ALAGAPPA UNIVERSITY

[Accredited with 'A+' Grade by NAAC (CGPA:3.64) in the Third Cycle
and Graded as Category–I University by MHRD-UGC]

(A State University Established by the Government of Tamil Nadu)

KARAIKUDI – 630 003

Directorate of Distance Education

P.G. Diploma in Business Management

II - Semester

405 21

FINANCIAL MANAGEMENT

Reviewer	
Dr. C. Vethirajan	Professor and Head, Department of Corporate Secretaryship, School of Management, Alagappa University, Karaikudi

Authors:

Dr Kiran Mehta, Professor [Finance] Chitkara Business School, Chitkara University, Chandigarh
Dr Renuka Sharma, Professor [Finance] Chitkara Business School, Chitkara University, Chandigarh
Units: (1.2, 1.3.4, 1.4, 3.3, 3.6, 4.5, 5.2.1, 5.4.3, 6.2, 7.2-7.4, 8.2-8.3, 11.3, 11.4, 12.2.1, 13.2-13.3)

Dr Bhavesh M Patel, Director, Post Graduate Institute of Management and Dean, Amrut Mody School of Management, Ahmedabad University, Gujarat
Units: (1.3-1.3.3, 1.5.3, 2.3.2, 2.4.2, 3.4-3.5, 4.2-4.4, 4.6, 6.2.1-6.4, 7.5, 8.4, 9.2-9.4, 10, 11.2, 12.2, 12.3-12.5, 13.4, 14.2-14.3.5)

CA C Rama Gopal, BCom, FCA, FCS, CAIIB, Practising Chartered Accountant, Education Counsellor, The Institute of Company Secretaries of India
Units: (1.5-1.5.2, 1.5.4, 3.7, 5.2)

Vikas Publishing House, Units: (1.0-1.1, 1.6-1.10, 2.0-2.3.1, 2.4-2.4.1, 2.5-2.9, 3.0-3.2, 3.7.1-3.12, 4.0-4.1, 4.7-4.11, 5.0-5.1, 5.3-5.4.2, 5.4.4-5.4.5, 5.5-5.10, 6.0-6.1, 6.5-6.10, 7.0-7.1, 7.6-7.10, 8.0-8.1, 8.5-8.9, 9.0-9.1, 9.5-9.10, 11.0-11.1, 11.3.1, 11.5-11.9, 12.0-12.1, 12.6-12.11, 13.0-13.1, 13.5-13.9, 14.0-14.1, 14.3.6-14.8)

Vikas® is the registered trademark of Vikas® Publishing House Pvt. Ltd.

VIKAS® PUBLISHING HOUSE PVT. LTD.
E-28, Sector-8, Noida - 201301 (UP)
Phone: 0120-4078900 • Fax: 0120-4078999
Regd. Office: A-27, 2nd Floor, Mohan Co-operative Industrial Estate, New Delhi 1100 44
• Website: www.vikaspublishing.com • Email: helpline@vikaspublishing.com

Work Order No. AU/DDE/DE12/Printing of Course Materials/2021 Dated 25.01.2021 Copies - 3000

SYLLABI-BOOK MAPPING TABLE

Financial Management

Syllabi	Mapping in Book
BLOCK I: BASICS OF FINANCIAL MANAGEMENT **UNIT-1:** Introduction: Financial Management: Objectives - Concept, Nature, Evaluation and Significance - Finance Functions: Managerial and Operative - Role of Financial Management in the Organization - Indian Financial System. **UNIT-2:** Financial System: Legal and Regulatory Frame Work - Financial Functions: Meaning and Scope - Finance and Tax Management Nexus - Tax Avoidance and Tax Evasion - Tax Incentive and Business Decisions. **UNIT-3:** Investment Function: Meaning and Scope - Time Value of Money Concepts and Applications - Risk Return Relationship - Dividend Function - Risk Return Trade Off - Management Planning - Global Management Environment **UNIT-4:** Long-Term Capital Resources: Equity and Debt Sources - Equity Share, Preference Shares - Types of Preference Share - Debentures - Types - Sources of Long-Term Capital.	**Unit 1:** Introduction to Financial Management **(Pages 1-25);** **Unit 2:** Financial System: Legal and Regulatory Frame Work **(Pages 26-35);** **Unit 3:** Investment and Dividend Function **(Pages 36-77);** **Unit 4:** Long-Term Capital Resources: Equity and Debt Sources **(Pages 78-90)**
BLOCK II: CAPITAL STRUCTURE **UNIT-5:** Capital Issues: Meaning, Nature, Purpose - Roles and Guidelines of SEBI in Capital Issues - Bridge Finance, Loan Syndication, Book Building - Borrowings from the Term Lending Institutions and International Capital Market - Tax Considerations in Financing Decision Areas. **UNIT-6:** Cost of Capital : Concept of Cost of Capital - Cost of Debt, Equity, Preference Share Capital, Retaining Earning - Weighted Average Cost: EBIT - EPS Analysis - Tax, Capital Structure and Value Nexus - Computation of Overall Cost of Capital - Tax and Cost of Capital. **UNIT-7:** Capital Structure: Determinates - Concept and Types - Optimum Capital Structure - Theories of Capital Structure - Net Income and Net Operative Income Approach - M.M. Approach - Traditional Theory - Their Assumptions - Significance and Limitations - Management Leverage Operating Leverage - Combined Leverage. **UNIT-8:** Capital Budgeting: Meaning, Nature and Types of Capital Investment - Methods of Appraisal Under Certainty Conditions: PBP, ARR, IRR and NPV Techniques - Basic and International Capital Budgeting.	**Unit 5:** Capital Issues **(Pages 91-113);** **Unit 6:** Cost of Capital **(Pages 114-153);** **Unit 7:** Capital Structure **(Pages 154-192);** **Unit 8:** Capital Budgeting **(Pages 193-244)**
BLOCK III: SOURCES OF FINANCE **UNIT-9:** Uncertainty and Risk Models: Simulation Analysis - Sensitivity Analysis - Decision Tree Analysis - Certainty Equivalent and Risk - Adjusted Return Measures - Tax Considerations in Investment Decisions Cost of Capital and Investment Decisions. **UNIT-10:** Working Capital Management: Definitions and Objectives - Concept and Types - Determinants - Financing Approaches - Conservative Approaches - Sources of Working Capital Finance Factors Affecting Working Capital Requirements - Working Capital Financing by Commercial Banks - Types of Assistance **UNIT-11:** Inventories and Receivables Management Under Conditions of Certainty and Uncertainty - Operating Cycle - Planning of Funds Through the Management of Assets - Various Techniques Used.	**Unit 9:** Uncertainty and Risk Models **(Pages 245-261);** **Unit 10:** Working Capital Management: Definition and Objectives **(Pages 262-291);** **Unit 11:** Inventories and Receivables Management under Conditions of Certainty and Uncertainty **(Pages 292-314)**

BLOCK IV: WORKING CAPITAL AND DIVIDEND POLICY

UNIT-12: Cash and Liquidity Management: Credit Management and Evaluation Alternative Credit Variables Methods and Functions - Tax Considerations in Remittances and Purchases.

UNIT-13: Dividend Theories: Valuation under Gordon and Walter Theories - Dividend Irrelevance Under M.M. Theory - Assumptions - Limitations - Implications and Contributions of Theories in Financial Decision Making Process.

UNIT-14: Dividend Policy: Types - Share Valuation Practices - Factors Affecting Dividend Decision - Tax Considerations in Dividend Decision when Tax is Levied at the Hands of Companies and Recipients.

CONTENTS

INTRODUCTION

NOTES

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

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

NOTES

BLOCK I
BASICS OF FINANCIAL MANAGEMENT

UNIT 1 INTRODUCTION TO FINANCIAL MANAGEMENT

Structure

1.0 INTRODUCTION

The subject of finance is more than 40 years old, though accounting and economics were in existence long before that. Today, everyone has started recognizing the importance of financial management both in personal finance, as well as in corporate finance functions. The language of money and finance impresses everyone, but it is also true that it is not understood by many. The contribution of finance in value creation is direct. Also, the language of finance is universal. Therefore, some understanding of the subject is desirable for all. Let us discuss some basic concepts related to financial management.

1.1 OBJECTIVES

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

- Discuss the concept, significance, and nature of financial management
- Describe the managerial and operative finance functions

- Explain the objectives of financial management
- Discuss the Indian financial system

NOTES

1.2 FINANCIAL MANAGEMENT: CONCEPT, NATURE, EVALUATION AND SIGNIFICANCE

Financial Management is an important functional area of managers in a company. Finance acts as lifeline of a company. The term 'management' is associated with planning, execution and control. Similarly, financial management is concerned with proper management of finance of a company, its execution, i.e., proper allocation, control and reduction in the cost of funds for the benefit of shareholders. It is one of the most crucial areas of decision making for managers in a company. The rapid development has led to increased size of companies. Therefore, there is an expansion in the roles and functions of a finance manager too.

Significance

The following points highlight the significance of financial management:

- It is the basis of acquisition of funds.
- It assists in financial planning for the future.
- It helps in finding out the financial position.
- It helps in reducing costs.
- It provides a guideline for allocation of funds.
- It plans for proper use of funds.
- It helps companies in meeting their financial objectives.
- It helps in the improvement of organizational efficiency.
- It provides useful insights to the stakeholders about the level, use and requirement of funds in the business.

Evaluation

The evaluation of the financial management decisions is basically concerned with trying to find out whether the decisions taken by the finance manager and the department is in tune with the goals of the organization or not. For this, the following methods or tools are generally used:

- Cost of capital to find out the cheapest and most appropriate source of funds.
- Financial leverage to understanding the return to equity shareholders and ways to increase it.

- Capital budgeting appraisal methods to select the best capital investment proposal.
- Ratio analysis
- Funds flow and cash flow analysis

The role of financial management can be understood in two ways. One is the **traditional view** and the other is the **modern view.**

The traditional view is based on the initial practices of businesses when the businesses were of smaller size and were confined to local setups only. The role of financial manager was very limited and confined to fund raising only. But with the passage of time, the fund raising has not been considered as the only role of financial manager. The proper allocation of finance is also very important for smooth functioning of a business. The purpose of allocation of funds is to ensure better profits for shareholders. The decisions regarding fund allocation affect the overall efficiency of a business. Therefore, proper planning for the benefit of an organization has also become an important role of a financial manager. While performing all these roles, the finance manager is also required to understand the rules and by-laws affecting the financial decisions.

1.2.1 Role of Financial Management in an Organization

Broadly, a financial manager performs the following functions:

- Fund raising
- Fund allocation
- Profit planning
- Understanding capital market

Fig. 1.1 *Role of Financial Mangement in Business*

NOTES

1.3 FINANCIAL MANAGEMENT: OBJECTIVES

Objectives drive the decision-making. Therefore, it is important to know the corporate financial objectives. The corporate form of business is very old, but the topic of corporate financial objective is not.

Till 1921, firms did not see any need for stating their financial objectives. The corporate financial objective, since then, has grown in three phases:

- Profit maximization objective
- Social responsibility of business
- Shareholder wealth maximization

1.3.1 Profit Maximization

Knight Frank (1921) first gave 'profit maximization' as the corporate financial objective in his 'perfect market theory'. Subsequently, Marshall Alfred (1926) gave framework of 'profit maximization' objective, based on Knight's Micro-economic theory. Businesses were making profit before this period. But, making profit was so easy at that time due to lack of competition that the businesses hardly felt any need for formal recognition of the corporate financial objective. Accounting based decisions are guided by the objective of maximizing profit.

1.3.2 Social Responsibility

Profit maximization goal of the firm remained non-controversial for almost a quarter of a century. Profiteering by firms and social exploitation over a period threw up newer concerns. In 1957, Frank Elton initiated the concept of managerial responsibility to society. This was a part of the struggle to explain the corporate objective in a more comprehensive manner. The issue of profit maximization as well as social responsibility of the firm became debatable. In 1958, Theodore Levitt stated that 'long-term profit maximization' is the goal of a firm. He concluded that general welfare of the society should be left to the government and material welfare to the industry. Interestingly, he added a prefix of 'long-term' to the goal of profit maximization.

Baumol (1959) brought in a new dimension by stating that a firm should pursue the goal of sales maximization. He contributed the single period model and multi-period model, both with and without advertisement, for the attainment of sales maximization objective.

Profit maximization and social responsibility are conflicting objectives. A compromise was found in the newer expression, namely, 'satisfactory profit' as the firm's goal, put forth by Robert Anthony in 1960. Morris (1963) added flavour to the argument by stating that a firm must attempt to maximize 'balanced rate of growth'. He defined balanced rate of growth as 'increase in demand for product and growth of firm's capital supply'.

NOTES

1.3.3 Shareholders' Wealth Maximization (SWM)

The debate around 'profit maximization' and 'social responsibility' led to finding a more logical expression of corporate financial objective. This pursuit led to the development of theory of 'shareholder wealth maximization'. David Durand and Lutz (1952) introduced the concept of shareholder wealth maximization. They observed that the goals of profit maximization as well as wealth maximization are consistent with each other only under two conditions—investment takes place in tiny increments and there is certainty of return.

Profit Maximization vs Wealth Maximization

Objectives of profit maximization and shareholder wealth maximization differ from each other on two issues—Cash flow and its timing, and risk.

Time factor

Profit maximization objective considers accounting profits and ignores the cash flow and timing of receiving the cash flow. Accounting profit is notional and it is not available for use. It is only the cash flow that is available for use. The timing of cash flow is also important. Cash received today is more valuable than the same amount received after one year. Therefore, the time factor, which distinguishes profit from wealth, has two components, (a) cash flow and (b) timing of it. In a way, 'time value of money' concept distinguishes wealth maximization objective from profit maximization objective.

Risk factor

The term 'wealth' comprises an element of risk in it, unlike the term 'profit'. Decisions are taken for the future, and future is uncertain and risky. Risk is absence of certainty. Business decisions are risky. Wealth maximization objective recognizes existence of risk and expects all decisions to be taken after careful consideration of risk. Choice based on calculated risk maximizes the value of the firm.

Table 1.1 *Comparison of Profit and Wealth Objectives*

	Profit Maximization	Wealth Maximization
Returns	√	√
Time factor	×	√
Risk factor	×	√

Profit and wealth are both based on returns as shown in Table 1.1. But unlike profit, wealth recognizes the timing of returns and the risk involved in a decision. Since time factor is considered, the concept of wealth takes cash flows as returns and not the accounting profit.

Thus, by recognizing the time and the risk elements, the concept of shareholder wealth maximization brings a balance between the short-term profits and the long-term profits of the firm.

NOTES

Issues in Shareholder Wealth Maximization

Both the academic and business worlds today have almost unanimously accepted the view that shareholder wealth maximization should be the corporate financial objective. All theories of financial management are developed around this definition of corporate financial objective. All the financial management tools are designed to measure wealth creation. Some issues, however, are still unresolved. Some of these unresolved issues include:

- What is the wealth indicator or measure?
- What are the effects of separation of ownership rights from management powers and on firm's pursuit of wealth maximization?
- What are the signals shareholders pick up for judging the wealth creation opportunity offered by the firm?

Issue 1: Measures of wealth

What is the indicator of shareholder wealth? How is the wealth measured? A list of four alternative measures of wealth is given below:

- Replacement (or liquidation) value of the firm's assets minus the liabilities
- Net market capitalization of the firm
- Gross market capitalization of the firm
- Common stock price or equity share price

Liquidation value

Liquidation value of a firm is the amount the firm will get upon disposal of all assets in the market minus liabilities. This could be considered as the *minimum* wealth of the shareholders. Replacement value of the firm is the value at which the assets can now be bought in the existing condition minus the liabilities. That would include the purchase price of the used assets and their transportation and installation costs. Liquidation value is the value the seller realizes, while replacement value is the cost that a buyer incurs. Liquidation value is less than replacement value because the buyer and the seller both incur the transaction costs. In case of a liquidating firm, liquidation value of assets is the true indicator or measure of its wealth. In case of a going concern, the concept of replacement value can be adopted for judgement about the minimum value of the firm. Share price cannot remain lower than per share replacement value of the firm.

Net market capitalization Net market capitalization of a firm is the product of two variables, the number of common stocks in market and their price. Hence,

Net market capitalization = Share price × Number of outstanding shares (1.1)

Gross market capitalization Value of debt is added into the value of shares to get the gross market capitalization of the firm. If the debt (bonds) are traded on the secondary market the market value is determined by multiplying the number of

outstanding bonds with the market price of bonds. In case of non-marketable debt the value is taken at the book value. Most valuation tools available in finance textbooks attempt to measure the creation of gross capitalization. Hence,

Gross market capitalization = Net market capitalization + (Bond price × Number of bonds outstanding) + Book value of all non-marketable loans (1.2)

Common stock price

When common stock price is taken as the measure of wealth, the number of outstanding shares is ignored, and only the share price is taken into account. Since a firm can change its number of outstanding shares by either issuing new shares, or by buying back shares, or by reissuing treasury stocks (where allowed), the firm's net or total value loses relevance and common stock price, as the wealth measure, gains acceptance.

No market is perfect market in reality; and the corporate and individual tax rates are usually different. Given this scenario, it is easy to conclude that increase (or decrease) in net market capitalization and increase (or decrease) in share price may or may not occur simultaneously. Therefore, 'maximization of common stock price' would get support as the true indicator of shareholder wealth. One may like to adjust the share price with dividend payment and issue of bonus stocks, if any, before taking share price as the wealth indicator.

Issue 2: Agency problem

Issue of wealth measurement is more significant in the corporate form of business organization, where ownership is separated from the management of the firm. The separation of ownership rights and managerial powers pose this serious question, 'Do managers take decisions for shareholder wealth maximization?' Gordon Donaldson (1963) pointed at the conflict of interest between owners and managers and consequential differences in decision rules. Many unresolved issues of financial management, especially difficulty in measuring and ranking of financial performance and assumption of risk, are enough to generate conflict. In a conflict situation, managers would use their discretion in pursuing policies, which maximize their own utility, rather than aiming at maximization of shareholder wealth. Some do not believe in such conflict of interest.

Attempted solutions for addressing agency problem

Conflict between interests of shareholders and managers will depend on managerial incentives and monitoring mechanism. Quite a few attempts are made for designing managerial compensation plans, which may align management and shareholder interest. Profit sharing is one of them. Sharing of value added (a percentage of increase in m*arket capitalization during one year) was also tried, and now stock option plans are offered as managerial incentives. All these incentive plans seem to have failed or have further expanded the agency gap.*

In addition to giving incentives, managerial behaviour must also be monitored. Some believe that a well-developed financial market would act as a restraint on managerial behaviour because of the threat of takeover. Others believe that labour market for managerial jobs would warrant that managers perform; otherwise failed managers would lose their employability. Some expect the government and its agencies to monitor managerial behaviour, but that inspires the debate about cost of governance and also the chance of success of government regulation.

The conflict goes on. The gap in interests persists.

Issue 3: Signals to capital market

Shareholders may not presume that managerial behaviour will be guided by the interest of shareholders. They are very much aware of the clash of interests, where managers enjoy the upper hand. Investors, therefore, look for some signals, which may be more indicative of the wealth potential of the stock and the firm.

Shareholders consider shareholding by senior managers and promoters as the important signal for drawing conclusion about the true value of the firm. Lewellon (1969) empirically found that where the stockholding of senior executives was much more extensive, there was no possibility of much divergence between interests of owners and managers. Leland and Pyle (1977) observed that the entrepreneur's information is better. Therefore, larger the number of shares held by him, greater the value of the firm. McConnell and Muscarella (1985) observed that, in general, announcements of increase/decrease in capital expenditure are followed by higher/lower stock price.

Thus, while judging the wealth potential of a firm, investment plans of the firm and promoter's shareholding draw serious attention of the capital market.

Ethics in business So many corporate scandals in India and abroad raise questions about whether the managers of these firms really attempt to maximize benefits of their shareholders, or maximize their own utilities. In absence of a real indicator of wealth, the market depends on the reporting of accounting results. Though this is an anti-thesis of the subject of finance, it is a reality. How would investors decide upon the price of shares? How do we measure managerial efficiency, other than from financial results? If we consider share price as the measure of wealth, that itself has to rely on reported earnings. In this situation, even genuine managers, who do not take decisions to maximize their own wealth, are likely to make judgmental errors causing harmful effect on the company. In this situation, unscrupulous managers find it easy to manipulate results and create a web of complex arrangement to mislead the market and maximize their own advantage. Often, it is difficult to judge whether the failure of a company is due to genuine error of managers or their wilful misconduct. Therefore, lessons of ethics are important for managers.

1.3.4 Alternate Objectives

In addition to above objectives, there are certain alternative objectives of a finance manager or of financial management as well:

- Maximization of Sales
- Maximization of Market Share
- Maximization of Earnings per Share (EPS)
- Maximization of Economic Value Added (EVA)
- Maximization of Rate or Return on Investment (ROI)
- Providing a level of Service Quality
- Maximizing the satisfaction level of all stakeholders

Check Your Progress

1. What is financial management concerned with?
2. State the conditions under which the goals of profit maximization and wealth maximization are consistent with each other.
3. Mention the elements whose recognition allows the concept of shareholder wealth maximization to bring a balance between short-term profits and long-term profits.

1.4 FINANCE FUNCTIONS: MANAGERIAL AND OPERATIVE

The financial management is concerned with meeting the finance related requirements of the business. In a typical organization, the finance function is performed by a separate department. Like other functional areas, viz., production, marketing, etc., the finance department is also established separately to perform various finance related functions. The finance department looks after the decisions related to financial planning, fund raising, tax management, cost accounting and corporate accounting, capital expenditures, pension fund scheme, cash management and management of foreign exchange requirement etc.

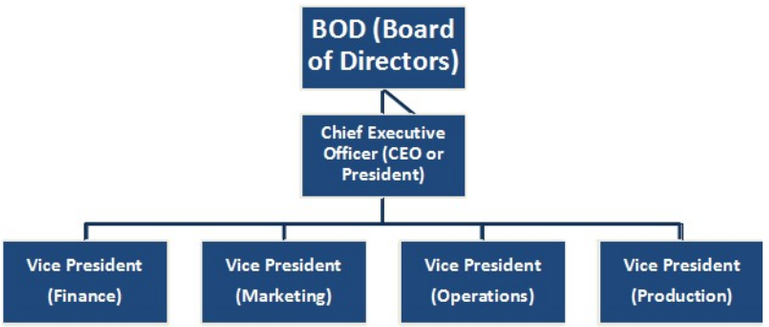


Fig. 1.2 *A Typical Organizational Chart*

Broadly, all these finance related functions can be categorized into two segments. One, finance functions performed by a treasurer and second, finance functions performed by a controller. All big companies have categorized their finance functions into treasury related and control related functions. The treasurer ensures the proper financial planning, fund allocation and risk management related decisions. While finance controller ensures documentation of all the finance functions, proper recording, making budgets to support finance related decisions and preparing the financial statements and other statements to help treasurer to take all strategic decisions and to meet the legal requirements of the company to produce necessary documents for disclosure practices too.

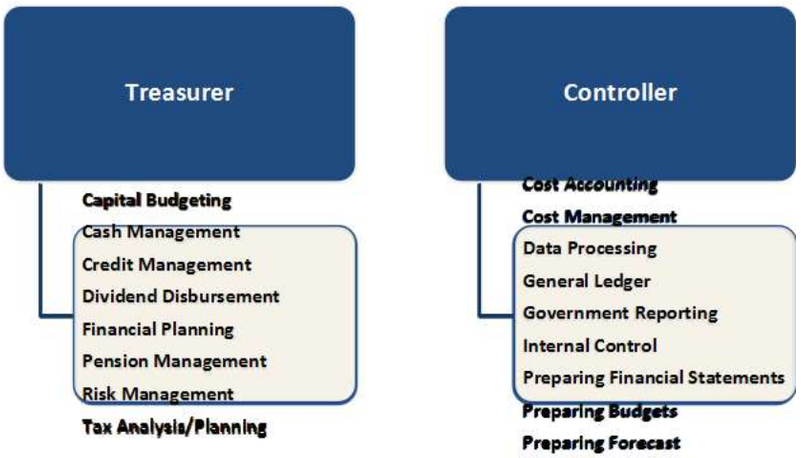


Fig. 1.3 *Role of Treasurer and Controller*

Bear in mind that the titles of Controller and Treasurer are not commonly used in the Indian organizations. Here, the term finance manager is used.

Managerial and Operative Functions

Another way of classifying financial functions is through the terms managerial and operative functions. While managerial finance functions are related to the application of managerial skills in the planning, execution, organising of decisions related to all financial activities in the organization, the operative functions are mostly restricted to duties which are rather clerical and procedural in nature.

The operative finance function is important in an organization since it assists the managerial functions in the execution of decisions and policies. It covers the activities under cash flow management and uses accounting as a tool to maintain records, analyse them and prepare reports. The activities done under operative finance functions help in the planning and decision making involved in managerial finance functions. Let's now discuss the managerial role of finance.

The scope of financial management can be described by the functions performed by a finance manager.

Functions/Roles of Finance Manager

NOTES

A finance manager, as discussed in the introductory paragraph, arranges the funds, takes decisions of allocation of funds, then makes the profit planning and ensures proper utilization of these funds. All these functions performed by a finance manager can be classified into four categories. These are as follows:

1. Financing decisions
2. Investment decisions
3. Dividend decisions
4. Liquidity/working capital decisions

Fig. 1.4 *Functions Performed by a Finance Manager*

Financing decisions

Financing decisions means decisions related to raising the funds. A company may require funds for different time periods, i.e., short term, medium term and long term. There are various alternatives of raising funds under all these three options. The long term financing decisions are known as capital structure or capital mix decisions. In case of capital structure decisions, the finance managers are required to select a right debt-equity mix for the company in such a manner that overall cost of capital remains minimum and wealth of the shareholders is maximized. Further, short term sources of finance can be in different forms. These include short term loans, bank overdraft, trade credit and commercial papers etc. The overall mix of short term and long term sources of finance is known as financing mix of the company.

Investment decisions

Investment decisions are actually related to fund allocation decision. The funds raised through various sources of finance are required to be invested in various

NOTES

assets. These assets can be fixed assets or current assets. The fixed assets directly affect the production and operational efficiency of the business. The investment in fixed assets is a risky decision because these decisions are taken for long term period and require huge investment. Time value of money concept is more applicable in case of long term investment decisions. These decisions are also called as capital budgeting or capital expenditure decisions.

Dividend decisions

The reward for shareholders' capital is called dividend. The dividend decision is one of the most important finance decisions taken by finance manager. Dividend is that portion of shareholders' earnings which is distributed among them. The remaining part is called retained earnings. The retained earnings are used to finance new projects or opportunities by the business. Some of the portion is intentionally retained by business so that in case any opportunity is received, the funds available in the form of retained earnings can be used for it. The shareholders of a company have different expectations from company. Some of them want instant reward or regular current income in the form of dividend, while other shareholders want to increase their capital gain and want that the company should invest these funds in more growth oriented projects. Therefore, deciding an optimum payout ratio and retention ratio is a critical decision in order to maintain harmonious relationship with all the shareholders with diverse expectations.

Liquidity/working capital decision

Liquidity decisions are generally related to working capital decisions. Liquidity means the ability of the business to meet its current liability as and when they arise. Liquidity and profitability aspects move opposite to each other. Both are equally important for the business. Maintaining sufficient liquidity is essential in order to maintain the credit worthiness of the business. Further, maintaining liquidity calls for a compromise with the profitability position. More the funds are blocked in liquid assets, lesser the funds can be utilized for operational activities and hence the profitability reduces. Therefore, it is essential to properly manage the working capital requirement of an organization. It involves, both, current assets and current liabilities. The financing of current assets is another issue which a finance manager has to deal with due care. In addition to this, the creditors and bills payable, which are parts of the current liability of a business can become indirect or spontaneous sources of finance too, if the business can manage to delay its payment cycle. Further, managing right level of inventory, right level of cash and bank balance and then managing the collection from bills receivables, all come under this decision.

Check Your Progress

4. How are finance related functions categorized?
5. What are the four aspects of functions performed by a financial manager?

1.5 INDIAN FINANCIAL SYSTEM

NOTES

Finance is needed everywhere. It is needed in all types of activities as related to human beings or business organizations. Human beings need money for survival. In the field of business, production can neither commence nor continue without finances. Without sustained production, profits cannot be generated. The need for finance is universal and pervasive. Financial system ensures the smooth flow of funds is available to the different sectors when needed. The financial system is the system that facilitates the transfer of money from the savers to the borrowers.

The scope of the financial system is not only complex, it is also closely interconnected to financial institutions, markets, instruments, services, practices, and transactions. The financial system is crucial to the allocation of resources in a modern economy.

The important components of a financial system are:

- Financial markets
- Financial instruments
- Financial institutions

1.5.1 Financial Markets

The financial markets perform the important function of mobilization of savings and channelizing them from the financial surplus units to the deficient units. A financial market allows people to buy and sell the financial securities and commodities at low transaction costs, realistic prices and with transparency.

Financial markets are pivotal for a country's growth and reforms. The financial markets possess enormous power that can either fuel the growth or destabilize the economy of a country in no time.

They facilitate:

- Raising capital funds in the capital markets
- Liquidity through the money markets
- Discovery of price of the securities and commodities
- Transfer of risk in the derivatives markets
- International trade in the currency markets
- Global transfer of funds and trading

Structure of financial markets

The term 'financial market' is wide in its scope and comprises several different types of markets such as money market, debt market, stock market, foreign exchange market and derivatives market etc. These financial markets are broadly divided into two sectors:

NOTES

- Organized sector
- Unorganized sector
- **Organized sector:** The Reserve Bank of India (RBI) controls the entire banking sector in India. The organized sector consists of the financial institutions such as RBI, State Bank of India (SBI) with its associates, 20 nationalized banks, schedule and non-scheduled commercial banks, foreign banks, and regional rural banks and refinancing institutions such as NABARD, IDBI, EXIM-BANK, SIDBI and IFCI. The non-banking financial institutions in the money market are LIC, GIC and its subsidiaries and UTI, to name a few. The surplus funds of quasi-governmental and large organizations are available to the organized markets through the banks.
- **Unorganized sector:** This sector consists of unregulated non-bank financial intermediaries, indigenous bankers and money lenders who thrive in rural areas and small towns, where the presence of the organized sector has been thin and with minimal impact. The people who borrow from unorganized sectors include the farmers, small traders, small scale producers and artisans.

Categories of financial markets

The financial market in India can be classified into the four broad categories—money market, debt market, forex market and capital market.

(i) ***Money market:*** The money market is a wholesale debt market. This market provides low-risk and highly-liquid short-term instruments, with maturity from a single day up to one year. Basically, the emphasis of this market is to provide liquidity of cash. It is a place where the large institutions and government manage their short-term cash requirements, be it by borrowing or investing. This market is dominated by the government, banks and financial institutions. The market provides a platform for raising instant and unexpected need for cash as well as investment of short-term surplus funds by the financial institutions, government and business corporations. These requirements have necessitated the growing need for a developed money market.

The money market facilitates quick and efficient transactions of large amounts between business corporations, government, bank, etc., for a short-term. Organizations park their excess cash balance in financial securities for a short-term, which can be converted back to cash with the least risk, whenever needed. Money market is concerned with the short-term debt, which is usually for less than one year.

The vast majority of the deals in the money market are transacted over telephone, fax or Internet. RBI has permitted the following institutions to participate in the Call/Notice Money Market both as lenders and borrowers

as per RBI circular RBI/2012-13/98 IDMD.PCD. 03/14.01.01/2012-13 dated 2 July 2012.

- Scheduled commercial banks (excluding regional rural banks);
- Co-operative banks other than land development banks; and
- Primary dealers
- Non-banking financial companies (NBFCs) can lend but are not allowed to borrow in the Indian money market. The RBI is the leader of the money market in India.

Money market refers to the entire network of financial institutions dealing in short-term funds, which benefits the lenders as well as borrowers with a source of supply. Money market is an integral part of the financial market where instruments with high liquidity and short-term maturities are traded. Money market is treated as a safe place due to the availability of highly liquid nature of securities with short-term maturities. In the money market, short-term obligations such as treasury bills, commercial papers and bankers' acceptances are bought and sold. However, the money market instruments provide a comparatively low yield. The money market provides a focal point for RBI intervention to influence the liquidity and general levels of interest rates in the economy.

(ii) ***Debt market:*** Debt securities like debentures and bonds are traded in a debt market. A debt market is also known as a 'fixed income market' as debt instruments pay only fixed returns. The debt market in India is classified into:

- Government securities market (concerning central and state government securities) and
- Bond market (concerning foreign institution (FI) bonds, PSU bonds, corporate bonds and debentures).

The advantage of holding debt instruments is their high liquidity to the investors, in particular with the government securities. The risk factor is considerably lower for the government securities. It is important to remember that the government securities may not be absolutely and totally risk-free instruments. The past behavior of the various state governments, in particular the government guaranteed instruments has shaken the confidence of the investors due to their default in repayment on maturity.

The importance of a fully active debt market was felt with the Asian financial crisis of the 1990s. In most Asian countries, though both equity and debt market exist, the equity markets have expanded at a much faster pace than the debt markets.

Debt markets are an alternative route for the organizations to finance their operations. However, the development of debt market has not kept pace

NOTES

with the growth and development of equity market in India. The debt markets are a crucial source of capital funds for a developing economy like India. The Indian debt market is one of the largest among the Asian countries.

The impacts of debt market on the Indian economy are:

- Lower risk investment instruments, compared to the equity, leading to a greater inflow of funds into the economy
- With more funds, implementation of government development plans can reach people at lower costs
- It allows the RBI to implement its monetary policy, effectively
- An opportunity for the investors to diversify their investment portfolio
- Assured return instruments at periodical intervals
- Greater transparency on account of stringent disclosure norms and auditing requirements

(iii) ***Forex market:*** Foreign exchange market, the market for trading currencies, is popularly known as forex market. The greatest advantage of foreign exchange market is its liquidity. Traders in the foreign exchange market include large banks, central banks, institutional investors, currency speculators, corporations, governments, other financial institutions and retail investors.

Forex market deals with multiple currencies. All the currencies trade in pairs, like the Euro-US dollar (EUR/USD) or US dollar / Japanese yen (USD/JPY), as the value of one currency is determined by its comparison to another currency. The Forex market facilitates the conduct of trade and currency transactions between the different countries.

Exports and imports in the foreign trade are financed by the commercial banks, which involves risks associated with foreign currency transactions. The average daily turnover in the global foreign exchange and related markets has been continuously growing. In a typical foreign exchange transaction, the importer purchases the specified quantity of currency by paying another currency, normally home currency. On the other hand, the exporter sells the acquired currency for the local currency. The transfer of funds in this market is dependent upon the applicable exchange rates. Forex market is one of the most developed and integrated market across the globe for which there is no central marketplace for the exchange of currencies. Both the buyers and sellers conduct the online currency trading.

In the foreign exchange market, currencies are traded at the applicable exchange rate.

Forex markets provide the opportunity for hedging for risk seeking investors who evaluate the country's economic and political situations, carefully, as these factors can influence the direction of the concerned currency.

(iv) ***Capital market* (*securities market*):** The capital market is the platform for companies and the government to raise long-term funds when securities are traded. A capital market facilitates the business enterprises (companies) and governments to raise long-term funds.

