Tax on distributable profits' or 'Dividend tax'.

Self Assessment Questions

5. The measurement of the cost of preference capital poses some conceptual difficulty. (True/False)

6. The preference share may be treated as a perpetual security if it is _____.

5.5 Cost of Equity Capital

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 provide 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: 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: If we say, the dividend-valuation model for a firm whose dividends are expected to grow at a constant rate of g is:

$$P_0 = \frac{\text{DIV}_1}{k_e - g} \qquad (7)$$

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

P_o – Price of the share

K_e – Cost of equity capital

S – Growth rate

Equation (7) can be solved for calculating the cost of equity k_e as follows:

$$k_e = \frac{\text{DIV}_1}{P_0} + g \qquad (8)$$

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 (8) 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., $DIV_1 > 0$).
- The dividends grow at a constant growth rate g, in perpetuity (forever).
- The growth rate is equal to the return on equity, ROE, times the retention ratio, b (i.e., $g = ROE \times b$).
- The dividend payout ratio 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 emphasised again that the cost of retained earnings will be equal to the shareholders' required rate of return since no flotation costs are involved.

Example 3: 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:

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

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

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 as explained below:

In case of two growth rates, the share price formula will have two parts. The first part includes super-normal growth for a definite period and the second part includes normal growth rate after super-normal growth period indefinitely (perpetually).

Thus, the formula for share price will be as follows:

$$P_0 = \sum_{t=1}^{n} \frac{DIV_0 (1 + g_s)^t}{(1 + k_e)^t} + \frac{P_n}{(1 + k_e)^n} \qquad (9)$$

The second part determines the component of share price (P_n) at the end the super-normal growth period assuming normal growth forever.

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:

$$P_n = \frac{DIV_{n+1}}{k_e - g_n} \qquad (10)$$

When we multiply P_n by $1/(1 + k_e)^n$ we obtain the present value of P_n in year 0. Substituting Equation (10) in Equation (9), we get

$$P_0 = \sum_{t=1}^{n} \frac{DIV_0 (1 + g_s)^t}{(1 + k_e)^t} + \frac{DIV_{n+1}}{k_e - g_n} \times \frac{1}{(1 + k_e)^n} \qquad (11)$$

The cost of equity, k_e, can be computed by solving Equation (11) by trial and error.

Example 4: 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:

$$134 = \sum_{t=1}^{6} \frac{3.50(1.15)_t}{(1+k_e)^t} + \frac{DIV_7}{(k_e - 0.08)} \times \frac{1}{(1+k_e)^6}$$

$$= \frac{4.03}{(1+k_e)} + \frac{4.63}{(1+k_e)^2} + \frac{5.33}{(1+k_e)^3}$$

$$+ \frac{6.13}{(1+k_e)^4} + \frac{7.05}{(1+k_e)^5} + \frac{8.11}{(1+k_e)^6} + \frac{8.11(1.08)}{(k_e - 0.08)} \times \frac{1}{(1+k_e)^6}$$

$$= 4.03(PV\,A_{1,\,k_e}) + 4.63(PV\,A_{2,\,k_e}) + 5.33(PV\,A_{3,\,k_e})$$

$$+6.13(PV\,A_{4,\,k_e})\ +7.05(PV\,A_{5,\,k_e}) + 8.11(PV\,A_{6,\,k_e}) + \frac{8.76}{k_e - 0.08}(PV\,A_{6,\,k_e})$$

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:

$$k_e = \frac{DIV_1}{P_0} \tag{12}$$

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 (12) can also be written as:

$$k_e = \frac{DIV_1}{P_0} = \frac{EPS_1}{P_0} \quad \text{(since } g = 0) \tag{13}$$

which implies that in a no-growth situation, the expected earnings–price (E/P) ratio may be used as the measure of the firm's cost of equity.

Cost of External Equity: The Dividend Growth Model

The firm's external equity consists of funds raised externally through public or rights 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:

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

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 the cost of internal equity for one reason. The selling price (P_s) 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:

$$k_e = \frac{DIV_1}{P_s} + g \tag{14}$$

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

Example 5: 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 (10) can be used to calculate the cost of internal equity:

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

The cost of external equity can be calculated as follow:

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

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% > cost of internal equity = 10.75%).

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.

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:

$$k_e = \frac{DIV_1}{P_0} + g = \frac{EPS_1(1-b)}{P_0} + br \qquad (\because g = br)$$

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

where 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 (8) may be written as follows:

$$P_0 = \frac{EPS_1(1-b)}{(k_e - rb)} \qquad (15)$$

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

$$k_e = \frac{EPS_1}{P_0}$$

Example 6: 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:

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

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 interval 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:

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

Activity 1

The current market price of a company's share is ₹120 and the expected dividend per share next year is ₹12. If the dividends are expected to grow at a constant rate of 8 per cent, what is the company's cost of equity?

Hint: Apply the formula $k_e = \dfrac{EPS_1}{P_0}$

Self Assessment Questions

7. External equity will not cost more to the firm than internal equity. (True/False)

8. The required rate of return of shareholders can be determined from the _____ valuation model.

5.6 Approaches to Derive Cost of Equity

Capital Asset Pricing Model

The expected rate of return on equity or the cost of equity can be measured as the risk-free rate plus risk premium. What is a risk-free rate of return? How is risk premium determined? Various types of securities may have different degrees of risk. One can think of a security, such as the government bond or the treasury bill as a risk-free security. For such security, the risk of default is zero and, therefore, investors expect compensation for time only. In India, the risk-free rate can be assumed to be about 9 per cent as a number of government securities offer such returns to investors. Securities, such as corporate bonds and shares have risk of default, shares being riskier than bonds or debentures. Therefore, investors, in addition to risk-free rate of return as a compensation for the time value of money, also require a premium to compensate for risk. Higher

the risk, higher the risk premium required. Thus, the required rate of return of equity is given by the following simple expression:

Required equity return = Risk-free rate + Risk premium

The above equation implies that the return on risky securities, such as equity shares must exceed the risk-free rate which the investor can easily earn from a risk-free security. The underlying assumption here is that investors are risk averse, and thus, require higher compensation in terms of returns for taking higher risk. Since the securities differ in terms of their riskiness, their risk premiums also vary. How do we find the amount of risk premium?

Risk of a particular share can be measured in a number of ways. In conventional terms, the risk associated with a share may be defined as the variability that is likely to occur in the future returns from the investment. This can be measured by computing the variability in returns expected by the investor. Such an approach would require information about chances (probability) of occurrence of various possible returns to the investor. The problem with this approach is the practical difficulty of obtaining probability distributions of returns. More than the practical difficulties, a question of the concept of risk is also involved.

Systematic and Unsystematic Risk

We can distinguish between systematic and unsystematic risk. When many securities, are combined to form a portfolio, generally it helps the investor in reducing the overall risk through the process of diversification. The amount of risk which is diversified is called unsystematic risk and the risk which cannot be eliminated is called systematic risk. Unsystematic risks are unique to individual companies. Examples include strike in a firm; resignation of the marketing manager; winning a large contract; non-availability of raw material etc. In a portfolio of securities, individual firms' risks cancel out. Systematic risks are market-related, and affect all companies. Examples of systematic risk include change in interest rates; change in corporate tax rate; deficit financing; restrictive monetary policy etc. Investors are exposed to such risks even when they hold highly diversified portfolio of securities. When measuring the risk of security, we focus on systematic risk.

To measure systematic risk, one may look for the information on how the returns of a share have behaved in the past in relationship with factors which have affected the stock market. For this, one may, for example, examine the behaviour of the index of the company's share prices vis-à-vis the market index of share prices. The measure of the sensitivity of the returns of a share with the market returns is called beta (β). The beta of share j is written as β_j.

This required rate of return on equity is given by the following relationship:

$$k_e = R_f + (R_m - R_f)\beta_j \qquad\qquad (16)$$

Equation (16) 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. It is to be noted 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 9 per cent when we use return on the 91-day treasury bills as the risk-free rate. If you use the current yield on 91-day treasury bills as the risk-free rate, then the market risk premium should also be based on the historical average return of 91-day treasury bills. On the other hand, if you use the current yield on 30-year government bonds as the risk-free rate, then the market risk premium should also be based on the historical average yield of 30-year 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** (β)**:** Beta (β) is the systematic risk of an ordinary share in relation to the market. A broad-based index like the BSE's Sensitivity (Sensex) Index is used as a proxy for the market.

Suppose 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:

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

Self Assessment Questions

9. We can distinguish between systematic and unsystematic risk. (True/False)

10. Higher the risk, higher the risk _____ required.

5.7 Weighted Average Cost of Capital and Weighted Marginal Cost of Capital

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:

$$k_0 = k_d(1-T)w_d + k_e w_e$$
$$k_0 = k_d(1-T)\frac{D}{D+E} + k_e\frac{E}{D+E} \tag{17}$$

where 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:

$$k_0 = k_1 w_1 + k_2 w_2 + k_3 w_3 + \cdots \tag{18}$$

where k_1, k_2, … are component costs and w_1, w_2, … 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 versus Market Value Weights

One 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.

Example 7: Weighted Average Cost of Capital

Lohia Chemicals Ltd has the following book value capital structure on 31 March, 2011:

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, based on the existing capital structure, is computed in Table 5.1.

Table 5.1 Computation of Weighted Average Cost of Capital

Source (1)	Amount (₹'000) (2)	Proportion (%) (3)	After-tax Cost (%) (4)	Weighted Cost (%) (5) = (3) × (4)
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 5.2 Computation of Weighted Average Cost of Capital (Market-value Weights)

Source (1)	Amount (₹'000) (2)	Proportion (%) (3)	After-tax Cost (%) (4)	Weighted Cost (%) (5) = (3) × (4)
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.

Activity 2

A company's cost of equity is 21 per cent and the before-tax cost of debt is 14 per cent. It has net worth of ₹3400 crore and borrowings of ₹1360 core. The market capitalization of the company is ₹5100 crore. The tax rate is 30 per cent. What is the company's weighted average cost of capital?

Hint: Refer section 5.7 for reference.

Self Assessment Questions

11. In financial decision-making the cost of capital should be calculated on an after-tax basis. (True/False)
12. Market-value weights are theoretically _____to book-value weights.

5.8 Summary

Let us recapitulate the important concepts discussed in this unit:

- Cost of capital is used as a standard for (a) evaluating investment decisions (b) designing a firm's debt policy (c) appraising the financial performance of top management.

- A company may raise debt in a variety of ways.

- 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.

- 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.

- The expected rate of return on equity or the cost of equity can be measured as the risk-free rate plus risk premium. This approach is based on the Capital Asset Pricing Model (CAPM).

- 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).

5.9 Glossary

- *Cost of capital:* It is defined as the minimum required rate of return on an investment project.

- *Market risk premium:* The market risk premium is measured as the difference between the long-term, historical arithmetic averages of market return and the risk-free rate.

- *Unsystematic risk:* The amount of risk which is diversified is called Unsystematic risk.

5.10 Terminal Questions

1. Explain the application of cost of capital.
2. Describe the various methods used for computing cost of debt.
3. Define cost of preference capital.

4. Discuss the methods of computing the cost of internal and external equity.

5. Write short notes on (a) capital asset pricing model (b) CAPM vs dividend growth model.

6. Illustrate with an example the weighted average cost of capital and weighted marginal cost of capital.

5.11 Answers

Self Assessment Questions

1. True

2. Financial performance

3. False

4. Tax

5. True

6. Irredeemable

7. False

8. Dividend

9. True

10. Premium

11. True

12. Superior

Terminal Questions

1. Cost of capital is useful as a standard for:

   • evaluating investment decisions,

   • designing a firm's debt policy, and

   • appraising the financial performance of top management.

   For more details, refer section 5.2.

2. Different types of debts are issued such as those issued at par, debt issued at discount or premium, tax adjustment and cost of the existing debt. For more details, refer section 5.3.

3. The cost of preference capital is a function of the dividend expected by investors. For more details, refer section 5.4.

4. Cost of Internal equity is computed using the dividend-growth model. Cost of External equity is computed using the dividend growth model. For more details, refer section 5.5.

5. (a) Capital asset pricing model: The expected rate of return on equity or the cost of equity can be measured as the risk-free rate plus risk premium. This approach is based on the CAPM.

   (b) CAPM vs dividend growth model: The dividend-growth approach has limited application in practice. For more details, refer section 5.6.

6. Weighted average cost of capital: 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.

   For more details, refer section 5.7.

5.12 Case Study

A firm finances all its investments by 40 per cent debt and 60 per cent equity. The estimated required rate of return on equity is 20 per cent after-taxes and that of the debt is 8 per cent after-taxes. The firm is considering an investment proposal costing ₹40,000 with an expected return that will last forever.

Discussion Questions

1. What amount (in rupees) must the proposal yield per year so that the market price of the share does not change?

Hint:

The minimum overall required rate of return is:

Debt	0.40 x 0.08 = 0.032
Equity	0.60 x 0.20 = 0.120
Weighted average	0.152

Thus, the investment proposal must earn 0.152 x ₹40,000 = ₹6,080 per year.

Annual return before taxes	₹6,080
Less: interest 0.08 x 0.40 x ₹40,000	1,280
Return on equity	₹4,800

After-tax rate of return on equity:

₹4,800 ÷ (0.60 x ₹40,000)

₹4,800 ÷ ₹24,000 = 0.20

References

- Brigham, F. E. & Houston, F.J. (2013). *Fundamentals of Financial Management* (13th ed.). USA: South-West Cengage Learning.

- Ross, S., Westerfield, R. & Jaffe J. (2012). *Corporate Finance*. New Delhi: McGraw-Hill.

- Brigham, F.E. & Ehrhardt, C.M., *Financial Management: Theory & Practice* (2010). USA: South-West Cengage Learning.

- Berk, J., DeMarzo. P. & Thampy A. (2010). *Financial Management*. New Delhi: Pearson Education.

- Paramasivan, C. & Subramanian, T. (2009) *Financial Management*. New Delhi: New Age International Publishers.

- James C. Vanhorne. (2000). *Fundamentals of Financial Management*. New Delhi: Prentice Hall Books.

E-References

- http://vcmdrp.tums.ac.ir/files/financial/istgahe_mali/moton_english/ financial_management_%5Bwww.accfile.com%5D.pdf (Retrieved on 28 May 2013)

- www.taxfaq.in/share-capital-types.html (Retrieved on 20 April 2013)

- www.bizfinance.about.com/od/cost-of-capital/qt/calculate-the-cost-debt-capital.htm (Retrieved on 20 April 2013)

Unit 6   Financial and Operating Leverage

Structure

Caselet

Practice of Leverage

Home-grown hedge funds will have to use extremely low leverage as compared to their competitors across the world. The regulatory body SEBI is giving final touches to a plan that will put a ceiling upon financial leverage provided by wealthy investors. These investors will be able to invest just once as opposed to several times in the globally advanced markets. The plan intends to be an amalgamation of external borrowings by local hedge funds from financial institutions and the inherent leverage from disclosure to derivatives market. SEBI is coordinating with the government to clear the ambiguity over the issue of taxation from the perspective of investors and the asset management companies. The practice of leverage is not always bad, it does prove beneficial to the investor, yet there are some hidden hazards. The regulatory body SEBI is cautious of double leverage when borrowed funds are put at stake for future projects.

Source: Adapted from http://articles.economictimes.indiatimes.com/2012-12-03/news/35568755_1_hedge-funds-alternative-investment-fund-fund-managers (Retrieved on 6 December 2012)

6.1 Introduction

In the previous unit, you studied about the application of cost of capital, cost of debt, cost of preference capital, the different models of cost of equity and weighted average cost of capital and weighted marginal cost of capital.

In case a company falls short of monetary assets then the company can exercise its financial influence to borrow money. This practice is not bad and can even increase a shareholder's return on investment.

In this unit, you will understand the meaning of financial leverage, the various measures of financial leverage, and the computation of Earning Per Share (EPS) and Return on Equity (ROE).

Objectives

After studying this unit, you should be able to:

- interpret the meaning of financial leverage
- analyse the combined effect of financial and operating leverage
- compute Earning Per Share (EPS) and Return on Equity (ROE)

6.2 Meaning of Financial Leverage

A company can finance its investments by debt and equity. It 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 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 at once 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.

Activity 1

Suppose a medium-sized publishing company is facing a tough time financially due to global recession. How can the company use financial leverage?

Hint: The company can finance its investments by debt and equity. Financial Leverage: Calculation of Earning Per Share and Return on Equity.

Self Assessment Questions

1. The rate of the equity dividend is not fixed and depends on the dividend policy of a company. (True/False)

2. The rate of interest on debt is fixed irrespective of the company's rate of return on _____.

6.3 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.,

$$L_1 = \frac{D}{D+E} = \frac{D}{V}$$

---

where 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.,

$$L_2 = \frac{D}{E} \qquad \qquad ...(1)$$

3. **Interest coverage** The ratio of net operating income (or EBIT) to interest charges, i.e.,

$$L_3 = \frac{EBIT}{Interest} \qquad \qquad ...(2)$$

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. However, it is difficult to get reliable information on market values in practice. The market values of securities fluctuate quite frequently.

There is no difference between the first two measures of financial leverage in operational terms.

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.

Self Assessment Questions

3. Interest coverage ratio measures capital gearing. (True/False)
4. The most commonly used measures of financial leverage are _____, _____ and _____.

6.4 Calculation of Earning Per Share (EPS) and Return on Equity (ROE)

Common or ordinary shareholders are entitled to the residual profits. The rate of dividend is not fixed; the earnings may be distributed to shareholders or retained in the business. Nevertheless, the net profits after taxes represent their return. A return on shareholders' equity is calculated to see the profitability of owners' investment. The shareholders' equity or net worth will include paid-up share capital, share premium and reserves and surplus *less* accumulated losses. Net worth can also be found by subtracting total liabilities from total assets.

Earning Per Share (EPS)

The profitability of the shareholders' investment can also be measured in many other ways. One such measure is to calculate the earnings per share. The Earnings Per Share (EPS) is calculated by dividing the profit after taxes by the total number of ordinary shares outstanding.

$$EPS = \frac{\text{Profit after tax} - \text{Dividend on Preference Share (if any)}}{\text{Number of share outstanding}} \quad (3)$$

EPS calculations made over years indicate whether or not the firm's earnings power on per-share basis has changed over that period. The EPS of the company should be compared with the industry average and the earnings

per share of other firms. EPS simply shows the profitability of the firm on a per-share basis; it does not reflect how much is paid as dividend and how much is retained in the business. But as a profitability index, it is a valuable and widely used ratio.

Return on Equity (ROE)

The return on equity is net profit after taxes divided by shareholders' equity which is given by net worth. It is to be noted here that if a company has both preference and ordinary share capital, ROE should be calculated after deducting preference dividend from PAT and using only the ordinary shareholder's capital.

$$\text{ROE} = \frac{\text{Profit After Taxes}}{\text{Net Worth (Equity)}} = \frac{\text{PAT}}{\text{NW}} \tag{4}$$

ROE indicates how well the firm has used the resources of owners. In fact, this ratio is one of the most important relationships in financial analysis. The earning of a satisfactory return is the most desirable objective of a business. The ratio of net profit to owners' equity reflects the extent to which this objective has been accomplished. This ratio is, thus, of great interest to the present as well as the prospective shareholders and also of great concern to management, which has the responsibility of maximizing the owners' welfare.

The returns on owners' equity of the company should be compared with the ratios for other similar companies and the industry average. This will reveal the relative performance and strength of the company in attracting future investments.

Self Assessment Questions

5. ROE does not indicate how well the firm has used the resources of owners. (True/False)

6. The profitability of the shareholders' _____ can also be measured in many other ways.

6.5 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:

$$DOL = \frac{\%\text{Change in EBIT}}{\%\text{Change in Sales}}$$

$$DOL = \frac{\Delta \text{EBIT}/\text{EBIT}}{\Delta \text{Sales}/\text{Sales}} \tag{5}$$

Equation (5) can also be written as follows:

$$DOL = \frac{\text{Contribution}}{\text{EBIT}} \tag{6}$$

Since contribution = EBIT + Fixed cost, Equation (6) can be expressed as follows:

$$DOL = \frac{\text{EBIT} + \text{Fixed Cost}}{\text{EBIT}} = 1 + \frac{F}{\text{EBIT}} \tag{7}$$

Degree of Financial Leverage

We have seen earlier in this chapter 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:

$$DFL = \frac{\%\text{Change in EPS}}{\%\text{Change in EBIT}} \tag{8}$$

or $\qquad DFL = \dfrac{\Delta \text{EPS}/\text{EPS}}{\Delta \text{EBIT}/\text{EBIT}} \tag{9}$

The following equation can also be used to calculate DFL:

$$DFL = \frac{\text{EBIT}}{\text{EBIT} - \text{INT}} = \frac{\text{EBIT}}{\text{PBT}} = 1 + \frac{\text{INT}}{\text{PBT}} \tag{10}$$

The numerator of Equation (10) is earnings before interest and taxes and the denominator is profit before taxes.

Let us understand the concepts of financial and operating leverages with numerical examples.

Example 1: Financial Leverage

The operating and cost data of ABC Ltd. are

Sales	₹25,00,000
Variable cost	₹15,00,000
Fixed cost	₹5,00,000 (including interest on ₹10,00,000)

Calculate degree of financial leverage.

Solution

Sales	₹25,00,000
– Variable cost	₹15,00,000
– Operating fixed costs (₹5,00,000 – ₹1,50,000)	₹3,50,000
EBIT	₹6,50,000
– Interest	₹1,50,000
Net earnings before Taxes	₹5,00,000

Financial leverage (DFL) $\dfrac{EBIT}{(EBIT-I)}$

$$= \frac{6,50,000}{6,50,000 - 1,50,000}$$

$$= \frac{6,50,000}{5,00,000}$$

$$= 1.3$$

Example 2: Operating Leverage

Determine the degree of operating leverage from the following data:

	S Ltd	R Ltd
	₹	₹
Sales	25,00,000	30,00,000
Fixed costs	7,50,000	15,00,000

Variable expenses are 50% of sales for firm S and 25% for firm R.

Solution

	S Company	R Company
	₹	₹
Sales	25,00,000	30,00,000
– Variable Costs (VC)	12,50,000	7,50,000
– Fixed Costs (FC)	7,50,000	15,00,000
EBIT (operating profit)	5,00,000	7,50,000
$DOL = \dfrac{(Sales-VC)}{EBIT}$	$\dfrac{25,00,000-12,50,000}{5,00,000}$	$\dfrac{30,00,000-7,50,000}{7,50,000}$

Where DOL = Degree of operating leverage

$$DOL_S = \frac{12,50,000}{5,00,000} = 2.5 \qquad DOL_R = \frac{25,50,000}{7,50,000} = 3$$

VC = Variable cost

EBIT= Earning before interest and taxes (or) operatign profit

R Ltd. has higher degree of operating leverage than S. Ltd.

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:

$$= \frac{\%\,Change\,in\,EBIT}{\%\,Change\,in\,sales} \times \frac{\%\,Change\,in\,EPS}{\%\,Change\,in\,EBIT}$$

$$= \frac{\%\,Change\,in\,EPS}{\%\,Change\,in\,Sales}$$

Yet another way of expressing the degree of combined leverage is as follows:

$$DCL = \frac{\text{Contribution}}{\text{Profit before taxes}}$$

$$= \frac{\text{EBIT+Fixed costs}}{\text{PBT}}$$

$$= \frac{\text{PBT+INT+}F}{\text{PBT}} = 1 + \frac{\text{INT+}F}{\text{PBT}}$$

Example 3: Degree of Combined Leverage

S Ltd. is identical to R Ltd. in respect of the pattern of financing. R Ltd. finances its assets the interest on which amounts to ₹ 50,000. The fixed costs amount to ₹ 1,50,000. Determine the degree of operating, financial and combined leverages at ₹ 10,00,000 sales for both the firms.

Solution

Determination of varion types of leverage.

Particulars	S Ltd.	R Ltd
	₹	₹
Sales revenue	10,00,000	10,00,000
– Variable costs	7,00,000	7,00,000
– Fixed Costs	1,50,000	1,50,000
EBIT (operating profit)	1,50,000	1,50,000
(–) interest	Nil	50,000
Earnings before taxes	1,50,000	1,00,000
(–) taxes (50%)	75,000	50,000
Earnings after taxes	75,000	50,000

$$\text{DOL} = \frac{10,00,000 - 7,00,000}{1,50,000} \quad\quad \frac{10,00,000 - 7,00}{1,50,000}$$

$$= \frac{3,00,000}{1,50,000} \quad\quad\quad\quad \frac{3,00,000}{1,50,000}$$

$$\text{2 times} \quad\quad\quad\quad\quad \text{2 times}$$

$$\text{DFL} = \frac{\text{EBIT}}{(\text{EBIT}-\text{I})} \qquad \frac{15,00,000}{1,50,000} \qquad \frac{15,00,000}{1,50,000}$$

$$= 1 \qquad\qquad = 1.5$$

$$\text{DCL} = \left(\frac{\text{Sales}-\text{VC}}{\text{EBIT}-\text{I}}\right) \qquad \frac{10,00,000 - 7,00,000}{1,50,000} \qquad \frac{10,00,000 - 7,00,000}{1,00,000}$$

$$= \qquad \frac{3,00,000}{1,50,000} \qquad \frac{3,00,000}{1,00,000}$$

$$= 2 \qquad\qquad = 3$$

Self Assessment Questions

7. Operating leverage affects a firm's _____ _____.

8. Operating and financial leverage cause to wide fluctuation in _____.

6.6 Summary

Let us recapitulate the important concepts discussed in this unit:

- 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.

- Some of the measures of financial leverage are: debt ratio, debt-equity ratio and interest coverage.

- The return on equity is net profit after taxes divided by shareholders' equity which is given by net worth.

- The Earnings Per Share (EPS) is calculated by dividing the profit after taxes by the total number of ordinary shares outstanding.

6.7 Glossary

- **Debt ratio:** It is defined as the ratio of debt to the total capital.

- **Debt-equity ratio:** The ratio of debt to equity.

- **Interest coverage:** The ratio of net operating income (or EBIT) to interest changes.

6.8 Terminal Questions

1. What do you understand by financial leverage?
2. Explain some of the measures of financial leverage.
3. Explain how return on equity is calculated.
4. Write a short note on earning per share.
5. Define the degree of operating leverage.
6. Explain the combined effect of financial and operating leverage.

6.9 Answers

Self Assessment Questions

1. True
2. Assets
3. False
4. Debt ratio, debt-equity ratio and interest coverage
5. False
6. Investment
7. Operating profit
8. EPS

Terminal Questions

1. A company can finance its investments by debt and equity. It 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. For more details, refer section 6.2.

2. Some of the measures of financial leverage are:
    - debt ratio
    - debt-equity ratio and
    - interest coverage

   For more details, refer section 6.3.

3. ROE indicates how well the firm has used the resources of owners. In fact, this ratio is one of the most important relationships in financial analysis. For more details, refer section 6.4.

4. Earning per share (EPS): The profitability of the shareholders' investment can also be measured in many other ways. One such measure is to calculate the earnings per share. For more details, refer section 6.4.

5. The degree of operating leverage is defined as the percentage change in the earnings before interest and taxes relative to a given percentage change in sales. For more details, refer section 6.5.

6. Operating and financial leverages together cause wide fluctuation in EPS for a given change in sales. For more details, refer section 6.5.

6.10 Case Study

Brightways Ltd

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 6.1 shows calculations.

Table 6.1 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 6.1, 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.

Table 6.2 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

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 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 6.2.

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 Re 0.45 from ₹1.20 to ₹1.65.

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

DOL is:

$$DOL = \frac{100,000 \ (₹\ 8 - ₹4)}{100,000 \ (₹8 - ₹4) - ₹280,000}$$

$$= \frac{₹400,000}{120,000} = 3.33$$

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 that 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:

$$DOL = \frac{₹600,000}{₹120,000} = 5.0$$

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.

In the example, Brightways Ltd was considering four alternative debt levels, DFL for those alternatives at EBIT of ₹120,000 is given below:

Table 6.3 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

It is indicated from Table 6.3 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.

For Brightways Ltd when it used less automated production processes, the combined leverage effect at a sales of ₹8 lakh (100,000 units at ₹8) and 50 per cent debt level is:

$$DCL = \frac{100,000(8-4)}{100,000(8-4)-280,000-37,500}$$

$$= \frac{400,000}{82,500} = 4.85$$

In the case of Brightways Ltd the combined effect of leverage is to increase EPS by 4.85 times for one unit increase in sales when it chooses less automated production process and employs 50 per cent debt. Thus, if the Brightways' sales increase by 10 per cent from ₹8 lakh to ₹8.80 lakh, then EPS will increase by: 10% × 4.85 = 48.5%. EPS at the sales level of ₹8 lakh is ₹1.65 then the new EPS will be:

$$EPS = 1.65 \times 1.485 = ₹2.45$$

Firms can employ operating and financial leverages in various combinations. Brightways Ltd, for example, can either choose high-automated production processes and high degree of operating leverages or low automated production processes and low degree of operating leverage associated with high or low level of debt. The following are the possible combinations of operating and financial leverages for Brightways Ltd:

Table 6.4 Combinations of Operating and Financial Leverage for Brightways Ltd

Low Automation			High Automation		
DOL	DFL	DCL	DOL	DFL	DCL
3.33	1.000	3.33	5.00	1.000	5.00
3.33	1.185	3.95	5.00	1.185	5.93
3.33	1.455	4.85	5.00	1.456	7.28
3.33	1.882	6.27	5.00	1.882	9.41

Table 6.4 indicates that the largest effect of leverage (9.41 times) will be obtained when the firm combines higher amount of operating leverage (5.00 times) with the highest level of debt (DFL = 1.882). If the company has this combination, EPS will increase by 9.41 times than the increase in sales. Thus, if Brightways' sales increase from ₹8 lakh to ₹11.60 lakh—an increase of 45 per cent and EPS increases from ₹2.55 to ₹13.35—an increase by 423 per cent (i.e., 45 per cent × 9.41).