Distinction between money market and capital market Both money market and capital markets are financial markets. Both facilitate transfer of funds from the savers/investors to borrowers/deficit-users.

1.5.2 Financial Instruments

These are further categorised as: money market instruments, capital market instruments and hybrid instruments.

Money market instruments

The money market is where money or its equivalent instruments are traded. The main function of the money market is to facilitate the efficient transfer of short-term funds between lenders and borrowers, which offers avenues as well as benefits for both groups. Short-term means a period that ranges from one day to one year. The lender/investor parts with the funds for a short-term loan to secure a reasonable return. The borrower benefits from access to rapid and relatively inexpensive cash in the form of short-term liabilities.

The money market consists of many sub-markets, such as the call money market, acceptance market, commercial bills market etc. Collectively, these constitute the money market. *The money market provides a focal point for the RBI to intervene to influence the liquidity and general levels of interest rates in the economy.*

The RBI which is a major constituent of the money market, aims at ensuring that the liquidity and short-term interest rates are consistent with its monetary policy objectives.

Money market instruments traded in India are:

- Call or notice money
- Banker's acceptances
- Certificates of deposit
- Collateralized borrowing and lending obligation (CBLO)
- Treasury bills
- Commercial bills
- Commercial papers
- Repos (repurchase agreements) and reverse repos

NOTES

Capital/Securities market instruments

The securities market is not a market place, but a system of inter-connections that provides effective conditions to buy and sell securities, where both professionals and non-professionals participate on the basis of demand and supply. The New York Stock Exchange (NYSE) is the best known example of a global security market, and similar markets exist all over the world. The Bombay Stock Exchange (BSE) comes to our minds when we speak of the securities market in India.

The securities market is an exchange where securities are traded by professional stockbrokers, which facilitates sale and purchase of transactions on the basis of demand and supply. In case of a commodity, if the demand is more and supply limited, price of that commodity flares up. In the reverse case, when supply is more and demand less, the price level dips. This behaviour is equally true even with the share market. All the securities, including shares and debentures, are traded on the stock exchange.

Security market instruments include: Bonds, Debentures, Equity and Preference Shares, etc.

1.5.3 Financial Market Institutions

The following are the important institutions of the financial markets. Here, we will get a brief acquaintance with them.

Commercial banks

Commercial banks collect deposits in the form of current accounts, savings accounts and fixed deposits from those who have surplus funds, and lend the funds to individuals and businesses. Their primary role was in providing working capital loans to the businesses. Commercial banks provide working capital loan to businesses through various schemes. Overdraft facility, factoring and bill discounting facility and letter of credit are among them. Commercial banks also provide term loan for a longer period for financing projects. In the current competitive periods commercial banks provide several fee-based services also.

There are public sector banks and private sector banks, as well as foreign banks, in India.

Commercial banks are regulated by the Reserve Bank of India, which requires the banks to maintain their capital adequacy ratio, cash reserve ratio and also to abide by several other regulations so that the financial health of bank can be maintained and depositors can 'bank' (rely) upon them. If the banking system fails, the entire economy would fail.

Cooperative banks

Cooperative banks are just like commercial banks, except that they are formed by people with common interest and goals and they operate with the cooperation

motto rather than profit motto. They came into existence to get out of the clutches of money-lenders who used to exploit farmers, labourers and other small businesses, and extend small credit to its members. The cooperative structure in India for short-term and medium-term credit is a three-tier structure with *agriculture credit societies* at the base and then *central cooperative banks* and *state cooperative banks.* Central cooperative banks are usually registered under the Cooperative Societies Act 1912, whereas state cooperative banks are registered under the act of the respective states. Therefore, regulations of cooperative banks are different from that of commercial banks.

Regional rural banks (RRBs)

RRBs are jointly owned by the Government of India, state government and a sponsor bank to extend much needed assistance to small and marginal farmers, labourers and rural artisan. These banks operate only in the notified areas, which primarily include rural areas, but also some urban areas. RRBs are established under the provisions of RRB Act, 1976. These banks help in implementing certain policies of the Governments. For example, wages under MGNREGA are distributed through RRBs.

Bank of International Settlement (BIS)

Banking sector has been always integrated internationally for transfer of money and issuance of international letter of credit etc. The BIS was established in 1930 to promote and facilitate collaborations among central banks of all member nations with a view to promote monetary and financial stability. It acts as a prime counterparty for central banks for their international transactions. It is based in Basel, Switzerland, where banking norms are discussed and decided for each central bank to adopt in their respective country. It does not accept any deposits or perform any banking function.

Investment banks

They primarily provide issue management services which includes advising corporate clients for determining debt-equity ratio, designing of an instrument, getting legal approvals, organising marketing (road-show) for the selling of securities, determining fair price for the issue of security, actually issuing the securities and making allotment of them. During this process, they also provide the services of underwriting of the issue either on good-faith basis or guaranteed basis. In good-faith underwriting they provide issue services for a fee, whereas in guaranteed basis underwriting, the unsubscribed portion of the issue is taken up by the investment banks, which they in turn sell in the market. The fees for guaranteed based underwriting are higher than good-faith underwriting. Today, many investment banks have expanded themselves to the full-service banks and provide many additional services including providing market intelligence, helping to buy or sale target companies, portfolio management, syndication of loan, insurance, etc.

NOTES

Asset management firms

Asset management company (AMC) is an investment management company. These firms manage any type of assets. Some manage infrastructure assets and some manage firms. In the context of financial market, the asset management fi rms manage pooled financial resources of others. Mutual funds, hedge funds and pension funds pool the money and hire asset management firms to manage the funds as per the funds' philosophy and in exchange earn fees.

Insurance companies

The insurance firm is the oldest type of financial institution. They sell insurance products, some of which cover risk of life and some other cover risk of property and casualty that people and businesses do not want to take. Thus, there are two types of insurance companies life insurance companies and general insurance companies. Life insurance companies cover the risk of policyholders in exchange of yearly premium and guarantees a lump sum payment in case the policy holder dies. One can take a full-life insurance policy and pay premium every year, or else can take a term policy and cover the life only for a certain period. Some are endowment policies that not only cover the life but also assure a lump sum payment at a certain age. Endowment policies are savings oriented life policies. Property or casualty (P&C) insurers are known as general insurance companies. General insurance covers the risk of potential financial loss from unexpected events like accident, fire, riots, earthquake, health, lawsuits, etc.

Venture capital funds

Venture capital funds pool of investible money from those investors who are willing to take extra risk and invest in high potential risky start-ups. Some entrepreneurs have business ideas and passion but cannot access capital market. Venture capital funds are ready to participate in the equity requirement of such start-ups and help them with managerial and other assistance. Venture funds exit the ventures at appropriate time with profit or loss. Each venture fund specializes in certain types of business ventures, for example some invest in IT start-ups only and some other in bio-tech start-ups only. Venture capitalists have encouraged entrepreneurship in India. Like venture funds, there are angel funds and charitable funds, too.

Developmental institutions or special purpose government agencies

Central and state governments have established some developmental institutions that act as special purpose agencies of the government. Important among them are:

- **Industrial Development Bank of India (IDBI)** IDBI was established by RBI in 1964 and in 1976 it was transferred to the Government of India. Its primary purpose was to assist the industrial development of India by granting project loans, underwriting and direct subscription in securities of the industrial companies, provide soft loan and technical development funds.

It used to also act as lead institution for providing consortium loan jointly with other financial institutions for industrial development. After establishment of Small Industrial Development Bank of India it started refinancing them and also to commercial banks and RRBs. It is raising funds from international money markets too.

- **State Industrial Development Bank of India (SIDBI)** SIDBI was established by IDBI in 1990 for working at the grass-root level and for providing developmental assistance for businesses in backward areas of the country. They offer financial lease and offer guarantees and act as agencies for the implementation of central and state schemes for industrial development. They also undertake projects and conduct survey for finding developmental opportunities.
- **National Bank for Agricultural and Rural Development (NABARD)** NABARD was set up by Government of India in 1982. Its main role has been to uplift rural areas by increasing credit flow towards agriculture and rural non-farm sector. It is associated with international agencies like World Bank and its affiliated developmental institutions.
- **National Housing Bank (NHB)** NHB was established in 1988 as a wholly owned subsidiary of RBI to promote private real estate. It is regulating and refinancing social housing programmes of Housing Finance Companies as well as other activities like research and IT infrastructure.
- **State Financial Corporations (SFCs)** SFCs are established under the State Finance Corporation Act, 1951. SFCs grant loans to industrial units for purchase of fixed assets and sometimes for working capital also, through pledge, mortgage and hypothecation or guarantee by the state government and commercial banks. It subscribes in shares and bonds of industrial units also. It also provides services like underwriting and guarantees.

International Monetary Fund (IMF)

IMF was established along with World Bank in 1944 with a view to assist in the reconstruction of international payment system. Member countries (188 as of now) can borrow temporarily from the pooled funds to meet their payment imbalance. The IMF requires member countries to unfold self-correcting policies through which it works to improve the economies of its member countries.

1.5.4 Regulators in the Indian Financial System

The major financial regulatory bodies in India's financial markets are as under:

- The Ministry of Finance (MOF)
- The Reserve Bank of India (RBI)
- The Securities and Exchange Board of India (SEBI)
- The Insurance Regulatory Development Authority (IRDA)

NOTES

- The National Stock Exchange (NSE)
- The Bombay Stock Exchange (BSE)
- The Foreign Investment Promotion Board (FIPB)
- The Central Board of Direct Taxes (CBDT)
- The Central Board of Excise and Customs (CBEC)

The financial system in India is regulated by independent regulators in the fields of banking, insurance and capital markets.

Check Your Progress

6. Which type of financial market is called wholesale debt market?
7. Mention some of the non-banking financial institutions in the money market.

1.6 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Financial management is concerned with proper management and execution of finance of a company, i.e., proper allocation, control and reduction of the cost of funds for the benefit of shareholders.
2. The goals of profit maximization as well as wealth maximization are consistent with each other only under two conditions: investment takes place in tiny increments and there is certainty of return.
3. By recognizing the time and risk elements, the concept of shareholder wealth maximization brings a balance between short-term profits and long-term profits.
4. Finance related functions are categorized into two segments, i.e., finance functions performed by treasurer and finance functions performed by controller.
5. The four aspects of functions performed by a financial manager are taking financing decisions, investment decisions, dividend decisions and liquidity/ working capital decisions.
6. The money market is the type of financial market which is called wholesale debt market.
7. The non-banking financial institutions in the money market in India are LIC, GIC and its subsidiaries and UTI, to name a few.

1.7 SUMMARY

NOTES

- Financial management is an important functional area of managers in a company. Finance acts as lifeline of a company. The term 'management' is associated with planning, execution and control.
- Financial management is concerned with proper management of finance of a company, its execution, i.e., proper allocation, control and reduction in the cost of funds for the benefit of shareholders.
- The role of financial management can be understood in two ways. One is the traditional view and the other is the modern view.
- A financial manager performs the functions of fund raising, fund allocation, profit planning and understanding capital market.
- Objectives drive the decision-making of a firm. Therefore, it is important to know the corporate financial objectives.
- Till 1921, firms did not see any need for stating their financial objectives. The corporate financial objective, since then, has grown in three phases: profit maximization objective, social responsibility of business and shareholder wealth maximization.
- Knight Frank (1921) first gave 'profit maximization' as the corporate financial objective in his 'perfect market theory'.
- Profit maximization goal of the firm remained non-controversial for almost a quarter of a century. Profiteering by firms and social exploitation over a period threw up newer concerns. In 1957, Frank Elton initiated the concept of managerial responsibility to society.
- Profit maximization and social responsibility are conflicting objectives. A compromise was found in the newer expression, namely, 'satisfactory profit' as the firm's goal, put forth by Robert Anthony in 1960.
- The debate around profit maximization and social responsibility led to finding a more logical expression of corporate financial objective.
- Objectives of profit maximization and shareholder wealth maximization differ from each other on two issues—Cash flow and its timing, and risk.
- The finance department looks after the decisions related to financial planning, fund raising, tax management, cost accounting and corporate accounting, capital expenditures, pension fund scheme, cash management and management of foreign exchange requirement etc.
- The four aspects of functions performed by a financial manager are taking financing decisions, investment decisions, dividend decisions and liquidity/ working capital decisions.

NOTES

- The treasurer ensures the proper financial planning, fund allocation and risk management related decisions.
- The need for finance is universal and pervasive. Financial system ensures the smooth flow of funds is available to the different sectors when needed. The financial system is the system that facilitates the transfer of money from the savers to the borrowers.
- The scope of the financial system is not only complex, it is also closely interconnected to financial institutions, markets, instruments, services, practices, and transactions. The financial system is crucial to the allocation of resources in a modern economy.
- The important components of a financial system are: Financial markets, Financial instruments and Financial institutions.

1.8 KEY WORDS

- **Finance management:** It is concerned with proper management of finance of a company, its execution, i.e., proper allocation, control and reduction in cost of funds for the benefit of shareholders.
- **Treasurer:** It is finance function concerned with proper financial planning, fund allocation and risk management related decisions.
- **Finance controller:** It is a finance function which ensures documentation of all the finance functions, proper recording, making budgets to support finance related decisions.
- **Finance manager:** It refers to the manager who arranges the funds, takes decisions of allocation of funds, then makes the profit planning and ensures proper utilization of these funds.

1.9 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short-Answer Questions

1. What are the phases in which corporate financial objectives have grown?
2. What is the profit maximization objective based on?
3. Write a short note social responsibility as a corporate financial objective.
4. Differentiate between profit maximization and wealth maximization.
5. List some of the alternative objectives a finance manager.

Long-Answer Questions

1. Explain the traditional and modern view of financial management and its nature.
2. Discuss the issue of measures of wealth in the wealth maximization objective of a firm.
3. Describe the functions performed by the finance manager.
4. Explain the categories of financial markets in India.
5. What are the different types of institutions in the financial market?

NOTES

1.10 FURTHER READINGS

Patel, Bhavesh. 2014. *Fundamentals of Financial Management*. New Delhi: Vikas Publishing House.

Khan, M.Y. and Jain, P.K. 2007. *Financial Management- Text Problems and Cases.* New Delhi: Tata McGraw-Hill.

Chandra, Prasanna. 2004. *Financial Management: Theory and Practice.* New Delhi: Tata McGraw-Hill.

Kulkarni, P.V. and B. G. Satyaprasad. 2002. *Financial Management.* New Delhi: Himalaya Publication House.

UNIT 2 FINANCIAL SYSTEM: LEGAL AND REGULATORY FRAME WORK

Structure

2.0 INTRODUCTION

In the previous unit, you were introduced to the basics of the financial system of our country. There you were taught that regulatory and legal frameworks are also present in the financial system. These regulations and frameworks are put in place to check the workings of the financial institutions in the systems along with the parties engaging with them. Regulatory and legal frameworks have a bearing on several important aspects of a business beginning with the form of enterprise to crucial legal obligations they need to adhere to in the interest of all parties involved. These frameworks and regulatory bodies ensure that the businesses have a set of standard rules of operations. It also contains provisions to ensure that punishment and methods of appeals are specified with may be used in case of contravention. In this unit, you will learn about the legal and regulatory framework relevant to business in the context of financial management, the meaning and scope of financial decisions as well as tax nexus.

2.1 OBJECTIVES

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

- Explain the meaning and scope of financial functions

- Discuss the legal and regulatory framework in the financial management system
- Describe the finance and tax management nexus

NOTES

2.2 FINANCIAL FUNCTIONS: MEANING AND SCOPE

You have already learnt about the meaning and scope of finance functions in the previous unit, let's briefly recapitulate the concept.

Organisation of the Finance Function

A firm should give proper attention to the structure and organisation of its finance department. If financial data are missing or inaccurate, the firm may not be in a position to identify the serious problems confronting the firm in time for necessary corrective action. The roles of different finance executives should be clearly defined in order to avoid conflict and overlapping of functions. Organisation of the finance function differs from company to company depending on their respective needs and the financial philosophy. The titles used to designate the key finance official are also different, viz., Vice-President Finance), Chief Executive (Finance). General Manager (Finance), etc. However, in most companies, the Vice-President (Finance) has under him two officers carrying out the two important functions–the accounting and the finance Functions. The former is designated as Controller and the latter as Treasurer.

The Vice-President (Finance) exercises his functions through his two deputies known as:

1. Controller or Comptroller
2. Treasurer.

The controller is concerned with the management and control of the firm's assets. His duties include providing information for formulating the accounting and financial policies, preparation of financial reports, direction of internal auditing, budgeting, inventory control, taxes, etc. While the treasurer or treasury department is mainly concerned with management and control of liquidity of funds. The treasurer has to ensure that there is proper usage, storage and risk management of liquid funds to meet firm's obligations, collect its receivable and also maximise the return of the firm's investments. Thus, the treasurer is mainly concerned with the managing the firm's funds. His duties include the following: Forecasting the financial needs; administering the flow of cash; managing credit: floating securities; maintaining relations with financial institutions and protecting funds and securities.

A brief description of the functions of the Controller and the Treasurer. as given by the Controllers Institute of America, is given below:

Functions of Controller

- **Planning and control**

To establish, coordinate and administer, as part of management, a plan for the control of operations. This plan would provide to extent required in the business, profit planning, programmes for capital investing and for financing: sales forecasts and expense budgets.

- **Reporting and interpreting**

To compare actual performance with operating plans and standards, and to report and interpret the results of operations to all levels of management and to the owners of business. To consult with the management about the financial Implications of its actions.

- **Tax administration**

To establish and administer tax policies and procedures.

- **Government reporting**

To supervise or co-ordinate the preparation of report to government agencies,

- **Protection of assets**

To ensure protection of business assets through Internal control, internal auditing and assuring proper insurance coverage

- **Economic appraisal**

To appraise economic and social forces and government influences and interpret their effect upon business.

Functions of Treasurer

- **Provision of finance**

To establish and execute programmes for the provision of the finance required by the business, including negotiation Its procurement and maintaining the required financial arrangements.

- **Investor relations**

To establish and maintain an adequate market for the company's securities and to maintain adequate contact with the investment community.

NOTES

- **Short-term financing**

To maintain adequate sources for the company's current borrowing from the money market.

- **Banking and custody**

To maintain banking arrangements, to receive, have custody of and disburse the company's moneys and securities and to be responsible for the financial aspects of real estate transactions.

- **Credit and collections**

To direct the granting of credit and the collection of accounts receivables of the company.

- **Investments**

To invest the company's funds as required and to establish and coordinate policies for investment in pension and other similar trusts,

- **Insurance**

To provide insurance coverage as may be required.

2.3 LEGAL AND REGULATORY FRAMEWORK

The legal and regulatory framework in the financing decisions of the firms can be understood through two different categories: framework for financial markets and framework for business enterprise.

2.3.1 Framework for Business Enterprise

The governance of business enterprises in India is largely under the following regulations:

- **Industrial Policy and Industries (Development and Regulation) Act, 1951:** The Industrial Policy Resolution of 1948 defined the broad contours of the policy delineating the role of the State in industrial development both as an entrepreneur and authority. This was followed by comprehensive enactment of Industries (Development & Regulation) Act, 1951 (referred as IDR Act) that provides for the necessary framework for implementing the Industrial Policy and enables the Union Government to direct investment into desired channels of industrial activity inter alia through the mechanism of licensing keeping with national development objectives and goals.

  The main objectives of the Industrial Policy of the Government are (i) to maintain a sustained growth in productivity;(ii) to enhance gainful

employment;(iii) to achieve optimal utilisation of human resources; (iv) to attain international competitiveness; and (v) to transform India into a major partner and player in the global arena. To achieve these objectives, the Policy focus is on deregulating Indian industry; allowing freedom and flexibility to the industry in responding to market forces; and providing a policy regime that facilitates and fosters growth. Economic reforms initiated since 1991 envisages a significantly bigger role for private initiatives. The policy has been progressively liberalized over years to at present.

- **Companies Act 2013:** This is an Act passed by the Parliament which contains provisions related to the incorporation of companies, their duties and responsibilities, as well as their dissolution amongst other related factors.
- **Securities Exchange Board of India Act, 1992:** It was established '...to protect the interests of investors in securities and to promote the development of, and to regulate the securities market and for matters connected therewith or incidental thereto'
- **Competition Act:** The Competition Act, 2002, as amended by the Competition (Amendment) Act, 2007, follows the philosophy of modern competition laws. The Act prohibits anti-competitive agreements, abuse of dominant position by enterprises and regulates combinations (acquisition, acquiring of control and M&A), which causes or likely to cause an appreciable adverse effect on competition within India.
- **Foreign Exchange and Management Act, 1999:** It contains provisions related to the regulation and governance of all types of foreign exchange transactions in India.
- **Income Tax Act 1961:** It contains provisions related to the calculation of direct tax incidence, liability, collection, penalty and appeals. It works in tandem with the tax rates as announced by the Finance Bill every year in the Parliament.
- **Goods and Services Act 2017:** It contains provisions related to the levy and collection of indirect tax on supply of goods and services in India.

2.3.2 Framework for Financial Markets

Financial markets handle money, and therefore become very sensitive for all as well as for the entire economy. Strong and balanced financial regulations are the key for bridling the greed which is always the cause for economic growth and also for the exploitation and unethical behaviour.

Efficient markets work under pragmatic regulations, supervisory agencies and fair rules of play. Dissemination of material and fair information and protection of genuine players should remain the key functions of the regulations and role of regulators in the financial system.

Financial Regulations

Financial / securities markets are highly regulated. Important regulations are listed below:

- The Securities Contract (Regulations) Act, 1956, for regulating transactions of securities on the secondary market through control over stock exchanges.
- The Companies Act, 2013, has provisions for issue, allotment and transfer of securities as well as for the disclosure requirements for the companies.
- The Securities and Exchange Board of India (SEBI) Act 1992 enabled the creation of SEBI for the regulation of securities market and protection of investors.
- The Depositories Act, 1996, provides for dematerialization of securities and regulations thereof.
- The Reserve Bank of India Act, 1934, under which the Reserve Bank of India (RBI) was established for the regulation of money flow in India. RBI is the main regulator of the money market.

Regulators

Financial markets need strong regulations. The regulators of Indian financial markets can be grouped in two, namely, independent regulators and part of government department or ministry.

Independent bodies via Act of Parliament

- **SEBI**: SEBI was established in 1988 as a non-statutory body to protect investors and to develop and regulate securities markets. It became an autonomous body after the enactment of the SEBI Act, 1992.
- **RBI**: Reserve Bank of India was established on 1 April 1935 under the Reserve Bank of India Act, 1934, as a central bank to regulate flow on money in the economy. It is, therefore, framing and implementing monetary policies of the country. Since money is handled by banking sector, banks and money market activities are regulated by the RBI.
- **IRDA**: The Insurance Regulatory and Development Authority (IRDA) was established under the IRDA Act, 1999, with a view to protecting the interest of policyholders, to regulate, promote and ensure orderly growth of insurance sector in India.

Part of government departments/ministry

- **FMC**: The Forward Market Commission of India is a regulatory body set up in 1953 under the Ministry of Consumer Affairs, Food and Public Distribution, Government of India.

NOTES

It was established under the Forward Contract Act, 1952. The FMC allows commodity trading in 22 exchanges in India, of which three are national level.

- **PFRDA**: The Pension Fund Regulatory and Development Authority was established in 2003 under the Finance Ministry to regulate pension funds.

2.4 FINANCE AND TAX MANAGEMENT NEXUS

A nexus means a connection. Nexus is the extent of business activity that must be present before a state can tax an entity's income. If a taxpayer has nexus in a particular state, the taxpayer must pay and collect/remit taxes in that state. You have seen in the previous section how companies in India are subject to the laws under the Income Tax Act, the finance bill and the Goods and Services Act. It is very important for the financial manager of any organization to follow the applicable rules and regulations so as to avoid penalties, punishments or forced closure orders.

2.4.1 Tax Avoidance and Tax evasion

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

2.4.2 Tax Incentive and Business Decisions

Tax incentives refer to the reduction of tax or favourable tax terms for certain activities or businesses by the government in the country. In our country and in others, these incentives or benefits are provided by the government to the firms to incentivise businesses and encourage investment. the government provides a number of tax benefits to firms to encourage capital investment. Tax incentives can be in any of the following forms: reduction in tax rates, tax holidays, exemptions, financial incentives, declaration of special zones, investment tax credit, etc.

Tax incentives may affect business decisions with regards to the choice of location (like locating the industry in SEZs), but the biggest relation of tax incentives and business decisions is seen in the area of sources of funds. It can reduce the expenditure of the firm in the short run but is always subject the changing laws. Therefore, financial managers need to carefully consider the tax related policies in order to understand its impact on the operations in the future.

The central government and state governments offer incentives for investment through subsidies, tax incentives and concessions in land and utility prices. Schemes vary from state to state. Usually, subsidy and tax incentives are offered to encourage small entrepreneurs and women entrepreneurs, as well as to promote investment in desired locations and businesses.

For example, the central government developed a scheme4 for capital investment subsidy in 1997 for units in 'growth centres' for the north eastern region and other areas. The central government announces subsidy plans for different regions from time to time. One needs to read the current industrial policy of the Government of India, with special attention to the applicable subsidy based on the classification of the zone in which the business is set up.

Many states, through the state finance corporations or state industrial development corporations provide subsidy to small-scale industries (SSIs) for investment in plant and machinery and provide industrial land, sheds, water and electricity at preferential rates. Subsidy is shown as capital and is tax-free.

Check Your Progress

1. Who out of the controller and treasurer is mainly concerned with the managing of the firm's funds?
2. Why was the SEBI established?
3. State the key functions of the regulations and regulators in the financial system.
4. Who is the main regulator of the money market in India?
5. What are the methods of tax evasions?

2.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The treasurer is mainly concerned with the managing of the firm's funds.
2. Securities Exchange Board of India Act, 1992 was established '...to protect the interests of investors in securities and to promote the development of, and to regulate the securities market and for matters connected therewith or incidental thereto'
3. Dissemination of material and fair information and protection of genuine players should remain the key functions of the regulations and role of regulators in the financial system.
4. The RBI is the main regulator of the money market.

NOTES

5. Tax evasion methods could be falsification of books, suppression of income and overstatement of deductions, etc., so that one has to pay less tax.

2.6 SUMMARY

- The organization of finance function differs from company to company depending upon their respective needs.
- In most companies, the vice president finance has under him two officers carrying out two important functions: accounting and finance functions. The former is designated as controller and the latter as treasurer.
- The legal and regulatory framework in the financing decisions of the firms can be understood through two different categories: framework for financial markets and framework for business enterprise.
- The governance of business enterprises in India is largely under the following regulations**:** Industrial Policy and Industries (Development and Regulation) Act, 1951, Companies Act 2013, Securities Exchange Board of India Act, 1992, Competition Act, Foreign Exchange and Management Act, 1999, Income Tax Act 1961 and Goods and Services Act 2017.
- Financial / securities markets are highly regulated. Important regulations are listed below: The Securities Contract (Regulations) Act, 1956, The Companies Act, 2013, The Securities and Exchange Board of India (SEBI) Act 1992, The Depositories Act, 1996, and The Reserve Bank of India Act, 1934.
- The regulators of Indian financial markets can be grouped in two, namely, independent regulators and part of government department or ministry.
- Tax avoidance means reduction in tax liability by using some legal methods.
- Tax evasion means the situation when on uses illegal means to reduce tax liabilities.
- Tax incentives are benefits given by the government in the form of reduction of taxes or reduction in the liability to pay taxes in order to encourage investments.

2.7 KEY WORDS

- **Tax avoidance:** It means reduction in tax liability by using some legal methods.
- **Tax evasion:** It means the situation when on uses illegal means to reduce tax liabilities.

NOTES

2.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short-Answer Questions

1. List the main objectives of the industrial policy of the government in India.
2. Mention the important regulations applicable to financial and securities markets in India.
3. What is tax avoidance? How is different from tax evasion?
4. Write a short note on tax incentive and business decisions.

Long-Answer Questions

1. Explain the role of controller and treasures in a company.
2. Describe the legal and regulatory framework for business enterprises and financial markets in India.

2.9 FURTHER READINGS

Patel, Bhavesh. 2014. *Fundamentals of Financial Management*. New Delhi: Vikas Publishing House.

Khan, M.Y. and Jain, P.K. 2007. *Financial Management- Text Problems and Cases.* New Delhi: Tata McGraw-Hill.

Chandra, Prasanna. 2004. *Financial Management: Theory and Practice.* New Delhi: Tata McGraw-Hill.

Kulkarni, P.V. and B. G. Satyaprasad. 2002. *Financial Management.* New Delhi: Himalaya Publication House.

NOTES

UNIT 3 INVESTMENT AND DIVIDEND FUNCTION

Structure

3.0 INTRODUCTION

Now that you are well versed with the concept of financial management and the role of financial managers, it is time to learn certain basic concepts which are relevant to the activities in the task of carrying out financial management. In this unit, you will learn about the basics of investment and dividend function. Under this, the concept of time value of money and risk return trade-off will be discussed. Further, the concept of management planning and global management will also be discussed.

3.1 OBJECTIVES

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

- Explain the meaning and scope of investment function
- Examine the concept and applications of time value of money
- Describe the risk return relationship
- Discuss the dividend function
- Explain the risk return trade off
- Discuss management planning and global management environment

3.2 INVESTMENT FUNCTION: MEANING AND SCOPE

NOTES

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

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

Scope of investment decision

Generally, the two major activities or decisions to be taken under investment decisions are related to:

- Fixed asset investment
- Mergers-acquisitions

3.3 TIME VALUE OF MONEY CONCEPTS AND APPLICATIONS

In a business, almost all financial decisions are related to cash flows in different time periods. The purchase of assets, issue of shares or raising loan/debt etc. all have influence on the cash flows in different time periods. For example, if a firm has to buy a plan and machinery for the production of goods, then it requires an initial cash outflow (cost of the plant and machinery) and it will generate cash inflows in the coming years for the revenue generation of the company. Similarly, if a firm borrows money from a bank, then it includes cash inflows followed by a stream of cash

NOTES

outflows of repayment of loan. In this situation, cash balance of the firm increases in the present and payment will be made in coming years, may be 5 years or 15 years. One cannot compare cash flows generated in present with the cash flows that will generate in future. The absolute cash flows may differ in timings and risk too. These cash flows are comparable only after making some adjustments. The recognition of time value and risk is very essential in financial management and decision making. For making right decisions, a firm should consider the time value of money. Identification of time value of money, return and risk are important in financial decision making as it helps in achieving shareholder's objective of wealth maximization.

Time value of money is the preference of an individual for the possession of money at present, rather than the same amount of money at some future date. An individual prefers a given amount of money today, rather than same amount of money in some near future time. This concept is called time preference for money. A rupee, which we can get after one year has less value than, if we get it today. Time is important as it gives you the opportunity to earn interest by postponing your consumption. There are some reasons of such preference. One of the reasons is risk. If we depart from our money and give it to someone else on the condition that other person will return it after few years. This departing of money involves risk too as we are not sure about future. Other reasons can be preference for consumption and investment opportunities available to us. Sometimes investment opportunities emerge and individuals can put their money in these profitable opportunities to earn some extra amount on it. These are the reasons that one should consider time value of money to make cash flows comparable.

Time Preference for Money

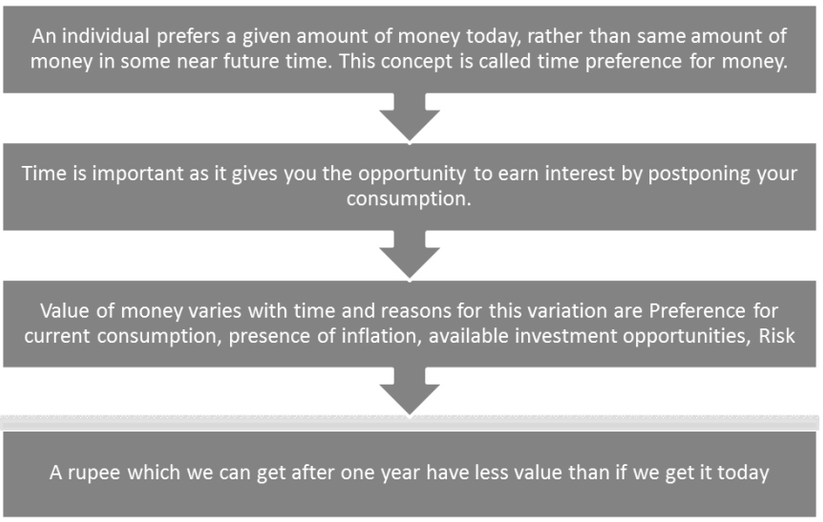


Fig. 3.1 *Time Preference for Money*

NOTES

Methods

There are two basic techniques to study time value of money:

- Compounding Technique (Future Value)
- Discounting Techniques (Present Value)

• Compounding Technique

In business decisions, cash flows are not related to one period only. They are spread over a period of time. Let us take an example, suppose an investor is indifferent towards today's cash inflows or cash inflows after one year with 10% interest (100 today = 110 after one year). The calculation of interest can be done on the continuous basis or on lump sum basis. If interest calculation is on continuous basis, it is called compound interest. Interest can be calculated by simple rate or by compounding rate. By applying the concept of compound interest, one can calculate the future value of cash flows. Simple interest is calculated only on the principle amount, not on subsequent stream of interests. Compound interest is calculated on principle as well as on the subsequent stream of interest too and is always greater than simple interest. In the following section different problems of compounding or future value calculation has been explained.

Future Value of a Single Amount

For the calculation of future value of any amount following formula is used:

Future Value = Principal × Compound Value Factor

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

Here, P is principal amount, I is interest rate, n is number of year and FV is the future value. $(1-i)^n$ is called **Compound Value Factor (CVF).** For this factor, we use tables to know the value after few years.

$FV_n = P\ X\ CVF_{n.i}$

Example 3.1

Rohan receive ₹ 1000 today and rate of interest is 10%. Calculate the future value after one year, two year and 5 years.

Solution:

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

$FV_n = 1000(1+0.10)^1 =$ ₹ 1100 after one year

$FV_n = 1000(1+0.10)^2 =$ ₹ 1210 after one year

$FV_n = 1000(1+0.10)^5 = 1000 \times 1.611 =$ ₹ 1611 after 5 years

$FV_n = 1000(1+0.10)^{20} = 1000 \times 6.727 =$ ₹ 6727 after 20 years

Example 3.2

Let us assume you deposit ₹ 65,500 in a bank for 10 years. Rate of interest is 12%. Calculate the amount you will get after 10 years.

NOTES

Solution:

After locating in compounding value factor table for 12 years and at 12% rate of interest, the CVF is 3.896. So, you will get ₹ 65,500 × 3.896 = ₹ 2,55,188.

Compound value can also be calculated for any lump sum figure as discussed in Example-2. This value of compound factor can also be calculated with the help of calculator or excel too.

One very important thing here is that as future time increases the rate of interest also increases.

Future value interest factor of $1 per period at i% for n periods, FVIF (i,n)

Period	1%	2%	3%	4%	5%	10%	12%	15%	20%	25%
1	1.010	1.020	1.030	1.040	1.050	1.100	1.120	1.150	1.200	1.250
2	1.020	1.040	1.061	1.082	1.103	1.210	1.254	1.323	1.440	1.563
3	1.030	1.061	1.093	1.125	1.158	1.331	1.405	1.521	1.728	1.953
4	1.041	1.082	1.126	1.170	1.216	1.464	1.574	1.749	2.074	2.441
5	1.051	1.104	1.159	1.217	1.276	1.611	1.762	2.011	2.488	3.052
6	1.062	1.126	1.194	1.265	1.340	1.772	1.974	2.313	2.986	3.815
7	1.072	1.149	1.230	1.316	1.407	1.949	2.211	2.660	3.583	4.768
8	1.083	1.172	1.267	1.369	1.477	2.144	2.476	3.059	4.300	5.960
9	1.094	1.195	1.305	1.423	1.551	2.358	2.773	3.518	5.160	7.451
10	1.105	1.219	1.344	1.480	1.629	2.594	3.106	4.046	6.192	9.313
11	1.116	1.243	1.384	1.539	1.710	2.853	3.479	4.652	7.430	11.642
12	1.127	1.268	1.426	1.601	1.796	3.138	3.896	5.350	8.916	14.552
13	1.138	1.294	1.469	1.665	1.886	3.452	4.363	6.153	10.699	18.190
14	1.149	1.319	1.513	1.732	1.980	3.797	4.887	7.076	12.839	22.737
15	1.161	1.346	1.558	1.801	2.079	4.177	5.474	8.137	15.407	28.422
16	1.173	1.373	1.605	1.873	2.183	4.595	6.130	9.358	18.488	35.527
17	1.184	1.400	1.653	1.948	2.292	5.054	6.866	10.761	22.186	44.409
18	1.196	1.428	1.702	2.026	2.407	5.560	7.690	12.375	26.623	55.511
19	1.208	1.457	1.754	2.107	2.527	6.116	8.613	14.232	31.948	69.389
20	1.220	1.486	1.806	2.191	2.653	6.727	9.646	16.367	38.338	86.736
25	1.282	1.641	2.094	2.666	3.386	10.835	17.000	32.919	95.396	264.698
30	1.348	1.811	2.427	3.243	4.322	17.449	29.960	66.212	237.376	807.794
35	1.417	2.000	2.814	3.946	5.516	28.102	52.800	133.176	590.668	2,465.190
40	1.489	2.208	3.262	4.801	7.040	45.259	93.051	267.864	1,469.772	7,523.164
50	1.645	2.692	4.384	7.107	11.467	117.391	289.002	1,083.657	9,100.438	70,064.923

Future value of an Annuity (A)

Annuity is a fixed receipt or payment each year over a period of time. Future value can also be calculated in case of an annuity for n years. Loans from employers and housing society's loan are some common examples of annuity. Annuity means fixed payment or receipt every year for a specific number of years. E.g. payment of LIC premium for 15 years fixed amount every year. In this case, formula will be different. For this following formula is used:

Future Value = Yearly annuity × Compound value factor for annuity of ₹1

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

In above equation, the term within the brackets $FVA_n = A\left[\frac{(1+i)^n - 1}{i}\right]$ is Compound Interest Factor in case of Annuity (CVFA).

$$FVA_n = A\ X\ (CVFA)_{n,i} FVA_n = A\left[\frac{(1+i)^n - 1}{i}\right]$$

NOTES

Example 3.3

Let us suppose, a person deposits ₹ 10,000 per year for 5 years at 15% rate of interest in a bank. How much will that person get after 5 years?

Solution:

Locate compound value factor for annuity at 15% rate of interest and for 5 years, it will be 6.742. So you are going to get ₹ 10,000 × 6.742 = ₹ 67,420 at the end of 5 years.

Future value interest factor of annuity of ₹1 per period at i% for n periods, FVA(n, i)

Period	1%	2%	3%	4%	5%	7%	10%	15%	20%	25%	30%
1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2	2.01	2.02	2.03	2.04	2.05	2.07	2.10	2.15	2.20	2.25	2.30
3	3.03	3.06	3.09	3.12	3.15	3.21	3.31	3.47	3.64	3.81	3.99
4	4.06	4.12	4.18	4.25	4.31	4.44	4.64	4.99	5.37	5.77	6.19
5	5.10	5.20	5.31	5.42	5.53	5.75	6.11	6.74	7.44	8.21	9.04
6	6.15	6.31	6.47	6.63	6.80	7.15	7.72	8.75	9.93	11.26	12.76
7	7.21	7.43	7.66	7.90	8.14	8.65	9.49	11.07	12.92	15.07	17.58
8	8.29	8.58	8.89	9.21	9.55	10.26	11.44	13.73	16.50	19.84	23.86
9	9.37	9.75	10.16	10.58	11.03	11.98	13.58	16.79	20.80	25.80	32.01
10	10.46	10.95	11.46	12.01	12.58	13.82	15.94	20.30	25.96	33.25	42.62
11	11.57	12.17	12.81	13.49	14.21	15.78	18.53	24.35	32.15	42.57	56.41
12	12.68	13.41	14.19	15.03	15.92	17.89	21.38	29.00	39.58	54.21	74.33
13	13.81	14.68	15.62	16.63	17.71	20.14	24.52	34.35	48.50	68.76	97.63
14	14.95	15.97	17.09	18.29	19.60	22.55	27.97	40.50	59.20	86.95	127.91
15	16.10	17.29	18.60	20.02	21.58	25.13	31.77	47.58	72.04	109.69	167.29
16	17.26	18.64	20.16	21.82	23.66	27.89	35.95	55.72	87.44	138.11	218.47
17	18.43	20.01	21.76	23.70	25.84	30.84	40.54	65.08	105.93	173.64	285.01
18	19.61	21.41	23.41	25.65	28.13	34.00	45.60	75.84	128.12	218.04	371.52
19	20.81	22.84	25.12	27.67	30.54	37.38	51.16	88.21	154.74	273.56	483.97
20	22.02	24.30	26.87	29.78	33.07	41.00	57.27	102.44	186.69	342.94	630.17
25	28.24	32.03	36.46	41.65	47.73	63.25	98.35	212.79	471.98	1,054.79	2,348.80
30	34.78	40.57	47.58	56.08	66.44	94.46	164.49	434.75	1,181.88	3,227.17	8,729.99
35	41.66	49.99	60.46	73.65	90.32	138.24	271.02	881.17	2,948.34	9,856.76	32,422.87
40	48.89	60.40	75.40	95.03	120.80	199.64	442.59	1,779.09	7,343.86	30,088.66	120,392.88
50	64.46	84.58	112.80	152.67	209.35	406.53	1,163.91	7,217.72	45,497.19	280,255.69	1,659,760.74

Sinking Fund

Sinking fund is used to redeem debt at the time of its maturity. For such fund, companies generally keep a fixed amount out of their earnings so that at the time of maturity of such debt company can easily repay them without hurting the existing liquidity. We know that,

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

NOTES

This equation can be solved for Annuity and the formula will become:

$$A = FVA_n \frac{i}{(1+i)^n - 1}$$

Example 3.4

A company has ₹ 8,00,000, 6% debentures outstanding today and has to redeem it after 10 years. For this redemption purpose, company wants to maintain a sinking fund which earns 10% interest and investment in this sinking fund is made at the end of the period. Calculate the annual payment company should make in sinking fund to ensure this redemption after 10 years.

Solution:

Formula for annual payment in sinking fund is as follows:

$$A = FVA_n \frac{i}{(1+i)^n - 1}$$

A is annual payment, FVA_n is ₹ 8,00,000 and rest part is 1/ CVFA (Compound value factor for annuity). Its table value is 1/15.937.

So, A = 8,00,000 × (1/ 15.937) = ₹ 50,197.65 is the annual payment in sinking fund account.

So if company keeps ₹ 50,197.65 annually for 10 years, it can redeem its debentures of ₹ 8,00,000 without hurting the cash and liquidity position of the company.

Discounting Method

• Discounting Techniques

Present Value

Till now, we have discussed about the situations where one can deposit some amount on continuous basis and calculate what one will get after years. This is called compounding. Sometimes, companies invest in some asset which gives return over a period of time. For example, if a company invests in plant and machinery of ₹ 10,00,000 now and every year, then this machine will generate cash inflows of 350000, 400000, 500000, 6000000 and 700000. In such situation, present value techniques is used to take financial decisions. Discounting of cash flows (inflows and out flows) is the process of determining the present value of a series of future cash flows. Present value of future cash inflows or outflows is the amount of current cash identical to future cash flows. Interest rate or discount rate is used to calculate the discounting value of future cash flows. The process of converting future cash flows into the current cash flows is called discounting.

Present Value of a single amount

Following formula is used to calculate the present value of a single value of future cash flow:

$$P = \frac{F_1}{(1+i)^n}$$

Present Value = Future Value × Present Value Factor of ₹ $P = F_1 (PVF)_{i,n}$

This formula is nothing but revised form of the earlier formula that is used in case of Future Value $FV_n = P(1+i)^n$. In the above equation, $\frac{1}{(1+i)^n}$ is Present Value Factor (PVF). So the equation for present value is $P = F_1 (PVF)_{i,n}$. The value of PVF is always less than one. As year increases value of PVF reduces.

Example 3.5

Let us suppose, Mr. A is going to get ₹ 1,00,000 after 10 years. Interest rate is 10% p.a. Calculate its present value.

Solution:

Here, present value factor (PVF) is 0.3855 (from table below) and by putting values in the above formula we can get present value.

₹ 1,00,000 × 0.3855 (PVF) = ₹ 38,550, So Present Value is ₹ 38,550

Present value interest factor of ₹1 per period at i% for n periods, PVF(n, i)

Period	1%	2%	3%	4%	5%	10%	11%	12%	15%	20%
1	0.990	0.980	0.971	0.962	0.952	0.909	0.901	0.893	0.870	0.833
2	0.980	0.961	0.943	0.925	0.907	0.826	0.812	0.797	0.756	0.694
3	0.971	0.942	0.915	0.889	0.864	0.751	0.731	0.712	0.658	0.579
4	0.961	0.924	0.888	0.855	0.823	0.683	0.659	0.636	0.572	0.482
5	0.951	0.906	0.863	0.822	0.784	0.621	0.593	0.567	0.497	0.402
6	0.942	0.888	0.837	0.790	0.746	0.564	0.535	0.507	0.432	0.335
7	0.933	0.871	0.813	0.760	0.711	0.513	0.482	0.452	0.376	0.279
8	0.923	0.853	0.789	0.731	0.677	0.467	0.434	0.404	0.327	0.233
9	0.914	0.837	0.766	0.703	0.645	0.424	0.391	0.361	0.284	0.194
10	0.905	0.820	0.744	0.676	0.614	0.386	0.352	0.322	0.247	0.162
11	0.896	0.804	0.722	0.650	0.585	0.350	0.317	0.287	0.215	0.135
12	0.887	0.788	0.701	0.625	0.557	0.319	0.286	0.257	0.187	0.112
13	0.879	0.773	0.681	0.601	0.530	0.290	0.258	0.229	0.163	0.093
14	0.870	0.758	0.661	0.577	0.505	0.263	0.232	0.205	0.141	0.078
15	0.861	0.743	0.642	0.555	0.481	0.239	0.209	0.183	0.123	0.065
16	0.853	0.728	0.623	0.534	0.458	0.218	0.188	0.163	0.107	0.054
17	0.844	0.714	0.605	0.513	0.436	0.198	0.170	0.146	0.093	0.045
18	0.836	0.700	0.587	0.494	0.416	0.180	0.153	0.130	0.081	0.038
19	0.828	0.686	0.570	0.475	0.396	0.164	0.138	0.116	0.070	0.031
20	0.820	0.673	0.554	0.456	0.377	0.149	0.124	0.104	0.061	0.026
25	0.780	0.610	0.478	0.375	0.295	0.092	0.074	0.059	0.030	0.010
30	0.742	0.552	0.412	0.308	0.231	0.057	0.044	0.033	0.015	0.004
35	0.706	0.500	0.355	0.253	0.181	0.036	0.026	0.019	0.008	0.002
40	0.672	0.453	0.307	0.208	0.142	0.022	0.015	0.011	0.004	0.001
50	0.608	0.372	0.228	0.141	0.087	0.009	0.005	0.003	0.001	0.000

NOTES

Present Value in case of Annuity (PVA)

Annuity is equal stream of cash flows every year for some years at a specified rate of interest. Investors may have some opportunity of receiving equal amount of money for some years. In this case, we calculate the present value of all future cash inflows and make it comparable to the present value of cash outflows before taking any acceptance or rejection decision. In such cases, following formula is used:

The computation of present value in case of annuity can be written in following way:

$$PV = \frac{A}{(1+i)^1} + \frac{A}{(1+i)^2} + \frac{A}{(1+i)^3} + \cdots + \frac{A}{(1+i)^n}$$

or

Present Value = Annuity × Present Value of an annuity factor of ₹ 1

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

$$\boldsymbol{PVn = A\ X\ PVFA_{n,i}}$$

This formula is used to calculate PV in case of annuity. Here, P is present value, A is annuity cash flows, and the remaining part is called Present Value Factor for Annuity (PVFA) whose value is given for n years and for r rate of interest. For this present value factor of annuity, we have a separate table (shown below).

Example 3.6

Mr. Right will receive an annuity of ₹ 10,000 for 5 years. If the rate of interest is 10%, calculate the present value of ₹ 10,000.

Solution:

By applying above formula:

$$PVA_n = 10000\left[\frac{1}{0.10} - \frac{1}{0.10(1+010)^5}\right]$$

$PVA_n = 10000(10 - 6.211) = ₹ 37,888.20$

Present value interest factor of an annuity of ₹1 per period at i% for n periods, PVFA(i, n)

Period	1%	2%	3%	4%	5%	10%	11%	12%	15%	20%
1	0.990	0.980	0.971	0.962	0.952	0.909	0.901	0.893	0.870	0.833
2	1.970	1.942	1.913	1.886	1.859	1.736	1.713	1.690	1.626	1.528
3	2.941	2.884	2.829	2.775	2.723	2.487	2.444	2.402	2.283	2.106
4	3.902	3.808	3.717	3.630	3.546	3.170	3.102	3.037	2.855	2.589
5	4.853	4.713	4.580	4.452	4.329	3.791	3.696	3.605	3.352	2.991
6	5.795	5.601	5.417	5.242	5.076	4.355	4.231	4.111	3.784	3.326
7	6.728	6.472	6.230	6.002	5.786	4.868	4.712	4.564	4.160	3.605
8	7.652	7.325	7.020	6.733	6.463	5.335	5.146	4.968	4.487	3.837
9	8.566	8.162	7.786	7.435	7.108	5.759	5.537	5.328	4.772	4.031
10	9.471	8.983	8.530	8.111	7.722	6.145	5.889	5.650	5.019	4.192
11	10.368	9.787	9.253	8.760	8.306	6.495	6.207	5.938	5.234	4.327
12	11.255	10.575	9.954	9.385	8.863	6.814	6.492	6.194	5.421	4.439
13	12.134	11.348	10.635	9.986	9.394	7.103	6.750	6.424	5.583	4.533
14	13.004	12.106	11.296	10.563	9.899	7.367	6.982	6.628	5.724	4.611
15	13.865	12.849	11.938	11.118	10.380	7.606	7.191	6.811	5.847	4.675
16	14.718	13.578	12.561	11.652	10.838	7.824	7.379	6.974	5.954	4.730
17	15.562	14.292	13.166	12.166	11.274	8.022	7.549	7.120	6.047	4.775
18	16.398	14.992	13.754	12.659	11.690	8.201	7.702	7.250	6.128	4.812
19	17.226	15.678	14.324	13.134	12.085	8.365	7.839	7.366	6.198	4.843
20	18.046	16.351	14.877	13.590	12.462	8.514	7.963	7.469	6.259	4.870
25	22.023	19.523	17.413	15.622	14.094	9.077	8.422	7.843	6.464	4.948
30	25.808	22.396	19.600	17.292	15.372	9.427	8.694	8.055	6.566	4.979
35	29.409	24.999	21.487	18.665	16.374	9.644	8.855	8.176	6.617	4.992
40	32.835	27.355	23.115	19.793	17.159	9.779	8.951	8.244	6.642	4.997
50	39.196	31.424	25.730	21.482	18.256	9.915	9.042	8.304	6.661	4.999

Loan Amortization and Capital Recovery

The reciprocal of the Present Value Factor for Annuity (PVFA) is called capital recovery factor. As we know that,

$$\boldsymbol{PVn = A\ X\ PVFA_{n,i}}$$

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

So the formula for annuity calculation is:

$$A = P\left[\frac{1}{PVFA_{n,i}}\right]$$

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

NOTES

Loan amortization schedule is also based on the concept of capital recovery. Capital recovery is the cash flow of investment for a specific time and for a specific rate of interest. In the above formula, term in brackets is called Capital Recovery Factor (CRF). Hence, above formula can be re-written as follows:

$$A = P\ X\ (CRF_{n,i})$$

Example 3.7

Suppose Mani wants to invest ₹ 1,00,000 today for a period of three years. If prevailing interest rate is 10%. How much income per year should Mani receive to recover his investment?

Solution:

Here following formula is applicable:

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

or

$$A = P\left[\frac{1}{PVFA_{n,i}}\right]$$

$$A = 100000 \frac{1}{\left[\frac{1}{0.10} - \frac{1}{0.10(1+0.10)^3}\right]}$$

or

$$A = 100000\left[\frac{1}{PVFA_{3,0.10}}\right]$$

$$A = 100000\left[\frac{1}{2.487}\right] = Rs.40{,}209$$

Example 3.8

Suppose Jake has taken a loan of ₹25,00,000 for the purchase of house from SBA Bank. Bank wants him to pay an annuity for 5 years at 12% rate of interest. Calculate the amount of annuity.

Solution:

$$A = 2500000\left[\frac{1}{PVFA_{5,0.12}}\right]$$

By locating the value of PVFA in the table at 5 years, 12% rate of interest

$$A = 2500000\left[\frac{1}{3.605}\right] = Rs.6{,}93{,}482$$

If Jake pays ₹ 6,93,482 annuity every year then in 5 years at 12% rate of interest, his loan will be zero after 5 years.

Present Value of Perpetuity

Perpetuity is an annuity which happens forever. Perpetuity is not common in financial decision making but still in some cases (irredeemable preference shares) perpetuity is found. On irredeemable preference share, principal amount is not returned but dividend payment is there. In such case following formula is used.

Present value of a Perpetuity = Perpetuity / Interest Rate = A/i

Example 3.9

Suppose an investor expects a perpetual sum of ₹ 5000 annually from his investment. What is the present value of this perpetuity, if interest rate is 10%?

Solution:

Present Value of a Perpetuity = 5000/0.10 = ₹50,000

Present Value of an Uneven Stream of Cash Flows

Investment made by a firm does not yield regular and equal income, generally cash flows associated with investment are uneven.

Example 3.10

An investor has an option of receiving following cash flows in 8 years at 9% interest rate. Calculate its present value.

Year	1	2	3	4	5	6	7	8
Cash flows	2000	2500	3000	1900	2100	1600	2700	2300

Solution:

In such cases, for every year we use different discount rates. In this question, interest rate is 9%. At this rate value of rupee after 1st year is 0.917, 2nd year is 0.842, 3rd year 0.772 and so on. As shown in the table

Years	PV Factor	Cash Flows	Present Value of Cash flows (Cash Flows X PVF)
1	0.917	2000	1834
2	0.842	2500	2105
3	0.772	3000	2316
4	0.708	1900	1345.2
5	0.650	2100	1365
6	0.596	1600	953.6
7	0.547	2700	1476.9
8	0.502	2300	1154.6

NOTES

Total off Present Value of Cash Flows = ₹ 12,550.30

We can write this entire calculation in the equation form too.

$$P = \frac{F_1}{(1+i)^n}$$

$$P = \frac{2000}{(1+0.10)^1} + \frac{2500}{(1+0.10)^2} + \frac{3000}{(1+0.10)^3} + \frac{1900}{(1+0.10)^4} + \frac{2100}{(1+0.10)^5} + \frac{1600}{(1+0.10)^6} + \frac{2700}{(1+0.10)^7} + \frac{2300}{(1+0.10)^8}$$

or

$$P = 2000\ (PVF)_{1,10} + 2500\ (PVF)_{1,10} + 3000\ (PVF)_{1,10} + 1900\ (PVF)_{1,10} + 2100\ (PVF)_{1,10} + 1600\ (PVF)_{1,10} + 2700\ (PVF)_{1,10} + 2300\ (PVF)_{1,10}$$

P = ₹ 12,550.30

Present Value of Growing Annuity

There are some situations where cash flows may grow at a constant rate and such types of situations are common in financial decision making. Example for this is dividend payments by companies. Investor believes that dividend will grow at a constant rate. We will try to explain this concept with the help of following example:

Example 3.11

Tina wants to finance her further studies and for that she has joined a company for 5 years. Her employer fixes an annual salary of ₹ 10000 with the provision that she will get an annual increment of 10%. It means that she will get amount as shown in the following table:

Years	Amount of Salary after every year	Amount will be
1	10000 0r $10000(1.10)^0$	10000
2	10000*1.10 or $10000(1.10)^1$	11000
3	10000*1.10 or $10000(1.10)^2$	12100
4	10000*1.10 or $10000(1.10)^3$	13310
5	10000*1.10 or $10000(1.10)^4$	14640

If required rate of return is 14% per annum then table will be like:

Years	Amount of Salary after every year	Amount will be
1	10000 0r $10000(1.14)^0$	10000.00
2	10000*1.10 or $10000(1.14)^1$	11400.00
3	10000*1.10 or $10000(1.14)^2$	12996.00
4	10000*1.10 or $10000(1.14)^3$	14815.44
5	10000*1.10 or $10000(1.14)^4$	16890.00

Years	Salary (with 10% growth)	Salary (with 14% growth)	PV at 11%	PV of Salary (with 10% growth)	PV of Salary (with 14% growth)
1	10000	10000	0.901	9009	9009
2	11000	11400	0.812	8928	9252
3	12100	12996	0.731	8847	9503
4	13310	14815	0.659	8768	9759
5	14640	16890	0.593	8688	10023
	61050	66101.44		**44240**	**47547**

The above calculation can be written in the following formula:

$$PV = \frac{A(1+g)}{(1+i)^1} + \frac{A(1+g)^1}{(1+i)^2} + \frac{A\,(1+g)^2}{(1+i)^3} + \cdots + \frac{A\,(1+}{(1+}$$

$$PV = A\left[\frac{(1+g)}{(1+i)^1} + \frac{(1+g)^1}{(1+i)^2} + \frac{(1+g)^2}{(1+i)^3} + \cdots + \frac{(1+g)}{(1+i)}\right.$$

We can simplify the above equation:

$$PV = A\left[\frac{(1+g)}{(1+i)^1} + \frac{(1+g)^1}{(1+i)^2} + \frac{(1+g)^2}{(1+i)^3} + \cdots + \frac{(1}{(1}\right.$$

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

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

When g =10% and rate of return is 11% and annuity is 10000 and n is 5 years

$$\boldsymbol{PV = \frac{10000}{0.11-0.10}\left[1 - \left(\frac{1+0.10}{1+0.11}\right)^5\right]}$$

$$\boldsymbol{PV = 1000000\left[1 - \left(\frac{1.10}{1.11}\right)^5\right]}$$

$$\boldsymbol{PV = 1000000\left[1 - (0.991)^5\right]}$$

$$\boldsymbol{PV = 1000000\left[1 - 0.956\right] = 44197}$$

The difference in formula calculation and table calculation is because of approximation.

When g =14% and rate of return is 11% and annuity is 10000 and n is 5 years

$$\boldsymbol{PV = \frac{10000}{0.11-0.14}\left[1 - \left(\frac{1+0.14}{1+0.11}\right)^5\right]}$$

NOTES

$$PV = -333333\left[1 - \left(\frac{1.14}{1.11}\right)^5\right]$$

$$PV = -333333\left[1 - (1.027)^5\right]$$

$$PV = -333333\left[-0.1425\right] = Rs.47496$$

Example 3.12

A company distributed a dividend of ₹ 80 in last year and this dividend stream is expected to grow at a rate of 10% per annum for next 15 years. If the discount rate is 20%, calculate the present value of expected series of future dividends.

Solution:

There are two ways to calculate the present value of dividend series.

Years	Dividend	PV at 20%	PV of Dividends
1	88	0.833	73.33
2	97	0.694	67.22
3	106	0.579	61.62
4	117	0.482	56.49
5	129	0.402	51.78
6	142	0.335	47.46
7	156	0.279	43.51
8	171	0.233	39.88
9	189	0.194	36.56
10	207	0.162	33.51
11	228	0.135	30.72
12	251	0.112	28.16
13	276	0.093	25.81
14	304	0.078	23.66
15	334	0.065	21.69
		Total PV of dividends	641.41

Second method is that we can apply the following formula:

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

$$PV = \frac{88}{0.20-0.10}\left[1 - \left(\frac{1+0.10}{1+0.20}\right)^{15}\right]$$

NOTES

$$PV = 880\left[1 - (0.9167)^{15}\right]$$

$$PV = 880\left[1 - 0.2713\right] = 641.256$$

Another alternative of growth is perpetual growth. In this example, suppose the dividend of a company grows at 10% forever or perpetual growth. In such case, following method is used to calculate the present value:

$$P = \frac{A}{i - g}$$

$$P = \frac{88}{0.20 - 0.10} = 880$$

₹ 880 is the present value of the future stream of dividends which is expected to grow at a rate of 10%.

Value of an Annuity due (PV and FV)

In the present unit, we have discussed the concept where cash flows occur at the end of the period whether on monthly basis or on annual basis. But in real life, cash flows can take place at the starting of a period too. This situation is called Annuity Due. For example, when we buy some product on instalment, lender asks us to make payment on the first day of the period (month or year). Buyer is required to make first payment at the time of purchase of the product and successive payments on the first date of every month starting from the next month. This is a typical example of Annuity due and this is applicable in case of lease and hires purchase agreements. So we can say that annuity due is a payment made in the beginning of every month starting from the purchase.

Future Value in Case of an Annuity Due

In this case following formula is used to calculate the future value:

Future value of an annuity due = Future value of an annuity × (1 – i)

$$FV_n = P\ X\ CVF_{n.i} \times (1 + \text{i})$$

or

$$FVA_n = A\left[\frac{(1+i)^n - 1}{i}\right]\ X\ (1+i)$$

Example 3.13

Suppose, Sam invests ₹ 100 in a saving account at the beginning of each year for 5 years to earn 7% interest.

Solution:

$$FVA_n = 100\ X\ CVFA_{5,0.07} \times (1+ 0.07)$$

NOTES

or

$$FVA_n = 100\left[\frac{(1+0.07)^n - 1}{0.07}\right] X\ (1+0.07)$$

$$FVA_n = 100\ X\ 5.751 \times (1.07) = ₹\ 615.357$$

Present Value in Case of an Annuity Due

In this case, following formula is used to calculate the future value:

$$\boldsymbol{PVn = A\ X\ PVFA_{n,i}\ X\ (1+i)}$$

or

$$PV_n = A\left[\frac{1}{i} - \frac{1}{i(1+i)^n}\right] X\ (1+i)$$

Example 3.14

Let us suppose an annuity of ₹ 1000 for 5 years at 8% interest rate. Also assume that payment is due in the beginning of the period. Calculate the present value of an annuity due.

Solution:

By using above mentioned formula:

$$\boldsymbol{PVn = 1000\ X\ PVFA_{5,0.08}\ X\ (1+0.08)}$$

or

$$PV_n = 100\left[\frac{1}{0.08} - \frac{1}{0.08(1+0.08)^5}\right] X\ (1-0.08)$$

$$\boldsymbol{PVn = 1000\ X\ 3.993\ X\ (1.08) = Rs.4312.44}$$

Multiple period compounding

In such types of problems, cash flows occur multiple times in a period. Till now, we have assumed that cash flows occur at one point of time in a year. But in real life, we receive interest many times in a year depending on the agreement. For example, in case of banks generally they give quarterly interest on their deposits and on debentures, bonds and loans companies give semi-annual interests. Likewise, other financial institutions may have quarterly or half-yearly interest payment system. On this basis, interest payment can be of two types:

Nominal interest rates: It is mentioned in the agreements that interest will be paid yearly and example of this is loan agreements and sometimes bonds.

Effective interest rates: It is mentioned in the agreements that interest is paid quarterly or half yearly or monthly. In such cases, actual interest rate would be higher than the nominal interest rate.

Effective interest rate> nominal interest rate

For the calculation of effective rate of interest following formula is used:

$$Effective\ interest\ rate\ (EIR) = \left[1 + \frac{i}{m}\right]^{n\ x\ m} - 1$$

Continuous compounding

Sometimes, interest rates are compounded on daily basis which is call continuous compounding. In such cases, we use following formula for the calculation of present value and future value:

$$Future\ value\ =\ P\ x\ e^{i,n}$$

$$Present\ Value = F\ x\ \frac{1}{e^{i,n}}$$

Effective Interest Rate

Half Yearly Compounding	Quarterly Compounding	Monthly Compounding
EIR $= \left[1 + \frac{i}{2}\right]^{1x2} - 1$	EIR $= \left[1 + \frac{i}{4}\right]^{1x4} - 1$	EIR $= \left[1 + \frac{i}{12}\right]^{1x12} - 1$
EIR $= \left[1 + \frac{0.12}{2}\right]^{1x2} - 1$	EIR $= \left[1 + \frac{0.12}{4}\right]^{1x4} - 1$	EIR $= \left[1 + \frac{0.12}{12}\right]^{1x12} - 1$
EIR $= (1.06)^2 - 1 = 0.1236$	EIR $= (1.03)^4 - 1 = 0.1255$	EIR $= (1.01)^{12} - 1 = 0.1268$
EIR = 12.36%	EIR = 12.55%	EIR = 12.68%

Net Present Value

This concept is very important in financial decision making as it leads to the shareholder's wealth maximization. NPV is the difference in the Present value of cash inflows and present value of cash outflows associated with a project. According to this method, NPV or Net Present Value is the difference between present values of cash inflows minus present value of cash outflows. In order to calculate present value of cash inflows and cash outflows, generally cost of capital, i.e., k_o is considered

NOTES

as discounting factor. The cost of capital is also known as cut-off rate or hurdle rate. Following formulas are used to calculate the value of NPV:

Net Present Value (NPV) = Present Value (PV) of Cash Inflows – Present Value (PV) of Cash Out flow

$$NPV = \left[\frac{C_2}{(1+k)} + \frac{C_2}{(1+k)^2} + \frac{C_3}{(1+k)^3} + \cdots \ldots \ldots \ldots + \frac{C_t}{(1+k)^n}\right] - C_0$$

Example 3.15

Ron wants to invest in a project which has an initial cash outlay of ₹ 2,00,000 and this project has a series of cash inflows for 6 years. These cash inflows are as follows:

Year	1	2	3	4	5	6
Cash Inflows	60000	55000	65000	45000	60000	55000

Calculate its present value and suggest Ron that whether he should invest in this project or he should reject it. Assume interest rate or cut off rate or cost of capital is 14% for such type of projects.

Solution:

Year	**Cash Inflows**	**PV at 14%**	**PV of Cash Inflows**
1	60000	0.877	52632
2	55000	0.769	42321
3	65000	0.675	43873
4	45000	0.592	26644
5	60000	0.519	31162
6	55000	0.456	25057
			221688
		NPV (PV of CI – PV of Cash outflows)	21688

Ron can invest in this project as its NPV is positive and it will definitely add some value in his initial investment.

All Formulas

Future Value = Principal X Compound Value Factor

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

$$FV_n = P\ X\ CVF_{n.i}$$

Future Value = Yearly annuity X Compound value factor for annuity of Rs.1

$$FVA_n = A\left[\frac{(1+i)^n - 1}{i}\right] \qquad FVA_n = A\ X\ (CVFA)_{n,i}$$

Sinking fund instalment

$$A = FVA_n \frac{i}{(1+i)^n - 1}$$

$$\boldsymbol{Present\ Value\ =\ Future\ Value\ X\ Present\ Value\ Factor\ of\ Rs.1} \qquad P = \frac{F_1}{(1+i)^n}$$

$$P = F_1 (PVF)_{i,n}$$

$$PV = \frac{A}{(1+i)^1} + \frac{A}{(1+i)^2} + \frac{A}{(1+i)^3} + \cdots + \frac{A}{(1+i)^n}$$

Or

$$Present\ Value\ =\ Annuity\ X\ Present\ Value\ of\ an\ annuity\ factor\ of\ Rs.1$$

$$PV_n = A\left[\frac{1}{i} - \frac{1}{i(1+i)^n}\right] \qquad \boldsymbol{PVn = A\ X\ PVFA_{n,i}}$$

Loan Amortization

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

Present value of a Perpetuity = Perpetuity / Interest Rate = A/i

Present value of growing annuity

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

perpetual growth

$$P = \frac{A}{i-g}$$

$$FV_n = P\ X\ CVF_{n.i}\ \text{X}\ (1+i)$$

or

$$FVA_n = A\left[\frac{(1+i)^n - 1}{i}\right] X\ (1+i)$$

$$\boldsymbol{PVn = A\ X\ PVFA_{n,i}\ X\ (1+i)} \quad \textbf{or} \quad PV_n = A\left[\frac{1}{i} - \frac{1}{i(1+i)^n}\right] X\ (1+i)$$

$$\boldsymbol{Effective\ interest\ rate\ (EIR) = \left[1 + \frac{i}{m}\right]^{n\ x\ m} - 1}$$

$$Future\ value\ =\ P\ x\ e^{i,n}$$

$$Present\ Value = F\ x\ \frac{1}{e^{i,n}}$$

NPV $= \left[\frac{C_2}{(1+k)} + \frac{C_2}{(1+k)^2} + \frac{C_3}{(1+k)^3} + \cdots \ldots\ldots\ldots + \frac{C_t}{(1+k)^n}\right] - C_0$

NOTES

NOTES

Check Your Progress

1. What are the two important aspects of investment decisions?
2. What is sinking fund?
3. Mention the two types of interest rates in case of multiple period compounding.

3.4 RISK RETURN RELATIONSHIP

Decisions and actions are taken to attain desired results. Decision and action precede, the result follows. The future holds uncertainty and risk. Success, therefore, gives a sense of satisfaction. Investors invest money in financial and physical assets in anticipation of earning desired returns and businesses also invest in projects with the same intention.

Corporate investment decisions are taken in anticipation of a stream of benefits over a long period. Mistake may be expensive. Diligence is expected to ensure that the future unfolds as per expectations. However, the returns, depending upon a security or a project, may not come as expected.

Management of risk is a complex subject. It is important to first understand what risk is and what it is not. In this discussion, the terms 'event', 'uncertainty', 'risk', 'probability' and 'expected returns' are useful.

Basic Definitions

Investors invest in securities in anticipation of returns. The anticipated returns may or may not happen. To understand this, it is essential to understand some terms associated with risk and return.

Event

Event is an 'occurrence' for which there is a given outcome. The term 'event' and 'outcome' can also be used interchangeably. When an investor invests money in some securities, the returns are not certainly known, but anticipated. The returns will depend on the unfolding events.

For example, if the economy turns out to be strong (one event) he may get handsome returns. But if the economy becomes average (second event) he would

get average returns. Economy may become gloomy (third event) and the investor may even lose the invested amount. Outcome can be more than one.