References

- Brigham, F. E. & Houston, F.J. (2013). *Fundamentals of Financial Management* (13th ed.). USA: South-West Cengage Learning.

- Ross, S., Westerfield, R. & Jaffe J. (2012). *Corporate Finance*. New Delhi: McGraw-Hill.

- Brigham, F.E. & Ehrhardt, C.M., *Financial Management: Theory & Practice* (2010). USA: South-West Cengage Learning.

- Berk, J., DeMarzo. P. & Thampy A. (2010). *Financial Management*. New Delhi: Pearson Education.

- Paramasivan, C. & Subramanian, T. (2009) *Financial Management*. New Delhi: New Age International Publishers.

- James C. Vanhorne. (2000). *Fundamentals of Financial Management*. New Delhi: Prentice Hall Books.

E-References

- http://vcmdrp.tums.ac.ir/files/financial/istgahe_mali/moton_english/financial_management_%5Bwww.accfile.com%5D.pdf (Retrieved on 28 May 2013)

- www.taxfaq.in/share-capital-types.html (Retrieved on 24 April 2013)

- www.bizfinance.about.com/od/cost-of-capital/qt/calculate-the-cost-debt-capital.htm (Retrieved on 24 April 2013)

Unit 7   Capital Budgeting Decision

Structure

Caselet

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 7.1.

Table 7.1 Discounted Payback Illustrated

	C_0	C_1	C_2	C_3	C_4	Simple PB	Discount PB	NPV at 10%
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

It can be seen in our example that if we use the NPV rule, Project *Q* (with the higher discounted payback period) is better.

7.1 Introduction

In the previous unit, you learnt about financial leverage, the various measures of financial leverage, and the computation of Earning Per Share (EPS) and Return on Equity (ROE).

In the present global scenario, it is essential for enterprises to decide which projects are worthy enough to invest money in. Here the financial manager needs to take a decision as to which ventures or other investments will be undertaken by the firm, how much capital will be allocated and, finally, when this investment will be undertaken.

In this unit, you will study about capital budgeting, capital rationing and evaluation of investment proposals.

Objectives

After studying this unit, you should be able to:

- explain the capital budgeting process
- describe the methods used to evaluate investment proposals
- identify the types of capital rationing

7.2 Capital Budgeting Process

Capital expenditure or investment planning and control involve a process of facilitating decisions covering expenditures on long-term assets. Since a company's survival and profitability hinges on capital expenditures, especially the major ones, the importance of the capital budgeting or investment process cannot be over-emphasized. A number of managers think that investment projects have strategic elements, and the investment analysis should be conducted within the overall framework of corporate strategy. Some managers feel that the qualitative aspects of investment projects should be given due importance.

Capital Investments

Strictly speaking, capital investments should include all those expenditures, which are expected to produce benefits to the firm over a long period of time and encompass both tangible and intangible assets. Thus, R&D (Research and Development) expenditure is a capital investment. Similarly, the expenditure incurred in acquiring a patent or brand is also a capital investment. In practice, a number of companies follow the traditional definition, covering only expenditures on tangible fixed assets as capital investments (expenditures). The Indian companies are also influenced considerably by accounting conventions and tax regulations in classifying capital expenditures. Large expenditures on R&D, advertisement, or employees training, which tend to create valuable intangible assets, may not be included in the definition of capital investments since most

of them are allowed to be expensed for tax purposes in the year in which they are incurred. To make sound decisions, these expenditures should be treated as capital investments and subjected to proper evaluation.

A number of companies follow the accounting convention to prepare asset wise classification of capital expenditures, which is hardly of much use in decision-making. Some companies classify capital expenditures in a manner, which could provide useful information for decision-making. Their classification is (i) replacement, (ii) modernization, (iii) expansion, (iv) new project, (v) research and development, (vi) diversification and (vii) cost reduction.

Capital Investment Planning and Control

There are five phases of capital expenditure planning and control, which are:

1. Identification (or origination) of investment opportunities
2. Development of forecasts of benefits and costs
3. Evaluation of the net benefits
4. Authorization for progressing and spending capital expenditure
5. Control of capital projects.

The available literature puts the maximum emphasizes on the evaluation phase because, first, this phase is easily amenable to a structured, quantitative analysis and second, it is considered to be the most important phase by academicians. Practitioners, however, consider other phases to be more important. The capital investment planning and control phases are discussed below.

Generating investment ideas: Investment opportunities have to be identified or created; they do not occur automatically. Investment proposals of various types may originate at different levels within a firm. Most proposals, in the nature of cost reduction or replacement or process or product improvements take place at plant level. The contribution of the top management in generating investment ideas is generally confined to expansion or diversification projects. The proposals may originate systematically or haphazardly in a firm. The proposal for adding a new product may emanate from the marketing department or from the plant manager who thinks of a better way of utilising idle capacity.

Investment ideas: The Indian scenario

In a number of Indian companies, the investment ideas are generated at the plant level. The contribution of the board in idea generation is relatively

insignificant. However, some companies depend on the board for certain investment ideas, particularly those that are strategic in nature. Other companies depend on research centres for investment ideas.

Developing cash flow estimates: Estimation of cash flows is a difficult task because the future is uncertain. Operating managers with the help of finance executives should develop cash flow estimates. An operating manager should properly handle the risk associated with cash flows and should also take in account the process of decision-making. Estimation of cash flows requires collection and analysis of all qualitative and quantitative data, both financial and non-financial in nature. Large companies would generally have a Management Information System (MIS) providing such data.

Executives in practice do not always have clarity about estimating cash flows. A large number of companies do not include additional working capital while estimating the investment project cash flows. A number of companies also mix up financial flows with operating flows.

Evaluating project: These are various investment criteria or capital budgeting techniques that are used practically. For example, the production people may be generally interested in having the most modern type of equipments and increased production even if productivity is expected to be low and goods cannot be sold. This attitude can bias their estimates of cash flows of the proposed projects. Similarly, marketing executives may be too optimistic about the sales prospects of goods manufactured, and overestimate the benefits of a proposed new product. It is, therefore, necessary to ensure that projects are scrutinized by an impartial group and that objectivity is maintained in the evaluation process.

Using methods of evaluation: Most Indian companies use payback criterion as a method of evaluation. In addition to payback and/or other methods, companies also use Internal Rate of Return (IRR) and Net Present methods. A few companies use Accounting Rate of Return (ARR) method. IRR is the second most popular technique in India.

The major reason for payback to be more popular than the DCF techniques is the executives' lack of familiarity with DCF techniques. Other factors are lack of technical people and sometimes unwillingness of the top management to use the DCF techniques.

Self Assessment Questions

1. The expenditure incurred in acquiring a _____ or brand is also a capital investment.

2. The contribution of the board in idea generation is relatively significant. (True/False)

Activity 1

Suppose you are working as business development manager for an automobile firm. How would you classify projects for capital investment?

Hint: Prioritize projects such as the ones that require to be expanded or be diversified.

7.3 Methods to Evaluate Investment Proposals

Three steps are involved in the evaluation of an investment:

1. Estimation of cash flows
2. Estimation of the required rate of return (the opportunity cost of capital)
3. Application of a decision rule for making the choice. Specifically, we focus on the merits and demerits of various decision rules.

Investment decision rule

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.

These conditions will be clarified as we discuss the features of various investment criteria in the following pages.

Evaluation criteria

A number of investment criteria (or capital budgeting techniques) are in practice. They may be grouped in the following two categories:

(i) *Discounted Cash Flow (DCF) criteria*

- Net Present Value (NPV)

- Internal Rate of Return (IRR)

- Profitability Index (PI)

(ii) *Non-discounted cash flow criteria*

- Payback (PB) Period

- Discounted payback period

- Accounting Rate of Return (ARR).

DCF Criteria

Net Present Value (NPV)

The Net Present Value (NPV) method is the classic economic method of evaluating the 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.

Illustration 7.1: 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 (Table C at the end of the book). The calculations are shown below:

$$\begin{aligned}
\text{NPV} &= \left[\frac{₹900}{(1+0.10)^1} + \frac{₹800}{(1+0.10)^2} + \frac{₹700}{(1+0.10)^3} + \frac{₹600}{(1+0.10)^4}\right. \\
&\quad \left. + \frac{₹500}{(1+0.10)^5}\right] - ₹2,500 \\
&= [₹900(\text{PVF}_{1,\,0.10}) + ₹800(\text{PVF}_{2,\,0.10}) + ₹700(\text{PVF}_{3,\,0.10}) \\
&\quad + ₹600(\text{PVF}_{4,\,0.10}) + ₹500(\text{PVF}_{5,\,0.10})] - ₹2,500 \\
&= [₹900 \times 0.909 + ₹800 \times 0.826 + ₹700 \times 0.751 \\
&\quad + ₹600 \times 0.683 + ₹500 \times 0.620] - ₹2,500 \\
&= ₹2,725 - ₹2,500 = + ₹225
\end{aligned}$$

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:

$$\begin{aligned}
\text{NPV} &= \left[\frac{C_1}{(1+k)^1} + \frac{C_2}{(1+k)^2} + \frac{C_3}{(1+k)^3} + \cdots + \frac{C_n}{(1+k)^n}\right] - C_0 \\
&= \sum_{t=1}^{n} \frac{C_t}{(1+k)^t} - C_0
\end{aligned} \tag{1}$$

where 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.

Acceptance Rule

- Accept if NPV > 0 (i.e., NPV is positive)
- Reject if NPV < 0 (i.e., NPV is negative)
- Project may be accepted if NPV = 0

Merits	Demerits
• Considers all cash flows	• Requires estimates of cash flows which is a tedious task
• True measure of profitability	• Requires computation of the opportunity cost of capital which poses practical difficulties
• Recognizes the time value of money	• Ranking of investments is not independent of the discount rates
• Satisfies the value-additivity principle (i.e., NPV's of two or more projects can be added)	
• Consistent with the Shareholders' Wealth Maximization (SWM) principle.	

Internal Rate of Return (IRR)

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 per cent) 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:

$$r = \frac{C_1 - C_0}{C_0}$$

$$r = \frac{C_1}{C_0} - 1 \tag{2}$$

Equation (2) can be rewritten as follows:

$$\frac{C_1}{C_0} = 1 + r$$

$$C_0 = \frac{C_1}{(1+r)} \tag{3}$$

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 the internal rate of return. The 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:

$$C_0 = \frac{C_1}{(1+r)} + \frac{C_2}{(1+r)^2} + \frac{C_3}{(1+r)^3} + \cdots + \frac{C_n}{(1+r)^n}$$

$$C_0 = \sum_{t=1}^{n} \frac{C_t}{(1+r)^t}$$

$$\sum_{t=1}^{n} \frac{C_t}{(1+r)^t} - C_0 = 0 \tag{4}$$

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.

Acceptance rule

⇒ Accept if IRR > *k*

⇒ Reject if IRR < *k*

⇒ Project may be accepted if IRR = *k*

Merits	Demerits
• Considers all cash flows	• Requires estimates of cash flows which is a tedious task
• True measure of profitability	• Does not hold the value additivity principle (i.e., IR₹of two or more projects do not add)
• Based on the concept of the time value of money	• At times fails to indicate correct choice between mutually exclusive projects
• Generally, consistent with wealth maximization principle	• At times yields multiple rates • Relatively difficult to compute

Profitability Index (PI)

Yet another time-adjusted method of evaluating the investment proposals is the benefit – cost (B/C) ratio or profitability index (PI). **Profitability index** is the ratio of the present value of cash inflows, at the required rate of return, to the initial cash outflow of the investment. The formula for calculating **benefit-cost ratio** or profitability index is as follows:

$$PI = \frac{\text{PV of cash inflows}}{\text{Initial cash outlay}} = \frac{PV(C_t)}{C_0}$$

$$= \sum_{t=1}^{n} \frac{C_t}{(1+k)^t} \div C_0 \tag{5}$$

Acceptance rule

⇒ Accept if PI > 1.0

⇒ Reject if PI < 1.0

⇒ Project may be accepted if PI = 1.0

Merits	Demerits
• Considers all cash flows	• Requires estimates of the cash flows which is a tedious task
• Recognizes the time value of money	• At times fails to indicate correct choice between mutually exclusive projects
• Relative measure of profitability	
• Generally consistent with the wealth maximization principle	

Non-discounted Cashflow Criteria

Payback (PB) 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:

$$\text{Payback} = \frac{\text{Initial Investment}}{\text{Annual Cash Inflow}} = \frac{C_0}{C} \tag{6}$$

Acceptance rule

$\Rightarrow$ Accept if PB < standard payback

$\Rightarrow$ Reject if PB > standard payback

Merits	Demerits
• Easy to understand and compute and inexpensive to use	• Ignores the time value of money
• Emphasizes liquidity	• Ignores cash flows occurring after the payback period
• Easy and crude way to cope with risk	• Not a measure of profitability
• Uses cash flows information	• No objective way to determine the standard payback
	• No relation with the wealth maximization principle

Discounted payback period

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.

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.

Accounting Rate of Return (ARR)

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:

$$\text{ARR} = \frac{\text{Average income}}{\text{Average investment}} \qquad\qquad (7)$$

In Equation (9), 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.

Acceptance rule
$\Rightarrow$ Accept if ARR > minimum rate
$\Rightarrow$ Reject if ARR < minimum rate

Merits	Demerits
• Uses accounting data with which executives are familiar • Easy to understand and calculate • Gives more weightage to future receipts	• Ignores the time value of money • Does not use cash flows • No objective way to determine the minimum acceptable rate of return

Why is NPV Important?

Why should the Present Value of any Project 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? We

know that 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.

Self Assessment Questions

3. A number of investment criteria (or capital budgeting techniques) are in practice. (True/False)
4. The essential property of a sound technique is that it should _____ the shareholder's wealth.

7.4 Capital Rationing

Firms may have to choose among profitable investment opportunities because of the limited financial resources.

Capital rationing refers to a situation where the firm is constrained for external, or self-imposed, reasons to obtain necessary funds to invest in all investment projects with positive NPV. Under capital rationing, the management

not only has to determine the profitable investment opportunities, but has to decide obtain that combination of the profitable projects which yields highest NPV within the available funds.

Capital rationing may arise due to external factors or internal constraints imposed by the management. Thus, there are two types of capital rationing:

 (i) External capital rationing

(ii) Internal capital rationing

(i) External capital rationing: It mainly occurs on account of the imperfections in capital markets. Imperfections may be caused by deficiencies in market information, or by rigidities of attitude that hamper the free flow of capital.

(ii) Internal capital rationing: It is caused by self-imposed restrictions by the management. Various types of constraints may be imposed.

Self Assessment Questions

5. Capital rationing may arise due to external factors or internal constraints imposed by the management. (True/False)

6. _____ rationing is caused by self-imposed restrictions by the management.

Activity 2

Suppose you are a businessman who wants to invest in a project that yields sufficient returns. What are the characteristics of an evaluation criterion that he should consider?

Hint: Among other factors an investment project should yield maximum returns.

7.5 Summary

Let us recapitulate the important concepts discussed in this unit:

 • Capital expenditure or investment planning and control involve a process of facilitating decisions covering expenditures on long-term assets.

 • There are five phases of capital expenditure planning and control which are mentioned as: (a) Identification (or origination) of investment opportunities (b) Development of forecasts of benefits and costs

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(c) Evaluation of the net benefits Authorization for progressing and spending capital expenditure (d) Control of capital projects.

- Three steps are involved in the evaluation of an investment: (a) Estimation of cash flows (b) Estimation of the required rate of return (the opportunity cost of capital) (c) Application of a decision rule for making the choice.

7.6 Glossary

- *Accounting rate of return:* It is the ratio of the average after tax profit divided by the average investment.
- *Internal rate of return:* It is the rate that equates the investment outlay with the present value of cash inflow received, after one period.
- *Payback:* Payback is the number of years required to recover the original cash outlay invested in a project.

7.7 Terminal Questions

1. What do you understand by capital budgeting?
2. Discuss the process used for capital expenditure planning and control.
3. Discuss some of the common methods used for evaluation of investment proposals.
4. Explain, with an example, the calculation of net present value.
5. What do you understand by internal rate of return. Breiefly examine the merits and demerits of DCF criteria.
6. What is capital rationing?

7.8 Answers

Self Assessment Questions

1. Patent
2. False
3. True
4. Maximize
5. True
6. Internal Capital

Terminal Questions

1. Since a company's survival and profitability hinges on capital expenditures, especially the major ones, the importance of the capital budgeting or investment process cannot be over-emphasized. For more details, refer section 7.2.

2. The process used for capital expenditure planning and control are:

   (a) Identification of investment of opportunities

   (b) Development of forecasts of benefits and costs

   (c) Evaluation of the net benefits. For more details, refer section 7.2.

3. Some of the methods used for the evaluation of investment proposals are:

   (a) Estimation of cash flows

   (b) Estimation of the required rate of return

   (c) Application of a decision rule for making the choice

   For more details, refer section 7.3.

4. NPV method is the classic economic method of evaluating the investment proposals. For more details, refer section 7.3.

5. IRR is another method of discounted cash flow technique which takes into account the magnitude and timing of the cash flow. For more details, refer section 7.3.

6. Capital rationing refers to a situation where the firm is constrained for external, or self-imposed, reasons to obtain necessary funds to invest in all investment projects with positive NPV. For more details, refer section 7.4.

7.9 Case Study

A company is considering the following investment projects:

Projects	C_0	C_1	C_2	C_3
		Cash Flows (₹)		
A	− 10,000	+ 10,000		
B	− 10,000	+ 17,500	+ 7,500	
C	− 10,000	+ 12,000	+ 4,000	+ 12,000
D	− 10,000	+ 10,000	+ 3,000	+ 13,000

(*i*) Payback, (*ii*) ARR, (*iii*) IRR and (*iv*) NPV; assuming discount rates of 10 and 30 per cent.

Solution:

(*a*) (*i*) **Payback**

Project A : 10,000/10,000 = 1 yr.

Project B : 10,000/7,500 = $1\frac{1}{3}$ yrs.

Project C :
$$2 \text{ yrs} + \frac{10,000 - 6,000}{12,000}$$
$$= 2\frac{1}{3} \text{ yrs.}$$

Project D : 1 yr.

(*ii*) **ARR**

Project A :
$$\frac{(10,000 - 10,000)1/2}{(10,000)1/2} = 0$$

Project B :
$$\frac{(15,000 - 10,000)1/2}{(10,000)1/2}$$
$$= \frac{2,500}{5,000} = 50\%$$

Project C :
$$\frac{(18,000 - 10,000)1/3}{(10,000)1/2}$$
$$= \frac{2,667}{5,000} = 53\%$$

Project D :
$$\frac{(16,000 - 10,000)1/3}{(10,000)1/2}$$
$$= \frac{2,000}{5,000} = 40\%$$

Note: The net cash proceeds include recovery of investment also. Therefore, net cash earnings are found by deducting initial investment.

(*iii*) **IRR**

Project A : The net cash proceeds in year 1 are just equal to investment. Therefore, *r* = 0%.

Project B : This project produces an annuity of ₹7,500 for two years. Therefore, the required PVAF is: 10,000/7,500 = 1.33. Looking in Table D across year 2 row, this factor is found under 32% column. Therefore, *r* = 32%.

Project C : Since cash flows are uneven, the trial and error method will have to be followed. Let us try 20% rate of discount. The NPV is +₹1,389. A higher rate should be tried. At 30% rate of discount, the NPV is –₹633. The true rate of return should be less than 30%. At 27% rate of discount we find that the NPV is –₹86 and at 26% +₹105. Through interpolation, we find *r* = 26.5%.

Project D : In this case also we use the trial and error method, and find that at 37.6% rate of discount NPV becomes almost zero. Therefore, *r* = 37.6%.

(*iv*) **NPV**

Project A :

at 10% $-10{,}000 + 10{,}000 \times 0.909 = -910$

at 30% $-10{,}000 + 10{,}000 \times 0.769 = -2{,}310$

Project B :

at 10% $-10{,}000 + 7{,}500 \ (0.909 + 0.826) = +3{,}013$

at 30% $-10{,}000 + 7{,}500 \ (0.769 + 0.592) = +208$

Project C :

at 10% $-10{,}000 + 2{,}000 \times 0.909 + 4{,}000 \times 0.826 + 12{,}000 \times 0.751 = +4{,}134$

at 30% $-10{,}000 + 2{,}000 \times 0.769 + 4{,}000 \times 0.592 + 12{,}000 \times 0.455 = -633$

Project D :

at 10% $-10{,}000 + 10{,}000 \times 0.909 + 3{,}000 \times (0.826 + 0.751) = +3{,}821$

at 30% $-10{,}000 + 10{,}000 \times 0.769 + 3{,}000 \times (0.592 + 0.4555) = +831$

The projects are ranked as follows according to the various methods:

| Project | Ranks | | | | |
	PB	ARR	IRR	NPV-10%	NPV-30%
A	1	4	4	4	4
B	2	2	2	3	2
C	3	1	3	1	3
D	1	3	1	2	1

References

- Brigham, F. E. & Houston, F.J. (2013). *Fundamentals of Financial Management* (13th ed.). USA: South-West Cengage Learning.

- Ross, S., Westerfield, R. & Jaffe J. (2012). *Corporate Finance*. New Delhi: McGraw-Hill.

E-References

- www.zenwealth.com/BusinessFinanceOnline/CB/CapitalBudgeting.html (Retrieved on 24 April 2013)

- www.kfknowledgebank.kaplan.co.uk/KFKB/Witi%20pages/ Capital%Zorationing.aspx (Retrieved on 24 April 2013)

Unit 8   Capital Structure Theories

Structure

Caselet

Capital Structure Analysis of L&T Limited

L&T is a large diversified company in the private sector. In 2003, it had a total sales of ₹8,783 crore and gross fixed assets of ₹6,305 crore. L&T's debt–equity ratio showed a fluctuating pattern during this period. From a high level of 2.5 in 1990, it has significantly reduced to a very low level of 0.20 in 1993. The ratio started increasing gradually and was close to 1 in 2003. L&T's interest coverage ratio has been more than 3.0, times except during 1990-92 and 2000-2002. Thus, the company has been maintaining a good debt servicing ability and has also been employing debt to take advantage of interest tax shield. Interest, as a percentage of sales, was quite high in the beginning of the 90s and during 2000-02 but it has reduced to about 3 per cent of sales in 2003.

How have L&T's share price and debt–equity ratio moved? From 1990 to 1998, L&T's share price and debt–equity ratio have moved in tandem and have shown an increasing trend. However, they seem to have moved in opposite direction during 1998-2003. In the recent years, L&T's debt–equity ratio has been increasing while the share price has been declining. L&T has borrowed funds from various sources. Long-term sources provide more than 70 per cent of total debt. Its long-terms sources include debentures, borrowings from banks and financial institutions and other sources such as public deposits etc. For financing its net current assets, the company has mostly used bank borrowing.

L&T's short-term borrowings come from banks and commercial papers. In the last few years the company has reduced its borrowing from financial institutions and is using banks borrowings and debentures for financing its investments. L&T has a history of heavily relying on internal funds and equity issues until 1980. The company made substantial use of debt during 1980s and the beginning of 1990s. A large part of long-term was raised through convertible debentures. The company has strengthened its equity base by converting its debentures into equity as well as retaining about 60 per cent of its profit. At the end of 2003, L&T has a total debt–equity ratio of 0.92. The debt includes both short-term and long-term debt. It has a strong coverage ratio. Thus, the company has strong financial capability and will be able to raise debt and equity funds for its future growth.

8.1 Introduction

In the previous unit, you learnt about capital budgeting, capital rationing and evaluation of investment proposals, and capital rationing.

The objective of a firm should be directed towards 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.

In this unit, you will study about the net income approach and its comparison with the traditional capital structure theories, the net operating income approach and the MM hypothesis.

Objectives

After studying this unit, you should be able to:

- explain the net income approach
- describe the traditional approach
- assess the NOI approach
- discuss the MM hypothesis

8.2 Relevance of Capital Structure Theories

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.

8.2.1 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 (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

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

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

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

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

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

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:

$$\text{Firm's cost of capital} = \frac{\text{Net operating income}}{\text{Value of the firm}}$$

$$k_o = \frac{\text{NOI}}{V} \qquad\qquad (4)$$

$$= \frac{1,000}{12,500} = 0.08 \text{ or } 8\%$$

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:

$$\text{WACC} = \text{cost of equity} \times \text{equity weight}$$
$$+ \text{cost of debt} \times \text{debt weight}$$

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

$$k_o = 0.0933 \times \frac{7,500}{12,500} + 0.06 \times \frac{5,000}{12,500}$$

$$k_o = 0.0933 \times 0.60 + 0.06 \times 0.40$$

$$= 0.056 + 0.025 = 0.08 \text{ or } 8\%$$

Example 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 capitalisation 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:

$$E = \frac{NOI - interest}{k_e} = \frac{NI}{k_e} = \frac{85,000}{0.10} = ₹850,000$$

$$D = \frac{Interest}{k_d} = \frac{15,000}{0.05} = ₹300,000$$

$$V = E + D = 850,000 + 300,000 = ₹1,150,000$$

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

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

The weighted average cost of capital, k_o, is:

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

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

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

Table 8.1 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 8.1, 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 WACC.

Table 8.1 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,	1,000,000	1,150,000	1,450,000

$V = E + D = \text{NOI}/k_o$

Debt/Total value, D/V	0.00	0.261	0.62
WACC, $\text{NOI} \div V$ $= k_e \times E/V + k_d \times D/V$	0.100	0.087	0.081

We construct Table 8.2 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.

Figure 8.1 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 8.1 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 that 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.
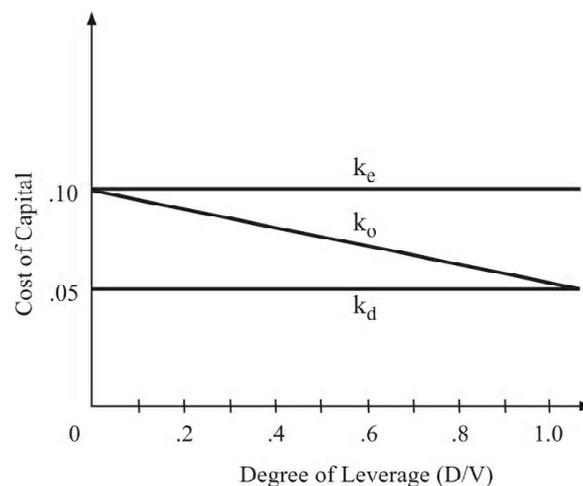
Figure. 8.1 The Effect of Leverage on the Cost of Capital under NI Approach

Table 8.2 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

8.2.2 Traditional Approach

The traditional approach 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 reaching the minimum level, it starts increasing with financial leverage. Hence, a firm has an optimum capital structure that occurs when WACC is minimum, and thereby maximizng 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 equity before debt financing. For example, suppose that the cost of capital for 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 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:

$$\text{WACC} = \text{cost of equity} \times \text{weight of equity}$$
$$+ \text{cost of debt} \times \text{weight of debt}$$

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

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 Example 2.

Example 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 8.3.

Table 8.3 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, $E = (\text{NOI– INT})/ k_e$	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:

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

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:

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

Criticism of the Traditional Approach

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.

Self Assessment Questions

1. The traditional theory implies that investors value levered firms more than unlevered firm. (True/False)

2. The _____ has emerged as a compromise to the extreme position taken by the NI approach.

Activity 1

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. Assuming the net income approach, what would be the firm's cost of capital and its value?

Hint: Refer Section 8.2.

8.3 Irrelevance of Capital Structure

8.3.1 NOI Approach

NOI Approach: According to NOI approach the market value of the firm is not affected by capital structure change. The market value of the firm is found by capitalizing the NOI at the overall or the WACC, which is a constant. The market value of the firm is $V = V_l = V_u = \dfrac{\text{NOI}}{k_d}$.

8.3.2 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.

Key Assumptions

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

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will not be a substitute for the corporate leverage if the borrowing and lending rates for individual investors are different from the 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 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:

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

$$V_l = V_u$$

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

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

where V is the market value of the firm and it is sum of the value of equity, $E,$ and the value of debt, D; $\text{NOI} = \text{EBIT} = \overline{X}$, 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.

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 8.2):

Levered firm's cost   =   Unlevered firm's cost

of capital (k_l)   of capital (k_u)

$$k_l = k_o = k_a = k_u$$
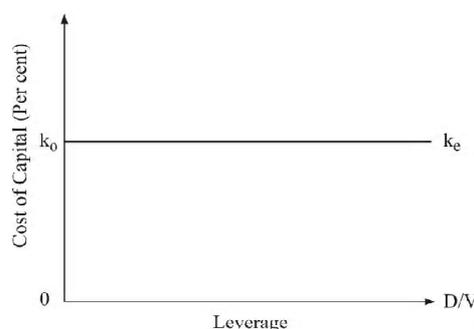
Figure 8.2 The Cost of Capital Under MM Proposition I

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.

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 to 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:

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

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

$$k_e = k_a + (k_a - k_d)\frac{D}{E} \qquad\qquad (5)$$

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, times 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 (5) 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.