Risk and Uncertainty

These two terms are interchangeably used in practice. 'Risk is that uncertainty which is predictable, and to which probability can be assigned.'

This definition has two conditions in it, (a) the decision maker is aware of all possible outcomes, which may happen and affect the decision, and (b) the decision-maker is in a position to assign probability to each possible outcome envisaged by him. Uncertainty is that event which cannot be predicted, and therefore, no probability can be assigned to it.

Consider two projects, A and B. Project A is likely to offer the rate of return in the range of 25 to 45 per cent, whereas Project B may offer 15 to 35 per cent. If the cut-off rate of the firm is 20% one would say that Project B is riskier than Project A, though in both cases the uncertainty (difference of 20% between highest and lowest rate of return) level is equal.

A layman's understanding of the two terms is quite different from statisticians' definitions. A layman looks at the down side risk (a possibility of earning rate of return less than the minimum acceptable rate). We shall also use the term 'uncertainty' to denote 'risk'.

Probability

Probability is the likelihood of happening of some event. Merriam Webster online dictionary defines probability as 'the chance that a given event will occur'. Probability is expressed as a proportion of one or percentage. The sum of probabilities of all possible occurrence is always one or one hundred per cent.

For example, an investor, who buys shares of Company A and Company B, estimates the occurrence of outcome (rate of return) from the investment as given in Table 3.1:

Table 3.1 *Occurrence of Rate of Returns and Probabilities of Two Shares*

State of Economy	Probability	Rate of Returns from Shares of...	
		Company A	Company B
Strong	0.20	50%	30%
Good	0.60	10%	8%
Weak	0.20	–20%	–10%
Total	1.00		

NOTES

The above occurrences can be plotted on the probability graph given in Figure 3.2A and Figure 3.2B.

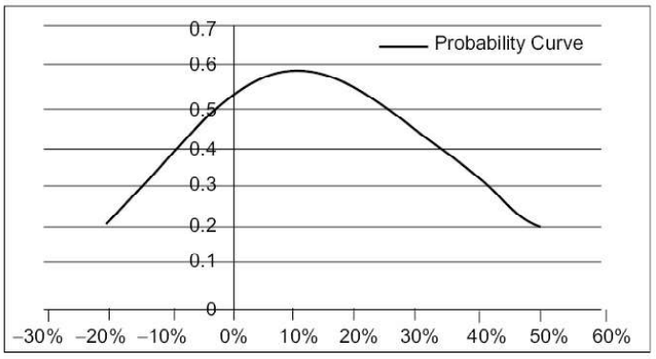


Fig. 3.2A *Probability Distribution of Outcomes for Shares of Company A*

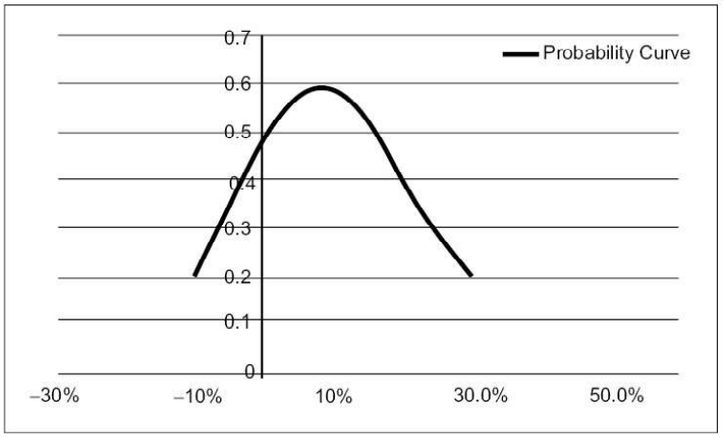


Fig. 3.2B *Probability Distribution of Outcomes for Shares of Company B*

If any occurrence is assigned Probability 1, then there is only one occurrence and it is a certain outcome and not risky.

Volatility

Risk causes volatility. However, not all volatilities are indicators of risk. For example, seasonality causes ups and downs in sales revenue and profits from one quarter to another. Economic cycle causes cyclical movement in sales revenue and profits from year to year. If volatility is predictable (because seasonality and cyclicality are expected) then it does not indicate riskiness in sales revenue and profits of the firm. The readers must have noticed that share prices and market index do not show seasonality and cyclicality, because the changes in sales revenue and profit are expected outcomes and they are well factored as normal. However, volatility in share prices is an indication of the risk.

Estimating returns and probability

The real test of a decision maker is in estimation of returns (occurrences) and probabilities for each occurrence. Returns on financial securities are derived from their underlying assets. Returns from equity shares would depend on earnings of a firm from its business. One needs to access relevant information available from various sources and demonstrate high degree skills to interpret them before returns from equity shares are anticipated. Returns on bonds are easier to forecast as dividend flow is contractual. However, if one wants to sell the binds in open market, the market price can be an estimate based on anticipated changes in the market interest rate.

Assigning probabilities to the outcome is more difficult. Past experience about a similar situation is useful in estimating probabilities. Opinion of expert economists and various agencies like government, rating agencies and others can be taken into account in estimating the probabilities of each outcome.

Expected Returns

Expected return from an investment with more than one expected outcomes is the weighted average returns of all outcomes. Weights of probabilities are considered as given in the example in Table 3.2.

Table 3.2 *Calculation of Expected Returns*

State of Economy	Probability	Company A		Company B	
		Rate of Return	Rate of Return × Probability	Rate of Return	Rate of Return × Probability
Strong	0.20	50%	10.00%	30%	06.00%
Good	0.60	10%	06.00%	8%	04.80%
Weak	0.20	–20%	–04.00%	–10%	–02.00%
Total	1.00		12.00%		08.80%

The equation will be,

$$\bar{R} = R_1 \times P_1 + R_2 \times P_2 + R_3 \times P_3 + \ldots + R_n \times P_n \quad (3.1)$$

This can be rewritten as,

$$\bar{R} = \sum_{i=1}^{n} R_i \times P_i \quad (3.2)$$

Where, $\bar{R}$ = Expected return

R = Returns

R_i = Returns from the occurrence 1 to n

P = Probability of returns

Expected Return (A) = 50% × 0.2 + 10% × 0.6 + (–20%) × 0.2

= 10% + 6% – 4% = **12%**

Expected Return (B) = 30% × 0.2 + 8% × 0.6 + (–10%) × 0.2

= 6% + 4.8% – 2% = **8.8%**

NOTES

Risk and Decision Making

The wealth maximization models have two ingredients, time value of money and risk. Investors and business managers, therefore, are expected to take an informed and calculated risk when they decide on investment plans.

Gamblers also take risks, rather chances. Blind and thoughtless chance taking is the characteristic of gambling. Risk taking is different. When decisions are taken on the basis of calculated chance, within the acceptable limit, it can be termed as risk taking. Two elements distinguish risk taking from gambling: (a) information or knowledge and (b) awareness about the ability to survive (absorb) the ill-fated outcome of decision. The former element lays emphasis on building a data base and developing skills to interpret data and the latter element works as a constraint on greed and helps in taking calculated risk. The ability to absorb adverse result, if any, has a shade of attitude towards risk and the financial strength of absorbing loss and still continuing as it is.

Knowledge Base

The need for a sound knowledge base is always felt by decision makers. The root cause of risk, therefore, is found in data and its interpretation. There are three types of data, as given in Figure 3.3:

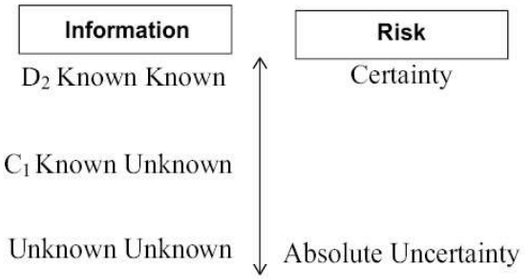


Fig. 3.3 *Types of Information and Risk*

One more type of data can be mentioned, namely, 'unknown known'. It is not mentioned here as it is not a characteristic expected of a business manager or a rational investor, because it demonstrates ignorance. Knowledge about the need for information, and availability of required and reliable information are the two aspects considered in the above classification. If a manager is aware about the need for information, and that required information is available, and it is very reliable, giving absolute confidence to the manager, then it can be called 'known known'. The 'known unknown' category implies that the manager is aware of the need for some information, but that information is not available, or if available, it may not give very high degree of confidence. A decision maker is expected to collect all information in the 'known known' category and also to reduce the 'unknown' elements in the 'known-unknown' category of information. Unknown element from the 'known unknown' information is reduced through a systematic study of

important variables. The 'unknown unknown' category implies that the manager is neither aware of the need for information, nor is that information available. Unpredictable acts of God are 'unknown unknown'.

The classification of information given above is only for convenience. It is actually in a continuum.

Attitude towards Risk

Risk is a perception. Decision is guided by the attitude of the decision maker towards risk. People can be classified into mainly three groups for this matter: risk averse, risk lover and risk neutral.

All those who take risk would do so if the corresponding returns expected by them is as high as justifying the degree of risk taken. Managers would take every additional unit of risk if the corresponding additional returns satisfy them. That means a different amount of risk premium is attached to a different degree of risk. Risk premium, thus, is the function of utility of risky returns. This is explained with the help of utility curves shown in Figures 3.4A.

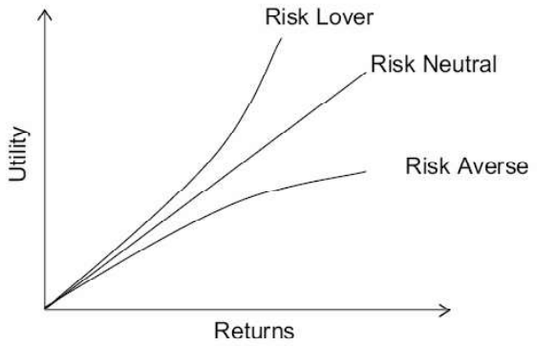


Fig. 3.4A *Relationship between Income and Utility*

Rational investors are expected to be risk averse. Their marginal utility of additional income will be low giving a concave curve. Consequently, a rational manager would expect a higher marginal return for every additional unit of risk taken.

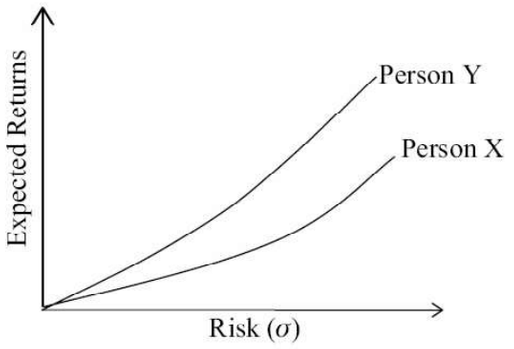


Fig. 3.4B *Different Utility Functions of Risk-averse Managers*

NOTES

Within the risk-averse class also, some individuals are willing to take more risk for a given expected return (like Person X in Figure 3.4B) and some others take less (like Person Y). This variation is due to different (a) attitudes towards risk, (b) abilities to manage the risk, and (c) ability to sustain the perils of risk. The difference in attitude of the managers and firms towards risk bring qualitative differences in taking informed decisions. Attitude towards risk varies for the same individual from time to time.

Measuring Risk

Measures of dispersion are used in measuring project risk. Some of them use probabilities, others do not. Some consider default probability equal, if probabilities are not assigned. The following statistical techniques are useful in measuring risk.

- Range
- Mean absolute deviation
- Variance
- Semi-variance
- Standard deviation
- Co-efficient of variation

The following section introduces all these techniques of measuring risk. While interpreting the techniques some decision rules will also be discussed for better understanding of techniques. However, those decision rules ignore the important step of incorporating risk in the project data analysis. Therefore, those decision rules only deal with mutually exclusive projects. The application of these decision rules directly to the measures of risk, therefore, is not the right way of deciding about the risky project. It is only meant for explanation.

Range

Range is the difference between the highest value of outcome and the lowest value of outcome as given in Equation 3.3.

$$R_g = R_h - R_i \tag{3.3}$$

Where, R_g = Range of a distribution

R_h = Highest value in a distribution

R_i = Lowest value in a distribution

The range does not consider probabilities, nor does it consider other possible outcomes between the highest and lowest values. Sensitivity analysis uses range values in its application.

Mean absolute deviation (MAD)

The term 'mean absolute deviation' is quite self-explanatory. The differences between the mean and observations is taken at absolute value (sign is ignored),

they are added up, and then the sum is divided by the number of observations to get mean absolute deviation of a distribution. Equation 3.4 gives the MAD formula.

$$MAD = \sum_{i=1}^{n} P_i \left| R_i - ER \right| \tag{3.4}$$

Where, n = Number of observations

P_i = Probability of ith possible value

R_i = ith possible value of variable

ER = Mean (expected value) of the distribution

$R_i - ER$ = Only the absolute value is considered, negative is ignored

If probabilities are not given then Equation 3.5 should be used (it assumes in a way that each outcome has equal probability):

$$MAD = \frac{1}{n} \times \sum_{i=1}^{n} \left| R_i - ER \right| \tag{3.5}$$

Expected return (ER) is calculated using the following Equation 3.2,

$$ER = \sum_{i=1}^{n} R_i \times P_i$$

Variance

Variance measures the dispersion of data using Equation 3.6:

$$\text{Variance} = \sum_{i=1}^{n} P_i \left(R_i - ER \right)^2 \tag{3.6}$$

The difference of the observed value from the mean of distribution is squared to avoid negative sign. By squaring the difference, the values which are far away from the mean are attached more weight. Due to squaring, the variance cannot be compared with expected (mean) return.

Semi-variance

It is same as variance but it considers R values only if $R_i < ER$ (i.e. only if there is a chance of getting less than expected result). If $R_i > ER$ then zero value is taken for $(R_i - ER)$.

$$SV = \sum_{i=1}^{n} P_i \left(R_i - ER \right)^2 \tag{3.7}$$

Where, SV = Semi-variance

$(R_i - ER)$ is considered only if it is positive and negative $(R_i - ER)$ is taken as zero.

NOTES

NOTES

Standard deviation (SD or s)

Variance cannot be compared with the expected (mean) return. Therefore, its root is taken and standard deviation (SD) is calculated so that it can be compared with the return.

$$SD = \mathsf{s} = \sqrt{\text{Variance}} = \sqrt{\sum_{i=1}^{n} P_i \left(R_i - ER\right)^2} \tag{3.8}$$

Standard deviation ignores the size of the project, therefore, comparison of two projects becomes difficult.

Coefficient of variation (CV)

The size of the project is considered in co-efficient of variation (CV).

$$CV = \frac{\mathsf{s}}{ER} \tag{3.9}$$

When standard deviation (σ) is divided by expected returns (i.e., mean or ER) we get the coefficient of variation. It is, therefore, useful in comparing risks of two projects with different sizes. Lower coefficient of variation is considered good.

Example 3.16: Risk measurement

Compute the six measures of risk for the outcome of an investment given below:

Outcome (₹)	Probability
1,100	0.2
700	0.5
600	0.3

Solution:

Range = 1,100 – 600 = ₹500

MAD: First we need to calculate expected return (ER)

ER = {(1,100 × 0.2) + (700 × 0.5) + (600 × 0.3)

= 750

Since the probabilities are given we should use Equation 3.2a

$$\text{MAD} = 0.2 \times |1{,}100 - 750| + 0.5 \times |1{,}100 - 750| + 0.3 \times |1{,}100 - 600|$$

$$= 0.2 \times 350 + 0.5 \times 50 + 0.3 \times 150 = 70 + 25 + 45$$

= 140

For the rest of the calculations the following work will be useful:

P_i	R_i	$P_i \times R_i$	$(R_i - ER)$	$(R_i - ER)^2$	$P_i\ (R_i - ER)^2$
0.2	1,100	220	350	122,500	24,500
0.5	700	350	–50	2,500	1,250
0.3	600	180	–150	22,500	6,750
ER		750		Variance	s^2 32,500
				Standard deviation	s 180

$$\text{Variance} = \sum_{i=1}^{n} P_i \left(R_i - ER\right)^2$$

$= 0.2 \times (1{,}100 - 750)^2 + 0.5 \times (700 - 750)^2 + 0.3 \times (600 - 750)^2$

$= 32{,}500$

Semi-variance $= 0.2 \times (1{,}100\ 0 - 750)^2 = 24{,}500$ (Using Equation 3.7)

This is upside risk because we took observation higher than ER. We can calculate semi-variance and determine the downside risk by taking values less than ER. Note that the sum of both semi-variances is equal to the variance.

Semi-variance $= 0.5 \times (700 - 750)^2 + 0.3 \times (600 - 750)^2 = 1{,}250 + 6{,}750 = 8{,}000$

$$SD = \mathsf{s} = \sqrt{\text{Variance}} = \sqrt{\sum_{i=1}^{n} P_i \left(R_i - ER\right)^2}$$

$= \sqrt{32{,}500} = 180.28$ (Using variance) or

$= \sqrt{24{,}500} = 156.52$ (Using first semi-variance)

$$CV = \frac{\mathsf{s}}{ER} = \frac{180.28}{750} = 0.24$$ (Using variance) or

$$CV = \frac{\mathsf{s}}{ER} = \frac{156.52}{750} = 0.21$$ (Using first semi-variance)

Risk and Return Relationship

Now that you have learnt about the measurement of risks. Let's discuss the relationship between risk and return. Return can be measured through different approaches including profit, cash flow, and ratios approach. It has been generally seen that which the increase in risk, the rate of expected return is higher. The following are the three components of return: return at zero risk, premium for business risk and financial risk.

NOTES

Business risk and return

These types of risks are due to variability in the sales. This is to say that in such cases if the firm has more than normal risk, then the firm will expect more than normal rate of return. This means that the rate of expected return will increase. And simultaneously, if the rate of return is of lower degree, then the expected return will also decrease.

Financial risk and return

This type of risk is related to the capital structure pattern. If the debt content is high in the capital structure, then the expected rate of return is higher. This is due to the requirement of higher profit needed to cover period interest payment and repayment of principal at maturity.

Risk and Return in Capital Investment Proposals

It has been generally seen that if there is low risk in the capital investment proposal, then low return is expected and similarly, when there is higher risk in the investment proposal then high return is expected.

Check Your Progress

4. What are the three aspects associated with risk and risk management?
5. Mention the elements that distinguish risk taking form gambling.

3.5 DIVIDEND FUNCTION

Dividend decision is a part of financing decision (alongwith raising funds, bonus share issue and share split) because through proper dividend decision and history, a firm can reduce cost of capital and tap internal sources of funds. This is done through retention of part of the profit that is not distributed through dividends. Working capital is partially financed through long-term sources because some part of working capital is constant. The other part needs short-term financing. Companies issue bonus shares and also split the shares. Both these actions increase number of shares in the market and increase the trading volume, which increase net market capitalization of the firm.

Investors eagerly await announcements of annual results and dividends. First, share prices start adjusting for the anticipated financial results and dividends, and subsequently to the actual announcement of them. Thus, dividend payment is an important event for a company and for the market as well. Companies are expected to create shareholder value through various decisions. One of the important decisions is how to distribute value among the shareholders. It is always interesting

to watch how companies create and distribute the value. The methods for distribution of the value among shareholders include:

- Cash dividends
- Stock dividends or bonus shares
- Stock split, and
- Buy-back

The financial managers have crucial function in taking decisions to ensure the maximization of firm's market value. For this, the optimum dividend payout ratio is to be calculated.

3.6 RISK RETURN TRADE OFF

Risk and return both are essential for taking an investment decision. In terms of finance, a finance manager always makes an attempt to find out a trade-off between risk and return. In a common man's language, return is the reward he expects on investment while risk is related to uncertainty or the possibility of deviations in the expected returns. This section deals with the concept of risk and return and methods of measuring or calculating risk and return on asset. The whole explanation is made under the following two headings:

1. Return and Risk of Individual Asset
2. Return and Risk of a Portfolio

Return of Single Asset

For a financial asset, the return has two significant components, current income which is known as dividend yield and capital gain. The following formula can be used to calculate return on a single financial asset:

Total Return = Dividend Yield + Capital Gain

$$R_t = \frac{Div_1}{P_0} + \frac{P_0 - P_1}{P_0} = \frac{Div_1 + (P_1 - P_0)}{P_0}$$

First part in the equation is the reward for holding shares which means dividend yield on initial investment, i.e., (dividend/initial price). Second part in the equation is the reward due to difference in initial price and price at the end i.e. capital gain yield (capital gain/ initial price).

Example

Mr. A invested ₹ 100 in shares and he received ₹ 10 dividend during the year on this. After a year, market price of these shares was ₹125. Calculate return on this investment.

NOTES

Solution:

Here, the following formula can be used to calculate return on a single financial asset:

$$R_t = \frac{Div_1}{P_0} + \frac{P_0 - P_1}{P_0} = \frac{Div_1 + (P_1 - P_0)}{P_0}$$

P_0 is ₹100 and P_1 is ₹125 dividend (Div_1)during year is ₹10. putting these values in following formula we can calculate return.

So the return is 35% which is quite high.

Average Rate of Return

Average rate of return can be calculated by using arithmetic average and geometric average too. The following formulae can be used to calculate average rate of return. The average rate of return is also called as expected rate of return.

For calculation of average rate of return using simple arithmetic mean, we use the following formula:

$$\overline{R} = \frac{1}{n}(R_1 + R_2 + R_3 + \ldots\ldots\ldots R_n)$$

And to calculate average rate of return using geometric mean, we use the following formula:

$$(1+R_g)^n = (1+R_1)(1+R_2)(1+R_3)(1+R_4)\ldots\ldots\ldots..(1+R_n)$$

$$R_g = \sqrt[n]{(1+R_1)(1+R_2)(1+R_3)(1+R_4)\ldots\ldots\ldots(1+R_n)} \quad -1$$

Where $R_1, R_2, \ldots R_n$ is the return during different time periods (weekly, monthly or yearly etc.)

The return calculated by using geometric mean is always less than the return calculated using arithmetic mean. The relationship between these two averages can be defined as under. Generally, the arithmetic mean return is preferred than the geometric mean return because of statistical properties of arithmetic mean.

$$R_g \approx R_a - \tfrac{1}{2}\sigma^2$$

When probabilities are assigned to different possibilities of return, then the following formula is used to calculate expected returns:

$$E(R) = R_1P_1 + R_2P_2 + R_3P_3 + \cdots + R_nP_n = \sum_{i=1}^{n} R_iP_i$$

Expected Return and Risk: Incorporating Probabilities in Estimates

In estimating expected rate of return, specific expected returns are multiplied with its respected probabilities. Probability is the chance of getting that single expected

return. Following table gives a brief overview of the way in which we can calculate expected return under different economic condition and with assigned probabilities.

Expected Return: Incorporating Probabilities in Estimates

Various economic conditions	Share Prices	Dividend yield	Capital Gain	Returns	Returns (%)	Probability	Expected Rate of return (%)
Higher Growth rate	406.50	0.019	0.189	0.208	20.8	.20	4.61
Expansion	385.50	0.014	0.132	0.146	14.6	.30	4.38
Stagnation	361.50	0.011	0.004	0.015	1.5	.30	0.45
Decline	330.50	0.009	-0.088	-0.079	-7.9	.20	1.58
						1.00	7.86

Here, the expected return is 7.86%

Further,

Return	Prob.		Deviation	(Deviation)^2	
R' %	**p'**	**P x R**	**R-E (R)**	**(R – E (R))^2**	**P X (R – E (R))^2**
20	0.3	6	-7.5	56.25	16.875
25	0.3	7.5	-2.5	6.25	1.875
30	0.2	6	2.5	6.25	1.25
40	0.2	8	12.5	156.25	31.25
Expected Return E (R) = 27.5					**51.25**
Variance = 51.25					
Standard Deviation = = 7.158911					

$$\text{Coefficient of Variation (C.V.)} = \frac{\sigma}{\bar{R}} \times 100$$

In above example, coefficient of variation is:

$$\text{Coefficient of Variation (C.V.)} = \frac{7.158911}{\overline{27.5}} \times 100 = 26.03$$

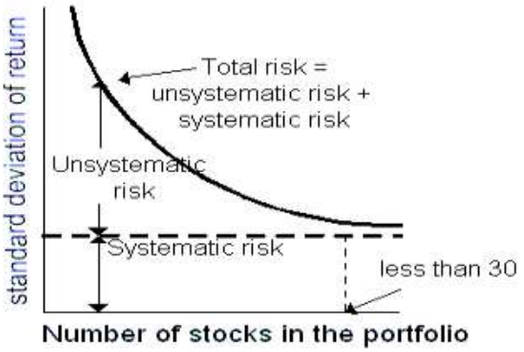
Risk Diversification: Systematic and Unsystematic Risk

Diversification means reducing risk by investing in more than one security. It is based upon general ideology of investment, 'Do not keep all your eggs in one basket'. The total risk of an asset is composed of two types of risk, systematic risk and unsystematic risk. Systematic risk is also known as un-diversifiable risk and unsystematic risk is known as diversifiable risk.

Unsystematic risk or Diversifiable risk

- This is that part of total risk which is caused due to unique factors i.e. firm or industry specific factors which affect return on assets.

- Factors can be labor stick, management problems in a firm, consumer preferences, and recession in one industry, power or raw material problems and so on.
- This is also called firm specific risk which one can reduce by doing diversification of their investment.



Systematic risk or non-diversifiable risk

- It is that part of total risk which is market specific not firm specific, that's why it affects prices of all securities. This risk also relates to the economic trends which affects the whole market.
- This risk cannot be avoided that's why it is called non-diversifiable risk.
- Systematic risk is measured by the **Beta (β).**
- Market risk, interest rate risk and purchasing power risk are the major factors of systematic risk. Even by doing diversification one cannot avoid such types of risks.

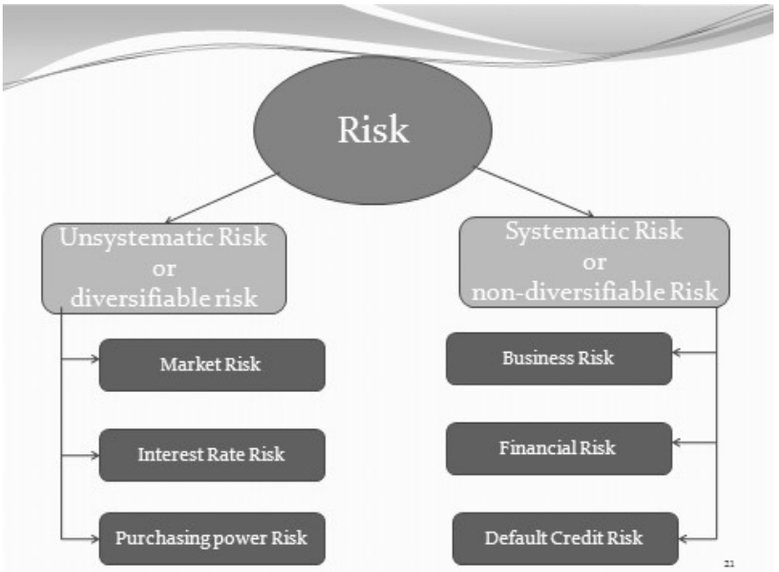


Fig. 3.5 *Types of Risk and Risk Diversification*

NOTES

Risk and Return on Single Security and Two Security Portfolio

For a single asset, calculation of risk and return is shown in the previous figure.

Calculation of return for two security portfolio: One can make various combinations of two securities. Return of a two security portfolio is weighted average of returns of the two assets. i.e.

$$E(R_p) = \sum w_i \sum R_i$$

- Here w is respective weights of individual security in the portfolio (50:50, 10:90, 30:70 etc.). And Ri is the returns of respective securities.

Calculation of risk for a portfolio of two securities

- Total risk is calculated by the standard deviation of the asset.
- Portfolio risk includes interactive risk of the underlying assets in the portfolio. It is measured by the covariance of return which is again dependent on the correlation of the two securities.
- To calculate risk of portfolio following equation is used:

Here,

$$\sigma_p^2 = w_1^2\sigma_1^2 + w_2^2\sigma_2^2 + 2\, w_1 w_2 \rho_{1,2}\, \sigma_1\sigma_2$$

- σ_p^2 is the variance of the portfolio.
- w_1 is proportion of total investment in security 1,
- w_2 is proportion of total investment in security 2,
- σ_1^2 is variance of returns of security 1,
- σ_2^2 is variance of returns of security 2,
- $\rho_{1,2}$ is coefficient of correlation between returns of two assets.

Examples:

Let us assume that the expected return on two assets L (low risk low return) and H (high risk high return) are 18% and 26% respectively. The corresponding weights are 0.45 and 0.55. What is expected return of this portfolio?

Solution:

Expected Portfolio Return = (0.45 x 0.18 + 0.55 x 0.26) = 22.4%

Example:

Continuing the previous example, let us assume that the standard deviation of assets, L and H are 18% and 25% respectively and the coefficient of correlation of their returns is 0.7. The weights of these two assets are 0.75 and 0.25. Calculate the expected portfolio returns and portfolio risk.

NOTES

Solution:

- Expected Portfolio Return = 0.75 x 0.18 + 0.25 x 0.26 = 20%.
- *Portfolio Risk*: putting values in the following formula,

$$\sigma_p^2 = w_1^2\sigma_1^2 + w_2^2\sigma_2^2 + 2\, w_1 w_2 \rho_{1,2}\, \sigma_1\sigma_2$$

So, Portfolio Risk is

Variance $\left(\sigma_p^2\right)$ = (0.0339475)

Standard Deviation $(\sigma) = \sqrt{Variance} = \sqrt{\sigma^2}$

Standard Deviation = 0.1842485 or 18.42%

3.7 MANAGEMENT PLANNING: ROLE OF MANAGERS IN RISK MANAGEMENT

Managing risk is critical to financial services organizations. The phenomenon of risk is not new but is so much more demonstrably powerful today. As a result, the managers of financial institutions, indeed everyone in a senior position, is expected to contribute to the overall duty of a firm to manage its risks.

Risk manifests itself in several differing ways. A basic step for all firms is to understand the nature of different types of risks, their sources and their relative impact.

All firms have to break their products and services into a long list of separate risk types, broadly, falling into three general sectors: credit risk, market risk and operational risk and initiate the required measures to contain the risks.

Executive managers must:

- Have a firm grasp of the businesses for which they are responsible
- Identify sources of risk and addresses them effectively
- Set in place a structure of control processes and monitor them
- Put all-round efforts to explore effective strategies to face and overcome business risks
- Judge the risk-bearing approach – moderate, aggressive or conservative
- Not depart from the approach outlined by the top management
- Quantify the probable loss for each option, in line with the basic management approach
- Present the probable loss in each option of decision-making
- Be frank and make honest efforts to assess and quantify the risk with each option
- Explore the options of mitigation, if not avoidable

NOTES

Managing risk is, therefore, an essential skill and responsibility of those who run financial institutions. Risk assessment and management is essential in every area of decision-making and this message should be spread through all levels of the management cadre. Those who manage risk well, benefit with significant rewards. Those who do not understand their importance and initiate suitable and timely action may face dismal failure in their business.

Compliance with regulations and regulatory risk management are becoming increasingly important in troubled times. In the exercise of risk management, an honest approach is essential. Failure to make this exercise, with sincerity, before final decision-making, may land any business in unanticipated and unprepared-for loss, at times, beyond the financial ability of the firm.

The leading companies have started focusing on five key drivers of risk management culture.

1. **Communication:** Communication is an essential part of effective management. All members of the staff have to be appraised of the organization's risk policies. Their tolerance levels, along with corresponding procedures for control, are to be shared as an important first step. Internal communications from senior executives to employees, from time to time, on risk-related issues can help a great deal in this area for periodical understanding and explaining their importance. Ensuring that employees are free to raise issues or doubts for clarification without fear of reprisal is equally important.
2. **Leadership commitment:** Leaders have to act as role models. Leaders should focus on practicing what they preach about risk management so that it is visible, which is more important. Their support for risk management policies should match their communication. This will ensure that other members of the staff will fall in line, when they realize their managers are serious and sincere about risk management.
3. **Teamwork and collaboration:** Teamwork enables members of staff to understand each other better. When more people work together and share information, they can identify areas of risk. Collective identification can lead to better involvement to develop appropriate risk mitigation strategies to ensure achievement of greater benefits.
4. **Resourcing:** Often, the knowledge, skills and abilities of internal employees are ignored, which play a prominent role in risk management. These areas are often overlooked by top management. Involving human resources in risk-related discussions and evolving strategies can create an impact on the staff and make a big difference.
5. **Risk controls:** Companies believe that they have adequate controls in place, while their employees feel otherwise about controls and their effective functioning. Frequent surveys amongst the employees, sharing

NOTES

the suggestions received and feedback on the steps initiated with necessary corrective actions on their accepted suggestions for improvement go a long way to understand the effectiveness of risk controls.

Most organizations do not recognize the impact of risks seriously and react only when something happens and it is too late to take corrective action. Risk management requires a proactive, not a reactive, approach.

3.7.1 Global Management Environment

A market is defined as a structure that permits individuals and business organizations to exchange goods and services. It is to be noted that a global market is not restricted to one geographic area but permits the trade of goods and services everywhere in the world. A company which intends to enter the global market will come across immense opportunities of increasing its sale and thereby revenue.

There can be many reasons for investing abroad: for reducing risks by investing in a relatively lower economic country, for expectation of higher returns compared to a given level of risk, for tax benefits, for seeking political stability.

In the international environment there are many risks which need to be managed by the financial managers and taken note of in the management planning. These include factors like government taxations, foreign exchange risks, political risks, sources of finance, investment policies, etc.

Check Your Progress

6. What are dividend yield and capital gain yield?
7. Which type of risk is called firm specific risk?
8. Mention the type of approach which is required in risk management.

3.8 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Two important aspects of investment decisions are (a) the evaluation of the prospective profitability of new investments, and (b) the measurement of a cut-off rate against which the prospective return of new investments could be compared.
2. Sinking fund is used to redeem debt at the time of its maturity. For such fund, companies generally keep a fixed amount of their earnings so that at the time of maturity such debt company can easily repay them without hurting the existing liquidity.
3. In multiple period compounding, interest payment can be of two types: nominal interest rates and effective interest rates.

4. There are three aspects associated with risk and risk management:
   - Identifying source of risk
   - Measuring the risk
   - Taking decisions based on calculated risk
5. Two elements distinguish risk taking form gambling: (a) information or knowledge and (b) awareness about the ability to survive the ill-fated outcome of decision.
6. Dividend yield is the reward for holding shares which means dividend yield on initial investment and the reward due to difference in initial price and price at the end is called the capital gain yield.
7. Unsystematic or diversifiable risk is also called firm specific risk.
8. Risk management requires a proactive, not a reactive, approach.

3.9 SUMMARY

- A firm's investment decisions involve capital expenditures. They are, therefore, referred to as capital budgeting decisions.
- The two major activities or decisions to be taken under investment decisions are related to:
  - o Fixed asset investment
  - o Mergers-acquisitions
- Time value of money is the preference of an individual for the possession of money at present, rather than the same amount of money at some future date.
- An individual prefers a given amount of money today, rather than same amount of money in some near future time. This concept is called time preference for money.
- The techniques of studying time value of money are compounding techniques and discounting techniques.
- Annuity is a fixed receipt or payment each year over a period of time. Future value can also be calculated in case of an annuity for n years.
- Corporate investment decisions are taken in anticipation of a stream of benefits over a long period. Management of risk is a complex subject.
- Risk is that uncertainty which is predictable and to which probability can be assigned.
- Probability is the likelihood of happening of some event.
- The real test of a decision maker is in estimation of returns (occurrences) and probabilities for each occurrence. Returns on financial securities are derived from their underlying assets.