The crucial part of Proposition II is that the levered firm's opportunity cost of capital will not rise even if very excessive use of financial leverage is made. The excessive use of debt increases the risk of default. Hence, in practice, the cost of debt, k_d, will increase with high level of financial leverage. MM argue that when k_d increases, k_e will increase at a decreasing rate and may even turn down eventually.[12] The reason for this behaviour of k_e, is that debt-holders, in the extreme leveraged situations, own the firm's assets and bear some of the firm's business risk. Since the operating risk of shareholders is transferred to debt-holders, k_e declines. This is illustrated in Figure 8.3.
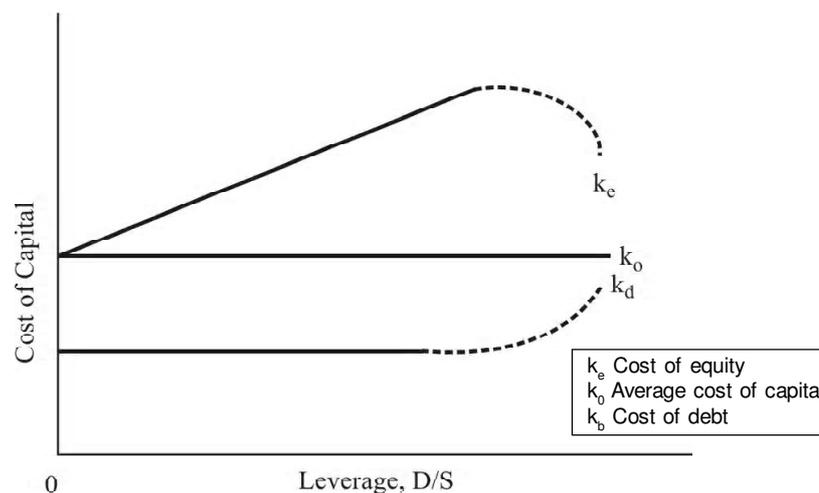
Figure 8.3 Cost of Equity under the MM Hypothesis

Criticism of the MM Hypothesis

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:

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.

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.

Transaction costs: The existence of transaction costs also interferes with the working of arbitrage. Due to 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.

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.

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.

Self Assessment Questions

3. Financial leverage does not affect a firm's net operating income, but it does affect _____ return.
4. The arbitrary process is the behavioural foundation for MM's hypothesis. (True/False)

8.4 Summary

Let us recapitulate the important concepts discussed in this unit:
- The value of a firm's shares (equity), E, is the discounted value of shareholders' earnings, called net income.
- The firm's overall cost of capital is the Weighted Average Cost of Capital (WACC).
- The traditional view has emerged as a compromise to the extreme position taken by the NI approach.
- The MM hypothesis can be best explained in terms of their two propositions.

8.5 Glossary

- **Levered firm:** It is defined as a firm that finances its assets by equity and debt.
- **Unlevered firm:** It is defined as a firm that uses no debt and finances its assets entirely by equity.

8.6 Terminal Questions

1. Describe the net income approach with an example.
2. Compare the NI approach with other traditional theories of capital structure.
3. Write a short note on the criticism of the traditional approach.
4. Explain MM hypothesis in terms of two propositions.
5. Present a critical analysis of the MM hypothesis.
6. Identify the key assumptions on which MM's Proposition I is based.

8.7 Answers

Self Assessment Questions

1. True
2. Traditional approach
3. Shareholder's
4. True

Terminal Questions

1. A firm that finances its assets by equity and debt is called a levered firm. For more details, refer section 8.2.1.
2. The traditional approach has emerged as a compromise to the extreme position taken by the NI approach. For more details, refer section 8.2.
3. The traditional theory implies that investors value levered firms more than unlevered firm. For more details, refer section 8.2.
4. MM's hypothesis has been based on two proposition: (I) and (II). For more details, refer section 8.3.2.
5. The arbitrary process is the behavioural foundation for MM's hypothesis. For more details, refer section 8.3.2.
6. MM's proposition I is based on certain assumptions. For more details, refer section 8.3.2.

8.8 Case Study

A company with net operating earnings of ₹ 5,00,000 is evaluating a number of possible capital structures. Which of the capital structures given below will you recomended and why?

Capital Structure	Debt in Capital Structure	Cost of debt K_i	Cost of equity K_e
1	3,00,000	10	12
2	5,00,000	11	14
3	7,00,000	14	16

Solution

Particulars	*Capital structure* (₹)	*Plans having debt of variant amount* (₹)	
	1	2	3
EBIT	₹5,00,000	₹5,00,000	₹5,00,000
(–) Interest	₹30,000	₹55,000	₹98,000
Net income NI	₹4,70,000	₹4,45,000	₹4,02,000
K_e	0.12	0.14	0.16
S (Market value of equity)	₹39,16,667	₹31,78,571	₹25,12,500
B (market value of debt)	₹3,00,000	₹5,00,000	₹7,00,000
Total market value (S + B) = V	₹42,16,667	₹36,78,517	₹32,12,500

Overall cost of capital (K_o)

$$= \left(\frac{EBIT}{V} \right)$$

	$\dfrac{₹5,00,000}{₹42,16,667}$	$\dfrac{5,00,000}{₹36,78,571}$	$\dfrac{₹5,00,000}{₹32,12,500}$
	= 0.11	= 0.13	= 0.15

Capital structure having debts of ₹3,00,000 is recommended.

Source: Collated by Vikas editorial team.

References

- Brigham, F. E. & Houston, F.J. (2013). *Fundamentals of Financial Management* (13th ed.). USA: South-West Cengage Learning.

- Ross, S., Westerfield, R. & Jaffe J. (2012). *Corporate Finance*. New Delhi: McGraw-Hill.

- Brigham, F.E. & Ehrhardt, C.M., *Financial Management: Theory & Practice* (2010). USA: South-West Cengage Learning.

- Berk, J., DeMarzo. P. & Thampy A. (2010). *Financial Management*. New Delhi: Pearson Education.

E-References

- http://vcmdrp.tums.ac.ir/files/financial/istgahe_mali/moton_english/financial_management_%5Bwww.accfile.com%5D.pdf (Retrieved on 28 May 2013)

- www.zenwealth.com/BusinessFinanceOnline/CB/CapitalBudgeting.html (Retrieved on 24 April 2013)

- www.kfknowledgebank.kaplan.co.uk/KFKB/Witi%20pages/Capital%Zorationing.aspx (Retrieved on 24 April 2013)

Unit 9   Sources of Finance

Structure

Caselet

Delite Furniture Company Limited (DFCL), situated in North of India, manufactures a range of home and office furniture and sells its product under the 'Delite' brand name, all over India. It is currently facing serious problems of maintaining high quality in its office furniture division, which operates on an old plant. These problems endanger the company's standing as producer of high-quality furniture. It has been approached, through a common banker, by a competing furniture manufacturing company in the East of India to become its trade partner and distribute its office furniture under its own brand name—Delite. The competitor's product is of good quality and is well known in Eastern India, but its products are not known in the rest of the country. If DFCL agrees to the competitor's offer, it will have to close the manufacturing set-up of the office furniture division and restructure the division as a marketing division. The cost of restructuring the division is estimated to be ₹60 crore.

DFCL's evaluation of the proposal indicates that it will be quite profitable to use its brand name to sell the quality product of the competitor. Because of the relatively lower costs in the East of India, the competitor's range of office furniture is about 5 to 10 per cent less costly. DFCL will be able to sell more than what it was able to sell of its own furniture. DFCL could enter into a five-year agreement with its competitor for selling its office furniture. It is

estimated that DFCL will have PBIT (Profit before Interest and Tax) of ₹24 crore p.a. for five years, from this arrangement.

DFCL's worry is to finance the restructuring of the office furniture division. The management is faced with three alternative means of financing: (*i*) internal financing by reducing the dividend, (*ii*) a rights issue and (*iii*) long-term loan from a bank at a fixed rate of 10 per cent p.a.

The company's latest annual report shows that it has paid up share capital of ₹400 crore (par value each share ₹100) and reserves and surplus of ₹260 crore. It has a high debt ratio. The current profit after tax is ₹80 crore and the proposed dividends of ₹50 crore. There is 20 per cent tax on dividends paid to shareholders and the corporate tax is 36.5 per cent. DFCL's required rate of return is 18 per cent. The company's share is selling in the range of ₹170–195. The company's investment banker suggests an issue price of ₹170 if it goes for a rights issue. The finance director thinks that the issue price in the case of the rights issue should be fixed at ₹190.

9.1 Introduction

In the previous unit, you learnt the the relevance of capital structure, the NI and the NOI approach. This unit will explain the various sources of finance for a firm. The two long-term securities available to a company for raising capital are—shares and debentures. Shares include ordinary (common) shares and preference shares. Ordinary shares provide ownership rights to investors. Debentures or bonds provide loan capital to the company, and investors get the status of lenders. Loan capital is also directly available from the financial institutions to the companies. Corporates also raise fixed deposits from the public.

Objectives

After studying the unit, you should be able to:

- discuss the features of short-term financing
- explain the features of ordinary shares
- analyse the pros and cons of equity financing
- evaluate the pros and cons of debentures and preference shares

9.2 Short-term Finance

Banks are the main institutional sources of working capital finance in India. After trade credit, bank credit is the most important source of financing working capital requirements. A bank considers a firm's sales and production plans and the desirable levels of current assets in determining its working capital requirements. The amount approved by the bank for the firm's working capital is called credit limit. Credit limit is the maximum fund which a firm can obtain from the banking system. In the case of firms with seasonal businesses, banks may fix separate limits for the peak level credit requirement and normal, non-peak level credit requirement indicating the periods during which the separate limits will be utilised by the borrower. In practice, banks do not lend 100 per cent of the credit limit; they deduct margin money. Margin requirement is based on the principle of conservatism and is meant to ensure security. If the margin requirement is 30 per cent, bank will lend only up to 70 per cent of the value of the asset. This implies that the security of bank's lending should be maintained even if the asset's value falls by 30 per cent.

Forms of Bank Finance: A firm can draw funds from its bank within the maximum credit limit sanctioned. It can draw funds in the following forms: (*a*) overdraft, (*b*) cash credit, (*c*) bills purchasing or discounting, and (*d*) working capital loan.

Overdraft: Under the overdraft facility, the borrower is allowed to withdraw funds in excess of the balance in his current account up to a certain specified limit during a stipulated period. Though overdrawn amount is repayable on demand, they generally continue for a long period by annual renewals of the limits. It is a very flexible arrangement from the borrower's point of view since he can withdraw and repay funds whenever he desires within the overall stipulations. Interest is charged on daily balances—on the amount actually withdrawn—subject to some minimum charges. The borrower operates the account through cheques.

Cash credit: The cash credit facility is similar to the overdraft arrangement. It is the most popular method of bank finance for working capital in India. Under the cash credit facility, a borrower is allowed to withdraw funds from the bank upto the sanctioned credit limit. He is not required to borrow the entire sanctioned credit once, rather, he can draw periodically to the extent of his requirements and repay by depositing surplus funds in his cash credit account. There is no commitment charge; therefore, interest is payable on the amount actually utilised by the borrower. Cash credit limits are sanctioned against the security of current assets. Though funds borrowed are repayable on demand, banks usually do

not recall such advances unless they are compelled by adverse circumstances. Cash credit is a most flexible arrangement from the borrower's point of view.

Purchase or discounting of bills: Under the purchase or discounting of bills, a borrower can obtain credit from a bank against its bills. The bank purchases or discounts the borrower's bills. The amount provided under this agreement is covered within the overall cash credit or overdraft limit. Before purchasing or discounting the bills, the bank satisfies itself as to the creditworthiness of the drawer. Though the term 'bills purchased' implies that the bank becomes owner of the bills, in practice, the bank holds bills as security for the credit. When a bill is discounted, the borrower is paid the discounted amount of the bill (viz., full amount of bill minus the discount charged by the bank). The bank collects the full amount on maturity.

To encourage bills as instruments of credit, the Reserve Bank of India introduced the new bill market scheme in 1970. The scheme was intended to reduce the borrowers' reliance on the cash credit system which is susceptible to misuse. It was also envisaged that the scheme will facilitate banks to deploy their surpluses or deficits by rediscounting or selling the bills purchased or discounted by them. Banks with surplus funds could repurchase or rediscount bills in the possession of banks with deficits. There can be situation where every bank wants to sell its bills. Therefore, the Reserve Bank of India plays the role of the lender of last resort under the new bill market scheme. Unfortunately, the scheme has not worked successfully so far.

Letter of credit: Suppliers, particularly the foreign suppliers, insist that the buyer should ensure that his bank will make the payment if he fails to honour its obligation. This is ensured through a letter of credit (L/C) arrangement. A bank opens an L/C in favour of a customer to facilitate his purchase of goods. If the customer does not pay to the supplier within the credit period, the bank makes the payment under the L/C arrangement. This arrangement passes the risk of the supplier to the bank. Bank charges the customer for opening the L/C. It will extend such facility to financially sound customers. Unlike cash credit or overdraft facility, the L/C arrangement is an indirect financing; the bank will make payment to the supplier on behalf of the customer only when he fails to meet the obligation.

Working capital loan: A borrower may sometimes require *ad hoc* or temporary accommodation in excess of sanctioned credit limit to meet unforeseen contingencies. Banks provide such accommodation through a demand loan account or a separate non-operable cash credit account. The borrower is required to pay a higher rate of interest above the normal rate of interest on such additional credit.

Security Required in Bank Finance: Banks generally do not provide working capital finance without adequate security. The following are the modes of security which a bank may require.

- **Hypothecation:** Under hypothecation, the borrower is provided with working capital finance by the bank against the security of movable property, generally inventories. The borrower does not transfer the property to the bank; he remains in the possession of property made available as security for the debt. Thus hypothecation is a charge against property for an amount of debt where neither ownership nor possession is passed to the creditor. Banks generally grant credit hypothecation only to first class customers with highest integrity. They do not usually grant hypothecation facility to new borrowers.

- **Pledge:** Under this arrangement, the borrower is required to transfer the physical possession of the property offered as a security to the bank to obtain credit. The bank has a right of lien and can retain possession of the goods pledged unless payment of the principal, interest and any other expenses is made. In case of default, the bank may either (*a*) sue the borrower for the amount due, or (*b*) sue for the sale of goods pledged, or (*c*) after giving due notice, sell the goods.

- **Mortgage:** Mortgage is the transfer of a legal or equitable interest in a specific immovable property for the payment of a debt. In case of mortgage, the possession of the property may remain with the borrower, with the lender getting the full legal title. The transferor of interest (borrower) is called the mortgagor, the transferee (bank) is called the mortgagee, and the instrument of transfer is called the mortgage deed.

   The credit granted against immovable property has some difficulties. They are not self-liquidating. Also, there are difficulties in ascertaining the title and assessing the value of the property. There is limited marketability, and therefore, security may often be difficult to realise. Also, without the court's decree, the property cannot be sold. Usually, for working capital finance, the mode of security is either hypothecation or pledge. Mortgages may be taken as additional security.

- **Lien:** Lien means right of the lender to retain property belonging to the borrower until he repays credit. It can be either a particular lien or general lien. Particular lien is a right to retain property until the claim associated with the property is fully paid. General lien, on the other hand, is applicable till all dues of the lender are paid. Banks usually enjoy general lien.

Self Assessment Questions

1. A firm can draw funds from its bank within the maximum_____ sanctioned.

2. Mortgage is the transfer of a legal or equitable interest in a specific immovable property for the payment of a debt. (True/False)

Activity 1

List the various methods through which short-term funds can be raised.

Hint: Refer section 9.3.

9.3 Long-term Funds

9.3.1 Ordinary Shares or Equity

Ordinary shares (referred to as common shares in the US) represent the ownership position in a company. The holders of ordinary shares, called shareholders (or stockholders in the US), 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 shareholders by purchasing ordinary shares, they are entitled for dividends. The amount or rate of dividend is not fixed; it is decided by the company's board of directors. 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 9.1 shows the details of share capital for the Tata Motors Company Limited.

Table 9.1 Tata Motors' Share Capital as on 31 March 2008

	(₹ in crore)
(*a*) Authorized 45,000,000 equity shares of ₹10 each	450.00
(*b*) Issued 38,53,03,954 equity shares of ₹10 each	384.54
(*c*) Subscribed and paid up 38,53,03,054 equity shares of ₹10 each fully paid up	384.54
(*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: ₹7,839.50 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 a ordinary share is in the denomination of Rs 100 or Rs 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:

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

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.

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: dividends and 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.

Claim on assets: Ordinary shareholders also have a residual claim on the company's assets in the case of 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.

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 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.

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.

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.

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 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 and frequent. A company tries to pay dividend regularly. It cuts dividend only when it cannot manage cash to pay dividends. For example, in 1986 the Reliance Industries Limited experienced a sharp drop in its profits and had a severe liquidity problem; 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: Dividends are not tax deductible as are interest payments, and 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.

Valuation of Ordinary Shares

The general principle of valuation applies to the share valuation. The value of a share today depends on cash inflows expected by investors and the risks

associated with those cash inflows. Cash inflows expected from an equity share consist of dividends that the owner expects to receive while holding the share and the price, which he expects to obtain when the share is sold. The price, which the owner is expected to receive when he sells the share, will include the original investment plus a capital gain (or minus a capital loss).

Single Period Valuation   Let us assume that an investor intends to buy a share and will hold it for one year. Suppose he expects the share to pay a dividend of ₹2 next year, and would sell the share at an expected price of ₹21 at the end of the year. If the investor's opportunity cost of capital or the required rate of return (k_e) is 15 per cent, how much should he pay for the share today?

The present value of the share today, P_0, will be determined as the present value of the expected dividend per share, at the end of the first year, DIV_1, plus the present value of the expected price of the share, after a year, P_1.

$$P_0 = \frac{DIV_1 + P_1}{1 + k_e} \qquad\qquad (2)$$

$$P_0 = \frac{2 + 21}{1.15} = ₹\ 20$$

An under-valued share has a market price less than the share's present value. On the other hand, an over-valued share has a market price higher than the share's present value.

Multi-period Valuation   The investor will receive dividend for one year, DIV_1, and the share value, P_1, when he sells the share at the end of the year. The value of the share today is given by Equation (2).

Why does the new investor purchase the share at the end of one year? Because he also expects a stream of dividends during the period he holds the share plus the liquidating price of the share. What determines the next year's price (P_1) if the share is held for one year? The price next year (P_1) will depend on expected dividend in year 2 and expected price of the share at the end of year 2. For example, if we consider that DIV_2 = ₹2.10 and P_2 = ₹22.05, then P_1 is:

$$P_1 = \frac{2.10 + 22.05}{1.15} = ₹21$$

Today's price (P_0) can be calculated as the discounted value of dividends in years 1 and 2 and liquidating price at the end of year 2 as follows:

$$P_0 = \frac{2}{1.15} + \frac{2.10 + 22.05}{(1.15)^2} = ₹20$$

Thus, if Equation (2) holds, P_1 should be given by the following formula:

$$P_1 = \frac{DIV_2 + P_2}{1 + k_e} \tag{3}$$

We can express P_0 as follows:

$$P_0 = \frac{1}{1 + k_e}(DIV_1 + P_1)$$

By substituting the value of P_1 from Equation (3), we obtain the share price today as given below:

$$P_0 = \frac{1}{1 + k_e}\left[DIV_1 + \frac{DIV_2 + P_2}{1 + k_e}\right]$$

$$P_0 = \frac{DIV_1}{1 + k_e} + \frac{DIV_2 + P_2}{(1 + k_e)^2} \tag{4}$$

We can further extend the time horizon. We can, for example, determine the price of the share after 2 years (P_2):

$$_2 = \frac{DIV_3 + \;_3}{1 + } \tag{5}$$

and determine today's price, P_0, in terms of dividends for 3 years and price after 3 years. If the final period is n, we can write the general formula for share value as follows:

$$P_0 = \frac{DIV_1}{(1 + k_e)} + \frac{DIV_2}{(1 + k_e)^2} + \cdots + \frac{DIV_n + P_n}{(1 + k_e)^n} \tag{6}$$

$$P_0 = \sum_{t=1}^{n} \frac{DIV_t}{(1 + k_e)^t} + \frac{P_n}{(1 + k_e)^n} \tag{7}$$

In principle, the time horizon n could be very large; in fact, it can be assumed to approach infinity (¥). *If the time horizon, n, approaches to infinity, then the present value of the future price will approach to zero.* Thus the price of a share today is the present value of an infinite stream of dividends.

$$P_0 = \frac{DIV_1}{(1 + k_e)} + \frac{DIV_2}{(1 + k_e)^2} + \; \ldots \; + \frac{DIV_{n=\infty}}{(1 + k_e)^{n=\infty}} \tag{8}$$

$$P_0 = \sum_{t=1}^{n=\infty} \frac{DIV_t}{(1 + k_e)^t} \tag{9}$$

Public issue of equity

Public issue of equity means raising of share capital directly from the public. For example, Riga Sugar Company Limited (RSIL), 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 intended to part-finance its project for manufacturing industrial paper in Vapi, Gujarat. The share is issued at par at ₹10.

As per the existing norms, a company with a track record is free to determine the issue price for its shares. Thus, it can issue shares at a premium. However, a new company has to issue its shares at par.

Underwriting of issues: It is legally obligatory to underwrite a public and a rights issue. In an 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 a company to few selected investors, particularly the institutional investors like, 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.

Rights issue of equity shares

A **rights issue** involves selling of ordinary shares to the existing shareholders of the 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.

9.3.2 Preference Shares

Preference share is often considered to be a hybrid security since it has many features of both ordinary shares and debenture. It is similar to ordinary share 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 debenture 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.

Features

Preference share has several features. Some of them are common to all types of preference shares while others are specific to some they are:

- **Claims on income and assets:** Preference share is a senior security as compared to 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 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 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 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 be 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:** As per the provisions of the Company's Act, now a company is not allowed to issue irredeemable preference shares. The preferance shares are legally required to be redeemable and that too with a maximum matuarity period of 20 years. 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 not often retired in accordance with the stipulation since there are not serious penalties for violation of redemption feature.

- **Sinking fund:** Like in the case of debenture, 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. 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 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 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 per cent–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 share attractive, the government of India has introduced convertible cumulative preference share (CCPS). Unfortunately, companies in India have hardly used this security to raise funds.

Pros and cons of preference shares

Preference share has a number of advantages to the company, which ultimately benefits 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 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 on equity and it is fixed. Also, the company can redeem it when it does not require the capital. In practice, when a company reorganizes its capital, it may convert preference capital into equity. Some time equity may be converted into preference capital. For example, IDBI in 1994 proposed to convert its equity capital as preference capital.

Valuation of Preference Shares

The value of the preference share would be the sum of the present values of dividends and the redemption value.

A formula similar to the valuation of bond can be used to value preference shares with a maturity period:

Value of preference share = Present value of dividends + Present value of maturity value:

$$P_0 = \left[\frac{PDIV_1}{(1+k_p)^1} + \frac{PDIV_2}{(1+k_p)^2} + ... + \frac{PDIV_n}{(1+k_p)^n} \right] + \frac{P_n}{(1+k_p)^n}$$

$$P_0 = \sum_{t=1}^{n} \frac{PDIV_1}{(1+k_p)^t} + \frac{P_n}{(1+k_p)^t} \tag{10}$$

Example 1: Value of a Preference Share

Suppose an investor is considering the purchase of a 12-year, 10 per cent ₹100 par value preference share. The redemption value of the preference share on maturity is ₹120. The investor's required rate of return is 10.5 per cent. What should she be willing to pay for the share now?

The investor would expect to receive ₹10 as preference dividend each year for 12 years and ₹110 on maturity (i.e., at the end of 12 years). We can use the present value annuity factor to value the constant stream of preference dividends and the present value factor to value the redemption payment.

$$P_0 = 10 \times \left[\frac{1}{0.105} - \frac{1}{0.105 \times (1.105)^{12}} \right] + \frac{120}{(1.105)^{12}}$$

$$= 10 \times 6.506 + 120 \times 0.302 = 65.06 + 36.24 = \text{Rs } 101.30$$

Note that the present value of ₹101.30 is composite of the present value of dividends, ₹65.06 and the present value of the redemption value, ₹36.24. The ₹100 preference share is worth ₹101.3 today at 10.5 per cent required rate of return. The investor would be better off by purchasing the share for ₹100 today.

9.3.3 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 bond. Mostly public sector companies in India issue bonds. In the USA, the term debenture is generally understood to mean unsecured bond.

Features

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 as follows:

- **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 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 the 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 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 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. 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 5.1 explains the nature of debenture ratings given by CRISIL. The other examples include Credit Analysis and Research Ltd. (CARE), Investment Information and Credit Rating Agency (ICRA) and Fitch Rating (India) Pvt. Ltd.

- **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 yield could 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:

$$\text{Current yield} = \frac{\text{Annual interest}}{\text{Market price}} = \frac{140}{750}$$
$$= 0.187 \quad \text{or} \quad 18.7\%$$

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.

Valuation of Bonds

Suppose an investor is considering the purchase of a five-year, ₹1,000 par value bond, bearing a nominal rate of interest of 7 per cent per annum. The investor's required rate of return is 8 per cent. What should he be willing to pay now to purchase the bond if it matures at par?

The investor will receive cash ₹70 as interest each year for 5 years and ₹1,000 on maturity (i.e., at the end of the fifth year). We can thus determine the present value of the bond (B_0) as follows:

$$B_0 = \frac{70}{(1.08)^1} + \frac{70}{(1.08)^2} + \frac{70}{(1.08)^3} + \frac{70}{(1.08)^4} + \frac{70}{(1.08)^5} + \frac{1000}{(1.08)^5}$$

It may be observed that ₹70 is an annuity for 5 years and ₹1,000 is received as a lump sum at the end of the fifth year. Using the present value tables, given at the end of this book, the present value of bond is:

$$B_0 = 70 \times 3.993 + 1,000 \times 0.681 = 279.51 + 681 = ₹960.51$$

Bond value = Present value of interest + Present value of maturity value

$$B_0 = \left[\frac{INT_1}{(1+k_d)} + \frac{INT_2}{(1+k_d)^2} + ... + \frac{INT_n}{(1+k_d)^n} \right] + \frac{B_n}{(1+k_d)^n} s$$

$$B_0 = \sum_{t=1}^{n} \frac{INT_t}{(1+k_d)^t} + \frac{B_n}{(1+k_d)^n} \tag{11}$$

Notice that B_0 is the present value of a bond (debenture), INT_t is the amount of interest in period t (from year 1 to n), k_d is the market interest rate or the bond's required rate of return, B_n is bond's terminal or maturity value in period n and n is the number of years to maturity.

In Equation (11), the right-hand side consists of an annuity of interest payments that are constant (i.e., $INT_1 = INT_2... INT_t$) over the bond's life and a final payment on maturity. Thus, we can use the annuity formula to value interest payments as shown below:

$$B_0 = INT \times \left[\frac{1}{k_d} - \frac{1}{k_d(1+k_d)^n} \right] + \frac{B_n}{(1+k_d)^n} \tag{12}$$

Yield-to-Maturity

We can calculate a bond's yield or the rate of return when its current price and cash flows are known. Suppose the market price of a bond is ₹883.40 (face value being ₹1,000). The bond will pay interest at 6 per cent per annum for 5 years, after which it will be redeemed at par. What is the bond's rate of return? The **yield-to-maturity** (YTM) is the measure of a bond's rate of return that considers both the interest income and any capital gain or loss. YTM is bond's internal rate of return. The yield-to-maturity of 5-year bond, paying 6 per cent interest on the face value of ₹1,000 and currently selling for ₹883.40 is 10 per cent as shown below:

$$883.4 = \frac{60}{(1+\text{YTM})^1} + \frac{60}{(1+\text{YTM})^2} + \frac{60}{(1+\text{YTM})^3}$$

$$+ \frac{60}{(1+\text{YTM})^4} + \frac{60+1,000}{(1+\text{YTM})^5}$$

We obtain YTM = 10 per cent by trial and error.

It is, however, simpler to calculate a perpetual bond's yield-to-maturity. It is equal to interest income divided by the bond's price. For example, if the rate of interest on ₹1,000 par value perpetual bond is 8 per cent, and its price is ₹800, its YTM will be:

$$B_0 = \sum_{t=1}^{n=\infty} \frac{\text{INT}}{(1+k_d)^t} = \frac{\text{INT}}{k_d}$$

$$k_d = \frac{\text{INT}}{B_0} = \frac{80}{800} = 0.10 \text{ or } 10 \text{ per cent}$$

(13)

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.

1. Non-Convertible Debentures (NCDs)
2. Fully Convertible Debentures (FCDs)
3. Partly Convertible Debentures (PCDs)
4. Optionally Convertable Debentures (OCDs)

Pros and cons of debentures

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

- **Less costly:** It involves less cost to the firm than the equity financing because (*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.

- *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.

Debenture has some limitations also:

- *Obligatory payments:* Debenture results in legal obligation of paying interest and principal, which, if not paid, can force the company into liquidation.

- *Financial risk:* It increases the firm's financial leverage, which may be particularly disadvantageous to those firms which have fluctuating sales and earnings.

- *Cash outflows:* Debentures must be paid on maturity, and therefore, at some points, it involves substantial cash outflows.

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

9.3.4 Fixed Deposits from Public

There are several modes through which a company can borrow funds for its short-term working capital requirements. This includes borrowings from banks, corporate bodies, individuals, and so on. These borrowings may either be secured or unsecured. A company may also obtain fixed deposits from public/ shareholders to meet its short-term fund requirements subject to certain provisions under the Companies Act, 1956 (the Act)

Pursuant to the provisions of the Act (Section 58A), the company can invite deposit subject to the following conditions

- It is in accordance with the prescribed rules.

- An advertisement is issued showing the financial position of the company and

- The company is not in default in the repayment of any deposit or interest.

Period of fixed deposits

As per the existing rules the period of fixed deposits is from 6 months to 36 months from the date of acceptance of such deposits or from the date of its renewal. However, a company may accept deposits up to 10 per cent of its paid up capital and free reserves which are repayable after three months, from the date of such deposits or renewal thereof to meet any of its short-term requirements.

Rate of interest

Maximum rate of interest that a company can offer on fixed deposits is fixed from time to time.

9.3.5 Non-Banking Financial Companies (NBFCs)

The RBI regulates NBFCs engaged in equipment leasing, hire purchase finance, loan and investment, Residuary Non-Banking Companies (RNBCs) and the deposit taking activity of miscellaneous non-banking companies (chit funds). With the amendment of the RBI Act in 1997, it is obligatory for NBFCs to apply for a Certificate of Registration (COR).

The maximum rate of interest that the NBFCs including nidhi and chit fund companies can pay is at present 11.0 per cent per annum (effective March 4,2003). The minimum rate of interest payable by RNBCs also remained unchanged at 5 per cent per annum (to be compounded annually) on the amount of deposits received in lump sum or at monthly or longer intervals and at 3.5 per cent per annum (to be compounded annually) on the amount deposited under daily deposit scheme.