NOTES

- Decision is guided by the attitude of the decision maker towards risk. People can be classified into mainly three groups for this matter: risk averse, risk lover and risk neutral.
- Return can be measured through different approaches including profit, cash flow, and ratios approach. It has been generally seen that which the increase in risk, the rate of expected return is higher. The following are the three components of return: return at zero risk, premium for business risk and financial risk.
- Dividend decision is a part of financing decision because through proper dividend decision and history, a firm can reduce cost of capital and tap internal sources of funds.
- Risk and return are both essential for taking an investment decision. For a financial asset, the return has two significant components, current income which is known as dividend yield and capital gain.
- Diversification means reducing risk by investing in more than one security. The total risk of an asset is composed of two types of risk, systematic risk and unsystematic risk.

3.10 KEY WORDS

- **Capital budgeting decision:** It involves the decision of allocation of capital or commitment of funds to long-term assets that would yield benefits (cash flows) in the future.
- **Time value of money:** It is the preference of an individual for the possession of money at present, rather than the same amount of money at some future date.
- **Risk:** It is that uncertainty which is predictable and to which probability can be assigned.
- **Trade off:** It refers to a situation that involves losing one quality or aspect of something in return for gaining another quality or aspect

3.11 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short-Answer Questions

1. Write a short note on the meaning and scope of investment function.
2. What are the reasons for time preference for money?
3. Briefly explain the concept of value of annuity due.

4. What are two conditions attached to the definition of risk?
5. What are the types of attitude towards risk?
6. How are risk and return related?

Long Answer Questions

1. Explain the two basic techniques to study time value of money.
2. Describe the techniques of measuring risk.
3. What is risk diversification and its types?
4. Discuss return and risk of individual asset and of a portfolio.

3.12 FURTHER READINGS

Patel, Bhavesh. 2014. *Fundamentals of Financial Management*. New Delhi: Vikas Publishing House.

Khan, M.Y. and Jain, P.K. 2007. *Financial Management- Text Problems and Cases.* New Delhi: Tata McGraw-Hill.

Chandra, Prasanna. 2004. *Financial Management: Theory and Practice.* New Delhi: Tata McGraw-Hill.

Kulkarni, P.V. and B. G. Satyaprasad. 2002. *Financial Management.* New Delhi: Himalaya Publication House.

NOTES

UNIT 4 LONG-TERM CAPITAL RESOURCES: EQUITY AND DEBT SOURCES

Structure

4.0 INTRODUCTION

Sourcing of long-term funds is a critical decision, both for small entrepreneurs and large businesses. It is important for the viability of a business.

Sources of funds vary in their basic features (rights and obligations of supplier of funds as well as that of the business who obtains funds from the suppliers). A security is designed with a mix and match of these basic features. The basic three features are:

- Right to get return
- Right to vote
- Right to get money back on maturity or on liquidation

In this unit, you will learn about the long term sources of funds.

4.1 OBJECTIVES

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

- Discuss the different sources of long term capital
- Explain the features of equity shares
- Examine the types of preference shares
- Describe debentures and its types

NOTES

4.2 SOURCES OF LONG-TERM CAPITAL

The sources of funds are classified into two main types ownership or equity funds and debt funds. Some securities are of hybrid type with features of both ownership and debt securities. A holder of ownership securities enjoys ownership rights; whereas a holder of debt security enjoys the rights as a lender, but the holder of a hybrid security enjoys a mix of rights depending upon the terms and conditions.

Ownership or Equity Sources

For non-corporate (sole-proprietorship and partnership) businesses, there is a single type of ownership security available and that is the owners' capital. Owners (sole-proprietor or partners) bring capital and enjoy the rights to participate in managing business (depending upon agreement) and the right to share profit or loss (usually in the proportion of every partner's share in capital). Other types of ownership security appropriate for corporate form of businesses include equity shares, preference shares, deferred shares, subsidies, tax incentives, etc.

Debt Sources

Debt funds or loan funds are different from ownership funds in terms of the rights of the lenders. Suppliers of debt funds are entitled to interest (rather than dividends) on their funds at a rate decided in the agreement and that is payable by the fi rm whether the firm earned profits or not. However, the suppliers of funds have no right to manage the firm or appoint their representative on the Board of Directors. Rights and obligations of lenders and borrowers are determined by the terms of agreement. Sources of long-term debt, used for financing projects, can be mainly divided in three categories—term loan, lease and debentures or bonds.

4.3 EQUITY SHARE

In case of a company, total ownership fund is called a 'stock' and it is divided into smaller units called 'shares' or 'common shares'. This allows a company to obtain funds from several owners, who are called 'shareholders' or 'members'. However, a private company can issue shares only privately through friends and relatives but a public company can issue shares to the public. The salient rights and obligations of equity shareholders are listed below:

- Shareholders have dividend rights, but getting it is uncertain depending upon the profits of the company and decision of the company to distribute profits as dividends.
- Shareholders enjoy the right to vote on matters defined by the Companies Act 2013, which includes right to elect their representatives on the Board of Directors. Right to vote can be exercised in person or via proxy.

- Shareholders have pre-emptive right which means a right to get allotment from the issue of new shares.
- Shareholders have residual rights on surplus funds in the event of liquidation of the company.
- Shareholders have the right to transfer shares, albeit with restrictions if the shares are in a private company.
- Shareholders' liability for the debt of the company is limited to the par value of shares held by them.

A firm has to pay tax on its profit and when distributed as dividends, the firm again pays dividend distribution tax, subject to law and the shareholders also pay personal income tax on dividend income.

Equity shares give permanent funds to the business and put no pressure on the liquidity of the firm because dividends are payable only if profit is earned and capital is never repayable. However, equity shares have other implications too. It is usually more costly than debt funds and after the successful project, if the firm does not grow enough or does not adjust the dividends policy, it can sit on a large cash balance. Demoralized shareholders' action of selling shares can create a situation where some management group can take over the firm.

Retained earnings are also source of equity capital. Most firms distribute only a part of the profit and retain the rest. This is internal financing of capital. Retained earnings are a part of equity capital, because it belongs to the shareholders.

Types of common shares

Firms issue different types of common shares (so, common shares are not common anymore). In India, a different type of common share issue was opened for the first time by Tata Motors in September 2008. Tata Motors announced that they would issue two types of shares on pre-emptive right basis; one at ₹340 on one-vote-one-share basis and another at ₹305 with lower voting right (one-tenth vote per share) and 5 per cent extra dividends. This creates two categories or types of common shares.

In the West, some types of common shares are entitled to dividends from a particular income stream. Also other varieties or types of common stock are found.

The **s**uppliers of **c**ommon **s**hare capital are promoters, friends and relatives (sometimes called 'love money'), general public, venture capitalists, angel capitalists and charitable venture capitalists**. S**ome of these are described below.

Venture capitalists: Usually, start-up businesses with new ideas (like information technology businesses, bio-technology businesses are the current examples) are risky and therefore, it is unlikely that regular suppliers of funds will fund such projects. Such ventures may be potentially quite profitable but very risky. Some investors (usually wealthy individuals, investment banks and other

financial institutions) see an opportunity here. They pool their own funds to form a venture capital fund with the purpose of finding and providing equity capital to such high potential growth firms. Venture capitalists also provide technical and managerial expertise and keep a say in the firm's decisions. In the initial agreement, venture capitalist inserts an exit clause, which is via taking the firm public or sale of business. As per this clause, after a pre-determined number of years, the new venture will 'go public' (means will become a company and will make initial public offering of shares), or sell the firm and the venture capitalist walks out with his share from the proceeds.

The entrepreneur, while getting the much-needed funds and technical and managerial expertise, faces the risk of interference in the activities of business and more important the risk of losing ownership and control of business upon going public.

Angel capitalists: Angel investors are those that 'save struggling firms with both finance and know-how when no one else will' (Van Osnabrugge and Robinson, 2004). Historically, it was appropriate to say that angel investors were willing to accept more risk than venture capitalists. There is hardly any angel investing in India, but in the West, this is quite common. Angel capitalists and venture capitalists are quite similar in nature except for risk taking. Angel funds can be considered for project investment as a part of turning around a sick business, where venture capitalist is not available.

Charitable venture capitalists: Charitable venture capitalists are not present in the Indian market but the West has adopted this mechanism for regional growth. These are venture capitalists with a charitable purpose, which fund the early-stage high potential small businesses. This kind of venture capitalists are established privately as non-profit organizations with the support of operating funds from the government (like state government and municipal corporations) and funds for investing are provided by charitable organizations and foundations. Operating funds are used for the operating expenses of the fund and investible funds are used for financing different ventures in the region.

Charitable venture capitalists operate exactly like venture capitalists but have a broader list of businesses that they support (usually ones that are likely to result into a positive regional growth in terms of employment and tax revenue). Charitable venture capitalists do make profit but reinvest the same for further investment purposes. Those who are interested to learn about such funding organizations may have a look at an example from the US. There is a scope for such organizations in different regions of India also.

Check Your Progress

1. How are loan funds different from ownership funds?
2. What is known as internal financing of capital?

NOTES

4.4 PREFERENCE SHARES AND ITS TYPES

Preference shares are also ownership shares but with a difference. Preference shareholders enjoy preferential rights over the rights of equity shareholders. They have a right to get dividends (subject to an upper limit specified in the issue document) before any dividend is paid to the equity shareholders. They also have a right to get their money back before anything is paid back to the equity shareholders in the event of winding up of the business and if there is a surplus of proceeds after paying all the liabilities of the company. In exchange of these two important rights (which protect their monetary interest to some extent), the preference shareholders forgo their voting rights on issues that are not concerning them directly. However, continuous non-payment of dividends will restore their voting right.

Preference shares can be categorized as ownership securities but they have some features like debt. These shares are called preference shares because they enjoy preferential treatment in getting dividends before any dividend is paid to equity shareholders and getting back their money before anything is paid to the equity shareholders from the proceeds from sales of assets after paying all liabilities at the time of liquidation of the firm. In exchange for these preferential rights, preference shareholders forgo their voting rights. They can vote on the agenda items in which their stake is directly involved. However, if dividends are skipped for some number of years, the preference shareholders acquire voting right as the equity shareholders.

This being ownership security, payment of dividends is considered as distribution of profit and therefore, dividend is not considered as tax deductible expense for the firm and preference shareholders also pays income tax on dividend income.

Usually, the upper limit on the dividend rate is prescribed in the document issuing preference shares but the company may not pay any dividend or pay partial or full dividends, depending upon the firm's profit and need to retain the profit. Preferential right to get dividends before equity shareholders give the preference shareholders a better chance of getting dividends. At the same time, if the firm has earned a very good profit, unlike equity shareholders, preference shareholders will have to be satisfied with limited dividends only, when equity shareholders may get more dividends. A few types of preference shares are listed below:

Redeemable or irredeemable preference shares

If nothing is mentioned in the issue document, the preference shares are irredeemable, meaning those preference shares are permanent like equity shares and will never mature. However, a firm can issue redeemable preference shares that have a specific maturity date like bonds.

Cumulative or non-cumulative preference shares

If the issue document is silent, the preference shares are non-cumulative, meaning that any unpaid dividend in any year will not be accumulated and that year's dividend is lost. However, if preference shares are specified as cumulative preference shares, then unpaid dividends are accumulated (though it does not become a liability of the company) and gets payable before any dividend is paid to equity shareholders anytime thereafter.

Participative or non-participative preference shares

If the issue document is silent, preference shares are non-participative. Participative preference shares participate in extraordinary dividends paid to equity shareholders. It works like this: say the issue document mentions that preference shares will carry a dividend rate of 12 per cent but they will get an additional dividend if equity shareholders are paid dividends more than 20 per cent. In this case, if equity shareholders are paid 24 per cent dividends, preference shareholders will first get 12 per cent and additional four per cent (thus a total of 16 per cent). Additional four per cent in this case is 24 per cent paid to the equity shareholders, less the limit of 20 per cent prescribed. This additional per cent can be prorated depending upon the terms.

The cost of preference shares is higher than the cost of debt but less than the cost of equity. Being ownership funds, it does not put pressure on the liquidity of the firm. Carrying features like debt, it does not threaten hostile takeover of the firm. Thus, it offers good flexibility but may not be popular in the market every time a firm needs to issue security in the market.

4.5 DEBENTURES AND ITS TYPES

A debenture is a long term source of finance. It is a promissory note issued by companies when they have to raise funds. The company makes a promise to pay interest on loan amount and repayment of principal amount. In India, an alternative form of issue of debenture is found. This form is bond issue. There is a huge market of bonds in India. Public limited companies can raise long term funds by issuing debentures or bonds to the general public. Debenture holders are the creditors of the company. The par value of debentures is generally the face value that is written on the debenture certificate or debenture deed.

Some major features of debentures are as follows:

- Debentures (secured or unsecured) carry a fixed rate of interest and are issued in different denominations (100 to 1000).
- Issue of debentures is supported by a debenture trust deed which has the entire list of terms and conditions of issuing debentures.

- Interest on debentures is tax deductible which makes this source of finance less costly in comparison to equity shares. In other words, cost of capital for debenture is quite less in comparison to other long term sources of finance.
- Debentures are preferred sources of finance in comparison to preference and equity shares as interest on debentures is fixed and companies have to pay interest whether they earn profit or not. At the time of winding up of the company, debentures holders first get their principle investment.
- Debentures are issued for a fixed duration which is called maturity of debenture. At the time of maturity, debentures will be redeemed as per the terms and conditions of the debenture deed. In India, debentures are generally issued for a period of maximum ten years.
- A sinking fund is maintained by the companies to redeem debentures on maturity without hurting the cash position of the company. The companies put a fixed amount of money in this fund in order to accumulate the total amount which is used to repay the debenture amount every year.
- These days, companies have buy-back provision on debentures too. This provision facilitates a company to redeem debentures at a specified price before maturity.
- Debentures are either secured or unsecured. Debentures have charge against the assets of the company up to the amount of loan. If the company defaults in the payment of interest or principal amount, then debentures can seize the assets of the company against which their loan is secure. In India, credit rating agencies give rating to different bonds or debentures on the basis of their security.
- Yield on debentures is related to the market price of the debentures. It can be calculated by taking a ratio of annual interest payment on debentures and debentures market price. Suppose, annual interest payment is ₹ 25 and current market price of debenture is ₹ 135 and face value of the debenture is ₹ 90. Then yield on debenture is 18.51% (₹ 25/ ₹ 135).
- Debenture holders have claim on the assets and income of the company prior to the shareholders (equity or preference). But if company has issued more than one type of debentures then their claim is also hierarchical among themselves.

Types of Debentures

Debentures can be categorized as non-convertible debentures, fully convertible debentures and partly convertible debentures. Non-convertible debentures are not convertible in equity shares and repayable on maturity date. Fully convertible debentures are convertible into equity shares as per the terms and conditions at

the time of issue of such types of debentures. Due to this feature of conversion, fully convertible debentures carry less interest rate. In case of partly convertible debentures, some part of debenture is convertible into equity share. Partly convertible debentures have mix features of non-convertible and fully convertible debentures.

By issuing convertible debentures, companies can get some special advantages like companies can raise funds without diluting the control of existing shareholders, generally convertible debentures are unsecured and such issue does not affect the borrowing capacity of the company.

Advantages and disadvantages of raising funds through debentures:

Advantages

- Less cost of capital
- Interest is tax deductible
- Such issue does not dilute the control of equity shareholders
- Best source of finance when prices are rising at a high rate.

Disadvantages

- Obligation to pay interest and capital
- Debenture issue increases financial risk of the company
- Requires more cash outflow at the time of maturity

Check Your Progress

3. What are cumulative preference shares?
4. What are the advantages companies can get by issuing convertible debentures?

4.6 OTHER SOURCES OF LONG-TERM CAPITAL

In this section, you will learn about some other major sources of long term capital.

Deferred Shares

Deferred shares are the type of ownership security that offers a more proportionate right of voting. The owner of one deferred share can have more than one vote, depending upon the terms of issue. In exchange of these extraordinary voting rights, the deferred shareholders' right to get dividend is deferred until a specified amount of dividend is paid to the equity shareholders. As a result of these disproportionate voting rights and deferred dividend rights, the owners of deferred shares can have a control over the management of the company with less investment.

Also, they stand a chance of earning windfall dividend income if the company make extraordinary profits.

Deferred shares were innovated for promoters of businesses. Promoters have ideas and willingness to take risk but may not have enough money to preserve the controlling interest in the company promoted by them. By way of buying deferred shares, promoters can get controlling interest in the company with little investment. However, deferred shares are not allowed anymore.

Implications of deferred share capital on the firm's cost of funds, liquidity and future growth options are the same as that of equity shares.

Term Loan

Term loan is usually supplied by commercial banks and financial institutions. Term loan is for a specific term (period) at a fixed or variable interest rate, with interest payable periodically, issued against some security and usually with several negative covenants attached. Negative covenants include, periodic reporting of accounting and other information, prior approval of the lender before some activities or changes are undertaken, appointment of members of Board of Directors and so on.

Term loans usually cost less than equity shares. Often, they may cost less than other debt funds too, if the firm is in a position to negotiate better terms with the funding institutions. Depending upon the terms and conditions, the firm can avoid liquidity implication, especially if project cash flow is ascertained with a reasonable degree of certainty and servicing of term loan is matched with project cash flow. Idle float (time difference between obtaining funds and spending it on project) can be minimized at a small commitment fee to reduce the cost of term loan.

A firm has to prepare a loan application with several information, documentations and calculations. The lender will evaluate the loan application to determine the creditworthiness of the applicant firm based on the firm's management, track record, project feasibility, etc. A long-term relationship with lending institution helps in quick approval of loan and in obtaining favourable terms and conditions of loans.

Lease

Lease is of two types, operating and finance (or capital) lease. Operating lease implies short-term rights of use of an asset. Therefore, lease rent on operating lease is like any other revenue expense. Operating lease does not amount to financing acquisition of an asset. Finance lease is for almost the entire life of an asset and therefore, it is a mode of financing.

A firm can acquire assets on lease instead of borrowing funds and then buying assets. In some situations lease arrangement is very helpful. A lessee (borrower) may get hundred per cent finance (except down payment) for the assets and it may turn out to be more convenient and at times cheaper too. Lease

payment is negotiable and therefore, one can create a better match of lease payment with project cash flow. Lease arrangement may be found cheaper in three ways if the lessor (lender) has access to cheaper funds or the lessor specializes in the assets that the lessee wants or the lessor is in higher tax bracket than the lessee. Otherwise, leasing is usually expensive.

Public Deposits

Companies can accept deposits directly from the public. This is an important source of financing the medium-term requirements of the company. Legalities and procedure for inviting public deposits are relatively very simple. It is popular among pensioners, who would get higher returns on their deposits than bank deposits. Public deposits are unsecured and still usually they cost less than loans. Public deposits come without any negative covenants. The maximum duration of public deposits is specified by Reserve Bank of India, though the issue of public deposit is governed by Companies Act, 1956.

Convertibles (Mezzanine)

Preference shares and bonds can be convertible also. Convertible securities are often called mezzanine securities. They are considered hybrid securities because at the time of issue, they are either preference shares or bonds but are convertible in to equity shares on a future date. Conversion may be either at the option of the security holder or it can be compulsory. Conversion time and conversion ratio are pre-determined. Before the conversion date, they are purely preference shares or bonds and after the conversion date, they become equity shares. Usually, a firm with good prospects is able to offer convertible securities at a low interest rate or low dividend rate because investors also derive value from the conversion. Principal sum of convertibles is never repaid because it is converted into equity shares and thus puts much less burden on the liquidity of the firm. Upon conversion, the firm's creditworthiness improves due to decline in debt-equity ratio. Therefore, high growth firms, who frequently need more funds, prefer issuing convertible securities so that they can manage their creditworthiness better, do without issuing equity shares (and save on floatation costs) and still they can maintain a desirable debt-equity ratio.

Bonds with Warrants

When bonds are issued with the right to get a certain number of equity shares on or after a certain date in the future, they are called 'bonds with warrants'. Warrant gives its holder a right to get a certain number of shares on a future date at a favourable price. These warrants are detachable, which allows a bondholder to sell the warrants separately before they are due for shares. Warrants make bonds cheaper because of the potential capital gain after the exchange of warrant for shares. Also, they allow the firm to increase its shares without incurring any floatation cost while mostly maintaining the debt-equity ratio.

Check Your Progress

5. Why were deferred shares innovated?
6. What are the two types of lease?

4.7 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Debt funds or loan funds are different from ownership funds in terms of the rights of the lenders.
2. Retained earnings are a source of equity capital. Most firms distribute only a part of the profit and retain the rest. Retained earnings is internal financing of capital. They are a party of equity capital.
3. If preference shares are specified as cumulative preference shares in the issue document, then unpaid dividends are accumulated and gets payable before any dividend is paid to equity shareholders anytime thereafter.
4. By issuing convertible debentures, companies can get some special advantages like companies can raise funds without diluting the control of existing shareholders, generally convertible debentures are unsecured and such issue does not affect the borrowing capacity of the company.
5. Deferred shares were innovated for promoters of businesses. Promoters have ideas and willingness to take risk but may not have enough money to preserve the controlling interest in the company promoted by them.
6. Lease is of two types, operating and finance (or capital) lease.

4.8 SUMMARY

- The sources of long term funds can be are classified into ownership funds and debt funds.
- Types of ownership securities include common or equity shares, preference shares, deferred shares and subsidies.
- Types of debt funds include term loans, bonds and debentures and lease.
- In case of a company, total ownership fund is called a 'stock' and it is divided into smaller units called 'shares' or 'common shares'. This allows a company to obtain funds from several owners, who are called 'shareholders' or 'members'. However, a private company can issue shares only privately through friends and relatives but a public2 company can issue shares to the public.

- Equity shares give permanent funds to the business and put no pressure on the liquidity of the firm because dividends are payable only if profit is earned and capital is never repayable.
- The **s**uppliers of **c**ommon **s**hare capital are promoters, friends and relatives (sometimes called 'love money'), general public, venture capitalists, angel capitalists and charitable venture capitalists**.**
- Preference shares are also ownership shares but with a difference. Preference shareholders enjoy preferential rights over the rights of equity shareholders. They have a right to get dividends (subject to an upper limit specified in the issue document) before any dividend is paid to the equity shareholders. They also have a right to get their money back before anything is paid back to the equity shareholders in the event of winding up of the business and if there is a surplus of proceeds after paying all the liabilities of the company.
- A debenture is a long term source of finance. It is a promissory note issued by companies when they have to raise funds. The company makes a promise to pay interest on loan amount and repayment of principal amount.
- Debenture holders are the creditors of the company. The par value of debentures is generally the face value that is written on the debenture certificate or debenture deed.
- Debentures can be categorized as non-convertible debentures, fully convertible debentures and partly convertible debentures.
- Other sources of long term capital include deferred shares, term loans, lease, convertibles, public deposits, bonds with warrants, etc.

4.9 KEY WORDS

- **Debenture:** It is a promissory note issued by companies when they have to raise funds.
- **Deferred shares:** These are type of ownership security that offers a more proportionate right of voting.
- **Term loan:** It refers to loan for a specific term at a fixed or variable interest rate, with interest payable periodically, issued against some security and usually with several negative covenants attached.
- **Bonds:** It refers to units of small denominations of loan requirement of companies which are backed by collateral.

NOTES

4.10 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short-Answer Questions

1. What are ownership and debt sources of funds?
2. How are preference shares a hybrid source of fund?
3. What are the advantages and disadvantages of debentures?
4. Write short notes on deferred shares and subsidies as a source of finance.
5. List the features of debt securities.
6. Briefly explain term loans.

Long-Answer Questions

1. Discuss the salient rights of equity shareholders and mention the different suppliers of common share capital.
2. Examine the features and types of debentures.
3. Explain the concept of preference shares.

4.11 FURTHER READINGS

Patel, Bhavesh. 2014. *Fundamentals of Financial Management*. New Delhi: Vikas Publishing House.

Khan, M.Y. and Jain, P.K. 2007. *Financial Management- Text Problems and Cases.* New Delhi: Tata McGraw-Hill.

Chandra, Prasanna. 2004. *Financial Management: Theory and Practice.* New Delhi: Tata McGraw-Hill.

Kulkarni, P.V. and B. G. Satyaprasad. 2002. *Financial Management.* New Delhi: Himalaya Publication House.

BLOCK II
CAPITAL STRUCTURE

NOTES

UNIT 5 CAPITAL ISSUES

Structure

5.0 INTRODUCTION

The lifeblood of any company's functioning is their capital. In the last unit, you were introduced to various types of long-term sources of funds. In this unit, you will learn about certain other corporate sources of finance. The prominent in this category is issued capital. The part of the capital which an organization sells through shares to the company comes under the category of capital issues and its management is critical. Capital issues are managed by merchant bankers and monitored by SEBI guidelines. In this unit, you will learn about the meaning, nature and purpose of capital issues along with SEBI guidelines in this respect. Further, you will learn about the different sources of corporate finance. In the last section of the unit, the tax related aspects will be discussed in relation to financing decisions.

5.1 OBJECTIVES

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

- Discuss the meaning, nature and purpose of capital issues
- Describe capital issue management

- Explain security issues and their types
- Discuss SEBI guidelines in capital issues
- Examine the concept of bridge finance, loan syndication and book building
- Discuss borrowings from the term lending institutions and International capital markets
- Explain tax considerations in financing decision areas

NOTES

5.2 CAPITAL ISSUES: MEANING, NATURE, PURPOSE

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

Capital Issue Management

Management of capital issues in India is a professional service rendered by merchant bankers. In fact, issue management is a major function for merchant bankers. The role of merchant bankers has increased due to the tremendous growth of public listed companies in number, size and complexity, SEBI's guidelines and requirements increase.

Capital issue management relates to the management of issues for raising funds through various instruments by companies.

The issue can be a public issue through a prospectus, rights issue, private placement and institutional placement programme. Issue management, in the case of issues through prospectus, involves the following functions:

1. Obtaining an observation letter for the issue from SEBI.
2. Arranging underwriting for the proposed issue.
3. Drafting and finalizing the prospectus and obtaining its clearance from the various agencies concerned.
4. Drafting and finalizing other documents, such as applications, forms, newspaper advertisements and other statutory requirements.
5. Selecting the registrar to the issues; the printing press; the advertising agencies; the brokers and bankers to the issue and finalizing the fees and charges to be paid to them.
6. Arranging for the press conference and investors' conferences.

7. Coordinating printing, publicity and other work, to get everything ready at the time of the public issue.
8. Complying with the SEBI guidelines before and after the issue is over (both in case of over-subscription or devolpment), by sending the various reports as required by the authorities.

The procedures and practices for managing public issues fall under two phases:

1. Pre-issue management begins with the structuring of issues and ends with the opening of a subscription list;
2. Post-issue management continues until the securities are listed on the stock exchange.

The management of capital issues in both phases is regulated and monitored by SEBI.

SEBI's objective in capital issue management is to protect the interests of investors through regulations and guidelines, establishing transparency in market dealings. You will learn about the role of SEBI and related guidelines in the following section. Before that, let's learn about the types of security issues.

5.2.1 Security Issues and Their Types

Security issues can be classified into following categories:

- **Public issue:** It is that form under which general public is approached to raise the capital. It can be of IPO, of FPO type. The IPO (initial public offer) is the public offer a company gives to the public when for the first time the shares of the company are listed on the stock exchange. Any future issue of shares to public is known as further public offer or follow-on public. In India, both IPOs and FPOs can be issued through the process of book building.
- **Right issue:** Any new issue of shares of existing class or new class results into the dilution of ownership of the existing shareholders. Therefore, whenever a company issues new share capital then the existing shareholders of the company have the right to buy these shares first and if the existing shareholders do not execute this right which is called right of pre-emption, only in that case the securities are offered to other parties. Such issue is called 'rights issue' and the additional share capital is offered in proportionate basis to the existing shareholders. Several rules, regulations and guidelines are provided by regulatory bodies to issue right shares.
- **Bonus issue:** A company issues bonus shares to its shareholders free of cost. Generally, the bonus shares are given in the form of dividend to the existing shareholders. When the free reserves of the company increase or it lacks liquidity then instead of paying dividend in the form of cash

NOTES

dividend, the company prefers to distribute bonus shares in the form of dividend.

- **Private placements:** It is that form of raising capital where the organizational or institutional investors are approached. But there is a difference in the IPO and private placement. In case of IPOs, an unlisted company gives the public offer to buy the securities of the company but in case of private placements, only a selected set of people/institutes are given offer to apply for the shares.

5.3 ROLES AND GUIDELINES OF SEBI IN CAPITAL ISSUES

As mentioned earlier, the management of capital issues is regulated as well as monitored by the Securities and Exchange Board of India. The role of SEBI is to not only monitor the activities happening in the market but also to regulate it in the interest of the investors. It also seeks to maintain a level of transparency in the market dealings.

The latest SEBI (Issue of Capital and Disclosures Requirements) Regulations came out in the year 2018. It has been amended several times since, the latest being in January 2021. Let's have a look at the some of the important and general provisions of the same.

There is a total of twelve main chapters dealing with different aspects like:

1. Preliminary
2. Initial Public Offer on Main Board
3. Rights Issue
4. Further Public Offer
5. Preferential Issue
6. Qualified Institutions Placement
7. Initial Public Offer of Indian Depository Receipts
8. Rights Issue of Indian Depository Receipts
9. Initial Public Offer by Small and Medium Enterprises
10. Innovators Growth Platform
11. Bonus Issue

11A. Power to Relax Strict Enforcement of The Regulations

12. Miscellaneous

In this section, you will only learn about important provisions related to initial public offer on main board.

An issuer shall be eligible to make an initial public offer only if:

NOTES

a) it has net tangible assets of at least three crore rupees, calculated on a restated and consolidated basis, in each of the preceding three full years (of twelve months each), of which not more than fifty per cent. are held in monetary assets: Provided that if more than fifty per cent. of the net tangible assets are held in monetary assets, the issuer has utilised or made firm commitments to utilise such excess monetary assets in its business or project; Provided further that the limit of fifty per cent. on monetary assets shall not be applicable in case the initial public offer is made entirely through an offer for sale.

b) it has an average operating profit of at least fifteen crore rupees, calculated on a restated and consolidated basis, during the preceding three years (of twelve months each), with operating profit in each of these preceding three years;

c) it has a net worth of at least one crore rupees in each of the preceding three full years (of twelve months each), calculated on a restated and consolidated basis ;

d) if it has changed its name within the last one year, at least fifty per cent. of the revenue, calculated on a restated and consolidated basis, for the preceding one full year has been earned by it from the activity indicated by its new name.

An issuer not satisfying the condition stipulated in sub - regulation (1) shall be eligible to make an initial public offer only if the issue is made through the book - building process and the issuer undertakes to allot at least seventy five per cent . of the net offer to qualified institutional buyers and to refund the full subscription money if it fails to do so .

If an issuer has issued SR equity shares to its promoters/ founders, the said issuer shall be allowed to do an initial public offer of only ordinary shares for listing on the Main Board subject to compliance with the provisions of this Chapter and these clauses -

i. the issuer shall be intensive in the use of technology, information technology, intellectual property, data analytics, bio - technology or nano - technology to provide products, services or business platforms with substantial value addition.

ii. the SR shareholder shall not be part of the promoter group whose collective net worth is more than rupees 500 crores:

iii. Explanation: While determining the collective net worth, the investment of SR shareholder in the shares of the issuer company shall not be considered.

iv. The SR shares were issued only to the promoters/ founders who hold an executive position in the issuer company; i

NOTES

v. The issue of SR equity shares had been authorized by a special resolution passed at a general meeting of the shareholders of the issuer, where the notice calling for such general meeting specifically provided for - a. the size of issue of SR equity shares, b. ratio of voting rights of SR equity shares vis - à - vis the ordinary shares, c. rights as to differential dividends, if any d. sunset provisions, which provide for a time frame for the validity of such SR equity shares, e. matters in respect of which the SR equity shares would have the same voting right as that of the ordinary shares,

vi. The SR equity shares have been held for a period of atleast 6 months prior to the filing of the red herring prospectus;

vii. The SR equity shares shall have voting rights in the ratio of a minimum of 2:1 upto a maxim um of 10:1 compared to ordinary shares and such ratio shall be in whole numbers only;

viii. The SR equity shares shall have the same face value as the ordinary shares;

ix. The issuer shall only have one class of SR equity shares;

x. The SR equity shares shall be equivalent to ordinary equity shares in all respects, except for having superior voting rights.

General Conditions

(1) An issuer making an initial public offer shall ensure that:

a) it has made an application to one or more stock exchanges to seek an in - principle approval for listing of its specified securities on such stock exchanges and has chosen one of them as the designated stock exchange, in terms of Schedule XIX ;

b) it has entered into an agreement with a depository for dematerialisation of the specified securities already issued and proposed to be issued;

c) all its specified securities held by the promoters are in dematerialised form prior to filing of the offer document;

d) all its existing partly paid - up equity shares have either been fully paid - up o r have been forfeited;

e) it has made firm arrangements of finance through verifiable means towards seventy five per cent. of the stated means of finance for a specific project proposed to be funded from the issue proceeds, excluding the amount to be raised through the proposed public issue or through existing identifiable internal accruals.

(2) The amount for general corporate purposes, as mentioned in objects of the issue in the draft offer document and the offer document shall not exceed twenty five per cent. of the amount being raised by the issuer.

NOTES

Additional conditions for an offer for sale

Only such fully paid - up equity shares may be offered for sale to the public , which have been held by the sellers for a period of at least one year prior to the filing of the draft offer document: Provided that in case the equity shares received on conversion or exchange of fully paid - up compulsorily convertible securities including depository receipts are being offered for sale, the holding period of such convertible securities, including depository receipts, as well as that of result ant equity shares together shall be considered for the purpose of calculation of one year period referred in this sub - regulation. Provided further that such holding period of one year shall be required to be complied with at the time of filing of the draft offer document.

Appointment of lead managers, other intermediaries and Compliance officer

1. The issuer shall appoint one or more merchant bankers, which are registered with the Board, as lead manager(s) to the issue.
2. Where the issue is managed by more than one lead manager, the rights, obligations and responsibilities, relating inter alia to disclosures, allotment, refund and underwriting obligations, if any, of each lead manager shall be predetermined and be disclosed in the draft offer document and the offer document as specified in Schedule I
3. At least one lead manager to the issue shall not be an associate (as defined under the Securities and Exchange Board of India (Merchant Bankers) Regulations, 1992) of the issuer and if any of the lead manager is an associate of the issuer, it shall disclose itself as an associate of the issuer and its role shall be limited to marketing of the issue.
4. The issuer shall, in consultation with the lead manager(s), appoint other intermediaries which are registered with the Board after the lead manager(s) have independently assessed the capability of other intermediaries to carry out their obligations.
5. The issuer shall enter into an agreement with the lead manager(s) in the format specified in Schedule II and enter into agreements with other intermediaries as required under the respective regulations applicable to the intermediary concerned: Provided that such agreements may include such other clauses as the issuer and the intermediaries may deem fit without diminishing or limiting in any way the liabilities and obligations of the lead manager(s), other intermediaries and the issuer under the Act, the Companies Act, 2013 or the Companies Act, 1956 (to the extent applicable), the Securities Contracts (Regulation) Act, 1956, the Depositories Act, 1996 and the rules and regulations made thereunder or any statutory modification or statutory enactment thereof: Provided further that in case of ASBA

NOTES

process, the issuer shall take cognisance of the deemed agreement of the issuer with the self - certified syndicate banks.

6. The issuer shall, in case of an issue made through the book building process, appoint syndicate member(s) and in the case of any other issue, appoint bankers to issue, at centres in the manner specified in Schedule XII .
7. The issuer shall appoint a registrar to the issue, registered with the Board, which has connectivity with all the depositories: Provided that if the issuer itself is a registrar, it shall not appoint itself as registrar to the issue; Provided further that the lead manager shall not act as a registrar to the issue in which it is also handling the post - issue responsibilities.
8. The issuer shall appoint a compliance officer who shall be responsible f or monitoring the compliance of the securities laws and for redressal of investors' grievances

Disclosures in the draft offer document and offer document

1. The draft offer document and offer document shall contain all material disclosures which are true and adequate to enable the applicants to take an informed investment decision.
2. Without prejudice to the generality of sub - regulation (1), the red - herring prospectus, and prospectus shall contain: (a) disclosures specified in the Companies Act, 2013 and; (b) disclosures specified in Part A of Schedule VI .
3. The lead manager(s) shall exercise due diligence and satisfy themselves about all aspects of the issue including the veracity and adequacy of disclosure in the draft offer document and the offer document.
4. The lead manager(s) shall call upon the issuer, its promoters and its directors or in case of an offer for sale, also the selling shareholders, to fulfil their obligations as disclosed by them in the draft offer document and the offer document and as required in terms of these regulations.
5. The lead manager(s) shall ensure that the information contained in the draft offer document and offer document and the particulars as per restated audited financial statements in the offer document are not more than six months old from the issue opening date.

Filing of the draft offer document and offer document

1. Prior to making an initial public offer, the issuer shall file three copies of the draft offer document with the concerned regional office of the Board under the jurisdiction of which the registered office of the issuer company is located, in accordance with Schedule IV , along with fees as specified in Schedule III , through the lead manager(s).

NOTES

2. (2) The lead manager(s) shall submit the following to the Board along with the draft offer document: a) a certificate, confirming that an agreement has been entered into between the issuer and the lead manager(s); b) a due diligence certificate as per Form A of Schedule V ; c) in case of an issue of convertible debt instruments, a due diligence certificate from the debenture trustee as per Form B of Schedule V ;
3. The issuer shall also file the draft offer document with the stock exchange(s) where the specified securities are proposed to be listed, and submit to the stock exchange(s), the Permanent Account Number, bank account number and passport number of its promoters where they are individuals, and Permanent Account Number, bank account number, company registration number or equivalent and the address of the Registrar of Companies with which the promoter is registered, where the promoter is a body corporate.
4. The Board may specify changes or issue observations, if any, on the draft offer document within thirty days from the later of the following dates: a) the date of receipt of the draft offer document under sub - regulation (1); or b) the date of receipt of satisfactory reply from the lead manager (s) , where the Board has sought any clarification or additional information from them; or c) the date of receipt of clarification or information from any regulator or agency, where the Board has sought any clarification or information from such regulator or agency; or d) the date of receipt of a copy of in - principle approval letter issued by the stock exchange(s).
5. If the Board specifies any changes or issues observations on the draft offer document, the issuer and lead manager(s) shall carry out such changes in the draft offer document and shall submit to the Board an updated draft offer document complying with the observations issued by the Board and highlighting all changes made in the draft offer document and before filing the offer documents with the Registrar of Companies or an appropriate authority, as applicable.
6. If there are any changes in the draft offer document in relation to the matters specified in Schedule XVI , an updated offer document or a fresh draft offer document, as the case may be, shall be filed with the Board along with fees specified in Schedule III .
7. Copy of the offer documents shall also be filed with the Board and the stock exchange(s) through the lead manager(s) promptly after 19 [filing] the offer documents with Registrar of Companies
8. The draft offer document and the offer document shall also be furnished to the Board in a soft copy.
9. The lead manager(s) shall submit the following documents to the Board after issuance of observations by the Board or after expiry of the period stipulated in sub - regulation (4) of regulation if the Board has not issued

NOTES

observations: a) a statement certifying that all changes, suggestions and observations made by the Board have been incorporated in the offer document; b) a due diligence certificate as per Form C of Schedule V , at the time of 2of the offer document; c) a copy of the resolution passed by the board of directors of the issuer for allotting specified securities to promoter(s) towards amount received against promoters' contribution, before opening of the issue; d) a certificate from a statutory auditor, before opening of the issue, certifying that promoters' contribution has been received in accordance with these regulations, accompanying therewith the names and addresses of the promoters who have contributed to the promoters' contribution and the amount paid and credited to the issuer's bank account by each of them towards such contribution; e) a due diligence certificate as per Form D of Schedule V , in the event the issuer has made a disclosure of any material development by issuing a public notice pursuant to para 4 of Schedule IX.

Draft offer document and offer document to be available to the public

1. The draft offer document filed with the Board shall be made public for comments, if any, for a period of at least twenty one days from the date of filing, by hosting it on the websites of the Board, stock exchanges where specified securities are proposed to be listed and lead manager(s) associated with the issue.
2. The issuer shall, within two days of filing the draft offer document with the Board, make a public announcement in one English national daily newspaper with wide circulation, one Hindi national daily newspaper with wide circulation and one regional language newspaper with wide circulation a t the place where the registered office of the issuer is situated, disclosing the fact of filing of the draft offer document with the Board and inviting the public to provide their comments to the Board, the issuer or the lead manager(s) in respect of the disclosures made in the draft offer document
3. The lead manager(s) shall, after expiry of the period stipulated in sub - regulation (1), file with the Board, details of the comments received by them or the issuer from the public, on the draft offer document, during that period and the consequential changes, if any, that are required to be made in the draft offer document.
4. The issuer and the lead manager(s) shall ensure that the offer documents are hosted on the websites as required under these regulations and its contents are the same as the versions as filed with the Registrar of Companies, Board and the stock exchanges, as applicable.
5. The lead manager(s) and the stock exchanges shall provide copies of the offer document to the public as and when requested and may charge a reasonable sum for providing a copy of the same.

NOTES

Face value of equity shares

The disclosure about the face value of equity shares shall be made in the draft offer document, offer document, advertisements and application forms, along with the price band or the issue price in identical font size.

Pricing

The issuer may determine the price of equity shares, and in case of convertible securities, the coupon rate and the conversion price, in consultation with the lead manager(s) or through the book building process, as the case may be.

The issuer shall undertake the book building process in the manner specified in Schedule XIII.

Underwriting

(1) If the issuer making an initial public offer, other than through the book building process, desires to have the issue underwritten, it shall appoint underwriters in accordance with the Securities and Exchange Board of India (Underwriters) Regulations, 1993.

(2) If the issuer makes a public issue through the book building process,

a. the issue shall be underwritten by lead manager(s) and syndicate member(s): Provided that at least seventy five per cent. of the net offer proposed to be compulsorily allotted to qualified institutional buyers for the purpose of compliance of the eligibility conditions specified in sub - regulation (2) of regulation 6, cannot be underwritten.

b. the issuer shall, prior to filing the prospectus, enter into underwriting agreement with the lead manager(s) and syndicate member(s), indicating therein the number of specified securities which they shall subscribe to at the predetermined price in the event of under - subscription in the issue.

c. if the syndicate member(s) fail to fulfil their underwriting obligations, the lead manager(s) shall fulfil the underwriting obligations.

d. the lead manager(s) and syndicate member (s) shall not subscribe to the issue in any manner except for fulfilling their underwriting obligations.

e. in case of every underwritten issue, the lead manager(s) shall undertake minimum underwriting obligations as specified in the Securities and Exchange Board of India (Merchant Bankers) Regulations, 1992.

Where the issue is required to be underwritten, the underwriting obligations should at least to the extent of minimum subscription.

Monitoring agency

1. If the issue size, excluding the size of offer for sale by selling shareholders, exceeds one hundred crore rupees, the issuer shall make arrangements for

NOTES

the use of proceeds of the issue to be monitored by a public financial institution or by a scheduled commercial bank named in the offer document as bankers of the issuer : Provided that nothing contained in this clause shall apply to an issue of specified securities made by a bank or public financial institution or an insurance company.

2. The monitoring agency shall submit its report to the issuer in the format specified in Schedule XI on a quarterly basis, till at least ninety five per cent. of the proceeds of the issue, excluding the proceeds raised for general corporate purposes, have been utilised.
3. The board of directors and the management of the issuer shall provide their comments on the findings of the monitoring agency as specified in Schedule XI .
4. The issuer shall, within forty five days from the end of each quarter, publicly disseminate the report of the monitoring agency by uploading the same on its website as well as submitting the same to the stock exchange(s) on which its equity shares are listed.

Check Your Progress

1. What are the terms used for capital issue?
2. State the difference between IPO and private placement.
3. What are the eligibility criteria regarding net assets for initial public offer?

5.4 DIFFERENT SOURCES OF CORPORATE FINANCE

In this section, you will learn about certain special sources of corporate finance.

5.4.1 Bridge Finance

The term 'Bridge Finance refers to the loans taken by firms, generally from commercial banks pending disbursement of term loans from financial institutions, viz.. IDBI. IFCI, ICICI. etc. It may be noted that there is always a time gap between the date of sanctioning of a loan and its disbursement by the financial institution to the concerned borrowing firm. In order to prevent delay in starting their projects, the firms arrange from the commercial banks short-term loans which are later on repaid as and when term loan disbursements are received from the financial institution.

The bridge finance is secured against mortgage of fixed properties and/or hypothecation of movable properties of the borrowing firm. The rate of interest on such a finance is usually higher than that on term loans.

NOTES

5.4.2 Loan Syndication

Loan syndication involves commitments for term loans from the financial institutions and banks for financing a particular project. In other words, in loan syndication, two or more financial institutions/banks agree to finance a particular project. One of the institutions may become a lead institution and bring about coordination in the financing arrangements of different financial Institutions/banks.

A loan syndication arrangement may be made in any of the following ways:

1. The borrower may directly make the loan application to a lead financial Institution, which in turn gets in touch with other financial Institutions banks interested in participating in the financial assistance to the borrower. The advantage of such arrangement would be that the borrower would not have to approach different financial institutions.
2. The borrower may approach a merchant bank to arrange for a loan syndication for him. The merchant bank discusses the matter with the financial institution interested in working as a lead financial institution. The merchant bank submits a formal application to the financial institution for the term loan. On receiving such an application the financial institution examines the proposal before accepting it for loan syndication.

The steps involved in a loan syndication arrangement can be put as follows:

1. Preparation of the project report,
2. Preparation of loan application,
3. Selection of the financial institution for loan syndication,
4. Receipt of sanction letter or letter of intent from the financial institution,
5. Compliance of the terms and conditions of the loan agreement by the borrower,
6. Documentation, and
7. Disbursement of loan.

5.4.3 Book Building

Book building is the process through which the prices of IPOs (securities issued first time for public) are obtained through the demand of market. Through the mechanism of book building, the companies can rise capital from general public by offering initial public offers (IPOs) as well as by issuing follow-on public offers (FPOs). Under the process of book building, the investors send their bids at the price which seem reasonable under a price range. The prices quoted by both small investors (retail investors) and big investors (wholesale investors/ institutional investors) are considered to identify the right price of security. There is a closing date of the bid and then the bids given by all the investors are evaluated. The price thus obtained is the outcome of price generated by the demand of public issue.

NOTES

The process of book building followed by companies on Bombay Stock Exchange is as follows:

- The issuer who is planning an IPO nominates a leading merchant banker as a 'book runner'.
- The issuer specifies the number of securities to be issued and the price band for orders.
- The issuer also appoints syndicate members with whom orders can be placed by the investors.
- Investors place their orders with a syndicate member who inputs the orders into the 'electronic book'. This process is called 'bidding' and is similar to open auction.
- A book should remain open for a minimum of five days.
- Bids cannot be entered less than the floor price.
- Bids can be revised by the bidder before the issue closes.
- On the closure of the book building period, the 'book runner' evaluates the bids on the basis of the evaluation criteria which may include -
    - o Price aggression
    - o Investor quality
    - o Earliness of bids, etc.
- The book runner and the company conclude the final price at which the company is willing to issue the stock and allocate securities.
- Generally, the number of shares is fixed; the issue size gets frozen based on the price per share discovered through the book building process.
- Allocation of securities is made to the successful bidders.
- Book building is a good concept and represents a capital market which is in the process of maturing.

5.4.4 Borrowings from Term Lending Institutions

Term loans refer to the types of loans which are repaid in regular payments over a certain period of time. Its duration can be anywhere between one to thirty years. There are many different financial institutions in India which are involved in providing term loans to the industry including Government institutions like IFCI, IDBI, IIBI, IDFC, TFCI and EXIM banks are UTI, LIC, SFCs, SIDCs, etc. The lending terms of these financial lending institutions are under the regulation of guidelines released by the Government of India.

Appraising Term Loans

The final structure of financing emerges after taking into account promoters' contribution, debt-equity ratio, debt service coverage ratio and security margin.

NOTES

While the normal norm for promoters' contribution is 22.5 per cent of project cost, the debt-equity ratio is 3:1 for small industrial units and 2:1 for medium and large units. While computing debt-equity ratio, unsecured loans from friends and relatives and capital incentives are considered a part of equity. Debt-equity ratio by and large constitutes an upper limit. The financial institution determines the proportion of debt in capital structure on the basis of the nature of the project (capital-intensive or otherwise), the ability of the project to service debt in reasonable time and the priority of the industry in government policy into which the project falls.

Debt Service Coverage Ratio (DSCR)

The payment of interest and repayment of principal within the stipulated time is measured by DSCR. Gross cash accruals are related to the project's liability in respect to interest and payment of the instalment towards the principal. The gross cash accruals should normally be 1.6 to 2 times of this to ensure that the project has inherent strength and potential to service debt.

Security Margin

The term loan is sanctioned against the security of fixed assets. The security margin represents the excess value of fixed assets over the term loan. Normally, the term loan is 75 per cent of the value of fixed assets. The security margin is 25 per cent.

Terms and Conditions for Grant of Loans

Term loans are granted subject to the following terms and conditions:

- Clean title to land as security.
- Insurance of assets, building and machinery separately.
- Scrutiny of articles of association to ensure that it does not contain any restrictive clause against covenants of the financial institutions.
- Lien on all fixed assets.
- Personal and corporate guarantees of major shareholders and associate concerns.
- Undertaking from promoters to finance shortfalls in funds/cost overrun.
- Approval of appointment of managerial personnel by DFI.
- Further capital expenditure only on the approval of DFI.
- Payment of dividend and issue of bonus shares subject to the approval of the financial institution.
- Undertaking for non-disposal of promoters' shareholding for a period of three years.

After the loan is sanctioned, the requirements to be met are:

- Acceptance of terms and conditions of loans

NOTES

- Deposit of legal charges
- Details for plot or land for project
- Search report and title deeds for the land
- General body resolution for creation of charge over assets
- Pollution clearance
- Legal documents to create a charge in proposed assets
- Personal guarantees and undertakings along with income tax and wealth tax clearance of the promoters and director
- Architects and auditor's certificate for civil construction.

Before the loan is disbursed, documents have to be executed and submitted. Stamp duty and registration fees have to be paid, subscribed and paid-up capital is to be brought in by the promoters as required by the DFI and creation and registration of charge on the present and future assets of the company.

After these requirements are complied with, disbursements are made on the basis of assets created at the site. There has to be a security matching every disbursement starting with land and buildings. The balance after the security margin is paid by the DFI. As machines arrive, term loan is disbursed at 75 per cent of their value, the cheque being made in the name of the supplier. In the case of large projects, disbursements are need-based. In such cases, promoters have to bring in their entire contribution first.

In some cases, after the term loan is sanctioned, a bridge loan is granted against a bank guarantee. The bank in turn disburses the loan in parts ensuring that machines or assets are on site. This is done in special cases where it is physically not possible to inspect each machine as it arrives because of locational factors or to overcome procedural problems such as establishing clean title and pollution clearance which require time.

Term Loans from Development Banks

Finance Institutions (DFIs) or development banks starting with the Industrial Finance Corporation of India and the State Finance Corporations to assist the promotion and financing of fixed assets of industrial units have been in existence since 1948. Now, at the all-India level, there are the Industrial Development Bank of India, Industrial Investment Bank of India Ltd (IIBI), Industrial Development Finance Company Ltd and Small Industries Development Bank of India.

5.4.5 Borrowings from International Capital Market

Indian corporates can access international capital markets through external equity and commercial borrowings. During the last few years, huge resources have also been raised from the international capital markets by way of Global Depository

Receipts/American Depository Receipts (GDRs/ADRs), foreign currency convertible bonds (FCCBs) and external commercial borrowings (ECBs).

The government, however, keeps a close watch on the build-up of debt to ensure that it remains within manageable limits. As a part of prudent debt management, the approvals are subject to an overall ceiling with a policy preference in favour of infrastructure and export sectors. To elongate the maturity profile of the external debt, the policy favours long-term borrowings. For these purposes, borrowings with an original maturity of eight years and above, although subject to approval, have been kept outside the overall ceiling. Similarly, the policy towards short-term credit has been to keep such exposures under strict control. Consequently, short-term credits are allowed only for the purposes of imports and are subject to an overall ceiling.

Scope

External Commercial Borrowings (ECBs) include commercial bank loans, buyer's credit, suppliers' credit, securitized instruments such as Floating Rate Notes and Fixed Rate Bonds, etc., credit from official export credit agencies and commercial borrowings from the private sector window of Multilateral Financial Institutions such as International Finance Corporation (Washington), ADB, AFIC, CDC, etc.

Table 5.1 *Forms of ECB and Eligible Borrowers*

Parameters	FCY denominated ECB	INR denominated ECB
Currency of borrowing	Any freely convertible Foreign Currency	Indian Rupee (INR)
Forms of ECB	Loans including bank loans; floating/ fixed rate notes/ bonds/ debentures (other than fully and compulsorily convertible instruments); Trade credits beyond 3 years; FCCBs; FCEBs and Financial Lease.	Loans including bank loans; floating/ fixed rate notes/bonds/ debentures/ preference shares (other than fully and compulsorily convertible instruments); Trade credits beyond 3 years; and Financial Lease. Also, plain vanilla Rupee denominated bonds issued overseas, which can be either placed privately or listed on exchanges as per host country regulations.
Eligible borrowers	All entities eligible to receive FDI. Further, the following entities are also eligible to raise ECB: i. Port Trusts; ii. Units in SEZ; iii. SIDBI; and iv. EXIM Bank of India.	a) All entities eligible to raise FCY ECB; and b) Registered entities engaged in micro-finance activities, viz., registered Not for Profit companies, registered societies/trusts/ cooperatives and Non-Government Organisations.

Source: *https://www.rbi.org.in/Scripts/BS_ViewMasDirections.aspx?id=11510*

As per RBI's Master Direction - External Commercial Borrowings, Trade Credits and Structured Obligations (Updated as on August 08, 2019):

Limit and leverage: Under the aforesaid framework, all eligible borrowers can raise ECB up to USD 750 million or equivalent per financial year under the automatic route. Further, in case of FCY denominated ECB raised from direct foreign equity holder, ECB liability-equity ratio for ECB raised under the automatic route cannot exceed 7:1. However, this ratio will not be applicable if the outstanding amount of all ECB, including the proposed one, is up to USD 5 million or its equivalent. Further, the borrowing entities will also be governed by the guidelines on debt equity ratio, issued, if any, by the sectoral or prudential regulator concerned.

NOTES

Procedure of raising ECB: All ECB can be raised under the automatic route if they conform to the parameters prescribed under this framework. For approval route cases, the borrowers may approach the RBI with an application in prescribed format (Form ECB) for examination through their AD Category I bank. Such cases shall be considered keeping in view the overall guidelines, macroeconomic situation and merits of the specific proposals. ECB proposals received in the Reserve Bank above certain threshold limit (refixed from time to time) would be placed before the Empowered Committee set up by the Reserve Bank. The Empowered Committee will have external as well as internal members and the Reserve Bank will take a final decision in the cases taking into account recommendation of the Empowered Committee. Entities desirous to raise ECB under the automatic route may approach an AD Category I bank with their proposal along with duly filled in Form ECB.

Procedure for Approval

(*i*) The approval of the Department of Economic Affairs for all credit proposals would continue to be necessary where the loan is directly taken from a foreign lender by either the borrower as an actual user of the loan or by a financial intermediary signing a framework credit agreement. In the case of the latter, sub-borrowers under framework credit agreement would not need separate approvals from the government.

(*ii*) Applications should contain the following details:

(*a*) Approval of the relevant authorities for the import, where such approval is required.

(*b*) Details of offer from one or more lenders.

(*c*) Details of contact person/office with telephone numbers to enable quick reference to be made, if clarifications are needed.

(*iii*) The approval letter will be issued by the ECB Division of the Department of Economic Affairs, Ministry of Finance.

5.5 TAX CONSIDERATIONS IN FINANCING DECISION AREAS

The income of all firms is subject to tax at the rates determined by the Finance Act passed every year by the Parliament. Tax implications are important both at the time of planning for raising of funds as well as their utilisation. The present section deals with the importance of taxation provisions in the financial planning. It also briefly explains certain specific provisions of the Income Tax Act, granting concessions to assesses for accelerating industrial growth.

Taxation Provisions and Financial Planning

Taxation provisions have a significant effect on the financial planning of a firm as discussed below.

NOTES

(i) Determination of Capital Structure of the Firm

While determining the capital structure of the firm, i.e., the debt-equity mix, the tax implications play an important role. The funds can be raised either through shares or loans including debentures. Dividend paid on share capital is not deductible as an expense for tax purposes while interest paid on loans is deductible as an expense. Hence, raising money through loans is cheaper, as compared to raising money through shares. In case of companies it makes a substantial difference, since the total income tax liability in their case is around 35% of their taxable income.

(ii) Capital Budgeting Decisions

While taking capital budgeting decisions, tax implications are considered. For example, in order to decide about the amount of investment required in a capital investment project, the following amounts are considered:

(a) The amount of tax the company will be in a position to save on account of writing off the loss on the sale of the old assets.

(b) The amount of tax the company may be required to pay on any profit made on the sale of the old asset.

(c) The amount of tax the company will be in a position to save because of initial depreciation or investment allowance or any other benefit on acquisition of new plant or machinery, ship of aircraft etc. It may be noted that investment allowance has been discontinued in India w.e.f. April 1st, 1990, However additional depreciation at the rate of 20% of actual cost of the new plant and machinery acquired after March 31st, 2005 is allowed as a deduction from business income.

(d) The amount of tax saved by the company on account of depreciation on the asset being allowed as a business expense for tax purposes.

(iii) Dividend Decisions

While taking the dividend decision, the finance manager does take into account the tax implications. According to the present taxation provisions, a company is required to pay dividend tax of 15% on the amount of dividend distributed by it. The dividend income is tax free in the hands of the shareholder. However, he does not get any credit for the tax paid by the company. Hence, in case of companies with a high growth rate it will be advisable to retain the earnings rather than distributing them in the form of dividends. In any case, if dividends are to be paid, it will be beneficial to pay such dividends in the form of shares as compared to cash dividends, since dividends in the form of shares (i.e., bonus shares) are subject to lower rate of tax.

NOTES

(iv) Method of Depreciation

While taking decision about the method of depreciation tax implications are taken into account. For example, if it is desired to make larger funds available in the initial years of the project by making savings on account of taxation, it will be better to charge depreciation according to diminishing balance method as compared to fixed instalment method. This is because the rate of depreciation in case for diminishing balance method is generally three times of the rate of depreciation in case of fixed instalment method to write off the asset during its effective life.

Check Your Progress

4. What is bridge finance secured against?
5. What is debt service coverage ratio?
6. Mention the various ways in which Indian corporates can access international capital markets.
7. Why is it said that it is beneficial for companies to pay dividends in the form of shares as compared to cash dividends?

5.6 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Capital issue is also known as issued capital and subscribed capital.
2. There is a difference between IPO and private placement. In case of IPOs, an unlisted company gives the public offer to buy the securities of the company but in case of private placements, only a selected set of people/ institutes are given offer to apply for the shares.
3. An issuer shall be eligible to make an initial public offer only if: it has net tangible assets of at least three crore rupees, calculated on a restated and consolidated basis, in each of the preceding three full years (of twelve months each), of which not more than fifty per cent. are held in monetary assets: Provided that if more than fifty per cent. of the net tangible assets are held in monetary assets, the issuer has utilised or made firm commitments to utilise such excess monetary assets in its business or project; Provided further that the limit of fifty per cent. on monetary assets shall not be applicable in case the initial public offer is made entirely through an offer for sale.
4. The bridge finance is secured against mortgage of fixed properties and/or hypothecation of movable properties of the borrowing firm.

5. In term loans, the payment of interest and repayment of principal within the stipulated time is measured by DSCR. Gross cash accruals are related to the project's liability in respect to interest and payment of the instalment towards the principal.
6. Indian corporates can access international capital markets through external equity and commercial borrowings. During the last few years, huge resources have also been raised from the international capital markets by way of Global Depository Receipts/, foreign currency convertible bonds and external commercial borrowings.
7. It is said that it will be beneficial to pay dividends in the form of shares as compared to cash dividends, since dividends in the form of shares (i.e., bonus shares) are subject to lower rate of tax.

5.7 SUMMARY

- Capital issue or issued capital refers to the number of shares issued by an organization to its shareholders.
- Management of capital issues in India is a professional service rendered by merchant bankers.
- The management of capital issues in both phases is regulated and monitored by SEBI.
- Security issues can be classified into following categories: public issue, right issues, bonus issue, private placements, etc.
- The role of SEBI is to not only monitor the activities happening in the market but also to regulate it in the interest of the investors. It also seeks to maintain a level of transparency in the market dealings.
- The latest SEBI (Issue of Capital and Disclosures Requirements) Regulations came out in the year 2018. It has been amended several times since, the latest being in January 2021.
- There are a total of twelve main chapters dealing with different aspects like: Preliminary, Initial Public Offer on Main Board, Rights Issue, Further Public Offer, Preferential Issue, Qualified Institutions Placement, Initial Public Offer of Indian Depository Receipts, Rights Issue of Indian Depository Receipts, Initial Public Offer by Small and Medium Enterprises, Innovators Growth Platform, Bonus Issue, Power to Relax Strict Enforcement of The Regulations and Miscellaneous.
- There are many sources of corporate finance including bridge finance, loan syndication, book building, borrowings from term lending institutions and international capital markets.

NOTES

5.8 KEY WORDS

- **Capital issue:** Also known as issued capital, it refers to that part of an authorized capital, which an organization is authorized to sell through the shares.
- **Public issue:** It is that form under which general public is approached to raise the capital.
- **Bridge finance:** It refers to the loans taken by firms, generally from commercial banks pending disbursement of term loans from financial institutions.
- **Loan syndication:** It involves commitments for term loans from financial institution and banks for financing a particular project.
- **Book building:** It is a process through which the prices of IPOs are obtained through the demand of the market.

5.9 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short-Answer Questions

1. What are the functions involved is capital issue management?
2. Mention the phases under which the procedures and practices for managing public issues.
3. What is bridge finance?
4. What are the different forms of a loan syndication arrangement? List the steps involved.
5. Write a short note on borrowings from the international capital markets.

Long-Answer Questions

1. Describe the categories of security issues.
2. Discuss the SEBI (Issue of Capital and Disclosures Requirements) regulations, 2018 regarding eligibility criteria for any company issuing securities.
3. What are the general conditions applicable in case of public issue?
4. Discuss the concept and process of book building followed by BSE.
5. Explain the meaning and appraisal of term loans in India.

5.10 FURTHER READINGS

Patel, Bhavesh. 2014. *Fundamentals of Financial Management*. New Delhi: Vikas Publishing House.

Khan, M.Y. and Jain, P.K. 2007. *Financial Management- Text Problems and Cases.* New Delhi: Tata McGraw-Hill.

Chandra, Prasanna. 2004. *Financial Management: Theory and Practice.* New Delhi: Tata McGraw-Hill.

Kulkarni, P.V. and B. G. Satyaprasad. 2002. *Financial Management.* New Delhi: Himalaya Publication House.

Website

Securities and Exchange Board of India (Issue of Capital and Disclosure Requirements) Regulations 2018 [Last amended on January 08, 2021] <https://www.sebi.gov.in/legal/regulations/jan-2020/securities-and-exchange-board-of-india-issue-of-capital-and-disclosure-requirements-regulations-2018-last-amended-on-january-08-2021-_41542.html>

RBI's Master Direction - External Commercial Borrowings, Trade Credits and Structured Obligations 2019 <https://www.rbi.org.in/Scripts/BS_ViewMasDirections.aspx?id=11510>

NOTES

UNIT 6 COST OF CAPITAL

NOTES

Structure

6.0 INTRODUCTION

Cost of capital is used by companies in order to evaluate new projects. In terms of accounting, it may be defined as the cost of a company's funds which includes both debt and equity. Basically, it serves as a benchmark which a company sets for its new projects. The cost of capital should be considered while taking investment decisions for a company.

In this unit, we will discuss the meaning and importance of cost of capital, analyse the various types of cost of capital and also understand the methods of calculating various components of cost of capital in detail.

6.1 OBJECTIVES

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

- Explain the meaning of cost of debt
- Describe the cost of preference capital
- Examine the cost of equity capital

- Discuss the costs of retained earnings and depreciation
- Explain the computation of overall cost of capital
- Assess the EBIT and EPS analysis
- Discuss the tax, capital structure and value nexus

NOTES

6.2 CONCEPT OF COST OF CAPITAL AND TAX

Just as a benchmark gives clear direction regarding what is expected from an individual, similarly cost of capital reflects whether an investment decision is worthy for the organization or not.

Capital, in general, is known as a mix of long term source of finance which includes equity share capital, preference share capital and debentures or debt capital. Sometimes retained earnings are also shown as a component of capital.

Cost of Capital

The three basic components of capital, i.e., equity share capital, preference share capital and debentures/bonds or debt capital, are actually the funds raised by a company from different stakeholders or investors. The fund providers of the company want some reward for their investment too. Basically, the reward which is expected by different long term fund providers to the company is known as cost of capital. The reward given to equity shareholders in the form of dividend, reward given to debenture holders in the form of interest and reward given to preference shareholders in the form of fixed dividend are cost of funds for the company. So, it can be stated that the finance managers must invest these long term sources of funds in such a manner that they are able to bear the cost of various components of capital, i.e., equity, preference and debt. The cost of individual component of capital is known as cost of that specific component, viz., cost of equity (ke), cost of preference (kp), and cost of debt (kd), and total cost of all the components of capital is known as weighted average cost of capital (WACC) because it is calculated by taking the weighted average of various components of capital. The finance managers are required to take only those opportunities for investment decisions which are providing minimum returns which is equal to overall cost of capital, i.e., WACC (weighted average cost of capital).

In nutshell, the cost of capital is the minimum required rate of return which a firm must earn to keep the market value of the company unchangeable.

Explicit and implicit cost of capital: The cost of equity, preference and debt is known as explicit or direct cost of capital while cost of retained earnings is known as implicit cost or indirect cost of capital. The retained earnings are the equity shareholders' funds on which the company has to bear an opportunity cost. These funds or retained earnings are actually not raised from equity shareholders

NOTES

but are with the company itself which are undistributed profits of equity shareholders. Therefore, no issuing cost or floatation cost is incurred by the company on retained earnings as a source of long term fund. These funds are of equity shareholders' funds and if these funds have been distributed to equity shareholders then, they would have been investing their money in their own way. Therefore, the cost of retained earnings is also known as opportunity cost of capital to company.

Importance of Cost of Capital

Let us discuss the relevance or importance of cost of capital from different perspectives:

- **Serves as a benchmark to take capital budgeting decisions**: The cost of capital serves as a benchmark for capital budgeting decision. In order to discount the cash flows or to calculate the present value of cash flows for checking whether a capital budgeting decision is to be accepted or rejected, it is the cost of capital rate which is used to calculate the present value of cash flows. It is also known as cut-off rate or hurdle rate.
- **To take optimum capital structure decision**: The optimum capital structure is that capital mix where the wealth of the shareholders is maximized or where the WACC or weighted average cost of capital is minimum. Hence, cost of capital serves as a basic decision criteria to determine optimum capital structure decision.
- **Helpful in taking various financial decisions**: The cost of capital helps to take a better dividend decision by the finance managers. The amount of profit that can be distributed as dividend and the amount of it which is to be retained depends upon its impact on the overall cost of raising funds, both explicit and implicit. Similarly, investment decision in current assets is also affected by the cost of capital to the business. Similarly, any decision taken by finance managers may have implication on overall value of business and hence affects the cost of capital. Therefore, cost of capital serves as a decision criterion for various finance decisions taken by financial managers.

6.2.1 Two Angles of Cost of Capital

Returns expected by investors, and cost incurred by the firm are the two sides of the same coin. However, both are usually not the same. The readers must try to understand the difference so that the different methods of calculating the cost of capital can be understood in the right perspective.

The cost incurred by a firm and the return received (or, expected) by shareholders vary due to many factors. These factors are depicted in Figure 6.1.

NOTES

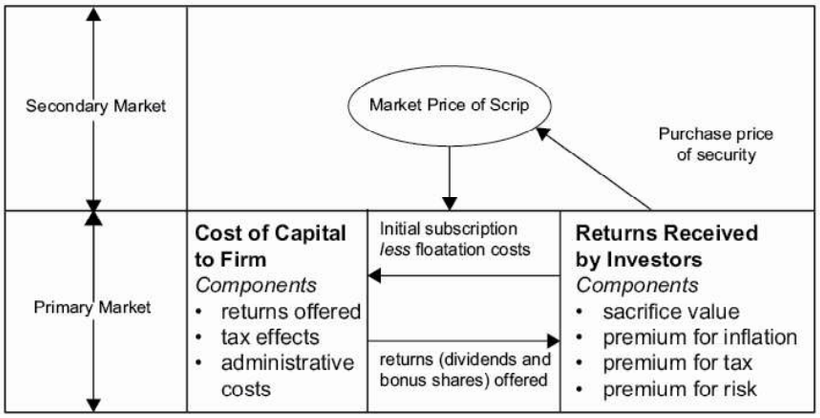


Fig. 6.1 *Gaps between the Firm's Cost and Investors' Return*

The firm does not get the same amount as the investors subscribe, and the investors do not receive the same amount what the company pays in the form of either interest or dividends. A mechanism exists by which investors can express their dissatisfaction about the performance of the company. This mechanism is provided by the stock markets, where price movement is the manifestation of investors' satisfaction or dissatisfaction.

The gap between the economists' concept of the cost of capital (i.e., investor expectations) and that of corporate finance (i.e., firm's cost of capital) is created by factors like,

- tax structure (corporate and personal)
- transaction cost, at times called floatation cost or issue cost, and
- pricing of the issue.