Self Assessment Questions

3. A_____involves selling of ordinary shares to the existing shareholders of a company.
4. It is not necessary to underwrite a public and a rights issue. (True/False)
5. A _____ is a long-term fixed income financial security.
6. There are several modes through which a company can borrow funds for its short-terms working capital requirements. (True/False)
7. Debenture holders are creditior of a firm. (True/False)
8. Ordinary shareholders have _____ ownership claim.

Activity 2

Find out the various methods through which a company can borrow funds for its short-term working capital requirements.

Hint: A company can obtain fixed deposits from public shareholders to meet its short-term requirements.

9.4 Summary

Let us recapitulate the important concepts discussed in this unit:

- Ordinary share, preference share and debentures are three important securities used by the firms to raise funds to finance their activities.
- Ordinary shares provide ownership rights to ordinary shareholders. They are the legal owners of the company. As a result, they have residual claims on income and assets of the company.
- The pre-emptive right of an ordinary shareholder entitles him to maintain his proportionate share of ownership in the company.
- One of India's strengths is that it has a well developed financial system comprising commercial banks, non-bank financing organizations, capital market institutions and insurance and pension funds.
- A company can also raise funds in the form of fixed deposits from the public shareholders to meet its short-term fund requirements.

9.5 Glossary

- ***Preference shares:*** It is a hybrid security since it has many features of both ordinary shares and debenture.
- ***Rights issue:*** It involves selling of ordinary shares to the existing shareholders of the company.
- ***Call feature:*** Permits the company to buy back preference shares at a stipulated buy-back or call price.
- ***Debenture:*** A debenture is a long-term promissory note for raising loan capital. The firm promises to pay interest and principal as stipulated.

9.6 Terminal Questions

1. What do you understand by short-term finance? Also explain the forms of bank finance available to a firm.
2. What are the features of ordinary shares?
3. What are the pros and cons of equity financing?
4. What are preference shares? Write briefly about its features.

5. Define debentures. Discuss its features.

6. How are fixed deposits raised from public?

9.7 Answers

Self Assessment Questions

1. Credit limit

2. True

3. Rights issue

4. False

5. Debenture

6. True

7. False

8. Residual

Terminal Questions

1. Banks are the main institutional source of working capital finance in India. For more details, refer section 9.2.

2. Ordinary share has a number of special features which distinguish if from other securities. For more details, refer section 9.3.1.

3. Equity capital is the most important long-term source of financing. It has advantages as well as disadvantages. For more details, refer section 9.3.1.

4. Preference share is often considered to be a hybrid security since it has features of ordinary shares and debentures. For more details, refer section 9.3.2.

5. A debenture is a long-term promissory note for raising capital. For more details, refer section 9.3.3.

6. A company may also obtain fixed deposits from public/shareholders to meet its short-term fund requirements subject to certain provisions under the Companies Act, 1956. For more details, refer section 9.3.4.

9.8 Case Study

German Remedies

German Remedies, established in 1949, is a well-known pharmaceutical company. It is a fast growing company. In the last decade, its gross fixed assets have grown from ₹6.60 crore to ₹31.60 crore. Except in 1986, the company has regularly paid dividend during the last 10 years. It has also been issuing bonus share to its shareholders. It has issued bonus shares in the ratio of 1:2 in 1976, 3:5 in 1979 and 1982 and 1:1 in 1991. The company had made its first public issue of shares in 1973 when it diluted its foreign equity by issuing 3.30 lakh equity shares of ₹10 each at a premium of ₹1. The issue was over-subscribed by 47 times. An investor who held one share in 1973 now holds 7.86 shares on account of issue of bonus shares.

The company has come up with an offer of 10.83 lakh 15 per cent secured, redeemable, partly convertible debentures of ₹100 each, totalling to ₹10.83 crore on rights basis, in the ratio of one debenture for every four equity shares held by the existing shareholders and employees. The issue has been given a rating of "*BBB +*" by CRISIL India (a credit rating organization), which implies sufficient protection to investors. The issue is intended to finance fixed investment of ₹3 crore for modernization of two units in the state of Maharashtra and long-term working capital requirements of ₹8.50 crore.

The following is the performance of the company between 990-1992:

In spite of growth in sales, net profits declined because of the increases in the cost of inputs.

	1990–91	*1991–92*
Sales (₹in crore)	67.80	72.63
Net Profit (₹in crore)	2.34	1.11
EPS (₹)	3.56	1.69
Dividend (%)	11.00	9.00
Book value (₹)	—	22.40
Market price (₹)	—	90.00
Borrowing (₹in crore)	24.50	32.50
Interest (₹in crore)	2.82	4.22

In the proposed issue, each debenture of ₹100 will have a convertible portion of ₹55 to be converted into one equity share on 1 December 1993. The non-convertible portion of ₹45 will be redeemed at par.

The company has made the following projections for the next three years:

	1992–93	1993–94	1994–95
Sales (₹crore)	93.85	105.10	118.77
Net profit (₹crore)	0.74	1.95	2.52
EPS (₹)	1.14	2.56*	3.31*

* On equity capital of ₹7.61 crore after conversion of debentures.

It may be noted that for the six-month period ending 30 September 1992, the company's sales were ₹40.37 crore with a net loss of ₹0.19 crore.

1. Explain the features of the proposed debenture.

2. Evaluate the proposed debenture issue from the points of views of investors and company.

References

- Brigham, F. E. & Houston, F.J. (2013). *Fundamentals of Financial Management* (13th ed.). USA: South-West Cengage Learning.

- Ross, S., Westerfield, R. & Jaffe J. (2012). *Corporate Finance*. New Delhi: McGraw-Hill.

- Brigham, F.E. & Ehrhardt, C.M., *Financial Management: Theory & Practice* (2010). USA: South-West Cengage Learning.

- Berk, J., DeMarzo. P. & Thampy A. (2010). *Financial Management*. New Delhi: Pearson Education.

- Paramasivan, C. & Subramanian, T. (2009) *Financial Management*. New Delhi: New Age International Publishers.

- James C. Vanhorne. (2000). *Fundamentals of Financial Management*. New Delhi: Prentice Hall Books.

E-References

- businesscasestudies.co.uk/business-theory/finance/source-of-finance.html (Retrieved on 24 April 2013)

- indiabudget.nic.in (Retrieved on 24 April 2013)

Unit 10   Asset-Based Financing

Structure

Caselet

Rohit Engineering is considering the lease of an equipment which has a purchase price of ₹3,50,000. The equipment has an estimated economic life of 5 years. As per the Income Tax Rule, a written down depreciation at 25 per cent is allowed. The lease rentals per year are ₹1,20,000. The company's marginal corporate tax rate is 50 per cent, before-tax borrowing rate for the company is 16 per cent. The company solved their problem on the following calculations.

Solution: The table below shows the cash flow consequences of the lease and NAL (net advantage or present value of lease).

1. Depreciation is calculated at 25 per cent (WDV) as follows:

Year	1	2	3	4	5
Dep.	87,500	65,625	49,219	36,914	27,685

2. Lost tax shield on depreciation is depreciation multiplied by tax rate.

3. Salvage value is assumed to be zero.

Net Present Value of Lease

Year	0	1	2	3	4	5
Purchase price avoided	350,000					
Lost DTS		–43,750	–32,813	–24,610	–18,457	–13,843
After-tax lease rentals		–60,000	–60,000	–60,000	–60,000	–60,000
Year	0	1	2	3	4	5
Net cash flows	350,000	–103,750	–92,813	–84,610	–78,457	–73,843
PV at 8%	350,000	–96,073	–79,541	–67,180	–57,666	–50,287
NPV	– 747					

The net present value of lease is negative. The company may like to purchase the equipment. The purchase option would still be better if the equipment has a salvage value at the end of its economic life.

10.1   Introduction

In the previous unit, you learnt about the various sources of financing for a firm. This unit discusses the different financing alternatives for a company which help to lower their cost and reduce risk.

Traditional financing is related to the liability side of the balance sheet. The firm issues long-term debt or equity to meet its financing needs, and in the process, expands its capitalization. The dangers of traditional financing are that equity becomes an expensive method of financing because of decreasing corporate earnings and low price-earning ratios. The high rate of inflation causes long-term debt to be an expensive source of financing as interest rates rise. The corporate finance managers, therefore, are developing financing alternatives related to the asset side of the balance sheet. These alternatives may lower the cost and redistribute the risk. Asset-based financing uses assets as direct security.

Objectives

After studying this unit, you should be able to:

- assess the importance of lease
- explain the advantages and disadvantages of leasing
- describe hire purchase financing
- evaluate the role of banks and financial institutions in infrastructure financing

10.2   Lease Financing

Leasing is widely used in western countries to finance investments. In the USA, which has the largest leasing industry in the world, lease financing contributes approximately one-third of total business investments. In the changing economic and financial environment of India, it has assumed an important role. What is lease financing? What are its advantages and disadvantages? How can a lease be evaluated?

10.2.1 Lease Defined

Lease is a contract between a lessor, the owner of the asset, and a lessee, the user of the asset. Under the contract, the owner gives the right to use the asset to the user over an agreed period of time for a consideration called the lease rental. The lessee pays the rental to the lessor as regular fixed payments over a period of time at the beginning or at the end of a month, quarter, half-year, or a year. Although generally fixed, the amount and timing of payment of lease rentals can be tailored to the lessee's profits or cash flows. In up-fronted leases, more rentals are charged in the initial years and less in the later years of the contract. The opposite happens in back-ended leases. At the end of the lease contract, the asset reverts to the lessor, who is the legal owner of the asset. As the legal owner, it is the lessor not lessee, who is entitled to claim depreciation on the leased asset. In long-term lease contracts, the lessee is generally given an option to buy or renew the lease. Sometimes, the lease contract is divided into two parts—primary lease and secondary lease for the purposes of lease rentals. Primary lease provides for the recovery of the cost of the asset and profit through lease rentals during a period of about four or five years. A perpetual, secondary lease may follow it on nominal lease rentals. Various other combinations are possible.

Although the lessor is the legal owner of a leased asset, the lessee bears the risk and enjoys the returns. The lessee benefits if the leased assets operates profitably, and suffers if the asset fails to perform. Leasing separates ownership and use as two economic activities, and facilitates asset use without ownership.

A lessee can be an individual or a firm interested in the use of an asset without owning. Lessors may be an equipment manufacturers or leasing companies who bring together the manufacturers and the users. In the USA, equipment manufacturers are the largest group of lessors followed by banks. In India, independent leasing companies form the major group in number in the leasing industry. Banks together with financial institutions are the largest group in terms of the volume of business.

10.2.2 Types of Leases

Two types of leases can be distinguished:

- Operating lease
- Financial lease

Operating lease

Short-term, cancellable lease agreements are called operating leases. Convenience and instant services are the hallmarks of operating leases. Examples: a tourist renting a car, lease contracts for computers, office equipment, car, trucks and hotel rooms. For assets such as computers or office equipment, an operating lease may run for three to five years. The lessor is generally responsible for maintenance and insurance. He may also provide other services. A single operating lease contract may not fully amortise the original cost of the asset; it covers a period considerably shorter than the useful life of the asset. Because of the short duration and the lessee's option to cancel the lease, the risk of obsolescence remains with the lessor. Naturally, the shorter the lease period and/or higher the risk of obsolescence, the higher will be the lease rentals.

Financial lease

Long-term, non-cancellable lease contracts are known as financial leases. Examples are plant, machinery, land, building, ships, and aircraft. In India, financial leases are very popular with high-cost and high technology equipment. Financial leases amortise the cost of the asset over the term of lease; they are, therefore, also called capital or full-payout leases. Most financial leases are direct

leases. The lessor buys the asset identified by the lessee from the manufacturer and signs a contract to lease it out to the lessee.

10.2.3 Cash Flow Consequences of a Financial Lease

A financial lease has cash flow consequences. It is a way of normal financing for a company. Suppose a company has found it financially worthwhile to acquire an equipment costing ₹800 lakh, and the equipment is estimated to last eight years. Instead of buying, the company can lease the equipment for eight years at an annual (end-of-the period) lease rental of ₹160 lakh from the manufacturer. Suppose that the company will have to provide for the maintenance, insurance, and other operating expenses associated with the use of the asset in both alternatives—leasing or buying. Assume a straight-line depreciation for tax purposes, a borrowing rate of 14 per cent, and a marginal tax rate of 35 per cent for the company. The cash flow consequences of the lease (as compared to the buy option) are shown in Table 10.1. They would be:

- **Avoidance of the purchase price (P_0):** The company can acquire the asset without immediately paying for it. Cash outflow saved is equivalent to a cash inflow; there is a cash inflow of ₹ 800 lakh.

- **Loss of Depreciation Tax Shield (DTS):** Depreciation is a deductible expense and saves taxes. Depreciation tax shield is equal to the amount of depreciation each year multiplied by the tax rate. The company will lose a series of depreciation tax shields when it takes the lease. The straight-line depreciation will be: ₹800/8 = ₹100 lakh, and the lost DTS will be: ₹100 × 0.35 = ₹35 lakh.

- **After-tax payment of Lease rentals (L_t):** There is a cash outflow of ₹160 lakh per year as lease payment. But these payments will yield tax shield of ₹160 × 0.35 = ₹56 lakh per year. Thus, the after-tax lease payments would be ₹160 lakh – ₹56 lakh = ₹104 lakh per year.

  The cash flow consequences of leasing depend on the tax status of a company; tax shields are available only when the company pays taxes. In case it does not, then depreciation is worth nothing. Also, tax shields would vary with the marginal tax rate for the company.

Table 10.1 Cash Flow Consequences of a Lease

(₹ in lakh)

Year (1)	Purchase Price (P_0) (2)	Avoided Depreciation (D) (3)	Depreciation Tax Shield (DTS) (4) = (3) × 0.35	Before-tax Lease Rentals (BTLR) (5)	After-tax Lease (ALR) (6) = .65 × (5)	Net Cash Flow (NCF) (7) = (1) + 4 + (5)
0	800				800	
1		−100	−35	−160	−104	−139
2		−100	−35	−160	−104	−139
3		−100	−35	−160	−104	−139
4		−100	−35	−160	−104	−139
5		−100	−35	−160	−104	−139
6		−100	−35	−160	−104	−139
7		−100	−35	−160	−104	−139
8		−100	−35	−160	−104	−139

10.2.4 Disadvantages of Leasing

We can now examine the disadvantages of leasing.

Leasing does not provide 100 per cent financing: One misconception about leasing is that it provides 100 per cent financing for the asset as the lessee can avoid payment for acquiring the asset. The lessee, it is assumed, can preserve his liquid resources for other purposes. When a firm borrows to buy an asset, cash increases with borrowing and decreases by the same amount with the purchase of the asset. It has the asset to use but a liability to repay the loan and interest. In leasing also, the firm acquires the asset and incurs the liability to make fixed payments in future. In practice, therefore, leasing, like borrowing, commits the company for a stream of payments in future.

Leasing does not provide off-the-balance-sheet financing: As per Accounting Standard 19 (AS19), in case of financial lease the lessee is required to capitalize the asset in the balance sheet and the amount of lease finance is required to be disclosed as the liability. As such, the balance sheet of the lessee is affected and in any case it is not off-the-balance mode of financing. Contractual obligations of any form through a lease or loan, reduce debt servicing ability and add to financial risk. Lenders recognise the lessee's cash flow burden arising from lease payments. As a lease uses the firm's debt capacity, it displaces debt.

Leasing can certainly help companies which have enough debt servicing ability but cannot borrow from banks or financial institutions on account of institutional norms on debt-equity or regulations. Under no circumstances can a lease enhance the firm's debt capacity.

Leasing does not improve performance: Another myth is that the return on investment (profits divided by investment) will increase since a lease does not appear as an investment on the books or the balance sheet. Besides, back-ended leases enable showing higher profits in the initial years of the lease. Such performance ratios are illusory.

A firm's value is affected by the value of its assets and liabilities rather than book profits created through accounting adjustments. A lease will create value to the firm only if the benefits from it are more than its costs.

Leasing does not avoid control of capital spending: Another misconception is that leasing does not need capital expenditure screening as no investments are involved. Since a long-term lease involves long-term financial commitments, it ought to be screened accordingly in any good capital expenditure planning and control system. If leasing is not screened and is used to circumvent capital expenditure screening and approval, it may add to the firm's risk, make it vulnerable to business fluctuations, and endanger its survival.

10.2.5 Advantages of Leasing

If all these myths are exploded, why then should a company lease instead of following the straightforward alternative of a secured loan and purchase of the asset? The primary consideration is the cost of lease vs. cost of buying. They can be different. For, if a firm is incurring losses or making low profits, it cannot take full advantage of the depreciation tax shield on purchase of assets. It is, therefore, sensible for it to let the leasing company (lessor) own the assets, take full advantage of tax benefits, and expect that the lessor passes on at least some part of the benefits in the form of reduced lease rentals. Both the lessor and the lessee may stand to gain financially.

Apart from these tangible financial implications, there are other real advantages to leasing.

Convenience and flexibility: If an asset is needed for a short period, leasing makes sense. Buying an asset and arranging to resell it after use is time consuming, inconvenient and costly.

Long-term financial leases also offer flexibility to the user. In India, borrowing from banks and financial institutions involve long, complicated

procedures. Institutions often put restrictions on borrowers, stipulate conversion of loan into equity, and appoint nominee directors on the board. Financial leases are less restrictive and can be negotiated faster, especially if the leasing industry is well developed. Yet another advantage of a lease is the flexibility it provides to tailor lease payments to the lessee's cash flows. Such tailored payment schedules are helpful to a lessee who has fluctuating cash flows.

New or small companies in non-priority sectors such as confectioneries, bottlers and distilleries find it difficult to raise funds from banks and financial institutions in India.

Shifting of risk of obsolescence: When the technology embedded in assets, as in a computer, is subject to rapid and unpredictable changes, a lessee can, through a short-term cancellable lease, shift the risk of obsolescence to the lessor. A manufacturer-lessor, or a specialised leasing company, is usually in a better position than the user to assume the risk of obsolescence and manage the fast advancing technology. Specialised leasing companies are emerging in India. In fact, in such situations, the lessee is buying an insurance against obsolescence, paying a premium in terms of higher lease rentals.

Maintenance and specialised services: With a full-service lease, a lessee can look for advantages in maintenance and specialised services. For example, computer manufacturers who lease out computers are better equipped than the user to provide effective maintenance and specialised services. Their cost too may be less than what the lessee would have to incur if he were to maintain the leased asset. The lessor is able to provide maintenance and other services cheaply because of his larger volume and specialisation. He may pass on a part of that advantage to the lessee. We do not yet have in India many integrated specialised leasing companies.

Activity 1

Readymade Garments Limited wants to lease a computer system for the purpose of colour matching. The system will cost ₹30 lakh, and if bought, it can be depreciated over its life of five years. The annual rentals, payable at the end of year for five years, will be ₹8.4 lakh. The applicable written-down depreciation rate is 25 per cent. The lessor will maintain the computer system at its cost which works out to be ₹50,000 per year. At the end of its useful life, the system can be sold for 50 per cent of its depreciated value. The company's borrowing rate is 14 per cent and tax rate is 35 per cent. Should the system be leased? Show your calculations.

Hint: Refer section 10.2

Self Assessment Questions

1. A contract between a lessor and a lessee is known as a _____.
2. Leasing provides 100 per cent financing. (True/False)

10.3   Hire Purchase Financing

Hire purchase financing is a popular financing mechanism, especially in certain sectors of Indian business such as the automobile sector. In hire purchase financing, there are three parties: the manufacturer, the hiree and the hirer. The hiree may be a manufacturer or a finance company. The manufacturer sells asset to the hiree who loans it to the hirer in exchange for the payment to be made over a specified period of time (Figure 10.1).
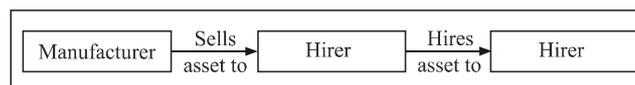
Figure 10.1 Hire Purchase Financing

A hire purchase agreement between the hirer and the hiree involves the following three conditions:

- The owner of the asset (the hiree or the manufacturer) gives the possession of the asset to the hirer with an understanding that the hirer will pay agreed instalments over a specified period of time.
- The ownership of the asset will transfer to the hirer on the payment of all instalments.
- The hirer will have the option of terminating the agreement any time before the transfer of ownership of the asset.

Thus, for the hirer, the hire purchase agreement is like a cancellable lease with a right to buy the asset. The hirer is required to show the hired asset on his balance sheet and is entitled to claim depreciation, although he does not own the asset until full payment has been made. The payment made by the hirer is divided into two parts: interest charges and repayment of principal. The hirer, thus, gets tax relief on interest paid and not the entire payment.

Features of Hire Purchase Agreement

- The buyer takes possession of goods immediately and agrees to pay the total hire purchase price in installments.

- Each installment is treated as hire charges.
- The ownership of the goods passes from the seller to the buyer on the payment of the last installment.
- In case the buyer makes any default in the payment of any installment the seller has the right to repossess the goods from the buyer and forfeit the amount already received treating it as hire charges.

The hirer has the right to terminate the agreement any time before the property passes. That is, he has the option to return the goods in which case he need not pay installments falling due thereafter. However, he cannot recover the sums already paid as this money legally represents hire charges on the goods in question.

Hire Purchase Financing vs. Lease Financing

Both hire purchase financing and lease financing are a form of secured loan. Both displace the debt capacity of the firm since they involve fixed payments. However, they differ in terms of the ownership of the asset. The hirer becomes the owner of the asset as soon as he pays the last instalment. In case of a lease, the asset reverts back to the lessor at the end of lease period. In practice, the lessee may be able to keep the asset after the expiry of the primary lease period for nominal lease rentals. The following are the differences between hire purchase financing and lease financing (Table 10.2):

Table 10.2 Difference between Leasing and Hire Purchase Financing

Hire Purchase Financing	**Lease Financing**
• *Depreciation* Hirer is entitled to claim depreciation tax shield.	• *Depreciation* Lessee is not entitled to claim depreciation tax shield.
• *Hire purchase payments* Hire purchase payments include interest and repayment of principal. Hirer gets tax benefits only on the interest.	• *Lease payments* Lessee can charge the entire lease payments for tax purposes. Thus, he/she saves taxes on the lease payments.
• *Salvage value* Once the hirer has paid all instalments, he becomes the owner of the asset and can claim salvage value.	• *Salvage value* Lessor does not become owner of the asset. Therefore, he has no claim over the asset's salvage value.

Instalment Sale

In contrast to the acquisition of an asset on the hire purchase basis, a customer can buy and own it outrightly, on instalment basis. Instalment sale is a credit

sale and the legal ownership of the asset passes immediately to the buyer, as soon as the agreement is made between the buyer and the seller. The outstanding instalments are treated as secured loan. As the owner of the asset, the buyer is entitled to depreciation and interest as deductible expenses and can claim salvage value on the sale of the asset. Except for the timing of the transfer of ownership, instalment sale and hire purchase are similar in nature.

Hire Purchase vs Instalment Sale

Both the systems of consumer credit look similar and are very popular in financing but there is a clear distinction between the two. In an instalment sale, as soon as the contract of sale is entered into, the goods are delivered and the ownership is transferred to the buyer but the price is paid in specified instalments over a period of time. In case of hire purchase, the ownership is transferred after the payment of the last instalment or when the hirer exercises his option to buy the goods. In hire purchase the hirer can purchase the goods at any time during the term of the agreement and he has the option to return the goods at any time without having to pay the rest of the instalments. But in instalment payment financing there is no such option to the buyer.

Hire Purchase Agreement

As far as the terms and conditions are concerned a hire purchase agreement is in many ways similar to a lease agreement. The important clauses in a hire purchase agreement are:

1. **Nature of Agreement:** Stating the nature, term and commencement of the agreement.

2. **Delivery of Equipment:** The place and time of delivery and the hirer's liability to bear delivery charges.

3. **Location:** The place where the equipment shall be kept during the period of hire.

4. **Inspection:** That the hirer has examined the equipment and is satisfied with it.

5. **Repairs:** The hirer to obtain at his cost, insurance on the equipment and to hand over the insurance policies to the owner.

6. **Alteration:** The hirer not to make any alterations, additions and so on to the equipment, without prior consent of the owner.

7. **Termination:** The events or acts of hirer that would constitute a default eligible to terminate the agreement.

8. **Risk:** The loss and damages to be borne by the hirer.

9. **Registration and fees:** The hirer to comply with the relevant laws, obtain registration and bear all requisite fees.

10. **Indemnity clause:** The clause as per Contract Act, to indemnify the lender.

11. **Stamp duty:** Clause specifying the stamp duty liability to be borne by the hirer.

12. **Schedule:** The equipments forming subject matter of agreement.

13. **Schedule of hire charges:** The agreement is usually accompanied by a promissory note signed by the hirer for the full amount payable under the agreement including the interest and finance charges.

Self Assessment Questions

3. Under the hire purchase system, the buyer takes _____ of the goods immediately.

4. The risk of damage and loss is borne by the buyer under the hire purchase system. (True/False)

10.4   Infrastructure Project Financing

There is a growing realization in many developing countries, of the limitations of governments, in managing and financing economic activities, particularly large infrastructure projects. Provision of infrastructure facilities, traditionally in the government domain, is now being offered for private sector investments and management. This trend has been reinforced by the resource crunch faced by many governments. Infrastructure projects are usually characterized by large investments, long gestation periods, and very specific domestic markets.

In evaluating these projects, an important question is the appropriate rate of return on the equity investment. Tolls and tariffs are set so as to recover operating costs and to provide a return to capital—the interest and repayment of debt and return on equity. Therefore, the decision on the appropriate return to equity has implications for the overall viability and acceptability of the project. While most elements of costs can be determined with reference to market prices, return to equity cannot be determined in the same way since most of the equity is provided by the sponsor or by a small number of investors. This

leaves room for disagreement on the appropriate return to equity. In the case of the Indian power projects, this has been one of the contentious issues.

10.4.1 What is Project Financing?

In project financing, the project, its assets, contracts, inherent economics and cash flows are separated from their promoters or sponsors, in order to permit credit appraisal and loan to the project, independent of the sponsors. The assets of the specific project serve as collateral for the loan, and all loan repayments are made out of the cash flows of the project. In this sense, the loan is said to be of non-recourse or limited recourse to the sponsor. Thus, project financing may be defined as that scheme of 'financing of a particular economic unit, in which a lender is satisfied in looking at the cash flows and the earnings of that economic unit as a source of funds, from which a loan can be repaid, and to the assets of the economic unit as a collateral for the loan'. In the past, project financing was mostly used in oil exploration and other mineral extraction projects through joint ventures with foreign firms. The most recent use of project financing can be found in infrastructure projects, particularly in power and telecommunication projects.

Project financing is made possible by combining undertakings and various kinds of guarantees by parties who are interested in a project. It is built in such a way that no one party alone has to assume the full credit responsibility of the project. When all the undertakings are combined and reviewed together, it results in an equivalent of the satisfactory credit risk for the lenders. It is often suggested that project financing enables a parent company to obtain inexpensive loans, without having to bear all the risks of the project. This is not true. In practice, the parent company is affected by the actual plight of the project, and the interest on the project loan depends on the parent's stake in the project.

The traditional form of financing is the corporate financing or the balance sheet financing. In this case, although financing is apparently for a project, the lender looks at the cash flows and assets of the whole company in order to service the debt and provide security. The following are the characteristics of project financing:

- **Separate project entity:** A separate project entity is created that receives loans from lenders and equity from sponsors. This entity is called Special Purpose Vehicle/Enterprise (SPV or SPE).
- **Leveraged financing:** The component of debt is very high in project financing. Thus, project financing is a highly leveraged financing.

- **Cash flows separated:** The project funding and all its other cash flows are separated from the parent company's balance sheet.

- **Collateral:** Debt services and repayments entirely depend on the project's cash flows. Project assets are used as collateral for loan repayments.

- **Sponsor's guarantees:** Project financiers' risks are not entirely covered by the sponsor's guarantees.

- **Risk sharing:** Third parties like suppliers, customers, government and sponsors commit to share the risk of the project.

Project financing is most appropriate for those projects which require large amount of capital expenditure and involve high risk. It is used by companies to reduce their own risk by allocating the risk to a number of parties. It allows sponsors to:

- finance projects larger than what the company's credit and financial capability would permit,

- insulate the company's balance sheet from the impact of the project,

- use high degree of leverage to benefit the equity owners.

Subject to the conditions given below, the banks and financial institutions are free to finance technically feasible, financially viable and bankable projects undertaken by both public and private sector undertakings.

- The amount sanctioned should be within the overall ceiling of the exposure norms prescribed by RBI for infrastructure financing.

- Banks/ financial institutions should have the requisite expertise for appraising if the project is technically feasible, financially viable and bankable, with particular reference to risk analysis and sensitivity analysis.

- In respect to infrastructure projects, where financing is by way of term loans or investment in bonds issued by government owned entities, banks/ financial institutions should undertake due diligence on the viability of such projects to ensure efficient utilization of resources and creditworthiness of the projects financed. Banks should also ensure that the individual components of financing and returns on the project are well defined and assessed. Lending and investment decisions in such cases should be based on commercial judgment of banks/financial institutions. State government guarantees may not be taken as a substitute for satisfactory credit appraisal. Such appraisal requirements should not be diluted on the basis of any reported arrangement with the RBI or any bank for regular

standing instructions/periodic payment instructions for servicing the loans/ bonds.

Banks may also lend to Special Purpose Vehicles (SPVs) in the private sector, registered under the Companies Act for directly undertaking infrastructure projects, which are financially viable and not acting as mere financial intermediaries. Banks may ensure that the bankruptcy or financial difficulties of the parent/sponsor should not affect the financial health of the SPV. Developing, maintaining and operating projects in power sector, highways, roads, bridges, pipelines, ports, rail systems, airports, water supply, irrigation, sanitation and sewerage systems, telecommunication, housing, industrial park or any other public facility of a similar nature are part of infrastructure.