A company is able to deploy lesser funds than what is supplied by investors. The company's income and debt servicing are subject to tax as per the law of the land. Corporate tax rates and personal tax rates are usually different. The tax system provides tax incentives and disincentives. They create a gap between cost to the firm and returns to investors. Future issue of scrip can be priced around the prevailing market price of share, after keeping a reasonable margin. Therefore, while estimating the future cost of funds, a firm cannot neglect the current market price of securities and possible price of future issues (together with floatation costs). These factors are displayed in Figure 6.1. These differences are taken care of in the equation used to calculate cost of individual securities. In the next section, we will be going into the section on the cost of individual funds where we will go over investor perspectives as well as company perspectives in.

NOTES

6.2.2 Cost of Debt and Tax

Let us look at the cost of debt first from the perspective of a firm and then from the perspective of an investor. The cost of debt from a firm's perspective is developed in three stages, first without tax and floatation cost, then with tax and finally with floatation cost. From the investor perspective K_d is called a bond-yield. An explanation as to why a firm has to first calculate the cost of debt from the investor's angle and adjust that with tax and floatation cost has been given towards the end of the chapter.

In every situation, and in both the perspectives, if you identify the net cash flows over the time line, you can calculate the rate, which is K_d from the company perspective and rate of return from investor perspective.

K_d from company perspective: The cost of bonds or debentures issued by a firm is first explained with the assumption of no tax and no floatation cost. Subsequently, tax and floatation costs are introduced.

***K_d* without tax and floatation cost:** The basic calculation of the cost of debt (K_d) can be better understood if we assume that there is no tax and no transaction cost. Annual interest is paid at a fixed rate, and the maturity amount is the same as the initial investment. The discount rate, at which the present value of the debt servicing cash flow is equal to the value of debt, is the cost of debt. That means here we need to calculate i or the rate. We will use the equation given below:

$$PV = \frac{CF_1}{(1+i)^1} + \frac{CF_2}{(1+i)^2} + \frac{CF_3}{(1+i)^3} + \ldots\ldots\ldots + \frac{CF_n}{(1+i)^n} \quad (6.1)$$

Or,

$$PV_{i,n} = \sum_{t=1}^{n} \frac{CF_t}{(1+i)^t} \quad (6.2)$$

where, $i = K_d$ = cost of debt; or the rate at which the present value of the cash flow stream is equal to the par value of the debt

CF_t = cash flow in year t. The cash flow here is interest payment each year and also repayment of par value in the last period.

If interest is paid at a constant rate, and if the issue and repayment prices are equal, Equation 6.2 will be derived into equation 6.3 as follows:

$$K_d = \frac{CF}{P_0} \quad (6.3)$$

where, $K_d = i$

P_o = bond price at period zero or par value

Example 6.1(a): Cost of Debt without Tax and Floatation Cost

Company-A has borrowed a sum of ₹ 1,000 at the interest rate of 15% per year. The interest is payable every year and the principal sum at the end of 5th year. What is the cost of borrowings?

Solution: Using Equation 6.1 or Equation 6.2,

$$₹1,000 = \frac{150}{(1+i)^1} + \frac{150}{(1+i)^2} + \frac{150}{(1+i)^3} + \frac{150}{(1+i)^4} + \frac{150+1,000}{(1+i)^5}$$

Solving for i,

$$i = K_d = 15\%$$

In this case we can use Equation 6.3 because equal interest is paid at the end of each period and borrowed amount and repayment amount are equal.

$$K_d = \frac{CF}{P_0} = \frac{150}{1,000} = 15\%$$

***K_d* with tax effect:** If interest payment is tax deductible, the firm's cost of debt would reduce. The basic Equation 6.2 can be modified to include the tax element, as below:

$$PV_{i,n} = \sum_{t=1}^{n} \frac{CF_t \times (1-T)}{(1+i)^t} \quad (6.4)$$

where, T = tax rate

Alternatively, Equation 6.3 can be rewritten as,

$$K_d = i = \frac{CF \times (1-T)}{P_0} \quad (6.5)$$

Example 6.1(b): Cost of Debt with Tax but Without Floatation Cost

In the Example 6.1a, if tax rate is 35%, what is the post-tax K_d of the firm?

Solution: Using Equation 6.5,

$$K_d = i = \frac{150 \times (1-0.35)}{1,000} = 9.75\%$$

***K_d* with floatation cost:** The floatation cost is incurred upfront, and the firm's receipt from the issue of bonds is reduced by the floatation costs. If floatation expenses are tax deductible in the year they are incurred then take initial cash inflow after tax savings on floatation costs.

Example 6.1(c): Cost of Debt with Tax and Floatation Costs

If a company, who issued bonds of ₹ 1,000 @ 15% for 5 years, is in the 35% tax bracket, and incurred 10% issue price as floatation cost, what is its cost of debt? Assume that floatation cost is tax-deductible in the year it is incurred.

NOTES

Solution: The company's net receipt from the issue bonds is ₹ 1,000 less ₹ 1,000 × 0.10 × (1 – 0.35) = 1,000 – 65 = ₹ 935.

Annual interest payment after tax is ₹ 1,000 × 0.15 × (1 – 0.35) = ₹ 97.50

Repayment at the end of the 5th year is ₹ 1,000

Using Equation 6.1,

$$₹935 = \frac{97.50}{(1+i)^1} + \frac{97.50}{(1+i)^2} + \frac{97.50}{(1+i)^3} + \frac{97.50}{(1+i)^4} + \frac{97.50+1,000}{(1+i)^5}$$

Solving for i or K_d we get K_d = 6.53%

If floatation cost has been included in the project cash flow, then do not include it in the calculation of the cost of debt. This approach will make it simple to calculate the cost of debt, though it is not conceptually sound.

If bonds are issued at a discount or at a premium or if the bonds are payable at a discount or at a premium, the cash flow can be adjusted suitably in the respective year to find K_d adjusted for the cash flow to make the cost calculation pragmatic. The essence is—prepare a cash flow stream on a time line and find a rate at which the initial net receipt of the cash flow match with the present value of the future cash flows.

Example 6.2: Honest Company Limited (HCL)

Honest Company Limited (HCL) had issued 150,000 bonds of ₹100 each, carrying a coupon rate of 14%. The principal sum will be payable together with a 5% redemption premium, in three equal annual instalments starting from the end of year 3. The company incurred 10% of the issue size as floatation cost. If floatation cost is tax deductible in the first four years in equal amounts, and redemption premium is deductible fully in the year of payment, calculate the effective cost of bonds to HCL. The company is in the 35 per cent tax bracket. Calculate the net cash flow stream related to these bonds from the company perspective and determine the cost of bonds.

Solution: First let us calculate net cash flow over a 5-year period of the bonds.

(figures in '000)

Particulars	Y_0	Y_1	Y_2	Y_3	Y_4	Y_5
Issue Size	15,000					
Floatation Cost	–1,500					
Interest		–2,100	–2,100	–2,100	–1,400	–700
Repayment Principal				–5,000	–5,000	–5,000
Premium				–250	–250	–250
Tax Savings On Interest		735	735	735	490	245
Premium				87.5	87.5	87.5
Floatation Cost		131.25	131.25	131.25	131.25	
Net Cash flow	13,500.00	–1,233.75	–1,233.75	–6,396.25	–5,941.25	–5,617.50

Annual amortisation of floatation cost = 1,500 ÷ 4 = 375

Annual tax savings on floatation cost = 375 × 0.35 = 131.25

Tax savings on redemption premium = (15,000 ÷ 3) × 0.05 × 0.35 = 87.50

NOTES

$$₹13,500 = \frac{1,233.75}{(1+K_d)^1} + \frac{1,233.75}{(1+K_d)^2} + \frac{6,396.25}{(1+K_d)^3} + \frac{5,941.25}{(1+K_d)^4} + \frac{5,617.50}{(1+K_d)^5}$$

Solving for K_d; K_d = 12.24%

The terms and conditions of issue and tax implications of all the costs should be incorporated in the calculation. Readers would have observed the reasons for the gap between the firm's cost of bonds and interest received by HCL's bondholders.

K_d (yield) from the investor perspective

An investor's return would depend on a situation that involves buying, holding and selling alternative that the investor has chosen. Depending upon these options there could be four different situations and four different types of yields—(a) bond-yield if bonds are bought at the time of issue and held up to maturity, (b) bond-yield if bonds are bought at the time of issue and sold in the market after a certain holding period but before maturity, (c) bond-yield if bonds are bought from the market and held till maturity, and (d) bond-yield if bonds are bought from the market and sold before maturity. Let us look at these four alternatives with the help of an example.

Example 6.3A(i): Investor's Yield on Bond Investment

Ms. C is a prudent investor, who wants to invest in the fixed income securities of a business firm. After a careful study she chose to invest in the bonds of Company-Z which has some outstanding bonds traded in the market, and has currently offered the issue of new bonds. The information about Company Z's outstanding bonds and new issue of bonds is as follows:

Outstanding bonds Company-Z issued these 7-year ₹ 100 par value bonds two years back, carrying a 12% coupon rate payable every year and repayable on maturity at par. These bonds are currently traded at ₹ 95.30.

New issue of bonds Company-Z has offered the new bonds with par value of ₹ 100 and a 5-year maturity period carrying a 13.35 per cent coupon rate payable every year, repayable at par.

Calculate the rate of returns of Ms. C if she (a) buys the new bonds and holds up to maturity, (b) buys the new bonds and holds for two more years before selling them at ₹ 105, (c) buys the outstanding bonds from the market and holds up to maturity, (d) buys the outstanding bonds from the market and holds for two years before selling them at ₹ 97.50, and (e) buys the outstanding bonds but can sell them any time upon getting an opportunity. Assume no tax.

NOTES

Solution: We will take one bond for calculation purpose.

(a) **Yield-to-maturity (YTM):** Return on bonds bought from issue and held up to maturity new bonds are bought at ₹ 100 to receive ₹ 13.35 interest every year for five years and maturity amount of ₹ 100. Ms. C would get the following yield:

$$₹100 = \frac{13.35}{(1+i)^1} + \frac{13.35}{(1+i)^2} + \frac{13.35}{(1+i)^3} + \frac{13.35}{(1+i)^4} + \frac{13.35+100}{(1+i)^5}$$

Solving for i.

i = Yield to Maturity = 13.35% return

(b) **Holding period return (HPR):** Return on bonds bought from the issue and held for two years.

New bonds are bought at ₹ 100; interest of ₹ 13.35 is received for two years and the bonds are sold at ₹ 105 at the end of two years. Ms. C's holding period return (HPR) will be,

$$₹100 = \frac{13.35}{(1+i)^1} + \frac{13.35+105}{(1+i)^2} = 15.67\% \text{ HPR}$$

(c) **Yield-to-maturity (YTM):** Return on bonds bought from the market and held up to maturity

The outstanding bonds are bought from the market at ₹ 95.30; interest of ₹ 12 is received every year for the next five years and par value of ₹100 is received on maturity. Ms. C's yield to maturity (YTM) will be,

$$₹95.30 = \frac{12}{(1+i)^1} + \frac{12}{(1+i)^2} + \frac{12}{(1+i)^3} + \frac{12}{(1+i)^4} + \frac{12+100}{(1+i)^5} = 13.35\% \text{ YTM}$$

(d) **Holding period return (HPR):** Return on bonds bought from the market and held for two years

The outstanding bonds are bought from the market at ₹95.30; interest of ₹12 is received every year for the next two years and bonds are sold at ₹97.50 after two years. Ms. C's holding period return (HPR) will be,

$$₹95.30 = \frac{12}{(1+i)^1} + \frac{12+97.5}{(1+i)^2} = 13.67\% \text{ HPR}$$

(e) **Bond-yield (Current Yield):** Return on bonds bought from the market and can be sold any time

The outstanding bonds are bought from the market at ₹95.30 and Ms. C can sell them any time, her return (current yield or bond-yield) will be,

$$\text{Current (Bond) Yield} = \frac{\text{Interest Amount}}{P_0} \quad (6.6)$$

$$\text{Current (Bond) Yield} = \frac{\text{Interest Amount}}{P_0} = \frac{12}{95.30} = 12.59\% \text{ Current Yield or Bond-Yield}$$

Investor's return depends on a situation. Depending upon the situation the return is called either yield-to-maturity (TYM) or current-yield or bond-yield or holding period return (HPR). From a given situation prepare a cash flow stream over the time line and then calculate the rate at which the current price is equal to the present value of future cash flows from the bonds to get the yield on bonds for that situation..

Why the company should consider bond-yield as K_d

The yield on outstanding bonds indicates market returns expected by investors on outstanding bonds. New issue of bonds would foster interest only if it carries a coupon rate which is at least equal to the yield on the outstanding bonds. It should be further adjusted against tax and floatation cost to get the firm's K_d on the new bonds.

The cost of new bonds is calculated in two steps: (a) calculating the coupon rate for the new bonds, and then from it (b) calculating the cost of new bonds.

(a) Calculating coupon rate for new bonds: Coupon rate of new bonds is derived from the yield on outstanding bonds. However, it would depend on whether current yield or yield-to-maturity is taken as the basis for determining the coupon rate of the new bonds. Let us continue with Example 6.3A(i) to determine the coupon rate of new bonds.

Example 6.3A(ii): Determining Coupon Rate of New Bonds

Example 6.3A(i) was like this: Company-Z issued these 7-year ₹100 par value bonds two years back, carrying a 12% coupon rate payable every year with the bonds repayable at par. These bonds are currently traded at ₹95.30. Let us assume that Company Z announced its plan for new projects and their financing, and the market settled at ₹92.31 for these outstanding bonds after the announcement. If Company Z wants to issue new bonds now, what coupon rate must it offer?

Solution: Let us calculate the current-yield first and then yield-to-maturity before we discuss which yield should form the basis for determining the coupon rate of these new bonds. For this calculation we must take the new price after the announcement of the projects.

Current yield: The current yield is as follows:

$$\text{Current (Bond) Yield} = \frac{\text{Interest Amount}}{P_0} = \frac{12}{92.31} = 13.00\%$$

NOTES

Yield-to-maturity (YTM): The yield-to-maturity (YTM) is as follows:

$$₹92.31 = \frac{12}{(1+i)^1} + \frac{12}{(1+i)^2} + \frac{12}{(1+i)^3} + \frac{12}{(1+i)^4} + \frac{12+100}{(1+i)^5} = 14.25\% \text{ YTM}$$

Now, the question is, whether the current yield or yield-to-maturity shall become the basis for determining the coupon rate of new bonds. Or, shall we take into account some other considerations? The answer will be as follows:

In this example, if the new bonds have a maturity period of five years (equal to the time-to-maturity on outstanding bonds), then yield-to-maturity of 14.25 per cent must be the coupon rate of the new bonds. If maturity period of new bonds are yet to be decided then the current-yield of 13 per cent will give a good approximation of the coupon rate. If maturity period of the new bonds is longer than the time-to-maturity on outstanding bonds, then one needs to determine the coupon rate in two steps—(a) take YTM as the rate for the first five years and then estimate three components of interest rates, i.e., sacrificing premium, inflation and tax for the period beyond five years, and then (b) take geometric average of first five year's YTM and components of interest rate plus risk premium during that additional period. This approach is very difficult and therefore, one can calculate risk premium component in YTM and then add that on the risk-free securities of the matching maturity period to develop a coupon rate. One can instead, take the current yield and make some judgmental adjustments before a coupon rate is developed.

The actual rate offered will have to be slightly different, and perhaps more, than the one developed on the basis of current-yield or YTM. Investors who subscribe to the primary issue of bonds take some additional risk. The risk of not getting allotment of bonds, and the risk of changes in market rates between the period of applying and getting the allotment being the main risks. Of course, the coupon rate developed this way follows the assumption that the bonds will be issued at par, coupon will be paid annually and they will be repaid at par on maturity.

(b) Calculating cost of new bonds: Having developed the coupon rate of new bonds, calculation of cost of new bonds will follow the same steps as calculating the cost of outstanding bonds. Par value as initial cash inflow, followed by the coupon payment every year and par value repayment at the end of life will form the cash flow stream. Adjust this cash flow stream with floatation cost, if any, and if it is not included in the project cash flow. Finally make adjustment for tax savings on the coupon payment, or take the annual coupon payment after tax when cash flow stream is prepared.

If new bonds have a five year maturity (equal to the time-to-maturity of outstanding bonds) period, and if the Company Z is in the marginal tax rate of 35 per cent, then the cost of new bonds will be,

$$K_{d\,(new)} = \text{YTM} \times (1 - t) = 14.25\% \times (1 - 0.35) = 9.263\%$$

If the maturity period is not yet decided, and if we use current yield, then cost of new bonds will be,

$$K_{d\,(new)} = \text{Current yield} \times (1 - t) = 13\% \times (1 - 0.35) = 8.45\%$$

6.2.3 Cost of Preference Capital and Tax

NOTES

You must be aware that a preference share is a security with the features of both debentures as well as equity. Preference shares carry a fixed dividend rate, payable only if the company has earned a distributable profit, and also if the company decides to pay the dividends. It has to be paid before any dividend is paid to the equity shareholders. Preference shares can be:

(a) Redeemable or irredeemable

(b) Cumulative or non-cumulative

(c) Participative or non-participative

A provision of repayment of principal sum with or without premium makes it a redeemable preference share, and that has no bearings on the calculation of its cost. If preference shares are cumulative, the unpaid dividend in any year becomes payable first when company earns distributable profit and decides to pay dividends to its equity shareholders. Participative preference shareholders are entitled to participate in the extra dividend, if equity shareholders are paid dividend at a rate higher than the agreed rate.

Cost of non-participative non-redeemable preference shares

If preference shares are non-participative and non-redeemable, then cost of preference share (K_p) can be calculated in the same way as cost of debt (K_d), except the tax on dividend. Equation will be as follows:

$$P_0 = \sum_{t=1}^{n} \frac{D_t}{(1 + K_p)^t} \tag{6.7a}$$

where, P_o = price of preference shares

K_p = cost of preference shares

D_t = dividends in year t.

If the dividend rate is the same every year then Equation 6.7a can be rewritten as, (which is different in tax treatment when compared with Equation 6.5):

$$K_p = \frac{D}{P_0} \tag{6.8}$$

This equation is based on the assumption that dividends will be paid regularly. Dividend payment on preference shares is not a contractual liability of the firm, unlike interest on bonds and debenture.

NOTES

Cost of non-participative redeemable preference shares

The term F_n would appear in the equation if the preference share is redeemable. Equation 6.7a can be modified to include maturity value at the end of the cash flow stream, and we get the Equation 6.7b.

$$P_0 = \sum_{t=1}^{n} \frac{D_t}{(1+K_p)^t} + \frac{F_n}{(1+K_p)^n} \qquad (6.7b)$$

where, F_n = principal repayment in the year n.

In this case also we can use Equation 6.8 instead of 6.7b if we expect constant dividend cash flow and the redemption amount will be the same as initial issue price or par.

Cost of participative preference shares

Participative preference shares are closer to equity shares in terms of features. Participative preference shareholders get an additional dividend, if equity shareholders are paid dividend higher than agreed upon. For example, the condition for 14 per cent participative preference shares may be that, if equity shareholders get a dividend of more than 20 per cent, then additional dividend paid to equity shareholders will be payable to participative preference shareholders also. In that case K_p will be always lower by 6 per cent points (20 per cent – 14 per cent), assuming that risk of both are same. Since preference shareholders take less risk, the difference in cost will be somewhat higher than 6 per cent points.

6.2.4 Cost of Equity Capital and Approaches to Derive Cost of Equity and Tax

A firm's equity has two parts—equity share capital and retained earnings. Ownership of both these funds rests with shareholders. Hence, the cost of equity and the cost of retained earnings have much similarity, except the floatation cost and tax differentials, if any.

It is most difficult to calculate the cost of equity because servicing of this capital is not a contractual liability. The dividend payment is determined by two primary factors—one, distributable profit earned by the firm and two, the amount needed for reinvestment for financing the growth. In addition, a firm may occasionally build shareholders' reserves through sources other than retained profit, like through capital gains on sale of assets. In the absence of a known dividend obligation of the company, the dividend history can be studied for the projection of future dividends. The amount of dividend, even if 100 per cent profit is paid out, is always uncertain because future profit is uncertain. Therefore, if there are reasons to believe that the profit trend will change in the future, the investors respond through their decision to buy or sell the firm's shares. Equity share price,

NOTES

hence, become sensitive to the expected earnings of the firm, if rest of the things are constant. Due to these reasons, more than one model has been developed for the calculation of the cost of equity and each one considers the market value of equity shares.

Unlike in debt and preference shares, the relevance of company perspective in the cost of equity is limited to the adjustment of floatation cost and under-pricing of the issue of shares. A firm cannot neglect the market price of shares, even if it does not plan to come out with a public issue of shares in the near future. Since shareholders enjoy residual rights on the profits, the K_e keeps changing with the changing market expectations. If a firm is unable to earn sufficient profits to match the shareholders expectations, it may face a real threat of takeover. However, a closely held company may not attach much importance to market prices or K_e, perhaps because their expectations' are different.

Methods of calculating K_e: investor perspective

In the backdrop of the previous discussion let us see the various methods of calculating the cost of equity. They include:

- The dividend yield approach
- The earning price ratio
- The realized yield approach
- The bond-yield plus risk premium
- The CAPM approach.

The first three methods are expected to give the same answer under a similar set of assumptions. The bond-yield plus risk premium method is based on judgement, whereas, the capital asset pricing model (CAPM) gives empirical evidence of a particular rate of K_e. These methods are described below, each followed by an example.

Dividend yield approach: This is a cash flow approach, where the cost of equity is the rate at which present value of future dividends is equal to the current price of shares. The dividends stream is the infinite stream. The basic equation is similar to Equation 6.1, and would look like,

$$P_0 = \frac{D_1}{(1+K_e)^1} + \frac{D_2}{(1+K_e)^2} + \frac{D_3}{(1+K_e)^3} + \ldots\ldots\ldots + \frac{D_n}{(1+K_e)^n} \qquad (6.9)$$

This equation may be rewritten as per the different assumptions regarding the dividends cash flow stream.

In case of 100 per cent payout: If the firm is paying out the entire amount of profit every year, it will not grow. In that case the dividend rate will remain unchanged over the period, if we assume the rest of the factors constant. In that case D_1, D_2, D_3 …D_n will be identical in Eq. 6.9. Therefore, Equation 6.9 will deduce to the

NOTES

Equation 6.10 due to infinite geometric progression (and it would be similar to Equations 6.5 and 6.8).

$$K_e = \frac{D}{P_0} \tag{6.10}$$

In case of partial payout: Most firms pay less than what is earned. Retained funds are deployed in business, which in turn would increase the firm's profit. If the company follows a constant dividend payout policy, its dividends per share will rise, even if the profitability rate does not change. That means, the dividend cash flow will grow. Thus, Equations 6.1 and 6.9 can be re-written as,

$$P_0 = \frac{D(1+g)^1}{(1+K_e)^1} + \frac{D(1+g)^2}{(1+K_e)^2} + \frac{D(1+g)^3}{(1+K_e)^3} + \ldots\ldots\ldots + \frac{D(1+g)^n}{(1+K_e)^n} \tag{6.11a}$$

Or,

$$P_0 = \frac{D(1+g)}{K_e - g} = \frac{D_1}{K_e - g} \tag{6.11b}$$

Or, with cross-multiplication we get the following equation for K_e,

$$K_e = \frac{D(1+g)}{P_0} = \frac{D_1}{P_0} + g \tag{6.12}$$

where, P_o = current share price

g = growth rate in dividends

Note that Equation 6.10 and Equation 6.11 are essentially the same and Equation 6.12 is derived from them by the process of cross-multiplication.

Example 6.4: MNO Co. Ltd (I)

MNO Co. Ltd.'s shares are quoted at ₹120 per share. The company is likely to pay a dividend of ₹20 per share next year. It will be a 100% payout of profits. Calculate K_e of the company's shares, assuming that the company's profitability will remain constant with a full payout of profits every year.

Solution: Investors will get ₹20 every year for an infinite period. Using Equation 6.10,

$$K_e = \frac{D}{P_0} = \frac{20}{120} = 16.67\%$$

Example 6.5: ABC Ltd

The current market price of shares of ABC Ltd. is ₹160. Last year's dividend was ₹15 per share. It is expected that given the profitability rate of ABC Ltd., the dividend will grow at the rate of 7% per year. What is the K_e of this company?

Solution: Using Equation 6.12,

$$K_e = \frac{15(1+0.07)}{160} + 0.07 = \frac{16.05}{160} + 0.07 = 0.1003 + 0.07 = 17.03\%$$

NOTES

Example 6.6: NOP Co. Ltd

If NOP Company has followed the policy of paying out 80% of earnings as dividends, and it is likely to earn constant ROI (also RONW as we assume no debt), then what will be the cost of equity? The company has issued 1,000 shares and the book value of each share is ₹120. Its next year's earning per share is expected to be ₹20. The shares are currently quoted at ₹120.

Solution:

1,000 shares @ ₹120 = ₹120,000 net worth

EPS, ₹20 or 1/6th of net worth = ₹20,000 net profit

D_1 = dividend per share = ₹16 = ₹16,000 dividend

Retained profit = ₹4,000, which will be added in the net worth

Net worth after 1 year will be ₹124,000

Profit will be ₹20,666.67 (1/6th of ₹124,000)

Profit growth = Dividend growth = Net worth growth = 3.33% (667.67 ÷ 20,000)

Using Equation 6.12,

$$K_e = \frac{16}{120} + 0.03 = 13.33\% + 3.33\% = 16.66\%$$

Compare the solutions of Example 6.4 (MNO Company) and Example 6.6 (NOP Company), where basic data is same. You will notice that in both cases (i.e., 100 per cent payout assumption and partial payout assumption) the K_e has remained constant, because it is assumed that the company's earnings will be at a constant rate.

Dividend growth: How do you estimate the growth of the dividend rate? Three different approaches can be recommended for estimating dividend growth:

Historical growth rate in dividends: The last few years' dividend history can be considered to calculate growth. It is assumed that the historical growth in the dividend rate will continue in the future also.

Security analysts' forecast: Security analysts are trained to project future profitability of the company based on the study of those the factors, which may change the past pattern of the firm's earnings and dividends. Their forecast can be considered as future growth in dividends.

Reinvested earnings: Growth in dividend is expected due to the reinvestment of earnings.

NOTES

The following equation can be applied for the calculation of dividend growth rate on this basis:

$$g = \frac{(1 - \text{Payout}) \times \text{Retained Earnings}}{\text{Equity}} \quad (6.13)$$

All the above three methods would give a constant growth in dividend rate over time. A variable rate of dividend growth can also be taken into account for calculating the cost of equity based. The basic formula for K_e (Equation 6.12) will still be the same,

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

Earning price (EP) ratio: This is very similar to the dividend yield approach of calculating the cost of equity, because in case of 100% payout policy E (EPS = earning per share) and D (dividend per share) are equal. Therefore, Equation 6.10 can be rewritten as follows:

$$K_e = \frac{E}{P_0} \quad (6.14)$$

where, E = earning per share

P = price per share

If the company does not payout full amount, but retains a portion of profit, then $\frac{E}{P} = \frac{D}{P} + g$, as g comes from part of earnings per share retained by the firm. E/P ratio and (D_1/P_0) would give identical result only if the return from investment of retained profit is equal to K_e, i.e., the same as earlier return.

If retained profit is invested at a positive NPV the difference in the results of E/P and $(D_1/P_0) + g$ will be observed. However, in case of moderate growth, this difference will be negligible. Companies with super growth will have a significant difference between the two. The dividend growth rate model is more reliable, if dividend growth is estimated on the basis of extrapolation of dividend history.

Realized yield approach: The yield earned by a shareholder who bought shares one year ago, and sold now after receiving dividend, is called realized yield. That is the cost of equity, and can be expressed as,

$$P_{-1} = \frac{P_0 + D}{1 + K_e} \quad (6.15)$$

This can be rewritten as,

$$K_e = \frac{P_0 + D}{P_{-1}} - 1 \quad (6.16)$$

where, P_{-1} = price of share last year

P_0 = price of share now

D = dividend received during the period

For example, price of a company's share a year ago was ₹180, and now it is ₹210. The company recently paid a dividend of ₹8 per share. What is the return realized by a shareholderrealize? Using Equation 6.16,

$$K_e = \frac{210+8}{180} - 1 = 1.2111 - 1 = 21.11\%$$

However, we know that this method would give accurate K_e of the past one year. The calculation of future cost of equity on the basis of the realizorganized yield approach may involve a big exercise of estimating future price and dividends. This model can be applied for a period longer than one year, for which the equation has to be modified as below:

$$P_0 = \frac{D_1}{(1+K_e)^1} + \frac{D_2}{(1+K_e)^2} + \frac{D_3}{(1+K_e)^3} + \ldots\ldots\ldots + \frac{P_n + D_n}{(1+K_e)^n} \qquad (6.17)$$

This calculation is based on an assumption that all types of incomes are equally taxed. But, in most countries income tax rates and capital gain tax rates are different. In that case $P_n - P_1$, which indicates a capital gain, would be subject to a lower income tax rate. Sometimes, even indexation is allowed in calculating capital gain tax. Indexation is an adjustment for inflation before the capital gain is determined.

Bond yield plus a risk premium: Calculating the cost of debt is easy. One can take the cost of debt as a basis and add a premium for the additional risk shareholders take to find the cost of equity.

$$K_e = K_d + R_p \qquad (6.18)$$

where, K_d = pre-tax bond yield, and

R_p = risk premium

R_p is essentially a judgement based on the study of variability of income and the degree of financial leverage. K_d in this formula should be based on the yield to the investors, and is taken on pre-tax basis.

CAPM approach: The capital asset pricing model (CAPM) was developed for measuring the shareholders expectation (K_e) based on the empirical relationship of returns from a particular share and that of market returns. In a way, CAPM gives a scientific shade to bond-yield plus risk premium.

$\Rightarrow$ $K_d = R_f$ + Risk premium (risk that bond holder takes)

$K_e = K_d$ + Risk premium (additional risk that shareholders take)

$\therefore$ $K_e = R_f$ + The total risk that shareholders of a company take.

(Total risk = Risk that bond holders take + Additional risk that shareholders take)

$\Rightarrow$ CAPM based formula for the cost of capital is,

$$K_e = R_f + \beta_i \times (R_m - R_f) \quad (6.19)$$

NOTES

where, R_m = return on market port-folio

R_f = risk free rate

b = systematic risk of the company (the covariance of returns on firm's share and market returns)

The risk premiums in all other cases are based on an educated guess, whereas the CAPM gives it based on the empirical evidence of the variability (b_i) of security i with market returns.

For example, if b of a company's share is 0.85, market return 21% and risk free rate 13%, what is the K_e of the company? Using Equation 6.19,

$$K_e = 0.13 + 0.85 \times (0.21 - 0.13)$$

$$= 19.8\%$$

A theoretically sound capital asset pricing model sometimes fails in accurately calculating the cost of equity because of certain assumptions of the model. The assumption of an efficient capital market, and the assumption that firms take only systematic risk are quite unrealistic in case of most capital markets and firms. The market return (R_m) may not be a figure representing return on a balanced portfolio, if market is not perfect or not highly efficient. Market efficiency is likely to be high in developed economies, where there are many players existing in a regulatory framework. Also the b of a firm's share may not represent only the systematic risk. If the firm is also taking an unsystematic risk due to absence of perfect diversification, a random variable will be introduced in the return on equity shares. Consequently, the historical b may not work as a good indicator of the future beta.

Cost of equity from the company perspective

In the discussion on the cost of debt (K_d) we observed that a company which has to issue debt in the market is required to adjust bond-yield with tax and flotation cost for calculating the cost of debt from the company's perspective.

The calculation of cost of equity (K_e) discussed under different methods essentially measures the shareholder's expectation of the return on equity. Do we need to adjust this when viewed from the company's perspective? Why and for what? Should the firm take the future K_e (all methods of calculating K_e are based on market expectations, hence it is a future K_e only), even if the firm has no intentions of making a public issue of shares in the foreseeable period? This point was explained in favour of the future K_e, when we initiated the discussion on the cost of equity. Therefore, only the future K_e is relevant to the firm because in the case of equity shares there is no legal but only moral obligation, which is expressed in terms of market expectations. Failure to meet the expectations could mean a threat

of takeover, as investor reaction would drop the share prices. However, a closely held firm may ignore this aspect, if its objective is served otherwise.

The next question is why and in what way, a company's perspective of the cost of equity is different from shareholders' expectations. Note the following points in this regard:

- The firm does not receive the full amount from the subscription by the investors. The firm incurs floatation cost which may be as high as 10 per cent of equity issue. Issue price of share is usually lower than market price
- Tax implications may be different

For example, if the incidence of tax on dividends is shifted from investors to the companies, this would mean lowering of shareholder expectations on one side, and payment of tax on dividends by the companies on the other, increasing the company's K_e. If the tax on dividends levied on the company, is say 10 per cent, and shareholders net expectation is 18 per cent return, then the company's K_e will be 19.8 per cent (i.e., 0.18 × 1.1)

Similarly, the difference between the issue price and the market value of shares, and floatation cost need to be adjusted in company's cost of equity. For example, consider a firm, whose shareholders expect 18 per cent returns, is required to pay tax on dividend at 10 per cent, and the company has to price the new share 10 per cent lower than the market price of outstanding shares. If it incurs an 8 per cent floatation cost, what is the company's cost of equity?

If there is no lower issue price and no floatation cost then firm's K_e is 19.8 per cent (0.18 × 1.1) as shown earlier. The issue price of new equity share is 91 per cent of the price of outstanding shares. After incurring the floatation cost the firm gets only 83.72 per cent (92 per cent of 91 per cent) of the price of outstanding shares. Thus, 19.80 per cent cost of the equity must be earned on 83.72 per cent value. That is 23.65 per cent (19.8 per cent ÷ 83.72 per cent) of the money received by the company. Therefore, K_e on the new equity shares is 23.65 per cent.

6.2.5 Cost of Retaining Earning and Tax

Retained earnings are the shareholders' funds. Therefore, the cost of equity and the cost of retained earnings are equal except for the tax differential and floatation costs.

Retained earnings are reflected in shareholders' wealth through an increased share price. Even if investors are indifferent to the dividend and appreciation in the share price (resulting from the reinvestment of unpaid dividend), the net gain of a shareholder will be different in the two cases. Dividend income is subject to income tax, which is usually levied at a higher rate, whereas, capital gain due to share price appreciation, after indexation, is taxed at a lower rate and that too at the time when gain is booked. Even, capital gain tax can be avoided or postponed if the investor invests the proceeds in other capital investments subject to the laws of the

NOTES

land. In the Indian context, the cost of retained earnings (K_{re}) may be higher than cost of equity (K_e) because the dividend tax burden is shifted from the investor to the company. Shareholders' income from dividend is not taxable, whereas capital gain is taxable. Floatation cost makes a real difference in K_{re} and $K_{e.}$

We must, however, ponder whether to include the cost of retained earnings in the calculation of the weighted average cost of capital.