Activity 2

Identify an infrastructure project in your location and find out the financing arrangements for the project and critically evaluate those arrangements in terms of costs and risks.

(*Hint:* Metro in Delhi or a toll bridge).

Self Assessment Questions

5. The traditional form of financing is known as _____or the balance sheet financing. _____.

6. Project financing is most appropriate for those projects which require large amount of capital expenditure and involve high risk. (True/False)

10.5 Summary

Let us recapitulate the important concepts discussed in this unit:

- A lease is an agreement for the use of the asset for a specified rental. The owner of the asset is called the lessor and the user the lessee.

- Two important categories of leases are operating leases and financial leases. Operating leases are short-term, cancellable leases where the risk of obsolescence is borne by the lessor. Financial leases are long-term non-cancellable leases where any risk in the use of the asset is borne by the lessee and who enjoys the returns too.

- The most compelling reason for leasing equipment rather than buying it is the tax advantage of depreciation that can mutually benefit both the lessee and the lessor.

- Other advantages include convenience and flexibility as well as specialized services to the lessee.

- In India, lease proves handy to those firms, which cannot obtain loan capital from normal sources.

- Financial lease involves fixed obligations in the form of lease rentals. Thus, it is like a debt and can be evaluated that way.

- Given the lease rentals and tax shields, one can find the amount of debt which these cash flows can service. This is equivalent loan. If equivalent loan is more than the cost of the asset, it is not worth leasing the equipment.

- You can also approach lease evaluation by calculating the Net Advantage of Lease (NAL).

- Hire purchase is the mode of financing the price of goods to be sold on a future date.

- On a hire purchase transaction the goods are let on hire by a finance company to the hirer on periodical installments.

- The banks and financial institutions are free to finance projects undertaken by both public and private sectors that are technically feasible, financially viable and bankable.

10.6   Glossary

- ***Equivalent loan:*** Is the amount of loan which commits a firm to exactly the same obligations as lease liability.

- ***Financial lease:*** Long-term non-cancellable lease contract.

- ***Lease:*** A contract between a lessor and a lessee.

- ***Net net net lease:*** In the triple net (net net net) lease, the lessee is obliged to take care of maintenance, taxes and insurance of the equipment.

- ***Operating lease:*** Short-term cancelalble lease agreement.

10.7   Terminal Questions

1. Define lease. Distinguish between operating and financial lease.
2. What are the cash flow consequences of a lease? Illustrate.

3. What are the myths and advantages of a lease?

4. What is hire purchase financing? Describe its features.

5. Write a note on infrastructure project financing.

6. Explain the relation between hire purchase financing and lease financing, and hire purchase financing and instalment sale.

10.8 Answers

Self-Assessment Questions

1. Lease

2. False

3. Possession

4. True

5. Corporate financing

6. True

Terminal Questions

1. Lease is a contract between a lessor, the owner of the asset, and a lessee, the user of the asset. For more details, refer section 10.2.

2. Financial lease has cash flow consequences. It is a way of normal financing for a company. For more details, refer section 10.2.2.

3. The first myth is that a lease provides 100 per cent of financing. For more details, refer section 10.2.4.

4. Hire purchase is a mode of financing the price of goods to be sold on a future date. For more details, refer section 10.4.

5. There is a growing realization in many countries of the limitations of governments in managing and financing economic activities, particularly infrastructure projects. For more details, refer section 10.4.

6. Both hire purchase financing and lease financing are a form of secured loan. For more details, refer section 10.3.

10.9 Case Study

Vishal Engineering Enterprises is a medium-sized engineering company. It had total assets of ₹270 crore and sales of ₹256 crore in 1998. The company has been growing at an annual rate of 23 per cent during the last five years, and the management expects to maintain this trend for the next couple of years. The growing operations of the company led the management to consider the possibility of acquiring a medium size, specially designed computer for its CAD/ CAM functions. The management of the company, therefore, invited representatives of some leading computer firms to help them in designing a useful and cost-effective system. After an evaluation of various available alternatives, the company fixed up its mind on TECH 2005 computer, supplied by a leading computer manufacturing company, which would best meet its current and expected future needs. The finance department evaluated the profitability of buying the TECH 2005 computer, using its normal capital budgeting procedures. The company has a policy of using 12 per cent after-tax cut-off rate for modernization, upgradation or automation projects. For higher risk projects, a higher cut-off rate is used. It was found that computer has a positive expected NPV. The chief finance manager has been recently reading a lot about leasing and hire purchase business in India. The subsidiaries of a number of banks, private firms as well as manufacturers have been offering lease and hire purchase finance. He thought that there should be some merit in these options. He therefore decided to talk to the management of the computer manufacturing company if they could sell the computer on lease or hire purchase basis. He found that the manufacturer was ready to consider supplying the computer on lease or hire purchase. The purchase price of the computer is ₹75 lakh. It has an expected life of eight years. The company expects to receive a pre-tax benefit of ₹18 lakh per year from the use of computer. The company's tax consultant had indicated that if the computer is purchased, the company can depreciate the computer on written down value basis at 25 per cent per annum. On the other hand, if the company decides to take the computer on lease, it will have to forego tax benefit on depreciation. The company will be required to pay lease rentals of ₹14 lakh at the beginning of each year, for eight years. If Vishal Engineering Enterprises buys the computer, it will be serviced and maintained by the computer company for no extra cost, but in the case of lease, Vishal Engineering Enterprises is expected to incur a maintenance cost of about ₹.1.75 lakh per annum. The chief financial

manager is not sure whether there would be any salvage value. However, he thought that if the technology does not change drastically, it may be sold for ₹6 lakh. He knew that if the computer was taken on lease, he will have to forego the salvage value. He believed that the company's after-tax cost of borrowing estimated to be 9.5 per cent is the appropriate rate to use, to evaluate the cash flows of leasing. The company's marginal tax rate is 35 per cent. As regards the hire purchase option, the manufacturer quoted a hire purchase installment of ₹18.375 lakh per annum, payable in the beginning of the year. He had calculated the annual installment as shown in the table here.

	₹ lakh
Cost of computer	75
Interest: 75 × 8 × 12%	72
	147
Annual installment: 147/8	18.375

The finance manager was surprised to find a higher quotation for the hire purchase installment than the lease rental. But he did realize that under hire purchase, his company will be entitled to claim tax benefit on depreciation and receive salvage value. Therefore, he thought it appropriate to systematically analyse the economics of both options.

Discussion Questions

1. Is leasing the computer attractive for Vishal? Give reasons to support your answer.

2. What is the net advantage of lease to the company?

References

- Brigham, F. E. & Houston, F.J. (2013). *Fundamentals of Financial Management* (13th ed.). USA: South-West Cengage Learning.

- Ross, S., Westerfield, R. & Jaffe J. (2012). *Corporate Finance*. New Delhi: McGraw-Hill.

- Brigham, F.E. & Ehrhardt, C.M., *Financial Management: Theory & Practice* (2010). USA: South-West Cengage Learning.

- Berk, J., DeMarzo. P. & Thampy A. (2010). *Financial Management*. New Delhi: Pearson Education.

- Paramasivan, C. & Subramanian, T. (2009) *Financial Management*. New Delhi: New Age International Publishers.
- James C. Vanhorne. (2000). *Fundamentals of Financial Management*. New Delhi: Prentice Hall Books.

E-References

- http://vcmdrp.tums.ac.ir/files/financial/istgahe_mali/moton_english/financial_management_%5Bwww.accfile.com%5D.pdf (Retrieved on 28 May 2013)

Unit 11   Dividend Policy

Structure

Caselet

Two companies—Alpha Ltd and Beta Ltd are in the same industry with identical earnings per share for the last five years. Alpha Ltd has a policy of paying 40 per cent of earnings as dividends, while Beta Ltd pays a constant amount of dividend per share. There is disparity between the market prices of the shares of the two companies. The price of Alpha's share is generally lower than that of Beta, even though in some years Alpha paid more dividends than Beta.

Alpha Ltd

Year	EPS ₹	DPS ₹	Market Price ₹
2005	4.00	1.60	12.00
2006	1.50	0.60	8.50
2007	5.00	2.00	13.50
2008	4.00	1.60	11.50
2009	8.00	3.20	14.50

Beta Ltd

Year	₹EPS	₹DPS	Market Price ₹
2005	4.00	1.780	13.50
2006	1.50	1.80	12.50
2007	5.00	1.80	12.50
2008	4.00	1.80	12.50
2009	8.00	1.80	15.00

Year	Payout		Dividend Yield		Earnings Yield	
	Alpha	Beta	Alpha	Beta	Alpha	Beta
2005	0.40	0.45	0.13	0.13	0.33	0.30
2006	0.40	1.20	0.07	0.14	0.18	0.12
2007	0.40	0.36	0.15	0.14	0.37	0.40
2008	0.40	0.45	0.14	0.44	0.35	0.32
2009	0.40	0.23	0.22	0.12	0.55	0.53

The above table shows payout, dividend yield and earnings yield for Alpha and Beta.

The investors have evaluated the shares of these two companies in terms of dividend payments. The average dividend per share over a period of five years for both the firms is ₹1.80. But the average market price for Beta Ltd (₹13.20) has been 10 per cent higher than the average market price for Alpha Ltd (₹12). The market has used a higher capitalization rate to discount the fluctuating dividend per share of Alpha Ltd, thus valuing the shares of Alpha Ltd at a lower price than that of the Beta Ltd.

11.1 Introduction

The previous unit dealt with alternative financing that a company can adopt. This unit will deal with another area of financial management– dividend policy.

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.

Objectives

After studying this unit, you should be able to:

- explain the objectives of dividend policy
- discuss the financing and dividend decision
- evaluate and judge the relevance of Walter's Model

11.2 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.

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.

11.2.1 Objectives of Dividend Policy

A firm's dividend policy has the effect of dividing its net earnings into two parts: 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.

11.2.2 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. 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.

11.2.3 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 above-mentioned 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.

11.2.4 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. However, the central government is empowered to allow any company to pay dividend for any financial year out of the profits of the company without providing for depreciation. The central government shall give such relief only when it is in the public interest. The dividend should be paid in cash, but a company is not prohibited to capitalize profits or reserves (retained earnings) for the purpose of issuing fully paid bonus shares (stock dividend). It has been held in some legal cases that capital profits should not be distributed as dividends unless (*i*) the distribution is permitted by the company's Articles of Association and (*ii*) the profits have been actually realized.

The legal rules act as boundaries within which a company can operate in terms of paying dividends. Acting within these boundaries, a company will have to consider many financial variables and constraints in deciding the amount of earnings to be distributed as dividends.

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. A mature company is generally liquid and is able to pay large amount of dividends. It does not have much investment opportunities; much of its funds are not tied up in permanent working capital and, therefore, it has a sound cash position. On the other hand,

growing firms face the problem of liquidity. Even though they make good profits, they continuously need funds for financing growing fixed assets and working capital. Because of the insufficient cash or pressures on liquidity, in case of growth firms, management may follow a conservative dividend policy.

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. However, a company with steady growing earnings and cash flows and without much investment opportunities may follow a high dividend payment policy in spite of high amount of debt in its capital structure. A growth firm lacking liquidity may borrow to pay dividends. But this is not a sound policy. This will adversely affect the firm's financial flexibility. Financial flexibility includes the firm's ability to access external funds at a later date. The firm may lose the flexibility and capacity of raising external funds to finance growth opportunities in the future.

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. A fast growing firm, which has a tight liquidity position, will not face any difficulty in paying dividends if it has access to the capital markets. A company that does not have sound cash position and it is also unable to raise funds, will not be able to pay dividends. Thus, the greater the ability of the firm to raise funds in the capital markets, greater will be its ability to pay dividends even if it is not liquid.

Restrictions in loan agreements: Lenders may generally put restrictions on dividend payments to protect their interests when the firm is experiencing low liquidity or low profitability. As such the firm agrees, as part of a contract with a lender, to restrict dividend payments. For example, a loan agreement may prohibit payment of dividends as long as the firm's debt-equity ratio is in excess of, say, 1.5:1 or when the liquidity ratio is less than, say, 2:1 or may require the firm to pay dividends only when some amount of current earnings has been transferred to a sinking fund established to retire debt. These are some of the examples of the restrictions put by lenders on the payment of dividends. When these restrictions are put, the company is forced to retain earnings and have a low payout.

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. On the contrary, some companies may follow a policy of paying more dividends during high inflation in order to protect the shareholders from the erosion of the real value of dividends. Companies with falling or constant profits may not be able to follow this policy.

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.

Self Assessment Questions

1. Shareholders' returns consist of two components: _____ and _____.
2. A firm's dividend policy has the effect of dividing its net earnings into _____ and _____.

11.3 Financing and Dividend Decision

Financial Decision

Financing decision is the second important function to be performed by the financial manager. Broadly, he or she must decide when, how and from where to acquire funds to meet the firm's investment needs. The central issue before him or her 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 or her 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 as well. 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 maximised with given risk, the market value per share will be maximised 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 or she 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.

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 maximises the market value of the firm's shares. Thus, if shareholders are not indifferent to the firm's dividend policy, the financial manager must determine the optimum dividend-payout ratio. 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.

Activity 1

Assume that you are the financial head of a five-year-old profit making public limited company. Your company has plans to expand in the next five years. What would be your decision on distributing dividend as the financial head and why? Also find out and write the dividend policy of any one Indian company.

Self Assessment Questions

3. Dividend policy of a firm affects both the _____ financing and the wealth of shareholders.

4. Capital profits should always be distributed as dividend. (True/False)

11.4 Dividend Relevance: 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:

- *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:

$$P = \frac{DIV}{k} + \frac{r(EPS - DIV)/k}{k} \qquad\qquad ...(1)$$

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 this 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:

$$P = \frac{DIV + (r/k)\,(EPS - DIV)}{k} \qquad \qquad ...(2)$$

Illustration 11.1: 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 11.1 is constructed.

Table 11.1 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.

Table 11.1 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	r = 0.10	r = 0.08
k = 0.10	k = 0.10	k = 0.10
EPS = ₹10	EPS = ₹10	EPS = ₹10
Payout Ratio 0%		
DIV = Re 0	DIV = Re 0	DIV = Re 0
P = 0 + (0.15/0.10) (10 – 0)/0.10	P = 0 + [(0.10/0.10) (10 – 0)]/0.10	P = 0 +[(0.08/0.10) (10 – 0)]/0.10
= ₹150	= ₹100	= ₹80
Payout Ratio 40%		
DIV = ₹4	DIV = ₹4	DIV = ₹4
P = [4 + (0.15/0.10) (10 – 4)]/0.10	P = [4 + (0.10/0.10) (10 – 4)]/0.10	P = [4 + (0.08/0.10) (10 – 4)]/0.10
= ₹130	= ₹100	= ₹88
Payout Ratio 80%		
DIV = ₹8	DIV = ₹8	DIV = ₹8
P = [8 + (0.15/0.10) (10 – 8)]/0.10	P = [8 + (0.10/0.10) (10 – 8)]/0.10	P = [8 + (0.08/0.10) (10 – 8)]/0.10
= ₹110	= ₹100	= ₹96
Payout Ratio 100%		
DIV = ₹10	DIV = ₹10	DIV = ₹10
P = [10 +(0.15/0.10)(10 – 10)]/0.10	P = [10 +(0.10/0.10)(10 – 10)]/0.10	P = [10 +(0.08/0.10) (10 – 10)]/0.10
= ₹100	= ₹100	= ₹100

11.4.1 Growth Firm: Internal Rate more than Opportunity Cost of Capital (*r > k*)

Growth firms are those firms that expand rapidly because of ample investment opportunities yielding returns higher than the opportunity cost of capital. 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.

11.4.2 Normal Firms: Internal Rate Equals Opportunity Cost of Capital ($r = k$)

Most of the firms do not have unlimited surplus-generating investment opportunities, yielding returns higher than the opportunity cost of capital. After exhausting super profitable opportunities, these 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 11.1 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 $r = k$.

11.4.3 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 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 11.1 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.

11.4.4 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 11.1. 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.
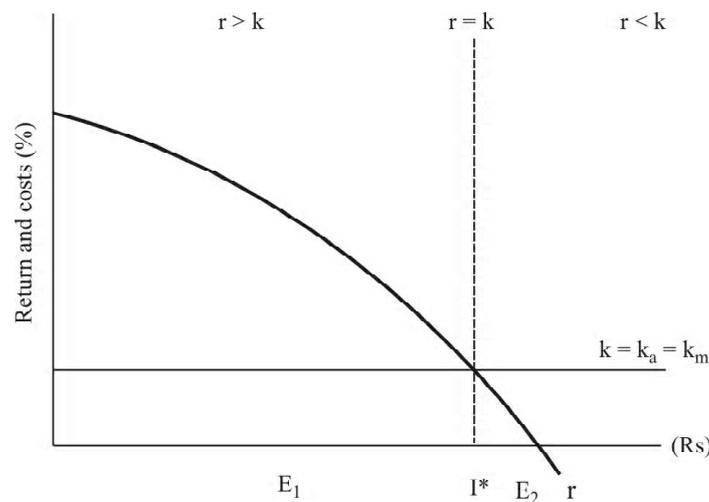
Figure 11.1 Earning, Investment and New Financing

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 first and the poorer investments made last. In Figure 11.1, 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.

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 11.1, 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 optimise 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.

Activity 2

A company earns ₹10 per share at an internal rate of 15 per cent. The firm has a policy of paying 40 per cent of earnings as dividends. If the required rate of return is 10 per cent, determine the price of the share under Walter's model

Hint: $P = \dfrac{DIV + (r + I)(EPS - DIV)}{k}$

Self Assessment Questions

5. Firms that expand rapidly because of ample investment yielding high returns than the opportunity cost of capital care are known as _____.

6. When dividend policy is treated as a financing decision the payment of cash dividends is a passive residual. (True/False)

11.5 Summary

Let us recapitulate the important concepts discussed in this unit:

- Earnings distributed to shareholders are called dividends.

- Dividends may take two forms: cash dividend and bonus shares (stock dividend).

- Walter's view the value of the firm depends on the profitability of investment opportunities available to the firm and the cost of capital. If the firm has profitable opportunities, its value will be maximum when 100 per cent of earnings are retained.

- Walter's formula for the market price of shares is:

$$P = \frac{\text{DIV}}{k} + \frac{r(\text{EPS} - \text{DIV})/k}{k}$$

where DIV is dividend per share, EPS is earnings per share, r is return on investment opportunities and k is the cost of capital.

- Walter's model is based on unrealistic assumptions: perfect markets, no taxes, no transaction costs, no external financing etc. In fact, this model mixes investment and dividend decisions.

11.6 Glossary

- **Bonus shares:** Shares issued to the existing shareholders without any charge.

- **Capital structure:** The mix of debt and equity is known as the firm's capital structure

- **Dividend-payout ratio:** The proportion of profits distributed as dividends**.**

- *Financial leverage:* The change in the shareholders' return caused by the change in the profits.
- *Optimum capital structure:* When market value of shares is maximized.
- *Retention ratio:* The retained portion of profits.

11.7 Terminal Questions

1. Explain the objectives of a firm's dividend policy.
2. Describe how shareholders' desire for income influence a firm's dividend decision.
3. What is meant by dividend policy?
4. Explain the essence of Walter's model.
5. State the assumptions of Walter's model.
6. What are the limitations of Walter's model?
7. What are the constraints a company faces on paying dividends?

11.8 Answers

Self Assessment Questions

1. Dividends, capital gains
2. Retained earnings, dividends
3. Long-term
4. False
5. Growth firms
6. True

Terminal Questions

1. A firm dividend policy has the effect of dividing its net earnings into two parts – retained earnings and dividends. For more details, refer section 11.2.
2. Because of market imperfections and uncertainty, shareholders might prefer near dividends. For more details, refer section 11.2.3.

3. Dividend policy involves the balancing of the shareholders' desire for current dividends and the firm's needs for growth. For more details, refer section 11.2.

4. According to Prof. James E Walter, the choice of dividend policies almost always affects the value of the firm. For more details, refer section 11.4.

5. Walter's model is based on the assumptions that the firm finances all investment through retained earnings. For more details, refer section 11.4.

6. Walter's model of share valuation mixes dividend policy with investment policy of the firm. For more details, refer section 11.3.4.

7. The company's decision regarding the amount of earnings to be distributed as dividends depends on legal and financial constraints. For more details, refer section 11.2.4.

11.9 Case Study

A.C. Company Ltd.

A.C. Company Ltd has improved its profitability in 2008–09, and is on a growth path after poor performance in the preceding two years. The following is the summary of the company's operations during the preceding three years:

The company's focus in 2008–09 was on cost reduction and funds management rather than growth in sales.

Operating and interest costs fell by 3.3 per cent and 60 per cent, respectively. According to the company's managing director, 'The turnover in 2008–09 dipped because of a drop in volumes. However, the sales are not strictly comparable because in the previous year, there was a large order worth ₹15 crore from a public sector oil company.

On the other hand, the net profit growth was higher because of better asset management. This resulted in reduced borrowings and lowered the financial charges.' The company was able to bring down its inventory holding period to 46 days from 81 days and debtors holding period to 95 days from 119 days. The company is changing its debt policy to a conservative policy. The debt-equity ratio of 1.8:1 in 2006–07 has been brought down to 0.5:1 in 2008–09.

A.C. Company Ltd: Operating Performance

			(₹crore)
	2006–07	*2007–08*	*2008–09*
Sales	53.4	75.6	69.5
Gross profit	3.4	4.5	12.3
Net profit	1.3	1.3	5.9
EPS (₹)	1.8	1.8	8.1

The prospects of the company for increased business in 2009–10 are estimated to be good. According to the managing director, 'The general industrial activity as such has picked up which should result in a better demand for the company's products from sectors such as automobiles, mining and chemicals.' Experts think that compressor industry will grow at 10 per cent in 2009–10. The company is anticipating a sales growth of 15–20 per cent in 2009–10.

The company's strategy of cost reduction and improving marketing efficiency will continue. The company operates in the compressor industry and drilling and mining equipment industry. It is number two in the compressor industry after Inger Soll Rand. The product profile of the company in the years has shifted in favour of the compressor sector. In 2008–09 the company's gross block increased to ₹22 crore from ₹20 crore. The company has planned for an investment of ₹5 crore in its Puna factory. The company's share enjoys good liquidity and its P/E ratio is 32. In the expectation of good performance, the company's share price started rising since January 2009, and sharply increased to ₹285 just before the budget from ₹190 in January. The current price (after technical correction) is around ₹225–35. In the last two years, the company paid a dividend of 10 per cent. The company was wondering if it should declare a higher dividend in 2008–09.

Discussion Questions

1. Evaluate the company's financial condition

2. Recommend the dividends to be paid by AC Company Ltd. Justify your advice.

References

- Brigham, F. E. & Houston, F.J. (2013). *Fundamentals of Financial Management* (13th ed.). USA: South-West Cengage Learning.

- Ross, S., Westerfield, R. & Jaffe J. (2012). *Corporate Finance*. New Delhi: McGraw-Hill.

- Brigham, F.E. & Ehrhardt, C.M., *Financial Management: Theory & Practice* (2010). USA: South-West Cengage Learning.

- Berk, J., DeMarzo. P. & Thampy A. (2010). *Financial Management*. New Delhi: Pearson Education.

- Paramasivan, C. & Subramanian, T. (2009) *Financial Management*. New Delhi: New Age International Publishers.

- James C. Vanhorne. (2000). *Fundamentals of Financial Management*. New Delhi: Prentice Hall Books.

E-References

- http://vcmdrp.tums.ac.ir/files/financial/istgahe_mali/moton_english/financial_management_%5Bwww.accfile.com%5D.pdf (Retrieved on 28 May 2013)

Unit 12　　　　　Working Capital Management

Structure

Caselet

Levels of Current Assets: Some Examples of Indian Companies

Current assets form a significant portion of total assets of many Indian companies. Consider the following examples:

	BHEL	GNFC	L&T	Voltas
Sales	7651.1	1476.7	8782.5	1232.3
Total assets (TA)	9600.4	1991.9	17095.9	862.9
Current assets (CA)	8601.0	882.9	11398.4	658.4
CA/TA	89.6	44.3	66.7	76.3
CA/Sales	112.4	59.8	129.8	53.4

Note: Data for the year 2003 except in case of BHEL.

- **Voltas:** Voltas is a large, well-diversified, private sector marketing-cum-manufacturing organization. In 2003, the company's current assets are three-fourths of total assets and more than half of sales.

- **L&T Limited:** L&T is also a diversified company in the private sector. In 2003, its current assets are two-thirds of total assets and about one and a third times of sales.

- **GNFC:** GNFC is a joint sector (joint venture between state of Gujarat and private sector) company manufacturing fertilizers, industrial products (methanol, formic acid, nitric acid, amonium nitrate, liquid nitrogen, etc.) and electronic products. Its current assets in the year 2003 are less than half of total assets and 60 per cent of sales.

- **BHEL:** BHEL was started as a large public sector company. Its shares have been partly divested now. It has a dominant position in the power sector. Its manufacturing operations are spread into industrial and transportation sectors also. A large number of its products are long production cycle products. The company's main customers are State Electricity Boards who fail to pay their due on time. BHEL's current assets in 2002 are 90 per cent of total assets and 112 per cent of sales.

12.1 Introduction

The previous unit dealt with the objectives and relevance of dividends. In this unit you will learn how the companies manage their working capital.

External funds available for a period of one year or less are called short-term finance. In India, short-term funds are used to finance working capital. Two most significant short-term sources of finance for working capital are: trade credit and bank borrowing. The use of trade credit has been increasing over the years in India. Bank borrowing is the next important source of working capital finance. Before the 70s, bank credit was liberally available to firms. It became a restricted resource in the 80s and 90s because of the change in the government policy; banks were required to follow the government prescribed norms in financing working capital requirements of firms. Now there are no government norms, and banks are free to take business decisions in granting finance for working capital.

Objectives

After studying this unit, you should be able to:

- judge the relevance of working capital
- discuss the determinants of working capital

- calculate the working capital needs of a firm
- evaluate how operating cycle is involved in conversion of sales into cash

12.2   Concepts of Working Capital

There are two concepts of working capital—gross and net.

- **Gross working capital** refers to the firm's investment in current assets. **Current assets** are the assets which can be converted into cash within an accounting year and include cash, short-term securities, debtors, (accounts receivable or book debts) 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.

12.2.1 Determinants of Working Capital

There are no set rules or formulae to determine the working capital requirements of firms. A large number of factors, having 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.

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.

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 six to twenty-four 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.

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 industry norms and practices. The firm should use discretion in granting credit terms to its customers. Depending upon the 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.

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 needless working capital if liberal credit terms are available to it from 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 for 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 materials, labour and other resources.

Price level changes: The increasing shifts in price level make the functioning of the financial manager difficult. The manager 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.

12.2.2 Balanced Working Capital Position

A 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. Paucity of working capital not only impairs the firm's profitability, but also results in production interruptions and inefficiencies and sales disruptions.

The dangers of excessive working capital are as follows:

- It results in unnecessary accumulation of inventories. Thus, chances of inventory mishandling, waste, theft and losses increase.

- It is an indication of defective credit policy and slack collection period. Consequently, higher incidence of bad debts results, which adversely affects profits.

- Excessive working capital makes management complacent which degenerates into managerial inefficiency.

- Tendencies of accumulating inventories tend to make speculative profits grow. This may tend to make dividend policy liberal and difficult to cope with in future when the firm is unable to make speculative profits.

Inadequate working capital is also harmful and has the following dangers:

- It stagnates growth. It becomes difficult for the firm to undertake profitable projects for non-availability of working capital funds.

- It becomes difficult to implement operating plans and achieve the firm's profit target.
- Operating inefficiencies creep in when it becomes difficult even to meet day-to-day commitments.
- Fixed assets are not efficiently utilized for the lack of working capital funds. Thus, the firm's profitability would deteriorate.
- Paucity of working capital funds render the firm unable to avail attractive credit opportunities etc.
- The firm loses its reputation when it is not in a position to honour its short-term obligations. As a result, the firm faces tight credit terms.

An enlightened management should, therefore, maintain the right amount of working capital on a continuous basis. Only then a proper functioning of business operations will be ensured. Sound financial and statistical techniques, supported by judgment, should be used to predict the quantum of working capital needed at different time periods.

A firm's net working capital position is not only important as an index of liquidity but it is also used as a measure of the firm's risk. Risk in this regard means chances of the firm being unable to meet its obligations on due date. The lender considers a positive net working as a measure of safety. All other things being equal, the more the net working capital a firm has, the less likelyhood it will default in meeting its current financial obligations. Lenders such as commercial banks insist that the firm should maintain a minimum net working capital position.

12.2.3 Issues in Working Capital Management

Working capital management refers to the administration of all components of working capital—cash, marketable securities, debtors (receivable) and stock (inventories) and creditors (payables).

The financial manager must determine levels and composition of current assets. He must see that right sources are tapped to finance current assets, and that current liabilities are paid in time.

There are many aspects of working capital management which make it an important function of the financial manager:

- **Time:** Working capital management requires much of the financial manager's time.
- **Investment:** Working capital represents a large portion of the total investment in assets.

- **Criticality:** Working capital management has great significance for all firms but it is very critical for small firms.
- **Growth:** The need for working capital is directly related to the firm's growth.

12.2.4 Sources of Working Capital

External funds available for a period of one year or less are called short-term finance. In India, short-term funds are used to finance working capital. Two most significant short-term sources of finance for working capital are: trade credit and bank borrowing. The use of trade credit has been increasing over years in India. Trade credit as a ratio of current assets is about 40 per cent. Bank borrowing is the next important source of working capital finance. Before seventies, bank credit was liberally available to firms. It became a restricted resource in the eighties and nineties because of the change in the government policy; banks were required to follow the government prescribed norms in financing working capital requirements of firms. Now there are no government norms, and banks are free to take business decisions in granting finance for working capital.

Two other short-term sources of working capital finance which have recently developed in India are: (i) factoring of receivables and (ii) commercial paper.

Activity 1

Assume the role of a finance manager. List out ten assets and ten liabilities and calculate the net working capital.

Self Assessment Questions

1. The difference between current assets and current liabilities is known as _____.

2. The operating efficiency of a firm relates to the optimum utilization of all its resources at minimum cost. (True/Fales)

12.3   Operating Cycle Method

The need for working capital to run 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 maximising 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 several 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 realised 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, and 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 account receivable for collection.

These phases affect cash flows, which most of the time, are neither synchronised nor certain. They are not synchronised because cash outflows usually occur before 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 and 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 matching 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? The length of the operating cycle of a manufacturing firm is the sum of: (*i*) Inventory Conversion Period (ICP) and (*ii*) Debtors (receivable) 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).

In practice, a firm may acquire resources (such as raw materials) on credit and 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 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 net operating cycle of a firm increases, it means further need for negotiated working capital.

Let us illustrate the computation of the length of operating cycle. Consider the statement of costs of sales for a firm given in Table 12.1.

The firm's data for sales and debtors and creditors are given in Table 12.2.

Table 12.2 Sales and Debtors

		(₹ lakh)
	19X1	*19X2*
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

12.3.1 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:

Gross operating cycle = Inventory conversion period + Debtors conversion period

$$GOC = ICP + DCP \tag{1}$$

12.3.2 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):

$$ICP = RMCP + WIPCP + FGCP \tag{2}$$

- **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 (say, 360). 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:

$$\text{Raw material period} = \frac{\text{Raw material inventory}}{[\text{Raw material consumption}]/360}$$

$$RMCP = RMI \div \frac{RMC}{360} = \frac{RMI \times 360}{RMC} \tag{3}$$

- **Work-In-Process Conversion Period (WIPCP):** Work-in-process conversion period (WIPCP) is the average time taken to complete the semi-finished or work-in-process. It is given by the following formula:

$$\text{Work-in-process period} = \frac{\text{Work-in-process inventory}}{[\text{Cost of production}]/360}$$

$$WIPCP = WIPI \div \frac{COP}{360} = \frac{WIPI \times 360}{COP} \tag{4}$$

- **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:

$$\text{Finished goods conversion period} = \frac{\text{Finished goods inventory}}{[\text{Cost of goods sold}]/360}$$

$$\text{FGCP} = \text{FGI} \div \frac{\text{CGI}}{360} = \frac{\text{FGI} \times 360}{\text{CGS}} \tag{5}$$

12.3.3 Debtors (receivable) 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 follows:

$$\text{Debtors conversion period (DCP)} = \frac{\text{Debtors}}{\text{Credit sales}/360} = \frac{\text{Debtors} \times 360}{\text{Credit sales}} \tag{6}$$

12.3.4 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 follows:

$$\text{Creditors deferral period (CDP)} = \frac{\text{Creditors}}{\text{Credit purchases}/360} = \frac{\text{Creditors} \times 360}{\text{Credit purchases}} \tag{7}$$

12.3.5 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

$$\text{NOC} = \text{GOC} - \text{CDP} \tag{8}$$

Table 12.3 Operating Cycle Calculation

(₹ in lakh)

Items	Actual 19X1	Projected 19X2
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.

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 12.3 shows detailed calculations of the components of a firm's operating cycle. Table 12.4 provides the summary of calculations.

During 19X1 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 19X2, 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 is the result of daily raw material consumption and total raw material consumption during a period 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 12.3.

Table 12.4 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

We note a significant change in the company's policy for 19X2 with regard to 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 12.4).

The operating cycle concept as 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 (receivable) and 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 lending into cash.

Activity 2

1. The following cost of sales statements are available for D.D. Manufacturers:

Statement of Cost of Sales   (₹in crore)

Items	19X1	19X2	19X3
1. Opening raw material inventory	5.2	6.8	7.6
2. Purchases	25.6	33.5	45.6
3. Closing raw material inventory	6.8	7.6	9.2
4. Raw material consumed $(1 + 2 - 3)$	24.0	32.7	44.0
5. Wages and salaries	8.1	11.2	15.3
6. Other mfg. expenses	3.2	4.4	5.8
7. Depreciation	1.8	2.0	2.6
8. Total cost $(4 + 5 + 6 + 7)$	37.1	50.3	67.7
9. Opening work-in-process inventory	1.8	2.0	3.1
10. Closing work-in-process inventory	2.0	3.1	4.6
11. Cost of production	36.9	49.2	66.2
12. Opening finished goods inventory	3.2	2.8	3.6
13. Closing finished goods inventory	2.8	3.6	2.9
14. Cost of goods sold	37.3	48.4	66.9
15. Selling, administrative and other expenses	1.3	1.9	2.1
16. Cost of sales $(14 + 15)$	38.6	50.3	69.0

The following is the additional data available:

	19X1	19X2	19X3
Sales	45.9	60.1	82.7
PBIT	7.3	9.8	13.7
Debtors: Opening	8.3	10.8	14.9
Closing	10.8	14.9	20.5
Creditors: Opening	3.7	4.6	8.0
Closing	4.6	8.0	12.0

You are required to calculate (*i*) operating cycle, (*ii*) net operating cycle, and (*iii*) cash conversion cycle for each of the three years.

Hint: Refer section 12.3 for formula.

Self Assessment Questions

3. _____ is involved in the conversion of sales into cash.
4. Acquisition of resources is one of the phases of operating cycle. (True/ False)

12.4 Summary

Let us recapitulate the important concepts discussed in this unit:

- Gross working capital refers to the firm's investment in current assets.
- Gross and net are the two concepts of working capital.
- The two important aims of working capital management are profitability and solvency.
- A firm is required to invest in current assets for a smooth, uninterrupted production and sale. How much a firm will invest in current assets will depend on its operating cycle.
- The firm's credit policy is another factor which influences the working capital requirement. It depends on the nature and norms of business, competition and the firm's desire to use it as a marketing tool.
- Working capital requirements of a firm are basically influenced by the nature of its business.
- The working capital needs of a firm are related to its sales.
- An extended manufacturing time span means a larger tie-up of funds in inventories.
- The credit policy of the firm affects the working capital by influencing the level of debtors.
- Operating cycle is defined as the time duration which the firm requires to manufacture and sell the product and collect cash. Thus operating cycle refers to the acquisition of resources, conversion of raw materials into work-in-process into finished goods, conversion of finished goods into sales and collection of sales. Larger is the operating cycle, larger will be the investment in current assets.
- 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.

12.5 Glossary

- *Cash conversion cycle:* Also known as net operating cycle
- *Creditors' deferral period:* The length of time the firm is able to defer payment.
- *Net working capital:* Refers to the difference between current assets and current liabilities.
- *Operating cycle:* Is the time duration required to convert sales into cash.
- *Raw material conversion period:* Is the average time period taken to convert material in to work-in-progress.
- *Spontaneous source of capital:* Payables which a firm can differ.

12.6 Terminal Questions

1. What determines the working capital need of a company?
2. What is the relevance of a balanced working capital position for a firm?
3. What are the various aspects of working capital management?
4. Discuss operating cycle.
5. How is the length of operating cycle determined? Explain with example.
6. Elucidate net operating cycle with example.

12.7 Answers

Self Assessment Questions

1. Net working capital
2. True
3. Operating cycle
4. True

Terminal Questions

1. There are no set rules or formulae to determine the working capital requirements of firms. For more details, refer section 12.2.1.

2. A firm should maintain a sound working capital position. It should have adequate working capital to run its business operations. For more details, refer section 12.2.2.

3. The various aspects of working capital management which make it an important function of the financial manager are time, investment, criticality and growth. For more details, refer section 12.2.

4. Operating cycle is the time duration required to convert sales, after the conversion of resources into inventories and cash. For more details, refer section 12.3.

5. The length of the operating cycle of a manufacturing firm is the sum of: (i) inventory conversion period and (ii) debtors (receivable) conversion period. For more details, refer section 12.3

6. Net operating cycle is the difference between gross operating cycle and payables deferral period. For more details, refer section 12.3.5.

12.8 Case Study

A pro forma cost sheet of a company called A Shakti Ltd. provides the following data:

	₹
Costs (per unit):	
Raw materials	52.0
Direct labour	19.5
Overheads	39.0
Total cost (per unit)	110.5
Profit	19.5
Selling price	130.0

The following is the additional information available:

Average raw material in stock: one month; average materials in process: half a month. Credit allowed by suppliers: one month; credit allowed to

debtors: two months. Time lag in payment of wages: one and a half weeks. Overheads: one month. One-fourth of sales are on cash basis. Cash balance is expected to be ₹1,20,000. The company prepares a statement as shown below to show the working capital needed to finance a level of activity of 70,000 units of output.

Calculation of Working Capital Needs

	₹
A. Investment in inventory	

1. Raw material inventory:
     one month (30 days)
     (RMC/360) × RMCP =
     {(70,000 × 52)/360} × 30
	303,333.33

2. Work-in-process inventory:
     half-a-month (15 days)
     (COP/360) × WIPCP =
     {(70,000 × 110.5)/360} × 15
	322,291.67

3. Finished goods inventory:
     one month (30 days)
     (COS/360) × FGCP =
     {(70,000 × 110.5)/360} × 30
	644,583.33

	1,270,208.33
B. Investment in debtors:	
two months (60 days) (Credit sale (cost)/360) × BDCP	
= {(52,500 × 110.5)/360} × 60	966,875.00
C. Cash balance	120,000.00
D. Investment in current assets (A + B + C)	2,357,708.33
E. Current liabilities: deferred payment	

1. Creditors: one month (30 days)
     (Purchases of raw material/360)
     × PDP = {(70,000 × 52)/360} × 30
	303,333.33

2. Deferred wages: 1 1/2 weeks (10 days) = {(70,000 × 19.5)/360} × 10	37,916.67

3. Deferred overheads: one month
(30 days) = {(70,000 × 39)/360} × 30   227,500.00

F. Total deferred payment (spontaneous
sources of working capital [E (1 + 2 + 3)]   568,750.00

G. Net working capital (D – F)

Discussion Questions

1. What would be their net working capital?

2. Prepare a statement showing the working capital needed to finance a level of activity of 70,000 units of output. You may assume that production is carried on evenly, throughout the year and wages and overheads accrue similarly.

References

- Brigham, F. E. & Houston, F.J. (2013). *Fundamentals of Financial Management* (13th ed.). USA: South-West Cengage Learning.

- Ross, S., Westerfield, R. & Jaffe J. (2012). *Corporate Finance*. New Delhi: McGraw-Hill.

- Brigham, F.E. & Ehrhardt, C.M., *Financial Management: Theory & Practice* (2010). USA: South-West Cengage Learning.

- Berk, J., DeMarzo. P. & Thampy A. (2010). *Financial Management*. New Delhi: Pearson Education.

- Paramasivan, C. & Subramanian, T. (2009) *Financial Management*. New Delhi: New Age International Publishers.

- James C. Vanhorne. (2000). *Fundamentals of Financial Management*. New Delhi: Prentice Hall Books.

E-References

- http://vcmdrp.tums.ac.ir/files/financial/istgahe_mali/moton_english/ financial_management_%5Bwww.accfile.com%5D.pdf (Retrieved on 28 May 2013)

Structure

Caselet

Determining the Cash Flow Forecast for Bright Paints Limited

Bright Paints Limited, situated in Punjab, is a large wholesaler of industrial paints. The company sells paints mostly to small retailers in cities and towns of Northern states. About 10 per cent of sales are made directly to the public on cash basis. For meeting its working capital requirement, the company has a cash credit limit from State Bank of India. However, it has been recently facing a liquidity problem. In its cash credit account, the company has an overdraft balance of ₹24 lakh at the end of March 2009. The managing director of the company is quite concerned about its adverse cash position. He discussed the matter with his finance manager, and asked him to make an assessment of the company's cash situation for the next six months. The finance manager's staff made the following estimates of revenues and expenditures for the next six months:

The company has a plan to buy two delivery vans in June for ₹8 lakh. It will pay taxes in June and September. The corporate tax rate is 35 per cent. The company sells to retailers on two months' credit terms. Debtors at the end of March are ₹500 lakh. The company will make more purchases in the months of April, May and June for high demands in the next three months. Suppliers extend one month's credit to the company. At the beginning of March, creditors were ₹630 lakh.

13.1   Introduction

In the previous unit, you studied the technique of estimating working capital and the concept of operating cycle method.

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. 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.

In this unit, you will study about the different facets of cash management, the motives for holding cash, technique of cash planning, cash forecasting and budgeting.

Objectives

After studying this unit, you should be able to:

- recognize the motives for holding cash
- identify the facets of cash management
- define cash planning
- interpret cash forecasting and budgeting
- describe optimum cash balance under certainty and uncertainty
- identify the investment opportunities

13.2   Motives for Holding Cash

A firm's need to hold cash may be attributed to the following three motives:

(i) **Transaction motive:** The transactions motive requires a firm to hold cash to conduct its business in the ordinary course. The firm needs cash primarily to make payments for purchases, wages and salaries, other operating expenses, taxes, dividends etc. The need to hold cash would not arise if there were perfect synchronization between cash receipts and cash payments, i.e., enough cash is received when the payment has to be made.

(ii) **Precautionary motive:** The precautionary motive is the need to hold cash to meet contingencies in the future. It provides a cushion or buffer to withstand some unexpected emergency. The precautionary amount of cash depends upon the predictability of cash flows. If cash flows can be predicted with accuracy, less cash will be maintained for an emergency.

(iii) **Speculative motive:** The speculative motive relates to the holding of cash for investing in profit-making opportunities as and when they arise. The opportunity to make profit may arise when the security prices change. The firm will hold cash, when it is expected that interest rates will rise and security prices will fall. Securities can be purchased when the interest rate is expected to fall; the firm will benefit by the subsequent fall in interest rates and increase in security prices. The firm may also speculate on materials' prices.

Self Assessment Questions

1. The speculative motive relates to the holding of cash for investing in profit-making opportunities as and when they arise. (True/False)

2. The _____ motive is the need to hold cash to meet contingencies in the future.

13.3 Facets of Cash Management

Cash management is concerned with the management 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 13.1.
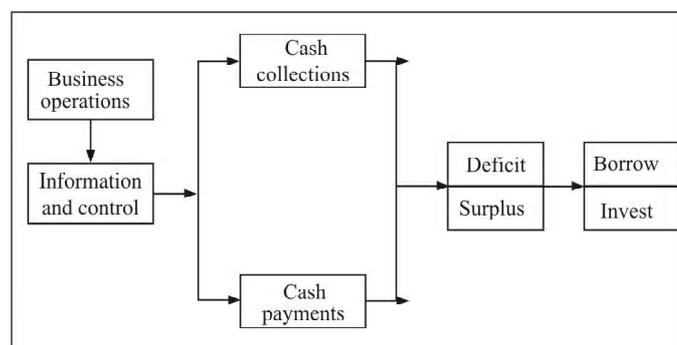
Figure 13.1 Cash Management Cycle

Management of cash is also important as it is difficult to predict cash flows accurately, particularly the inflows and there is no perfect agreement between the inflows and outflows of cash. Sometimes, cash outflows will exceed cash inflows (as payments for taxes, dividends or seasonal inventory build up) while at other times, cash inflow will be more than cash payments (as there may be large cash sales and debtors may be realized in large sums promptly). Management of cash is also critical since cash constitutes the smallest portion of the total current assets, yet the management's precious time is devoted in managing it. A lot of innovations have been done in cash management techniques, recently. 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.

A firm should chart out strategies concerning the facets of cash management which are as follows:

  (i) **Cash planning:** Cash inflows and outflows must be drawn out to project cash surplus or deficit for each part of the planning period and for this purpose, a cash budget must be prepared.

 (ii) **Managing the cash flows:** The management of a firm should ensure the proper and uninterrupted flow of cash. The cash inflows should be accelerated while, as far as possible, the cash outflows should be slowed down.

(iii) **Optimum cash level:** The firm must take a decision regarding the suitable level of cash balances. The cost of excess cash and danger of cash deficiency needs to be compared to figure out the appropriate level of cash balances. The firm should decide about the division of such 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.

Activity 1

Suppose you are the finance manager of a firm. What will be your main consideration while managing cash?

Hint: The financial manager should chart out strategies concerning the facets of cash management.

Self Assessment Questions

3. Cash management concerns only cash inflows into the firm. (True/False)
4. Ideal cash management systems are independent of the organization structure and competition of the firm. (True/False).

13.4 Cash Planning

Cash flows are inseparable parts of the business operations of firms. A firm needs cash to invest in inventory, receivable and fixed assets and to make payment for operating expenses in order to maintain growth in sales and earnings. It is possible that 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 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. However, 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.

Activity 2

Suppose you are working as an investment banker. How would you go about controlling the use of cash?

Hint: Devise a technique for controlling the use of cash.

Self Assessment Questions

5. Cash flows are inseparable parts of the business operations of firms. (True/False)

6. _____ is a techniques to plan and control the use of cash.

13.5 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.

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 and those extending beyond one year are considered long-term.

Short-term cash forecasts

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

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:

- The receipt and disbursements method
- The adjusted net income method

The 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 between 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.

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 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 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 for its working capital requirements.

- 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 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, company's practices may differ on the duration of long-term forecasts to suit their 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 and it also indicates financing problems arising from these developments.

Self Assessment Questions

7. _____ is the most significant device to plan for and control cash receipts and payments.

8. The receipt and disbursement method is used for long-term cash forecasting. (True/False)

13.6   Determining the Optimum Cash Balance

One of the primary responsibilities of the financial manager is to maintain a sound liquidity position of the firm so that the dues are settled in time. The firm needs cash to purchase raw materials and pay wages and other expenses as well as for paying dividend, interest and taxes. The test of liquidity is the availability of cash to meet the firm's obligations when they become due.

A firm maintains the operating cash balance for transaction purposes. It may also carry additional cash as a buffer or safety stock. The amount of cash

balance will depend on the risk-return trade-off. If the firm maintains small cash balance, its liquidity position weakens, but its profitability improves as the released funds can be invested in profitable opportunities (marketable securities). When the firm needs cash, it can sell its marketable securities (or borrow). On the other hand, if the firm keeps high cash balance, it will have a strong liquidity position but its profitability will be low. The potential profit foregone on holding large cash balance is an opportunity cost to the firm. The firm should maintain optimum—just enough, neither too much nor too little—cash balance. How to determine the optimum cash balance if cash flows are predictable and if they are not predictable?

Optimum cash balance under certainty: Baumol's model

The Baumol model of cash management provides a formal approach for determining a firm's optimum cash balance under certainty. It considers cash management similar to an inventory management problem. As such, the firm attempts to minimize the sum of the cost of holding cash (inventory of cash) and the cost of converting marketable securities to cash.

The Baumol's model makes the following assumptions:

- The firm is able to forecast its cash needs with certainty.

- The firm's cash payments occur uniformly over a period of time.

- The opportunity cost of holding cash is known and it does not change over time.

- The firm will incur the same transaction cost whenever it converts securities to cash.

Assume that the firm sells securities and starts with a cash balance of C rupees. As the firm spends cash, its cash balance decreases steadily and reaches zero. The firm replenishes its cash balance to C rupees by selling marketable securities. This pattern continues over time. Since the cash balance decreases steadily, the average cash balance will be: $C/2$. This pattern is shown in Figure 13.2.

The firm incurs a holding cost for keeping the cash balance. It is an opportunity cost; that is, the return foregone on the marketable securities. If the opportunity cost is k, then the firm's holding cost for maintaining an average cash balance is as follows:

$$\text{Holding cost} = k(C/2) \tag{1}$$
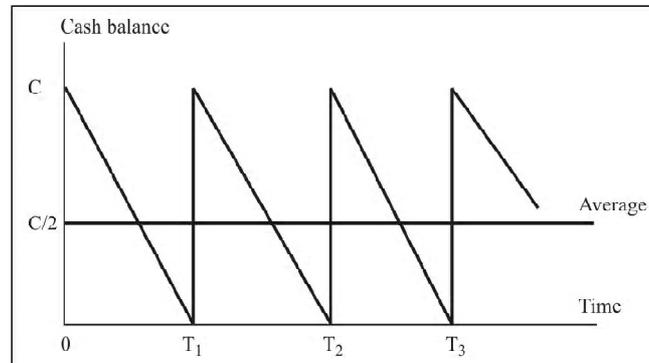
Figure 13.2 Baumol's Model for Cash Balance

The firm incurs a transaction cost whenever it converts its marketable securities to cash. Total number of transactions during the year will be total funds requirement, *T*, divided by the cash balance, *C*, i.e. *T/C*. The per transaction cost is assumed to be constant. If per transaction cost is *c*, then the total transaction cost will be:

$$\text{Transaction cost} = c(T / C) \tag{2}$$

The total annual cost of the demand for cash will be:

$$\text{Total cost} = k(C / 2) + c(T / C) \tag{3}$$

What is the optimum level of cash balance, *C**? You know that the holding cost increases as demand for cash, *C*, increases. However, the transaction cost reduces because with increasing C the number of transactions will decline. Thus, there is a trade-off between the holding cost and the transaction cost. Figure 13.3 depicts this trade-off.
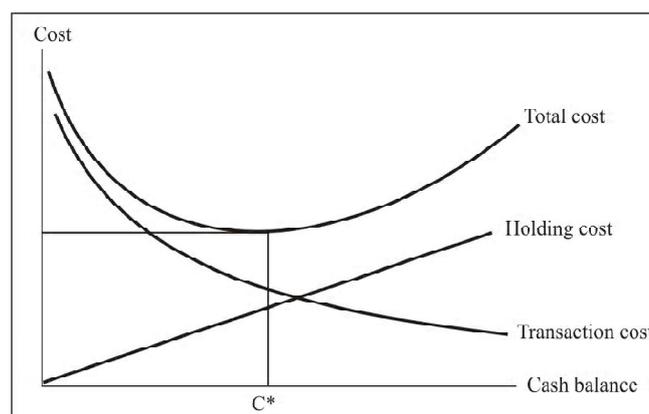
Figure 13.3 Cost Trade-Off: Baumol's Model

The optimum cash balance, C^*, is obtained when the total cost is minimum. The formula for the optimum cash balance is as follows:

$$C^* = \sqrt{\frac{2cT}{k}} \qquad\qquad (4)$$

where C^* is the optimum cash balance, c is the cost per transaction, T is the total cash needed during the year and k is the opportunity cost of holding cash balance. The optimum cash balance will increase with increase in the per transaction cost and total funds required and decrease with the opportunity cost.

Example 1: Baumol's model

Advani Chemical Limited estimates its total cash requirement as ₹2 crore next year. The company's opportunity cost of funds is 15 per cent per annum. The company will have to incur ₹150 per transaction when it converts its short-term securities to cash. Determine the optimum cash balance. How much is the total annual cost of the demand for the optimum cash balance? How many deposits will have to be made during the year?

$$C^* = \sqrt{2cT/k}$$

$$C^* = \sqrt{\frac{2(150)(20,000,000)}{0.15}} = \text{Rs } 200,000$$

The annual cost will be:

$$
\begin{aligned}
\text{Total cost} &= 150 \ (20,000,000/200,000) \ + \ 0.15 \ (200,000/2) \\
&= 150 \ (100) \ + \ 0.15 \ (100,000) \ = \ 15,000 \ + \ 15,000 \\
&= ₹30,000
\end{aligned}
$$

During the year, the company will have to make 100 deposits, i.e. converting marketable securities to cash.

Optimum cash balance under uncertainty: The Miller-Orr model

The limitation of the Baumol model is that it does not allow the cash flows to fluctuate. Firms in practice do not use their cash balance uniformly nor are they able to predict daily cash inflows and outflows. The Miller-Orr (MO) model overcomes this shortcoming and allows for daily cash flow variation. It assumes that net cash flows are normally distributed with a zero value of mean and a standard deviation. As shown in Figure 13.4, the MO model provides for two control limits—the upper control limit and the lower control limit as well as a return point. If the firm's cash flows fluctuate randomly and hit the upper limit,

then it buys sufficient marketable securities to come back to a normal level of cash balance (the return point). Similarly, when the firm's cash flows wander and hit the lower limit, it sells sufficient marketable securities to bring the cash balance back to the normal level (the return point).
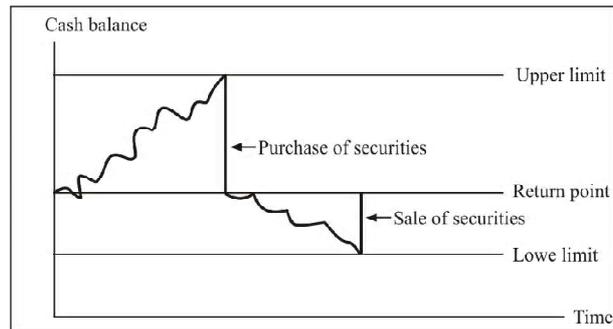
Figure 13.4 Miller-Orr Model

The firm sets the lower control limit as per its requirement of maintaining minimum cash balance. At what distance the upper control limit will be set? The difference between the upper limit and the lower limit depends on the following factors:

- The transaction cost (c)
- The interest rate (i)
- The standard deviation (σ) of net cash flows

The formula for determining the distance between upper and lower control limits (called Z) is as follows:

$$\text{(Upper Limit} - \text{Lower Limit)} = (3/4 \times \text{Transaction Cost} \times \text{Cash Flow Variance/Interest per day)}^{1/3} \qquad (5)$$

$$Z = \left(3/4 \times c\sigma^2 / i\right)^{1/3} \qquad (6)$$

We can notice from Equation (6) that the upper and lower limits will be far off from each other (i.e. Z will be larger) if transaction cost is higher or cash flows show greater fluctuations. The limits will come closer as the interest increases. Z is inversely related to the interest rate. It is noticeable that the upper control limit is three times above the lower control limit and the return point lies between the upper and the lower limits. Thus,

Upper limit = Lower limit + 3Z $\qquad\qquad\qquad\qquad\qquad\qquad$ (7)

Return point = Lower limit + Z $\qquad\qquad\qquad\qquad\qquad\qquad$ (8)

The net effect is that the firms hold the average cash balance equal to:

Average cash balance = Lower limit + 4/3 Z (9)

The MO model is more realistic since it allows variation in cash balance within lower and upper limits. The financial manager can set the lower limit according to the firm's liquidity requirement. The past data of the cash flow behaviour can be used to determine the standard deviation of net cash flows. Once the upper and lower limits are set, managerial attention is needed only if the cash balance deviates from the limits. The action under these situations are anticipated and planned in the beginning.

Example 2: The Miller-Orr model

PKG Company has a policy of maintaining a minimum cash balance of ₹5,00,000. The standard deviation of the company's daily cash flows is ₹2,00,000. The annual interest rate is 14 per cent. The transaction cost of buying or selling securities is ₹150 per transaction. Determine PKG's upper control limit and the return point as per the Miller-Orr model.

We can use Equation (6) for calculating the spread between upper and lower control limits (Z). Since the standard deviation of net cash flows is given on a daily basis, the annual interest rate is changed to daily basis.

or $\qquad Z = \left[\dfrac{3}{4} \times \dfrac{150 \times 2,00,000^2}{0.14/365} \right]^{\frac{1}{3}} = ₹2,27,227$

The upper control limit and return point are as follows:

$$\begin{aligned}
\text{Upper limit} &= \text{Lower limit} + 3Z = 5,00,000 + (3 \times 2,27,227) \\
&= ₹1,81,680 \\
\text{Return point} &= \text{Lower limit} + Z = 5,00,000 + 2,27,227 \\
&= ₹7,27,227 \\
\text{Av. cash balance} &= \text{Lower limit} + 4/3Z = 5,00,000 + 4/3 (2,27,227) \\
&= ₹8,02,969
\end{aligned}$$

PKG will not allow the lower limit of cash balance of ₹5,00,000. If the firm's cash balance touches this limit, it will sell marketable securities worth (Z) ₹2,27,227 and restore return point to ₹7,27,227 cash balance level. On the other hand, if PKG's cash balance touches the upper limit of ₹1,181,680, it will spend cash buying marketable securities worth ($2Z$) ₹454,454 and bring cash balance to the return point: ₹11,81,680 − ₹4,54,454 = ₹7,27,227.

Self Assessment Questions

9. A firm maintains the operating cash balance for _____ purposes.

10. The MO model is more realistic since it allows variation in cash balance within lower and upper limits. (True/False)

13.7   Investing Surplus Cash in Marketable Securities

There is a close relationship between cash and money market securities or other short-term investment alternatives. Investment in these alternatives should be properly managed. Excess cash should normally be invested in those alternatives that can be conveniently and promptly converted into cash. Cash in excess of the requirement of operating cash balance may be held for two reasons. *First*, the working capital requirements of the firm fluctuate because of the elements of seasonality and business cycles. The excess cash may build up during slack seasons but it would be needed when the demand picks up. Thus, excess cash during slack season is idle temporarily, but has a predictable requirement later on. *Second*, excess cash may be held as a buffer to meet unpredictable financial needs. A firm holds extra cash because cash flows cannot be predicted with certainty. Cash balance held to cover the future exigencies is called the precautionary balance and is usually invested in the short-term money market investments until needed.

Instead of holding excess cash for the earlier-mentioned purpose, the firm may meet its precautionary requirements as and when they arise by making short-term borrowings. The choice between the short-term borrowings and liquid assets holding will depend upon the firm's policy regarding the mix of short-term financing.

The excess amount of cash held by the firm to meet its variable cash requirements and future contingencies should be temporarily invested in marketable securities, which can be regarded as near moneys. A number of marketable securities may be available in the market. The financial manager must decide about the portfolio of marketable securities in which the firm's surplus cash should be invested.

Among other factors like safety, maturity and mark etability, one more major factor decides the selection of investment opportunities in the legal applications applicable to the organization. E.g. an insurance company, a cooperative society, a charitable trust etc. are not free to choose its own investment opportunity. It is regulated by the respective laws applicable to those organizations.

Self Assessment Questions

11. The working capital of a firm fluctuate because of the elements of seasonality and business cycles. (True/False)
12. The _____ must dcide about the portfolio of marketable securities in which the firm's surplus cash should be invested.

13.8 Summary

Let us recapitulate the important concepts discussed in this unit:

- A firm should chart out strategies concerning the facets of cash management.
- 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 effective control of disbursement can also help the firm in conserving cash and reducing the financial requirements. Disbursements arise due to trade credit, which is a (spontaneous) source of funds.
- The firm's need to hold cash may be attributed to the following three motives: (i) Transaction motive (ii) Precautionary motive (iii) Speculative motive.
- Cash flows are inseparable parts of the business operations of firms.
- Cash budget is the most significant device to plan for and control cash receipts and payments.
- One of the primary responsibilities of the financial manager is to maintain a sound liquidity position of the firm so that the dues are settled in time.
- There is a close relationship between cash and money market securities or other short-term investment alternatives.

13.9   Glossary

- ***Cash planning:*** It is defined as the technique to plan and control the use of cash.
- ***Sensitivity analysis:*** It is defined as a useful method of getting information about variability of cash flows.

13.10 Terminal Questions

1. Explain cash management. List the different facets of cash management.
2. What are the main motives for holding cash for a firm?
3. Write a short note on cash planning.
4. Illustrate with an example the preparation of a cash budget.
5. Discuss the Baumol model.
6. Write a short note on investing surplus cash in marketable securities.

13.11 Answers

Self Assessment Questions

1. True
2. Precautionary
3. False
4. False
5. True
6. Cash planning
7. Cash budget
8. False
9. Transaction
10. True
11. True
12. Finance manager

Terminal Questions

1. Cash management is concerned with the management 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. For more details, refer section 13.3.

2. The main motives of a firm to hold cash are:
   - Transaction motive
   - Precautionary motive
   - Speculative motive

   For more details, refer section 13.2.

3. Cash planning is a technique of planning and controlling the use of cash. For more details, refer section 13.4.

4. The preparation of a cash budget is based on the estimation of cash outflows. For more details, refer section 13.5.

5. The Baumol model of cash management provides a formal approach for determining a firm's optimum cash balance under certainty. For more details, refer section 13.6.

6. The features that a firm should examine while choosing among alternative investment are:
   - Safety
   - Maturity
   - marketability

   For more details, refer section 13.7.

13.12 Case Study

Cash Budget Preparation for Payal Plastics Company

Payal Plastics Company (PPC) is engaged in the manufacture of plastic-based products for home use. The company is located in Faridabad in Haryana. It is one of the leading suppliers of plastic products in the markets of Haryana, Punjab and Delhi. In recent years, the competition has intensified and many small manufacturers have entered the market. PPC has been able to face the competition on the strength of the quality and price of its products. In spite of high competition, it has grown rapidly.

PPC is a profitable company, but it has been facing liquidity problem for a couple of years. The company has defaulted in paying its obligations and has stretched payment to its creditors. This has affected company's creditworthiness. The company management is worried that the frequent stretching of credit payments might cause suppliers to demand cash payments for purchases. The managing director, therefore, wants the

finance manager to prepare a cash budget and make a plan for meeting a deficit situation.

The finance manager set to develop a monthly cash budget for the period starting from April 2009 to September 2009. She obtained the actual sales figures from the records of the last three months, and based on the past trends and future market prospects developed the sales forecasts as shown below:

Actual sales	(₹lakh)	Sales forecasts	(₹lakh)
January	240		
April	260		
February	280		
May	210		
March	320		
June	160		
July	240		
August	200		
September	160		
October	200		

Of the total sales, PPC's cash sales are 20 per cent and credit sales 80 per cent. The company's credit terms are 30 days. But it is able to collect only about fifty per cent of the accounts receivables in the first month after sales. About 30 per cent collections take place in the second month after the sales and the remaining in the third month of sales.

PPC's products require a very heavy use of material. The average consumption of raw material is 70 per cent of sales. The company buys 60 per cent of the materials required for the next month in the previous month. Suppliers' credit terms are 30 days. But the records show that the company pays for 60 per cent of purchases in a month, 20 per cent in two months and the remaining in three months. The following payments are expected for wages and salaries:

Month	(₹lakh)	Month	(₹lakh)
April	42	July	40
May	39	August	32
June	32	September	28

The fixed and variable general administrative and marketing expenses are estimated to be about ₹2.5 lakh per month and 5 per cent of sales, respectively. Power and fuel expenses are expected to be 4 per cent of sales and depreciation ₹12 lakh per month. The company has planned a capital expenditure of ₹70 lakh, of which 50 per cent will be paid in May and the remaining in June. On a ₹20 lakh borrowing, half-yearly interest at 16 per cent annual rate is to be paid in the month of June. A tax payment on the previous year's profit of ₹2.5 lakh is due in April. The financial manager estimated that PPC's tax liability for the next year is expected to be ₹24 lakh, which is payable in equal instalments in March, June, September and December. The company is expected to have cash and bank balance of ₹140,000 in the beginning of April.

After collecting the information about cash flows, the finance manager created an Excel file by classifying each item of cash flows systematically into cash receipts and payments. Her concern was that as and when any change in sales or collection experience is made the cash flow forecasts should automatically get updated.

Questions

1. Prepare a cash budget for PPC, and provide an explanation for the results.

2. Assume that sales forecasts are off by ± 10 per cent. What are the implications?

References

- Brigham, F. E. & Houston, F.J. (2013). *Fundamentals of Financial Management* (13th ed.). USA: South-West Cengage Learning.

- Ross, S., Westerfield, R. & Jaffe J. (2012). *Corporate Finance*. New Delhi: McGraw-Hill.

- Brigham, F.E. & Ehrhardt, C.M., *Financial Management: Theory & Practice* (2010). USA: South-West Cengage Learning.

- Berk, J., DeMarzo. P. & Thampy A. (2010). *Financial Management*. New Delhi: Pearson Education.

E-References

- http://vcmdrp.tums.ac.ir/files/financial/istgahe_mali/moton_english/ financial_management_%5Bwww.accfile.com%5D.pdf (Retrieved on 28 May 2013)

Unit 14   Receivables and Inventory Management

Structure

Caselet

Indus Engineering Limited (IEL) is a well-known manufacturer of engineering goods. The company's product line includes about 100 models of various products. The company produces and stocks goods according to the sales forecasts for each item. Recently, the company introduced a tight inventory control system because of the shortage of financial resources, and it has been maintaining inventories below the target levels. It was thought by many company executives that the policy of tight inventory control has resulted in substantial loss of sales. It was noticed that the company has been frequently losing orders to competitors because of stock-outs.

The problem of lost sales forced the management to reconsider its inventory policy. The company, therefore, appointed a committee, consisting of general managers of finance, marketing and production, to determine whether finished goods inventory levels should be increased. The committee reported that more than the tightness of the current inventory control system; the problem was based on inaccurate sales forecasts. It was noted that it was very difficult to make prediction of new demand since customers erratically placed orders.

The committee recommended that the company should adopt a system of safety stocks to avoid stock-out problem. It was suggested that safety stocks

should be determined after a careful consideration of (i) costs, (ii) return, and (iii) risks associated with inventory maintenance. It was, therefore, thought necessary to compile data on possible inventory levels, lost sales on account of stock-outs and annual cost of maintaining higher levels of finished goods inventory.

14.1 Introduction

In the previous unit, you studied about the different facets of financial management, motives for holding cash, the need for cash planning, the process of cash forecasting and budgeting, determining the optimum cash balance and investing surplus cash in marketable securities.

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. Trade credit creates accounts receivable or trade debtors that the firm is expected to collect in the near future. A credit sale involves an element of risk since the cash payments are yet to be received. 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 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.

In this unit, you will study about the credit policy, collection procedures and the nature of inventory.

Objectives

After studying this unit, you should be able to:

- discuss collection procedures
- describe the nature of credit policy
- explain the nature of inventory
- assess the techniques of inventory management

14.2 Credit Policy: Nature and Goals

The credit policy of a firm affects the working capital by influencing the level of debtors. The firm should use discretion in granting credit terms to its customers. Depending upon the 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 rationalised 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 credit-worthiness of the existing customers. The case of delayed payments should be thoroughly investigated.

14.2.1 Optimum Credit Policy: A Marginal Cost-Benefit Analysis

The firm's operating profit is maximized when total cost is minimized for a given level of revenue. Credit policy at point *A* in Figure 14.1 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 receivable. 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:
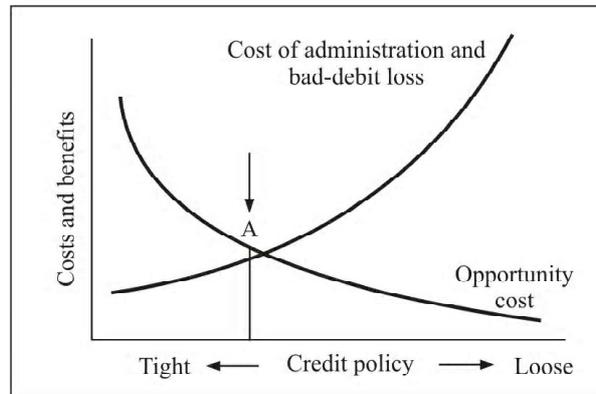
Figure 14.1 Costs of Credit Policy

- Estimation of incremental operating profit.

- Estimation of incremental investment in accounts receivable.

- Estimation of the incremental rate of return of investment.

- Comparison of the incremental rate of return with the required rate of return.

14.2.2 Credit Policy Variables

In establishing an optimum credit policy, the financial manager must consider the important decision variables which influence the level of receivables. The major controllable decision variables include 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 receivable 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 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.

Credit standards

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 receivable. 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 obligation 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 the firm's investment in accounts receivable. Default rate can be measured in terms of bad-debt losses ratio—the proportion of uncollected receivable. 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.

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 upon the point where incremental return equals incremental cost.

Self Assessment Questions

1. The credit policy of the firm affects the working capital by influencing the level of debtors. (True/False)

2. The _____or the credit manager may administer the credit policy of a firm.

Activity 1

What are the important decision variables that the financial manager must consider while establishing on optimum credit policy.

Hint: These decision variables are three in number.

14.3   Collection Procedures

A collection policy is needed because all customers do not pay the firm's bills on time. Some customers are slow payers while some are non-payers. The collection efforts should, therefore, aim at accelerating the collections from slow-payers and reducing the bad-debt losses. A collection policy should ensure prompt and regular collection. Prompt collection is needed for fast turnover of working capital, keeping collection costs and bad-debts within limits and maintaining collection efficiency. Regularity in collections keeps debtors alert, and they tend to pay their dues promptly.

14.3.1 Monitoring Receivable

A firm needs to continuously monitor and control its receivable to ensure the success of collection efforts. Two traditional methods of evaluating the management of receivable are: (i) average collection period (ACP) and (ii) aging schedule. These methods have certain limitations to be useful in monitoring receivable. A better approach is (iii) collection experience matrix.

(i) Average collection period

We have earlier defined average collection period as:

$$ACP = \frac{Debtors \times 360}{Credit\ sales}$$

The average collection period so calculated is compared with the firm's stated credit period to judge the collection efficiency. For example, if a firm's stated credit period is 25 days and the actual collection period is 40 days, then one

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may conclude that the firm has a lax system of collection. An extended collection period delays cash inflows, impairs the firm's liquidity position and increases the chances of bad-debt losses. The average collection period measures the quality of receivable since it indicates the speed of their collectability.

There are two limitations of this method. *First*, it provides an average picture of collection experience and is based on aggregate data. For control purposes, one needs specific information about the age of outstanding receivables. *Second*, it is susceptible to sales variations and the period over which sales and receivables have been aggregated. Thus, average collection period cannot provide a very meaningful information about the quality of outstanding receivable.

(ii) Aging schedule

The aging schedule removes one of the limitations of the average collection period. It breaks down receivables according to the length of time for which they have been outstanding.

Example, if the firm's stated credit period is 25 days, the aging schedule indicates that 50 per cent of receivables remain outstanding beyond this period. A significant amount of receivables remains uncollected much longer than the firm's credit period. Thus, aging schedule provides more information about the collection experience. It helps to spot out the slow-paying debtors. However, it also suffers from the problem of aggregation, and does not relate receivables to sales of the same period.

Outstanding	Outstanding (₹)	Percentage
0–25	200,000	50.0
26–35	100,000	25.0
36–45	50,000	12.5
46–60	30,000	7.5
Over 60	20,000	5.0
	400,000	100.0

(iii) Collection experience matrix

The major limitations of the traditional methods are that they are based on aggregated data and fail to relate outstanding receivables of a period with the credit sales of the same period. Thus, using the traditional methods, two analysts can come up with entirely different signals about the status of receivables if they aggregate sales and receivables data differently. Using disaggregated data for analysing collection experience can eliminate this problem. The key is to relate receivables to sales of the same period. When sales over a period of time are

shown horizontally and associated receivables vertically in a tabular form, a matrix is constructed. Therefore, this method of evaluating receivables is called collection experience matrix. Consider an example.

Suppose that the financial manager of a firm is analysing its receivables from the credit sales of past six months starting from July to December. The credit sales of the company are as follows:

₹ in lakh		*₹ in lakh*	
July	400	October	220
August	410	November	205
September	370	December	350

From the sales ledger, the financial manager gathered outstanding receivables data for each month's sales. For example, he found that for July, there was a sale for ₹400 lakh, the outstanding receivables during July, August and September were ₹330 lakh, ₹242 lakh and ₹80 lakh. Similarly, he ascertained receivables for sales of other months. This information is shown in Table 14.1.

When we read a column top-down, we get an idea of the manner in which the firm collects a given month's sales. How well does the firm collect current month's sales? This can be ascertained by reading the diagonals drawn in Table 14.1. For example, the top diagonal shows the manner in which current month's sales are collected. The next diagonal shows receivables one month older and so on. For the firm in our example, we find that about 80 per cent of sales in a given month remain uncollected by the end of that month. In other words, about 20 per cent of sales in a given month are collected in the same month. If the percentages increase as we move down any diagonal, it implies that the firm is unable to collect its receivables faster. This requires an investigation for appropriate remedial action.

Table 14.1 Sales and Receivables from July to December

(₹ in lakh)

Month	July	Aug.	Sept.	Oct.	Nov.	Dec.
Sales	400	410	370	220	205	350
Receivables						
July	330					
Aug.	242	320				
Sept.	80	245	320			
Oct.	0	76	210	162		
Nov.	0	0	72	120	160	
Dec.	0	0	0	40	130	285

Table 14.2 Collection Experience Matrix

(₹ in lakh)

Month	July	Aug.	Sept.	Oct.	Nov.	Dec.
Sales	400	410	370	220	205	350
Receivables (%)						
July	82.5					
Aug.	60.5	78.0				
Sept.	20.0	59.8	86.5			
Oct.	0	18.5	56.8	73.6		
Nov.	0	0	19.5	54.5	78.0	
Dec.	0	0	0	18.2	63.0	81.4

Self Assessment Questions

3. A firm need not continuously monitor and control its receivable to ensure the success of collection efforts. (True/False)

4. A collection policy is needed because all customers do not pay the firm's bill in time. (True/False)

14.4 Nature of Inventory

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.

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.

Objective of Inventory Management

In the context of inventory management, the firm is faced with the problem of meeting two conflicting needs:

- 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.

14.4.1 Inventory Management Techniques

In managing inventories, the firm's objective should be in consonance with the shareholder wealth maximization principle. To achieve this, the firm should determine the optimum level of inventory. Efficiently controlled inventories make the firm flexible. Inefficient inventory control results in unbalanced inventory and inflexibility—the firm may sometimes run out of stock and sometimes may pile up unnecessary stocks. This increases the level of investment and makes the firm unprofitable.

To manage inventories efficiency, answers should be sought to the following two questions:

- How much should be ordered?

- When should it be ordered?

The first question, how much to order, relates to the problem of determining Economic Order Quantity (EOQ), and is answered with an analysis of costs of

maintaining certain level of inventories. The second question, when to order, arises because of uncertainty and is a problem of determining the **reorder point**.

Economic Order Quantity (EOQ)

One of the major inventory management problems to be resolved is how much inventory should be added when inventory is replenished. If the firm is buying raw materials, it has to decide the lots in which it has to be purchased on replenishment. If the firm is planning a production run, the issue is how much production to schedule (or how much to make). These problems are called order quantity problems, and the task of the firm is to determine the optimum or economic order quantity (or economic lot size). Determining an optimum inventory level involves two types of costs: (a) ordering costs and (b) carrying costs. The economic order quantity is that inventory level that minimizes the total of ordering and carrying costs.

Ordering costs: The term ordering costs is used in case of raw materials (or supplies) and includes the entire costs of acquiring raw materials. They include costs incurred in the following activities: requisitioning, purchase ordering, transporting, receiving, inspecting and storing (store placement). Ordering costs increase in proportion to the number of orders placed.

Carrying costs: Costs incurred for maintaining a given level of inventory are called carrying costs. They include storage, insurance, taxes, deterioration and obsolescence. The storage costs comprise cost of storage space (warehousing cost), stores handling costs and clerical and staff service costs (administrative costs), incurred in recording and providing special facilities such as fencing, lines, racks etc.

Carrying costs vary with inventory size. This behaviour is contrary to that of ordering costs which decline with increase in inventory size. The economic size of inventory would thus depend on trade-off between carrying costs and ordering costs.

Ordering and carrying costs trade-off: The optimum inventory size is commonly referred to as **economic order quantity.** It is that order size at which annual total costs of ordering and holding are the minimum.

Order-formula approach: The trial and error, or analytical, approach is somewhat tedious to calculate the EOQ. An easy way to determine EOQ is to use the order-formula approach. Let us illustrate this approach.

Suppose the ordering cost per order, *O*, is fixed. The total order costs will be number of orders during the year multiplied by ordering cost per order. If *A*

represents total annual requirements and Q the order size, the number of orders will be A/Q and total order costs will be:

Total ordering cost

$$= \frac{(\text{Annual requirement} \times \text{Per order cost})}{\text{Order size}}$$

$$\text{TOC} = \frac{AO}{Q} \tag{1}$$

Let us further assume that carrying cost per unit, c, is constant. The total carrying costs will be the product of the average inventory units and the carrying cost per unit. If Q is the order size and usage is assumed to be steady, the average inventory will be:

$$\text{Average inventory} = \frac{\text{Order size}}{2} = \frac{Q}{2} \tag{2}$$

and total carrying costs will be:

Total carrying cost = Average inventory
$$\times \text{ Per unit carrying cost}$$

$$\text{TCC} = \frac{Qc}{2} \tag{3}$$

The total inventory cost, then, is the sum of total carrying and ordering costs:

Total cost = Total carrying cost + Total order cost

$$= \sqrt{\frac{2 \times \text{quantity required} \times \text{ordering cost}}{\text{carrying cost}}}$$

$$\text{EOQ} = \sqrt{\frac{2AO}{c}} \tag{4}$$

To illustrate the use of EOQ formula, let us assume data of the example, taken to illustrate the trial and error approach. If the total requirement is 1,200 units, ordering cost per order is ₹37.50 and carrying cost per unit is ₹1, the economic order quantity will be:

$$\text{EOQ} = \sqrt{\frac{2 \times 1,200 \times 37.5}{1}} = 300 \text{ units}$$

Inventory Control Systems

A firm needs an inventory control system to effectively manage its inventory. There are several inventory control systems in vogue. They range from simple systems to very complicated systems.

ABC Inventory Control System

Large numbers of firms have to maintain several types of inventories. It is not desirable to keep the same degree of control on all the items. The firm should pay maximum attention to those items whose value is the highest. The firm should, therefore, classify inventories to identify which items should receive the most effort in controlling. The firm should be *selective* in its approach to control investment in various types of inventories. This analytical approach is called the ABC analysis and tends to measure the significance of each item of inventories in terms of its value.

Just-In-Time (JIT) Systems

Japanese firms popularized the Just-In-Time (JIT) system in the world. In a JIT system, material or the manufactured components and parts arrive to the manufacturing sites or stores just few hours before they are put to use. The delivery of material is synchronized with the manufacturing cycle and speed. JIT system eliminates the necessity of carrying large inventories, and thus, saves carrying and other related costs to the manufacturer. The system requires perfect understanding and coordination between the manufacturer and suppliers, in terms of the timing of delivery and quality of the material. Poor quality material or components could halt the production. The JIT inventory system complements the Total Quality Management (TQM). The success of the system depends on how well a company manages its suppliers. The system puts tremendous pressure on suppliers. They will have to develop adequate systems and procedures to satisfactorily meet the needs of manufacturers.

Out-sourcing

A few years ago there was a tendency on the parts of many companies to manufacture all components in-house. Now more and more companies are adopting the practice of out-sourcing. Out-sourcing is a system of buying parts and components from outside rather than manufacturing them internally. Many companies develop a single source of supply, and many others help developing small and middle size suppliers of components that they require. Tata Motors has, for example, developed number of ancillary units around its manufacturing sites that supply parts and components to its manufacturing plants. With the help of Tata Motors, the ancillaries are able to maintain the high quality of the manufactured components. The car manufacturing company, Maruti, which is now controlled by Suzuki of Japan, has the similar system of supply.

Computerized Inventory Control Systems

More and more companies, small or large size, are adopting the computerized system of controlling inventories A computerized inventory control system enables a company to easily track large items of inventories. It is an automatic system of counting inventories, recording withdrawals and revising the balance. There is an in-built system of placing order as the computer notices that the reorder point has been reached. The computerized inventory system is inevitable for large retail stores, which carry thousands of items. The computer information systems of the buyers and suppliers are linked to each other. As soon as the supplier's computer receives an order from the buyer's system, the supply process is activated.

Self Assessment Questions

5. _____are those basic inputs that are converted into finished product through the manufacturing process.

6. Cost incurred for maintaining a given level of inventory are called carrying costs. (True/False)

Activity 2

Suppose you are working as a store keeping manager and your job responsibility includes managing inventory as well. Identify some of the inventory management techniques that you can use.

Hint: Refer section 14.4

14.5 Summary

Let us recapitulate the important concepts discussed in this unit:

- The credit policy of the firm affects the working capital by influencing the level of debtors.

- A collection policy is needed because all customers do not pay the firm's bills on time.

- Inventories are stock of the product a company is manufacturing for sale and components that make up the product.

14.6   Glossary

- *Credit standards:* These are the criteria which a firm follows in selecting customers for the purpose of credit extension
- *Inventory:* Inventories are stock of the product a company is manufacturing for sale and components that make up the product

14.7   Terminal Questions

1. Describe the nature of credit policy.
2. Illustrate the concept of optimum credit policy.
3. Analyse the role played by various credit policy variables.
4. Write short notes on: (a) Average collection period (b) Aging schedules.
5. Write a short note on the nature of inventory.
6. Explain the various inventory management techniques.

14.8   Answers

Self Assessment Questions

1. True
2. Financial manager
3. True
4. True
5. Raw materials
6. True

Terminal Questions

1. The credit policy of a firm affects the working capital by influencing the level of debtors. For more details, refer section 14.2.
2. The firm's operating profit is maximized when total cost is minimized for a given level of revenue. For more details, refer section 14.2.1.
3. In establishing an optimum credit policy, the financial manager must consider the important decision variables which influence the level of receivables. For more details, refer section 14.2.2.

4. (a) average collection period: ACP = $\dfrac{\text{Debtors} \times 360}{\text{Credit Sales}}$.

   For more details, refer section 14.3.1.

5. The various forms in which inventories exist in a manufacturing company are: (i) raw materials (ii) work-in-process (iii) finished goods. For more details, refer section 14.4.

6. The various inventory management techniques are:

    (i) Economic Order Quantity

    (ii) ABC Inventory Control System

   For more details, refer section 14.4.1.

14.9 Case Study

Analysis of Investment in Inventory

Bansal Engineering Limited (BEL) produces many products. The managing director has estimated sales for the next year as ₹176 crore and gross profit ₹70 crore, after deducting cost of goods sold of ₹106 crore. The average working capital requirements to support the forecast sales are estimated as follows:

	(₹ lakh)	Percentage of Forecast Sales
Current Assets		
Cash	175	1.0
Receivables	3,520	20.0
Inventories:		
Raw Materials	704	4.0
Work-in-process	816	4.6
Finished goods	490	2.8
Total	5,705	32.4
Less: Current liabilities	1,305	7.4
Working capital	4,400	25.0

The company uses sales forecasts as the basis for production and inventory of finished goods. The shortage of funds forced the company to tightly control on inventories and maintain finished goods inventory below the target levels, as desired by the sales forecasts. The company has been losing orders to competitors because of stock-outs resulting from the tight inventory control.

The problem of lost sales forced management to reconsider its inventory policy. The company is therefore considering adopting a system of safety

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stocks to avoid stock-out problem. It would like to estimate the costs and benefits of all new options. It was, therefore, thought necessary to compile data on possible inventory levels, lost sales on account of stock-outs and annual cost of maintaining higher levels of finished goods inventory. Table 14.3 provides these estimates.

Table 14.3 Bansal Engineering Limited: Impact of Alternative Inventory Policies

Inventory Policy Options	Inventory Level (₹ lakh)	Lost Sales (₹ lakh)	Carrying Cost (₹ lakh)
Current	490	772	27
A	610	550	34
B	770	350	42
C	1013	190	56
D	1276	90	70
E	1406	50	77

It can be seen from Table 14.3 that the company can affect reduction in stock-outs and thus increase sales by increasing levels of finished goods inventory. To do so, however, the company will incur additional carrying costs including warehousing, handling, administration, set up, insurance etc.

Discussion Questions

1. Discuss how BEL has made use of sales forecasts.

2. Analyse the usage of inventory management system by BEL.

References

- Brigham, F. E. & Houston, F.J. (2013). *Fundamentals of Financial Management* (13th ed.). USA: South-West Cengage Learning.

- Ross, S., Westerfield, R. & Jaffe J. (2012). *Corporate Finance*. New Delhi: McGraw-Hill.

- Brigham, F.E. & Ehrhardt, C.M., *Financial Management: Theory & Practice* (2010). USA: South-West Cengage Learning.

- Berk, J., DeMarzo. P. & Thampy A. (2010). *Financial Management*. New Delhi: Pearson Education.

- Paramasivan, C. & Subramanian, T. (2009) *Financial Management*. New Delhi: New Age International Publishers.

E-Reference

- www.occ.gov/publications/publications-by-type/comptrollers-handbook/asif.pdf (Retrieved on 24 April 2013)

NOTES

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ANNEXURE

Table A: Compound Value Factor of a Lump Sum (CVF) of ₹1

Interest Rate

Year	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%
1	1.010	1.020	1.030	1.040	1.050	1.060	1.070	1.080	1.090	1.100	1.110	1.120	1.130	1.140
2	1.020	1.040	1.061	1.082	1.103	1.124	1.145	1.166	1.188	1.210	1.232	1.254	1.277	1.300
3	1.030	1.061	1.093	1.125	1.158	1.191	1.225	1.260	1.295	1.331	1.368	1.405	1.443	1.482
4	1.041	1.082	1.126	1.170	1.216	1.262	1.311	1.360	1.412	1.464	1.518	1.574	1.630	1.689
5	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539	1.611	1.685	1.762	1.842	1.925
6	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677	1.772	1.870	1.974	2.082	2.195
7	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828	1.949	2.076	2.211	2.353	2.502
8	1.083	1.172	1.267	1.369	1.477	1.594	1.718	1.851	1.993	2.144	2.305	2.476	2.658	2.853
9	1.094	1.195	1.305	1.423	1.551	1.689	1.838	1.999	2.172	2.358	2.558	2.773	3.004	3.252
10	1.105	1.219	1.344	1.480	1.629	1.791	1.967	2.159	2.367	2.594	2.839	3.106	3.395	3.707
11	1.116	1.243	1.384	1.539	1.710	1.898	2.105	2.332	2.580	2.853	3.152	3.479	3.836	4.226
12	1.127	1.268	1.426	1.601	1.796	2.012	2.252	2.518	2.813	3.138	3.498	3.896	4.335	4.818
13	1.138	1.294	1.469	1.665	1.886	2.133	2.410	2.720	3.066	3.452	3.883	4.363	4.898	5.492
14	1.149	1.319	1.513	1.732	1.980	2.261	2.579	2.937	3.342	3.797	4.310	4.887	5.535	6.261
15	1.161	1.346	1.558	1.801	2.079	2.397	2.759	3.172	3.642	4.177	4.785	5.474	6.254	7.138
16	1.173	1.373	1.605	1.873	2.183	2.540	2.952	3.426	3.970	4.595	5.311	6.130	7.067	8.137
17	1.184	1.400	1.653	1.948	2.292	2.693	3.159	3.700	4.328	5.054	5.895	6.866	7.986	9.276
18	1.196	1.428	1.702	2.026	2.407	2.854	3.380	3.996	4.717	5.560	6.544	7.690	9.024	10.575
19	1.208	1.457	1.754	2.107	2.527	3.026	3.617	4.316	5.142	6.116	7.263	8.613	10.197	12.056
20	1.220	1.486	1.806	2.191	2.653	3.207	3.870	4.661	5.604	6.727	8.062	9.646	11.523	13.743
25	1.282	1.641	2.094	2.666	3.386	4.292	5.427	6.848	8.623	10.835	13.585	17.000	21.231	26.462
30	1.348	1.811	2.427	3.243	4.322	5.743	7.612	10.063	13.268	17.449	22.892	29.960	39.116	50.950
40	1.489	2.208	3.262	4.801	7.040	10.286	14.974	21.725	31.409	45.259	65.001	93.051	132.782	188.884
50	1.645	2.692	4.384	7.107	11.467	18.420	29.457	46.902	74.358	117.391	184.565	289.002	450.736	700.233

(Contd..)

Table A Contd.

Interest Rate

Year	15%	16%	17%	18%	19%	20%	21%	22%	23%	24%	25%	30%	40%
1	1.150	1.160	1.170	1.180	1.190	1.200	1.210	1.220	1.230	1.240	1.250	1.300	1.400
2	1.323	1.346	1.369	1.392	1.416	1.440	1.464	1.488	1.513	1.538	1.563	1.690	1.960
3	1.521	1.561	1.602	1.643	1.685	1.728	1.772	1.816	1.861	1.907	1.953	2.197	2.744
4	1.749	1.811	1.874	1.939	2.005	2.074	2.144	2.215	2.289	2.364	2.441	2.856	3.842
5	2.011	2.100	2.192	2.288	2.386	2.488	2.594	2.703	2.815	2.932	3.052	3.713	5.378
6	2.313	2.436	2.565	2.700	2.840	2.986	3.138	3.297	3.463	3.635	3.815	4.827	7.530
7	2.660	2.826	3.001	3.185	3.379	3.583	3.797	4.023	4.259	4.508	4.768	6.275	10.541
8	3.059	3.278	3.511	3.759	4.021	4.300	4.595	4.908	5.239	5.590	5.960	8.157	14.758
9	3.518	3.803	4.108	4.435	4.785	5.160	5.560	5.987	6.444	6.931	7.451	10.604	20.661
10	4.046	4.411	4.807	5.234	5.695	6.192	6.727	7.305	7.926	8.594	9.313	13.786	28.925
11	4.652	5.117	5.624	6.176	6.777	7.430	8.140	8.912	9.749	10.657	11.642	17.922	40.496
12	5.350	5.936	6.580	7.288	8.064	8.916	9.850	10.872	11.991	13.215	14.552	23.298	56.694
13	6.153	6.886	7.699	8.599	9.596	10.699	11.918	13.264	14.749	16.386	18.190	30.288	79.371
14	7.076	7.988	9.007	10.147	11.420	12.839	14.421	16.182	18.141	20.319	22.737	39.374	111.120
15	8.137	9.266	10.539	11.974	13.590	15.407	17.449	19.742	22.314	25.196	28.422	51.186	155.568
16	9.358	10.748	12.330	14.129	16.172	18.488	21.114	24.086	27.446	31.243	35.527	66.542	217.795
17	10.761	12.468	14.426	16.672	19.244	22.186	25.548	29.384	33.759	38.741	44.409	86.504	304.913
18	12.375	14.463	16.879	19.673	22.901	26.623	30.913	35.849	41.523	48.039	55.511	112.455	426.879
19	14.232	16.777	19.748	23.214	27.252	31.948	37.404	43.736	51.074	59.568	69.389	146.192	597.630
20	16.367	19.461	23.106	27.393	32.429	38.338	45.259	53.358	62.821	73.864	86.736	190.050	836.683
25	32.919	40.874	50.658	62.669	77.388	95.396	117.391	144.210	176.859	216.542	264.698	705.641	4499.880
30	66.212	85.850	111.065	143.371	184.675	237.376	304.482	389.758	497.913	634.820	807.794	2619.996	24201.432
40	267.864	378.721	533.869	750.378	1051.668	1469.772	2048.400	2847.038	3946.430	5455.913	7523.164	36118.865	700037.697
50	1083.657	1670.704	2566.215	3927.357	5988.914	9100.438	13780.612	20796.561	31279.195	46890.435	70064.923	497929.223	20248916.240

Table B: Compound Value Factor of an Annuity (CVFA) of ₹1

Interest Rate

Year	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	2.010	2.020	2.030	2.040	2.050	2.060	2.070	2.080	2.090	2.100	2.110	2.120	2.130	2.140
3	3.030	3.060	3.091	3.122	3.153	3.184	3.215	3.246	3.278	3.310	3.342	3.374	3.407	3.440
4	4.060	4.122	4.184	4.246	4.310	4.375	4.440	4.506	4.573	4.641	4.710	4.779	4.850	4.921
5	5.101	5.204	5.309	5.416	5.526	5.637	5.751	5.867	5.985	6.105	6.228	6.353	6.480	6.610
6	6.152	6.308	6.468	6.633	6.802	6.975	7.153	7.336	7.523	7.716	7.913	8.115	8.323	8.536
7	7.214	7.434	7.662	7.898	8.142	8.394	8.654	8.923	9.200	9.487	9.783	10.089	10.405	10.730
8	8.286	8.583	8.892	9.214	9.549	9.897	10.260	10.637	11.028	11.436	11.859	12.300	12.757	13.233
9	9.369	9.755	10.159	10.583	11.027	11.491	11.978	12.488	13.021	13.579	14.164	14.776	15.416	16.085
10	10.462	10.950	11.464	12.006	12.578	13.181	13.816	14.487	15.193	15.937	16.722	17.549	18.420	19.337
11	11.567	12.169	12.808	13.486	14.207	14.972	15.784	16.645	17.560	18.531	19.561	20.655	21.814	23.045
12	12.683	13.412	14.192	15.026	15.917	16.870	17.888	18.977	20.141	21.384	22.713	24.133	25.650	27.271
13	13.809	14.680	15.618	16.627	17.713	18.882	20.141	21.495	22.953	24.523	26.212	28.029	29.985	32.089
14	14.947	15.974	17.086	18.292	19.599	21.015	22.550	24.215	26.019	27.975	30.095	32.393	34.883	37.581
15	16.097	17.293	18.599	20.024	21.579	23.276	25.129	27.152	29.361	31.772	34.405	37.280	40.417	43.842
16	17.258	18.639	20.157	21.825	23.657	25.673	27.888	30.324	33.003	35.950	39.190	42.753	46.672	50.980
17	18.430	20.012	21.762	23.698	25.840	28.213	30.840	33.750	36.974	40.545	44.501	48.884	53.739	59.118
18	19.615	21.412	23.414	25.645	28.132	30.906	33.999	37.450	41.301	45.599	50.396	55.750	61.725	68.394
19	20.811	22.841	25.117	27.671	30.539	33.760	37.379	41.446	46.018	51.159	56.939	63.440	70.749	78.969
20	22.019	24.297	26.870	29.778	33.066	36.786	40.995	45.762	51.160	57.275	64.203	72.052	80.947	91.025
25	28.243	32.030	36.459	41.646	47.727	54.865	63.249	73.106	84.701	98.347	114.413	133.334	155.620	181.871
30	34.785	40.568	47.575	56.085	66.439	79.058	94.461	113.283	136.308	164.494	199.021	241.333	293.199	356.787
40	48.886	60.402	75.401	95.026	120.800	154.762	199.635	259.057	337.882	442.593	581.826	767.091	1013.704	1342.025
50	64.463	84.579	112.797	152.667	209.348	290.336	406.529	573.770	815.084	1163.909	1668.771	2400.018	3459.507	4994.521

(Contd...)

Table B Contd.

Interest Rate

Year	15%	16%	17%	18%	19%	20%	21%	22%	23%	24%	25%	30%	40%
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	2.150	2.160	2.170	2.180	2.190	2.200	2.210	2.220	2.230	2.240	2.250	2.300	2.400
3	3.473	3.506	3.539	3.572	3.606	3.640	3.674	3.708	3.743	3.778	3.813	3.990	4.360
4	4.993	5.066	5.141	5.215	5.291	5.368	5.446	5.524	5.604	5.684	5.766	6.187	7.104
5	6.742	6.877	7.014	7.154	7.297	7.442	7.589	7.740	7.893	8.048	8.207	9.043	10.946
6	8.754	8.977	9.207	9.442	9.683	9.930	10.183	10.442	10.708	10.980	11.259	12.756	16.324
7	11.067	11.414	11.772	12.142	12.523	12.916	13.321	13.740	14.171	14.615	15.073	17.583	23.853
8	13.727	14.240	14.773	15.327	15.902	16.499	17.119	17.762	18.430	19.123	19.842	23.858	34.395
9	16.786	17.519	18.285	19.086	19.923	20.799	21.714	22.670	23.669	24.712	25.802	32.015	49.153
10	20.304	21.321	22.393	23.521	24.709	25.959	27.274	28.657	30.113	31.643	33.253	42.619	69.814
11	24.349	25.733	27.200	28.755	30.404	32.150	34.001	35.962	38.039	40.238	42.566	56.405	98.739
12	29.002	30.850	32.824	34.931	37.180	39.581	42.142	44.874	47.788	50.895	54.208	74.327	139.235
13	34.352	36.786	39.404	42.219	45.244	48.497	51.991	55.746	59.779	64.110	68.760	97.625	195.929
14	40.505	43.672	47.103	50.818	54.841	59.196	63.909	69.010	74.528	80.496	86.949	127.913	275.300
15	47.580	51.660	56.110	60.965	66.261	72.035	78.330	85.192	92.669	100.815	109.687	167.286	386.420
16	55.717	60.925	66.649	72.939	79.850	87.442	95.780	104.935	114.983	126.011	138.109	218.472	541.988
17	65.075	71.673	78.979	87.068	96.022	105.931	116.894	129.020	142.430	157.253	173.636	285.014	759.784
18	75.836	84.141	93.406	103.740	115.266	128.117	142.441	158.405	176.188	195.994	218.045	371.518	1064.697
19	88.212	98.603	110.285	123.414	138.166	154.740	173.354	194.254	217.712	244.033	273.556	483.973	1491.576
20	102.444	115.380	130.033	146.628	165.418	186.688	210.758	237.989	268.785	303.601	342.945	630.165	2089.206
25	212.793	249.214	292.105	342.603	402.042	471.981	554.242	650.955	764.605	898.092	1054.791	2348.803	11247.199
30	434.745	530.312	647.439	790.948	966.712	1181.882	1445.151	1767.081	2160.491	2640.916	3227.174	8729.985	60501.081
40	1779.090	2360.757	3134.522	4163.213	5529.829	7343.858	9749.525	12936.535	17154.046	22728.803	30088.655	120392.883	1750091.741
50	7217.716	10435.649	15089.502	21813.094	31515.336	45497.191	65617.202	94525.279	135992.154	195372.644	280255.693	1659760.743	50622288.099

Table C: Present Value Factor of a Lump Sum (PVF) of ₹1

Year	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%
							Interest Rate							
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	0.901	0.893	0.885	0.877
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826	0.812	0.797	0.783	0.769
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751	0.731	0.712	0.693	0.675
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683	0.659	0.636	0.613	0.592
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621	0.593	0.567	0.543	0.519
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564	0.535	0.507	0.480	0.456
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513	0.482	0.452	0.425	0.400
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467	0.434	0.404	0.376	0.351
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424	0.391	0.361	0.333	0.308
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386	0.352	0.322	0.295	0.270
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350	0.317	0.287	0.261	0.237
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319	0.286	0.257	0.231	0.208
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290	0.258	0.229	0.204	0.182
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263	0.232	0.205	0.181	0.160
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239	0.209	0.183	0.160	0.140
16	0.853	0.728	0.623	0.534	0.458	0.394	0.339	0.292	0.252	0.218	0.188	0.163	0.141	0.123
17	0.844	0.714	0.605	0.513	0.436	0.371	0.317	0.270	0.231	0.198	0.170	0.146	0.125	0.108
18	0.836	0.700	0.587	0.494	0.416	0.350	0.296	0.250	0.212	0.180	0.153	0.130	0.111	0.095
19	0.828	0.686	0.570	0.475	0.396	0.331	0.277	0.232	0.194	0.164	0.138	0.116	0.098	0.083
20	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149	0.124	0.104	0.087	0.073
25	0.780	0.610	0.478	0.375	0.295	0.233	0.184	0.146	0.116	0.092	0.074	0.059	0.047	0.038
30	0.742	0.552	0.412	0.308	0.231	0.174	0.131	0.099	0.075	0.057	0.044	0.033	0.026	0.020
40	0.672	0.453	0.307	0.208	0.142	0.097	0.067	0.046	0.032	0.022	0.015	0.011	0.008	0.005
50	0.608	0.372	0.228	0.141	0.087	0.054	0.034	0.021	0.013	0.009	0.005	0.003	0.002	0.001

(Contd..)

Table C Contd.

| | | | | | | Interest Rate | | | | | | | |
Year	15%	16%	17%	18%	19%	20%	21%	22%	23%	24%	25%	30%	40%
1	0.870	0.862	0.855	0.847	0.840	0.833	0.826	0.820	0.813	0.806	0.800	0.769	0.714
2	0.756	0.743	0.731	0.718	0.706	0.694	0.683	0.672	0.661	0.650	0.640	0.592	0.510
3	0.658	0.641	0.624	0.609	0.593	0.579	0.564	0.551	0.537	0.524	0.512	0.455	0.364
4	0.572	0.552	0.534	0.516	0.499	0.482	0.467	0.451	0.437	0.423	0.410	0.350	0.260
5	0.497	0.476	0.456	0.437	0.419	0.402	0.386	0.370	0.355	0.341	0.328	0.269	0.186
6	0.432	0.410	0.390	0.370	0.352	0.335	0.319	0.303	0.289	0.275	0.262	0.207	0.133
7	0.376	0.354	0.333	0.314	0.296	0.279	0.263	0.249	0.235	0.222	0.210	0.159	0.095
8	0.327	0.305	0.285	0.266	0.249	0.233	0.218	0.204	0.191	0.179	0.168	0.123	0.068
9	0.284	0.263	0.243	0.225	0.209	0.194	0.180	0.167	0.155	0.144	0.134	0.094	0.048
10	0.247	0.227	0.208	0.191	0.176	0.162	0.149	0.137	0.126	0.116	0.107	0.073	0.035
11	0.215	0.195	0.178	0.162	0.148	0.135	0.123	0.112	0.103	0.094	0.086	0.056	0.025
12	0.187	0.168	0.152	0.137	0.124	0.112	0.102	0.092	0.083	0.076	0.069	0.043	0.018
13	0.163	0.145	0.130	0.116	0.104	0.093	0.084	0.075	0.068	0.061	0.055	0.033	0.013
14	0.141	0.125	0.111	0.099	0.088	0.078	0.069	0.062	0.055	0.049	0.044	0.025	0.009
15	0.123	0.108	0.095	0.084	0.074	0.065	0.057	0.051	0.045	0.040	0.035	0.020	0.006
16	0.107	0.093	0.081	0.071	0.062	0.054	0.047	0.042	0.036	0.032	0.028	0.015	0.005
17	0.093	0.080	0.069	0.060	0.052	0.045	0.039	0.034	0.030	0.026	0.023	0.012	0.003
18	0.081	0.069	0.059	0.051	0.044	0.038	0.032	0.028	0.024	0.021	0.018	0.009	0.002
19	0.070	0.060	0.051	0.043	0.037	0.031	0.027	0.023	0.020	0.017	0.014	0.007	0.002
20	0.061	0.051	0.043	0.037	0.031	0.026	0.022	0.019	0.016	0.014	0.012	0.005	0.001
25	0.030	0.024	0.020	0.016	0.013	0.010	0.009	0.007	0.006	0.005	0.004	0.001	0.000
30	0.015	0.012	0.009	0.007	0.005	0.004	0.003	0.003	0.002	0.002	0.001	0.000	0.000
40	0.004	0.003	0.002	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table D: Present Value Factor of an Annuity (PVFA) of ₹1

Interest Rate

Year	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	0.901	0.893	0.885	0.877
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736	1.713	1.690	1.668	1.647
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487	2.444	2.402	2.361	2.322
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170	3.102	3.037	2.974	2.914
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791	3.696	3.605	3.517	3.433
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355	4.231	4.111	3.998	3.889
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868	4.712	4.564	4.423	4.288
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335	5.146	4.968	4.799	4.639
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759	5.537	5.328	5.132	4.946
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145	5.889	5.650	5.426	5.216
11	10.368	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495	6.207	5.938	5.687	5.453
12	11.255	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814	6.492	6.194	5.918	5.660
13	12.134	11.348	10.635	9.986	9.394	8.853	8.358	7.904	7.487	7.103	6.750	6.424	6.122	5.842
14	13.004	12.106	11.296	10.563	9.899	9.295	8.745	8.244	7.786	7.367	6.982	6.628	6.302	6.002
15	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.559	8.061	7.606	7.191	6.811	6.462	6.142
16	14.718	13.578	12.561	11.652	10.838	10.106	9.447	8.851	8.313	7.824	7.379	6.974	6.604	6.265
17	15.562	14.292	13.166	12.166	11.274	10.477	9.763	9.122	8.544	8.022	7.549	7.120	6.729	6.373
18	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.372	8.756	8.201	7.702	7.250	6.840	6.467
19	17.226	15.678	14.324	13.134	12.085	11.158	10.336	9.604	8.950	8.365	7.839	7.366	6.938	6.550
20	18.046	16.351	14.877	13.590	12.462	11.470	10.594	9.818	9.129	8.514	7.963	7.469	7.025	6.623
25	22.023	19.523	17.413	15.622	14.094	12.783	11.654	10.675	9.823	9.077	8.422	7.843	7.330	6.873
30	25.808	22.396	19.600	17.292	15.372	13.765	12.409	11.258	10.274	9.427	8.694	8.055	7.496	7.003
40	32.835	27.355	23.115	19.793	17.159	15.046	13.332	11.925	10.757	9.779	8.951	8.244	7.634	7.105
50	39.196	31.424	25.730	21.482	18.256	15.762	13.801	12.233	10.962	9.915	9.042	8.304	7.675	7.133

(Contd..)

Table D Contd.

Interest Rate

Year	15%	16%	17%	18%	19%	20%	21%	22%	23%	24%	25%	30%	40%
1	0.870	0.862	0.855	0.847	0.840	0.833	0.826	0.820	0.813	0.806	0.800	0.769	0.714
2	1.626	1.605	1.585	1.566	1.547	1.528	1.509	1.492	1.474	1.457	1.440	1.361	1.224
3	2.283	2.246	2.210	2.174	2.140	2.106	2.074	2.042	2.011	1.981	1.952	1.816	1.589
4	2.855	2.798	2.743	2.690	2.639	2.589	2.540	2.494	2.448	2.404	2.362	2.166	1.849
5	3.352	3.274	3.199	3.127	3.058	2.991	2.926	2.864	2.803	2.745	2.689	2.436	2.035
6	3.784	3.685	3.589	3.498	3.410	3.326	3.245	3.167	3.092	3.020	2.951	2.643	2.168
7	4.160	4.039	3.922	3.812	3.706	3.605	3.508	3.416	3.327	3.242	3.161	2.802	2.263
8	4.487	4.344	4.207	4.078	3.954	3.837	3.726	3.619	3.518	3.421	3.329	2.925	2.331
9	4.772	4.607	4.451	4.303	4.163	4.031	3.905	3.786	3.673	3.566	3.463	3.019	2.379
10	5.019	4.833	4.659	4.494	4.339	4.192	4.054	3.923	3.799	3.682	3.571	3.092	2.414
11	5.234	5.029	4.836	4.656	4.486	4.327	4.177	4.035	3.902	3.776	3.656	3.147	2.438
12	5.421	5.197	4.988	4.793	4.611	4.439	4.278	4.127	3.985	3.851	3.725	3.190	2.456
13	5.583	5.342	5.118	4.910	4.715	4.533	4.362	4.203	4.053	3.912	3.780	3.223	2.469
14	5.724	5.468	5.229	5.008	4.802	4.611	4.432	4.265	4.108	3.962	3.824	3.249	2.478
15	5.847	5.575	5.324	5.092	4.876	4.675	4.489	4.315	4.153	4.001	3.859	3.268	2.484
16	5.954	5.668	5.405	5.162	4.938	4.730	4.536	4.357	4.189	4.033	3.887	3.283	2.489
17	6.047	5.749	5.475	5.222	4.990	4.775	4.576	4.391	4.219	4.059	3.910	3.295	2.492
18	6.128	5.818	5.534	5.273	5.033	4.812	4.608	4.419	4.243	4.080	3.928	3.304	2.494
19	6.198	5.877	5.584	5.316	5.070	4.843	4.635	4.442	4.263	4.097	3.942	3.311	2.496
20	6.259	5.929	5.628	5.353	5.101	4.870	4.657	4.460	4.279	4.110	3.954	3.316	2.497
25	6.464	6.097	5.766	5.467	5.195	4.948	4.721	4.514	4.323	4.147	3.985	3.329	2.499
30	6.566	6.177	5.829	5.517	5.235	4.979	4.746	4.534	4.339	4.160	3.995	3.332	2.500
40	6.642	6.233	5.871	5.548	5.258	4.997	4.760	4.544	4.347	4.166	3.999	3.333	2.500
50	6.661	6.246	5.880	5.554	5.262	4.999	4.762	4.545	4.348	4.167	4.000	3.333	2.500

Table E: Continuous Compounding of ₹1 e^x and Continuous Discounting of ₹1

$$(e^x): \lim_{m \to \infty}\left(1 + \frac{i}{m}\right)^{(nm)} \text{ or } e^{(i)(n)}$$

x	e^x Value	e^{-x} Value	x	e^x Value	e^{-x} Value	x	e^x Value	e^{-x} Value
0.00	1.0000	1.00000	0.45	1.5683	.63763	0.90	2.4596	.40657
0.01	1.0110	0.99005	0.46	1.5841	.63128	0.91	2.4843	.40252
0.02	1.0202	.98020	0.47	1.6000	.62500	0.92	2.5093	.39852
0.03	1.0305	.97045	0.48	1.6161	.61878	0.93	2.5345	.39455
0.04	1.0408	.96079	0.49	1.6323	.61263	0.94	2.5600	.39063
0.05	1.0513	.95123	0.50	1.6487	.60653	0.95	2.5857	.38674
0.06	1.0618	.94176	0.51	1.6653	.60050	0.96	2.6117	.38298
0.07	1.0725	.93239	0.52	1.6820	.59452	0.97	2.6379	.37908
0.08	1.0833	.92312	0.53	1.6989	.58860	0.98	2.6645	.37531
0.09	1.0942	.91393	0.54	1.7160	.58275	0.99	2.6912	.37158
0.10	1.1052	.90484	0.55	1.7333	.57695	1.00	2.7183	.36788
0.11	1.1163	.89583	0.56	1.7307	.57121	1.20	3.3201	.30119
0.12	1.1275	.88692	0.57	1.7683	.56553	1.30	3.6693	.27253
0.13	1.1388	.87809	0.58	1.7860	.55990	1.40	4.0552	.24660
0.14	1.1503	.86936	0.59	1.8040	.55433	1.50	4.4817	.22313
0.15	1.1618	.86071	0.60	1.8221	.54881	1.60	4.9530	.20190
0.16	1.1735	.85214	0.61	1.8404	.54335	1.70	5.4739	.18268
0.17	1.1853	.84366	0.62	1.8589	.53794	1.80	6.0496	.16530
0.18	1.1972	.83527	0.63	1.8776	.53259	1.90	6.6859	.14957
0.19	1.2092	.82696	0.64	1.9865	.52729	2.00	7.3891	.13534
0.20	1.2214	.81873	0.65	1.9155	.52205	3.00	20.086	.04979
0.21	1.2337	.81058	0.66	1.9348	.51885	4.00	54.598	.01832
0.22	1.2461	.80252	0.67	1.9542	.51171	5.00	148.41	.00674
0.23	1.2586	.79453	0.68	1.9739	.50662	6.00	403.43	.00248
0.24	1.2712	.78663	0.69	1.9937	.50158	7.00	1096.6	.00091
0.25	1.2840	.77880	0.70	2.0138	.49659	8.00	2981.0	.00034
0.26	1.2969	.77105	0.71	2.0340	.49164	9.00	8103.1	.00012
0.27	1.3100	.76338	0.72	2.0544	.48675	10.00	22026.5	.00005
0.28	1.3231	.75578	0.73	2.0751	.48191			
0.29	1.3364	.74826	0.74	2.0959	.47711			
0.30	1.3499	.74082	0.75	2.1170	.47237			
0.31	1.3634	.73345	0.76	2.1383	.46767			
0.32	1.3771	.72615	0.77	2.1598	.46301			
0.33	1.3910	.71892	0.78	2.1815	.45841			
0.34	1.4049	.71177	0.79	2.2034	.45384			
0.35	1.4191	.70569	0.80	2.2255	.44933			
0.36	1.4333	.69768	0.81	2.2479	.44486			
0.37	1.4477	.69073	0.82	2.2705	.44043			
0.38	1.4623	.68386	0.83	2.2933	.43605			
0.39	1.4770	.67707	0.84	2.3164	.43171			
0.40	1.4918	.67032	0.85	2.3396	.42741			
0.41	1.5068	.66365	0.86	2.3632	.42316			
0.42	1.5220	.65705	0.87	2.3869	.41895			
0.43	1.5373	.65051	0.88	2.4109	.41478			
0.44	1.5527	.64404	0.89	2.4351	.41066			

Table F: Value of the Standard Normal Distribution Function
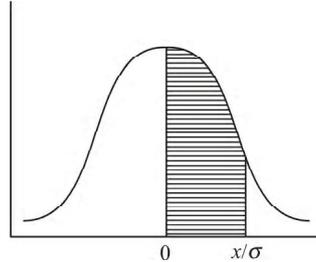
d	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1688	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2818	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990

Table G: Comulative Distribution Function for the Standard Normal Random Variable

d	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
−0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641
−0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247
−0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859
−0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483
−0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121
−0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776
−0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2483	0.2451
−0.7	0.2420	0.2389	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148
−0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867
−0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611
−1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379
−1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170
−1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985
−1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823
−1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681
−1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559
−1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455
−1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367
−1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294
−1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0202	0.0250	0.0244	0.0239	0.0233
−2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0158	0.0197	0.0192	0.0188	0.0183
−2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0122	0.0154	0.0150	0.0146	0.0143
−2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0094	0.0119	0.0116	0.0113	0.0110
−2.3	0.0107	0.0104	0.0102	0.0099	0.0096	0.0071	0.0091	0.0089	0.0087	0.0084
−2.4	0.0082	0.0080	0.0078	0.0075	0.0073	0.0054	0.0069	0.0068	0.0066	0.0064
−2.5	0.0062	0.0060	0.0059	0.0057	0.0055	0.0040	0.0092	0.0051	0.0049	0.0048
−2.6	0.0047	0.0045	0.0044	0.0043	0.0041	0.0030	0.0039	0.0038	0.0037	0.0036
−2.7	0.0035	0.0034	0.0033	0.0032	0.0031	0.0022	0.0029	0.0028	0.0027	0.0026
−2.8	0.0026	0.0025	0.0024	0.0023	0.0023	0.0016	0.0021	0.0021	0.0020	0.0019
−2.9	0.0019	0.0018	0.0018	0.0017	0.0016	0.0011	0.0015	0.0015	0.0014	0.0014
−3.0	0.0014	0.0013	0.0013	0.0012	0.0012	0.0008	0.0011	0.0011	0.0010	0.0010
−3.1	0.0010	0.0009	0.0009	0.0009	0.0008	0.0006	0.0008	0.0008	0.0007	0.0007
−3.2	0.0007	0.0007	0.0006	0.0006	0.0006	0.0004	0.0006	0.0005	0.0005	0.0005
−3.3	0.0005	0.0005	0.0005	0.0004	0.0004	0.0003	0.0004	0.0004	0.0004	0.0004
−3.4	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002	0.0003	0.0003	0.0003	0.0003
−3.5	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0002	0.0002	0.0002	0.0002
−3.6	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
−3.7	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
−3.8	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
−3.9	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
−4.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

(Contd..)

Table G Contd.

d	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.9279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9595
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9991	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9986	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.9990	0.9990
3.1	0.9990	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995
3.3	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998
3.5	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998
3.6	0.9998	0.9998	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
3.7	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
3.8	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
3.9	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
4.0	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

ASSIGNMENT

DRIVE	SUMMER 2015
PROGRAM	BBA
SEMESTER	V
SUBJECT CODE & NAME	BBA502 & FINANCIAL MANAGEMENT
BK ID	B1850
CREDITS	4
MARKS	60

Note: Answer all questions. Kindly note that answers for 10 marks questions should be approximately of 400 words. Each question is followed by evaluation scheme.

Q.No	Questions	Marks	Total Marks
1	*"SWM (shareholders' wealth maximization) provides an unambiguous measure of what financial management should seek to maximize in making investment and financing decisions on behalf of the shareholders". Elaborate.*		
	Maximizing wealth of shareholders and firm value –risk return trade- off	10	10
2	*"Responsibility accounting is a system of accumulating and reporting both actual and budgeted costs (also revenues) by individual responsible persons is called responsibility accounting". Do you agree ? Justify your agreement/disagreement.*		
	Objectives and principles of responsibility accounting Responsibility centres for actual and budgeted costs	5 5	10
3	*"An annuity is a stream of constant cash flow (payment or receipt) occurring at regular intervals of time". Illustrate with examples.* *You wish to take a world tour that will cost you 10.00 lakhs – the cost is expected to remain unchanged in nominal terms. You are willing to save Rs. 80,000 annually to fulfil your desire. How long will you require to wait if your savings reap an investment benefit of 14 % annually ?*		
	Explain annuity with examples Calculate the number of years	5 5	10
4	*How will you calculate WACC (weighted Average Cost of Capital) ?* *Following is the condensed financial statement of a firm in the current year:*		

Particulars	Rs. (Lakhs)
Sales revenue	500
Less : operating costs	300
	200
Less : Interest Costs	12
Earnings before taxes	188
Less : Taxes 0.40)	75.2
Earnings after taxes	112.8

The firm's existing capital consists of Rs. 150 lakh in equity capital having 15 % cost and of Rs. 100 lakh of 12 % debt. Determine WACC.

	Procedure to calculate WACC (weighted Average Cost of Capital) Calculate WACC	4 6	10
.5	*How will you distinguish between Capital expenditure and Capital budgeting ? Compare and contrast between NPV and IRR. Which according to you is more effective ?*		
	Distinguish between Capital expenditure and Capital budgeting Compare and contrast between NPV and IRR. Find which is more effective.	3 7	10
6	*Critically explain the concept of optimum cash balance under certainty as per Baumol's model.*		
	Critical explanation of optimum cash balance under certainty referring to Baumol's model.	10	10