6.2.6 Cost of Depreciation and Tax

Is depreciation a source of funds, and if it is, does it involve cost? How much? Accountants define depreciation as the wear and tear value of assets, which involves no cash flow. Therefore, operating cash flow is equal to the profit after tax plus depreciation. Depreciation is not a fresh source of funds, but a recovery of capital earlier tied up in the fixed assets of the company. Therefore, the cost of depreciation is equal to the cost of capital. However, since depreciation is not a new fund but just an accounting entry we can fairly conclude that depreciation carries no cost.

$K_{dpn} = K_o$ *where* K_{dpn} = Cost of depreciation and

K_o = Cost of overall funds.

Usually firms use the depreciation funds for reinvestment purpose, so that assets purchased earlier can maintain their earning power. Therefore, replacement investment proposals are discounted at the weighted average cost of capital (K_o). Irrespective of views, depreciation and its costs can be ignored from the calculation of WACC, because exclusion of it has no effect on WACC calculation.

Check Your Progress

1. What is the cost of capital in a nutshell?
2. Differentiate between explicit and implicit cost of capital.
3. How is the cost of debt developed from a firm's perspective?
4. Why should the company consider bond-yield as K_d?
5. What is a preference share?
6. Name the different methods of calculating K^e (cost of equity) through investors' perspective.

6.3 WEIGHTED AVERAGE COST OF CAPITAL AND COMPUTATION OF OVERALL COST OF CAPITAL

After discussing how to calculate the costs of various sources of funds, we should calculate the weighted average cost of capital. The first question, however is, should we calculate the current K_o or a future K_o? The current cost of capital may

NOTES

be calculated for the purpose of knowledge, even if the firm is not going to use it for the evaluation of the proposed investment plan. Calculation of the current cost of capital is useful when the post completion audit of a project is conducted, because in the post completion audit the current K_o is compared with the actual K_o. For capital budgeting purpose the future cost of capital must be calculated. The firm must first announce its investment and financing plans to the market and allow the market to respond to the announcement. After the market has adjusted the prices of securities, the market price should be taken into account in the calculation of the cost of each fund and for determining the appropriate weights. That gives the new weighted average cost of capital. This is also known as the overall cost of capital.

The discussion on the topic of WACC is presented in three parts—(a) what sources should be included in the calculation of the weighted average cost of capital, (b) what weights should we consider in the WACC calculation and finally (c) how to calculate the weighted average cost of capital.

Sources of Funds Included in Calculation of WACC

We discussed quite a few sources of funds and looked at the method of calculating cost of each fund. Some sources and their cost calculation were mentioned to offer comprehensiveness. Shall we include all the sources in calculating the weighted average cost of capital? Answer is not affirmative. Retained earnings and its costs should not be included in calculating WACC, because equity should be taken at the market value in calculating the weighted average cost of capital. Market value of equity reflects retained profit.

Depreciation fund and its cost should not be included, because it is not a fresh source of funds; it is just a recovery of previously invested capital. Therefore, an amount equal to depreciation is already included in the sources of funds, whether equity or debt. Old funds are just getting recycled when funds equal to depreciation is reinvested.

Thus, all debts, preference share capital and equity share capital are included in the calculation of weighted average cost of capital.

Weights in WACC

There are three options available for determining the weights of sources of funds:

1. Book value weights
2. Weights of marginal funds used for the project(s)
3. Market value weights

Book value weights

Accounting values that appear in the balance sheet of a firm are called the book values. Book values of various sources of funds are influenced by the accounting policies of the firm; also they are historical values. Book value weights are not

NOTES

recommended for the calculation of weighted average cost of capital when applied for the evaluation of capital budgets. However, when the market values are not available (securities are either not listed or not actively traded on stock exchange), or when the market value is distorted (heavy speculative effect), one may have to take book value weights for the calculation of overall cost of funds. When the book value weights are accepted, the retained earnings (reserves) and its cost must be included in the calculation of K_o.

Weights of marginal funds

Marginal funds are those funds, which will be used for financing a particular project. Using weights of marginal funds in the calculation of WACC may find apparent acceptance, but it would be inaccurate. Firms are not able to maintain their capital structure (debt-equity ratio) at the same level on a day-to-day basis, though they may maintain the average debt-equity ratio in long term. If the debt-equity ratio of any firm is plotted for a last few years, it would show the curve as given in Fig. 6.3. This is because equity increases gradually with earnings of profit, whereas debt is increased in phases.

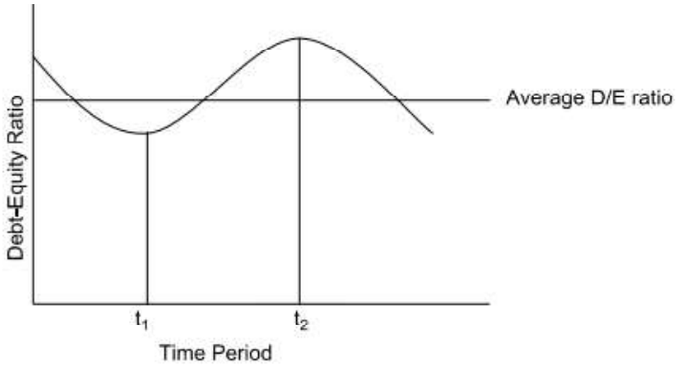


Fig. 6.3 *Changes in Debt-equity Ratio over a Period*

At point t_1 a firm has the low debt-equity ratio, and therefore. It will take more debt to finance a new project at that time to restore the planned debt-equity ratio. If the same project is considered at time t_2 then it will be funded through higher equity amount. We have seen that K_e is higher than K_d. If WACC based on marginal funds is considered, then the same project will be less attractive if considered at t_2 compared to that at time t_1. The order in which projects are considered would also have a great bearing on the choice of projects if weights of marginal funds are considered. This difficulty can be overcome, if the firm is considering marginal funds for all projects during the next plan period and is maintaining its capital structure. In case the firm plans to adjust the capital structure (remember, capital structure is a dynamic decision variable) then also marginal funds' weights for plan period loses its relevance.

Market value weights

Many argue that for debt and equity one must take market values and apply the cost of each fund to get the weighted average cost of capital.

Pragmatic weights

Weights of funds depend on the method of calculating the cost of respective funds. The pragmatic answer to the question what weights must be considered is given below:

1. Take the outstanding bonds at the book value in WACC calculation. Reason is quite simple; cost of bonds is a result of commitment made at the time of bond issue. The change in market value does not change a firm's commitment.
2. In calculating the future weighted average cost of capital, we need to include cost of bonds that will be issued soon for financing the new projects. As we discussed, the coupon rate on the new bonds is derived from investor's yield-to-maturity on the outstanding bonds, and from the coupon rate the cost of new bonds is determined. Therefore, even new bonds must be taken at the book value in WACC calculation.
3. Preference shares should be treated like debt in the matter of weight determination. If, however, outstanding preference shares are participative type, then market value weight must be considered.
4. Equity must be always taken at the market value because every method of calculating the cost of equity is based on the market value of shares. If new equity shares are issued then floatation cost and difference between market price and issue price must be carefully treated in the cost calculation, before considering market value weight. Alternatively, one may include floatation expense and difference in issue price and price of outstanding shares as the project cost, and take market value weight of equity without any adjustment.

It can be concluded that, one should take all equity (current and new) at market value, and take old as well as new debt at the book values. The preference shares are taken as market value only if they are participative, otherwise book value is appropriate for the preference shares.

Calculation of WACC

Once the costs of individual funds are calculated and their weights are determined, the calculation of cost of overall funds is easy. Weighted average cost of all funds is calculated using the Equation 6.20,

$$K_o = \frac{K_d W_d + K_p W_p + K_e W_e}{W_d + W_p + W_e} \qquad (6.20)$$

where, W_d = weight of debt

W_p = weight of preference shares

W_e = weight of equity

NOTES

If there are more than one sources of debt with different costs, take cost of each debt and its corresponding weight while calculating weighted average cost of capital.

Example 6.7: WACC Calculation

A company's cost of funds and their weights are given below:

Source of Funds	Amount/Weight	Cost
Equity	₹10 lakh	18.5%
Debt	8 lakh	12.3%
Preference shares capital	3 lakh	15.6%

Calculate the weighted average cost of capital of this company.

Solution: Using Equation 6.20,

We will take another problem for the calculation of weighted average cost of capital.

Example 6.8: WACC: A Comprehensive Problem

$$K_o = \frac{(0.185 \times 10) + (0.123 \times 8) + (0.156 \times 3)}{10 + 8 + 3} = 15.724\%$$

The following is the list of selected items from the latest balance-sheet of SMP Ltd.

Equity share capital @ ₹10 each	₹15,00,000
Reserves and surplus	22,00,000
Debt: 15% bonds	18,00,000
14% term loan	20,00,000
Total capital employed	75,00,000

The company has announced plans of investing ₹ 40,00,000 in three different projects in the next 5 years. The company's intention is to finance half the investment through bond issues and the rest through internal accrual that SMP Ltd. would earn in next five years.

The shares of SMP Ltd. are currently quoted at ₹ 80 per share, and the CAPM based cost of equity was calculated at 19.8 per cent after the announcement. Outstanding debentures of ₹ 100 par value are quoted at ₹ 90. The term loan, after considering other bank charges, effectively costs the firm at the rate of 14.5 per cent on pre-tax basis. The new issue of bonds will succeed if the company incurs floatation

cost of 8 per cent. SMP Ltd. is subject to 35 per cent tax on its income. The existing debentures' after-tax effective cost is calculated as 11 per cent.

Calculate the future weighted average cost of capital of SMP Ltd.

Solution:

(a) K_d for outstanding debentures: 11 per cent.

(b) K_d for term loan: 14.5% × (1 – 0.35) = 9.425%

(c) K_d for new bonds can be derived from the yield on the existing bonds. Yield-to-maturity (YTM) on outstanding bonds is a better indicator of the coupon rate on the new bonds, but since maturity period of outstanding bonds is not given we can take the 'bond-yield' or 'current yield' on the outstanding bonds as a basis for determining the cost of new bonds.

$$\text{Current Yield} = \frac{\text{Interest Amount}}{P_o} = \frac{15}{90} = 16.67\%$$

∴ K_d on new bonds after-tax = 16.67% × (1 - 0.35) = 10.84%

∴ K_d after tax and after floatation cost = 10.84% ÷ 0.92 = 11.78%

(d) Par value (book value) of new bonds: ₹ 20,00,000

(e) Addition in equity: ₹ 20,00,000

(f) Number of outstanding shares: ₹ 15,00,000 ÷ ₹ 10 = 1,50,000

(g) Weight of equity: 1,50,000 × ₹ 80 = ₹ 1,20,00,000

(h) Cost of equity: 19.8%

(i) Calculation of future WACC:

Source of Funds	MV/BV	Weight	Cost	Weight × Cost
Outstanding Debentures	BV	18,00,000	11.000%	1,98,000
Loan	BV	20,00,000	9.425%	1,88,500
New Bonds	BV	20,00,000	11.780%	2,35,600
Equity	MV	1,40,00,000	19.800%	27,72,000
		1,98,00,000	17.142%	33,94,100

WACC (K_o) = 33,94,100 ÷ 1,98,00,000 = 17.142%

Note that, retained earnings are not included in the calculation. Share price reflects it. In this case the firm is not planning any equity issue; otherwise number of outstanding share would have been higher by the number of new shares. Old debt is taken at the book value. New debt will have a book value calculated at par, and floatation expense is factored in its cost.

Check Your Progress

7. What are the three options available for determining the weights of sources of funds?
8. What is book value weights?

NOTES

6.4 EBIT AND EPS ANALYSIS

NOTES

In accounting and finance, Earnings Before Interest and Taxes (EBIT), is a measure of a firm's profit that includes all expenses except interest and income tax expenses. It is the difference between operating revenues and operating expenses. When a firm does not have non-operating income, then operating income is sometimes used as a synonym for EBIT and operating profit.

EBIT = revenue – operating expenses

Operating income = revenue – operating expenses

A professional investor contemplating a change to the capital structure of a firm (e.g., through a leveraged buyout) first evaluates a firm's fundamental earnings potential (reflected by earnings before interest, taxes, depreciation and amortization [EBITDA and EBIT], and then determines the optimal use of debt vs. equity.

EBIT is calculated by subtracting the expenses (e.g. the cost of goods sold, selling and administrative expenses) from revenues. Net income is later obtained by subtracting interest and taxes from the result.

The term Earnings per Share (EPS) represents the portion of a company's earnings, net of taxes and preferred stock dividends which is allocated to each share of common stock. The figure can simply be calculated by dividing net income earned in a given reporting period (usually quarterly or annually) by the total number of shares outstanding during the same term. A weighted average is typically used because the number of shares outstanding can fluctuate.

The most commonly used measures of financial leverage are:

- **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.

- **Debt–equity ratio:** The ratio of debt to equity, i.e.,

$$L_2 = \frac{D}{E} \tag{6.21}$$

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

$$L_3 = \frac{\text{EBIT}}{\text{Interest}} \tag{6.22}$$

The first two measures of financial leverage can be expressed either in terms of book values or market values. The market value to financial leverage is

theoretically more appropriate because market values reflect the current attitude of investors. But it is difficult to get reliable information on market values in practice. The market values of securities fluctuate quite frequently.

There is no difference between the first two measures of financial leverage in operational terms. They are related to each other in the following manner.

$$L_1 = \frac{L_2}{1+L_2} = \frac{D/E}{1+D/E} = \frac{D}{V} \tag{6.23}$$

$$L_2 = \frac{L_1}{1-L_1} = \frac{D/V}{1-D/V} = \frac{D}{E} \tag{6.24}$$

These relationships indicate that both these measures of financial leverage will rank companies in the same order. However, the first measure (i.e. *D/V*) is more specific as its value will range between zero to one. The value of the second measure (i.e. *D/E*) may vary from zero to any large number. The debt–equity ratio, as a measure of financial leverage, is more popular in practice. There is usually an accepted industry standard to which the company's debt-equity ratio is compared. The company will be considered risky if its debt–equity ratio exceeds the industry standard. Financial institutions and banks in India also focus on debt-equity ratio in their lending decisions.

The first two measures of financial leverage are also measures of capital gearing. They are static in nature as they show the borrowing position of the company at a point of time. These measures, thus, fail to reflect the level of financial risk, which is inherent in the possible failure of the company to pay interest and repay debt.

The third measure of financial leverage, commonly known as coverage ratio, indicates the capacity of the company to meet fixed financial charges. The reciprocal of interest coverage, that is, interest divided by EBIT, is a measure of the firm's income gearing. Again, by comparing the company's coverage ratio with an accepted industry standard, investors can get an idea of financial risk. However, this measure suffers from certain limitations. First, to determine the company's ability to meet fixed financial obligations, it is the cash flow information, which is relevant, not the reported earnings. During recessionary economic conditions, there can be wide disparity between the earnings and the net cash flows generated from operations. Second, this ratio, when calculated on past earnings, does not provide any guide regarding the future riskiness of the company. Third, it is only a measure of short-term liquidity rather than of leverage.

The primary motive of a company in using financial leverage is to magnify the shareholders' return under favourable economic conditions. The role of financial leverage in magnifying the return of the shareholders is based on the assumptions that the fixed-charges funds (such as the loan from financial institutions and banks or debentures) can be obtained at a cost lower than the firm's rate of return on net assets (RONA or ROI). Thus, when the difference between the earnings generated by assets financed by the fixed-charges funds and costs of these funds is distributed

NOTES

to the shareholders, the earnings per share (EPS) or return on equity (ROE) increases. However, EPS or ROE will fall if the company obtains the fixed-charges funds at a cost higher than the rate of return on the firm's assets. It should, therefore, be clear that EPS, ROE and ROI are the important figures for analysing the impact of financial leverage.

Importance of EBIT and EPS Analysis

EBIT-EPS analysis serves as a scientific basis for comparing various financial plans. It helps in showing ways to maximize EPS. Hence, EBIT-EPS analysis may be defined as 'a tool of financial planning that evaluates various alternatives of financing a project under varying levels of EBIT and suggests the best alternative having highest EPS and determines the most profitable level of EBIT'.

Concept of EBIT-EPS Analysis

The EBIT-EBT analysis is the method that studies the leverage, i.e., comparing alternative methods of financing at different levels of EBIT. Simply put, EBIT-EPS analysis examines the effect of financial leverage on the EPS with varying levels of EBIT or under alternative financial plans.

It examines the effect of financial leverage on the behaviour of EPS under different financing alternatives and with varying levels of EBIT. EBIT-EPS analysis is used for making the choice of the combination and of the various sources. It helps select the alternative that yields the highest EPS.

We know that a firm can finance its investment from various sources such as borrowed capital or equity capital. The proportion of various sources may also be different under various financial plans. In every financing plan the firm's objectives lie in maximizing EPS.

Importance of EBIT-EPS Analysis

We have seen that EBIT-EPS analysis examines the effect of financial leverage on the behaviour of EPS under various financing plans with varying levels of EBIT. It helps a firm in determining optimum financial planning having highest EPS.

- **Financial planning:** EBIT-EPS analysis is used for determining sources of funds. The objective of the firm is to maximize EPS in case of financial planning. EBIT-EPS analysis evaluates the alternatives and finds the level of EBIT that maximizes EPS.
- **Comparative analysis:** EBIT-EPS analysis is used to evaluate the relative efficiency of departments, product lines and markets. It identifies the EBIT earned by these different departments, product lines and from various markets, which helps financial planners in ranking them according to profitability and also assess the risk associated with each.
- **Performance evaluation:** This analysis is useful in comparative evaluation of performances of various sources of funds. It evaluates whether a fund obtained from a source is used in a project that produces a rate of return higher than its cost.

- **Determining optimum mix:** EBIT-EPS analysis is advantageous in selecting the optimum mix of debt and equity. By emphasizing on the relative value of EPS, this analysis determines the optimum mix of debt and equity in the capital structure. It helps determine the alternative that gives the highest value of EPS as the most profitable financing plan or the most profitable level of EBIT as the case may be.

Analysis of EBIT and EPS on the Basis of Financial Leverage

EPS is calculated by dividing profit after taxes, PAT also called net income, NI, by the number of shares outstanding. PAT is found out in two steps. First, the interest on debt, INT, is deducted from the earnings before interest and taxes, EBIT, to obtain the profit before taxes, PBT. Then, taxes are computed on and subtracted from PBT to arrive at the figure of PAT. The formula for calculating EPS is as follows:

$$\text{Earnings per share} = \frac{\text{Profit after tax}}{\text{Number of shares}}$$

$$\text{EPS} = \frac{\text{PAT}}{N} = \frac{(\text{EBIT} - \text{INT})(1-T)}{N} \tag{6.25}$$

Where, T is the corporate tax rate and N is the number of ordinary shares outstanding. If the firm does not employ any debt, then the formula is:

$$\text{EPS} = \frac{\text{EBIT}(1-T)}{N} \tag{6.26}$$

ROE is obtained by dividing PAT by equity (E). Thus, the formula for calculating ROE is as follows:

$$\text{Return on equity} = \frac{\text{Profit after tax}}{\text{Value of equity}}$$

$$\text{ROE} = \frac{(\text{EBIT} - \text{INT})(1-T)}{E} \tag{6.27}$$

For calculating ROE either the book value or the market value equity may be used. How does the financial leverage affect EPS and ROE? We shall describe two situations to illustrate the impact of the financial leverage on EPS and ROE. First, we shall analyse the impact of the alternative financial plans on EPS and ROE assuming that EBIT is constant. Second, we shall assume that EBIT varies and shows the effect of the alternative financial plans on EPS and ROE under the conditions of varying EBIT.

Example 6.9: ABC Ltd. has an EBIT of ₹ 1,60,000. Its capital structure consists of the following secutities:

10% Debentures	₹ 5,00,000
12% Preference Shares	1,00,000
Equity Shares of ₹ 100 each	4,00,000

NOTES

The company is in the 55% tax bracket. You are required to determine:

(i) the company's EPS

(ii) the percentage change in EPS associated with 30% increase and 30% decrease in EBIT

(iii) the degree of financial leverage.

Solution:

(i) **Computation of Present Earning Per Share**

Present EBIT	₹ 1,60,000
Less: Interest	50,000
EBT/PBT	1,10,000
Less: Tax (55%)	60,500
EAT	49,500
Less: Preferendce Dividend	12,000
Earnings available for equity shareholders	37,500
Number of Equity shares	4,000
Earning per share (EPS)	9,375

(ii) (a) **Computation of Earning Per Share**
(After 30% Increase in EBIT)

		₹
EBIT	(1,60,000 + 30% of 1,60,0000)	2,08,000
Less: Interest		50,000
	EBIT/PBT	1,58,000
Less: Tax (55%)		86,900
	EAT	71,100
Less: Preference Dividend		12,000
Profits available for equity shareholders		59,100
Number of equity shares		4,000
Earning per share	(59,100/4,000)	14.775
Increase in EPS	(14.775 – 9.375)	= 5.4

Percentage Increase in EPS as a result of 30% Increase in EBIT $= \frac{5.4}{9.375} \times 100$

= 57.6%

(ii) (b) **Computation of Earning Per Share**
(After 30% Decrease in EBIT)

NOTES

		₹
EBIT	(1,60,000 – 30% of 1,60,0000)	1,12,000
Less: Interest		50,000
	EBT	62,000
Less: Tax (55%)		34,100
	EAT	27,900
Less: Preference Dividend		12,000
Profit available for equity shareholders		15,900
Number of equity shares		4,000
Earning per share (EPS)	(15,900/4,000)	3.975
Decrease in EPS	(9.375 – 3.975)	5.4

Percentage decrease in EPS as a result of 30% decrease in EBIT $= \frac{5.4}{9.375} \times 100$

$= 57.6\%$

Thus, as a result of 30% variation in EBIT, the EPS will vary in the same direction by 57.6%.

(iii) Degree of Financial Leverage

$$\frac{\text{Percentage Change in } EPS}{\text{Percentage Change in } EBIT}$$

$$= \frac{57.60}{30} = 1.92$$

Alternatively, degree of financial leverage can be calculaged as under:

		₹
Present EBIT		1,60,000
Less: Interest Gross Preference Dividend (12,000 × 100/45)		76,667
EBT		83,333
Financial Leverage	$\frac{EBIT}{EBT} = \frac{1,60,000}{83,333}$	= 1.92

6.5 TAX, CAPITAL STRUCTURE AND VALUE NEXUS

NOTES

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

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

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

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

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

$$= ₹\ 10,000$$

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

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

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

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

$$V_1 = \frac{\bar{X}(1-T)}{k_a} + \frac{TK_dD}{k_d} \tag{6.28}$$

$$V_1 = V_u + TD \tag{6.29}$$

Equation (6.28) implies that when the corporate tax rate, T, is positive (T > 0), the value of the levered firm will increase continuously with debt. Thus, theoretically the value of the firm will be maximized when it employs 100 per cent debt. This is shown in Figure 6.4.

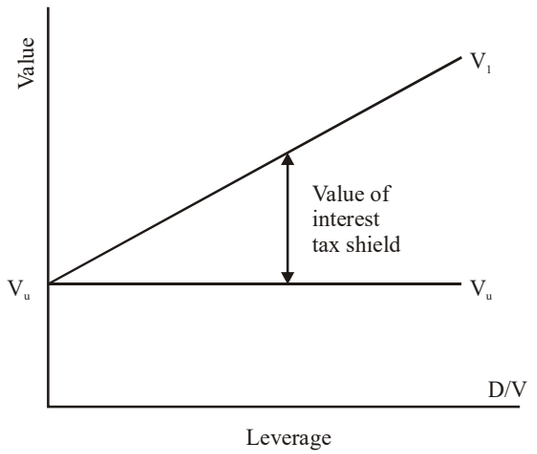


Fig. 6.4 *Value of the Levered Firm*

One significant implication of the MM hypothesis with the corporate tax in practice is that a firm without debt or with low debt can enhance its value if it exchanges debt for equity.

Enhancing the Firm Value through Debt

Let's take a hypthetical example of XYZ firm. The XYZ company's market value of equity is about ten times of its book value. It does not employ any debt. The summarized book and market value balance sheet of the company for year ending on 31 March 2020 is given in Table 6.1.

Table 6.1 *XYZ Technologies Limited: Balance Sheet as on 31 March 2020*

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

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

NOTES

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

Table 6.2 *XYZ Technologies Limited*

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

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

Implications of the MM Hypothesis with Corporate Taxes

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

> …existence of a tax advantage for debt financing...does not necessarily mean that corporations should at all times seek to use the maximum possible amount of debt in their capital structures.... (T)here are, as we pointed out, limitations imposed by lenders, as well as many other dimensions in realworld problems of financial strategy which are not fully comprehended within the framework of static equilibrium models.... These additional considerations, which are typically grouped under the rubric of the need for preserving flexibility, will normally imply the maintenance by the corporation of a substantial reserve of untapped borrowing power.

NOTES

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

Check Your Progress

9. How is EBIT calculated?
10. What does EBIT-EPS analysis study?
11. State one significant implication of the MM hypothesis with the corporate tax in practice.

6.6 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. In a nutshell, the cost of capital is the minimum required rate of return which a firm must earn to keep the market value of the company unchangeable.
2. The cost of equity, preference and debt is known as explicit or direct cost of capital whereas, the cost of retained earnings is known as implicit cost or indirect cost of capital.
3. The cost of debt from a firm's perspective is developed in three stages, first without tax and floatation cost, then with tax, and finally with floatation cost.
4. The company should consider bond-yield as K_d because the yield on outstanding bonds indicates market returns expected by investors on outstanding bonds. New issue of bonds would foster interest only if it carries a coupon rate which is at least equal to the yield on the outstanding bonds. It should be further adjusted against tax and floatation cost to get the firm's K_d on the new bonds.
5. A preference share is a security with the feat uses of both debentures as well as equity.
6. The various methods of calculating the cost of equity are:
   - The dividend yield approach
   - The earning price ratio
   - The realized yield approach
   - The bond-yield plus risk premium
   - The CAPM approach.

NOTES

7. There are three options available for determining the weights of sources of funds:
   - Book value weights
   - Weights of marginal funds used for the project(s)
   - Market value weights
8. Accounting values that appear in the balance sheet of a firm are called the book values.
9. EBIT is calculated by subtracting expenses (e.g. the cost of goods sold, selling and administrative expenses) from revenues.
10. EBIT-EPS analysis studies the effect of financial leverage on the behaviour of EPS under different financing alternatives and with varying levels of EBIT.
11. One significant implication of the MM hypothesis with the corporate tax in practice is that a firm without debt or with low debt can enhance its value if it exchanges debt for equity.

6.7 SUMMARY

- Capital, in general, is known as a mix of long term source of finance which includes equity share capital, preference share capital and debentures or debt capital. Sometimes, retained earnings are also shown as a component of capital.
- The cost of equity, preference and debt is known as explicit or direct cost of capital while cost of retained earnings is known as implicit cost or indirect cost of capital.
- There are many sources of funds. Debt, equity shares, preference shares, retained earnings and depreciation are prominent among them.
- The cost of debt from a firm's perspective is developed in three stages, first without tax and floatation cost, then with tax and finally with floatation cost.
- From the investor perspective K_d is called a bond-yield.
- An investor's return would depend on a situation that involves buying, holding and selling alternative that the investor has chosen.
- The yield on outstanding bonds indicates market returns expected by investors on outstanding bonds. New issue of bonds would foster interest only if it carries a coupon rate which is at least equal to the yield on the outstanding bonds.
- A preference share is a security with the features of both debentures as well as equity.

NOTES

- Participative preference shareholders get an additional dividend, if equity shareholders are paid dividend higher than agreed upon.
- A firm's equity has two parts—equity share capital and retained earnings. Ownership of both these funds rests with shareholders. It is most difficult to calculate the cost of equity because servicing of this capital is not a contractual liability.
- Unlike in debt and preference shares, the relevance of company perspective in the cost of equity is limited to the adjustment of floatation cost and under-pricing of the issue of shares. A firm cannot neglect the market price of shares, even if it does not plan to come out with a public issue of shares in the near future
- Retained earnings are the shareholders' funds. Therefore, the cost of equity and the cost of retained earnings are equal except for the tax differential and floatation costs.
- Depreciation is not a fresh source of funds, but a recovery of capital earlier tied up in the fixed assets of the company.
- In accounting and finance, Earnings before Interest and Taxes (EBIT), is a measure of a firm's profit that includes all expenses except interest and income tax expenses. It is the difference between operating revenues and operating expenses.
- When a firm does not have non-operating income, then operating income is sometimes used as a synonym for EBIT and operating profit.
- A professional investor contemplating a change to the capital structure of a firm (e.g., through a leveraged buyout) first evaluates a firm's fundamental earnings potential (reflected by earnings before interest, taxes, depreciation and amortization (EBITDA and EBIT), and then determines the optimal use.
- EBIT-EPS analysis serves as a scientific basis for comparing various financial plans. It helps in showing ways to maximize EPS.
- The EBIT-EBT analysis is the method that studies the leverage, i.e. comparing alternative methods of financing at different levels of EBIT.
- It examines the effect of financial leverage on the behaviour of EPS under different financing alternatives and with varying levels of EBIT.
- EPS is calculated by dividing profit after taxes, PAT also called net income, NI, by the number of shares outstanding.
- MM's hypothesis that the value of the firm is independent of its debt policy is based on the critical assumption that corporate income taxes do not exist.
- The MM's 'tax-corrected' view suggests that, because of the tax deductibility of interest charges, a firm can increase its value with leverage.

NOTES

6.8 KEY WORDS

- **Yield-to-maturity (YTM):** It is the total return anticipated on a bond if the bond is held until the end of its lifetime.
- **Holding period return (HPR):** It is the total return received from holding an asset or portfolio of assets over a period of time, generally expressed as a percentage.
- **Bond-yield:** It is the amount of return an investor realizes on a bond.
- **CAPM:** It stands for Capital Asset Pricing Model. It is used to calculate the required rate of return for any risky asset.
- **WACC:** It stands for Weighted Average Cost of Capital. It is the average rate of return a company expects to compensate all its different investors.

6.9 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short-Answer Questions

1. What are explicit and implicit cost of capital?
2. Mention the importance of cost of capital.
3. What is the importance of EBIT-EPS analysis?
4. Why is it said that EPS, ROE and ROI are important figures for analysing the impact of financial leverage?
5. Briefly explain the tax, capital structure and value nexus.

Long-Answer Questions

1. Derive the equation of calculating the cost of debt without tax and floatation cost with examples.
2. Explain in detail the methods of calculating the cost of equity.
3. Illustrate how are the weights in WACC determined.
4. Write a short note on pragmatic weights.
5. How do EBIT and EPS depend upon the financial leverage?

6.10 FURTHER READINGS

Patel, Bhavesh. 2014. *Fundamentals of Financial Management*. New Delhi: Vikas Publishing House.

Khan, M.Y. and Jain, P.K. 2007. *Financial Management- Text Problems and Cases.* New Delhi: Tata McGraw-Hill.

Chandra, Prasanna. 2004. *Financial Management: Theory and Practice.* New Delhi: Tata McGraw-Hill.

Kulkarni, P.V. and B. G. Satyaprasad. 2002. *Financial Management.* New Delhi: Himalaya Publication House.

NOTES

UNIT 7 CAPITAL STRUCTURE

NOTES

Structure

7.0 INTRODUCTION

The decisions regarding capital structure of an organization are very important. They set the overall working and planning of the funds of an organization. The capital structure of an organization includes the ways in which a firm finances its overall working by effective use of available funds of a company. In this unit, you will learn about the concept and types of capital structure. The idea of optimum capital structure and the theories of capital structure will also be discussed. Lastly, the management, operating and combined leverage will also be touched upon.

7.1 OBJECTIVES

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

- Explain the concept and determinates of capital structure
- Examine the elements of an optimum capital structure
- Discuss the theories of capital structure
- Describe the concepts of management, operating and combined leverage

7.2 CAPITAL STRUCTURE: CONCEPT AND TYPES

Funds are required in order to run a business smoothly and successfully. Finance plays an important role right from the inception of business to its winding up. Both inadequacy and excess funds are bad for a business. So it is significant to correctly

estimate the capital requirements of a business. Not only estimation of total requirement of capital is important but determination of capital structure is also very important. As per Gerestenberg, 'capital structure of a company refers to the composition or make-up of its capitalization and it includes all long-term capital resources viz. loans, reserves, shares and bonds.' So, it can be concluded that capital structure is the combination of debt and equity securities and termed as the permanent sources of financing.

The terms financial structure, capital structure and capitalization are different and should not be mixed up. Financial structure is composed of a specific proportion of short-term debt, long-term debt and shareholder's funds. In other terms, financial structure means all the financial resources used by a firm. The term capitalization is a quantitative concept which tells us about the total amount of securities or capital issued by a company, whereas the term capital structure is the qualitative aspect which tells us about the proportion of various securities in the securities issued. A company can raise money by issuing debentures, equity shares and preference shares and capital structure defines the respective proportion of each of these securities. Capitalization defines the total amount of all these sources. Following example makes this difference more clear:

Example 7.1

Calculate the capitalization, capital structure and financial structure of the company from the following information:

Equity share capital	₹15,00,000
Preference share capital	₹10,00,000
Retained earnings	₹8,00.000
Long term loans	₹11,00,000
Debentures	₹6,00,000
Current liabilities	₹5,00,000

Solution:

1) Capitalization is the addition of equity share capital, preference share capital, long term loans and debentures. 15,00,000 + 10,00,000 + 11,00,000 + 6,00,000 = 42,00,000.

2) Capital structure is ₹42,00,000 and is calculated as follows:

Source	Amount	Proportion
Equity Share Capital	₹15,00,000	35.72
Preference Share Capital	₹10,00,000	23.81
Long Term Loans	₹11,00,000	26.19
Debentures	₹6,00,000	14.28
	42,00,000	100

NOTES

Some authors are in favor of including retained earnings in the capital structure. In that case, capital structure is ₹ 50,00,000.

Source	Amount	Proportion
Equity Share Capital	₹15,00,000	30
Preference Share Capital	₹10,00,000	20
Long Term Loans	₹11,00,000	22
Debentures	₹6,00,000	12
Retained Earnings	₹8,00,000	16
	50,00,000	100

3) Financial structure includes all the sources, long as well as short sources of capital.

Source	Amount	Proportion
Equity Share Capital	₹15,00,000	27.27
Preference Share Capital	₹10,00,000	18.18
Long Term Loans	₹11,00,000	20
Debentures	₹6,00,000	10.91
Retained Earnings	₹8,00,000	14.55
Current Liabilities	₹5,00,000	9
	55,00,000	100

Types or Forms of Capital Structure

Capital structure of a company can be any of the following:

- Equity share
- Equity and preference shares
- Equity shares and debentures
- Equity, preference and debentures

Financing a firm's assets is a significant decision in every business. There should be a proper mix of debt and equity in financing all the assets. When a firm uses long term, fixed interest bearing financial sources (preference and debt) in capital structure along with the equity shares then, such concept is called financial leverage or trading on equity. Long term fixed interest bearing sources of finance are used by firms in order to increase their earnings to the equity shareholders. Interest payment is tax deductible which increases earnings available to the shareholders but this does not increase the earning of the firm (profit) which is possible due to the efficiency of the operation of the firm. The impact of using long term fixed interest bearing sources can be understood by the following examples:

NOTES

Example 7.2

John Ltd has 20000 equity shares of ₹100 each in its capital structure at present. The board of directors are planning to raise further ₹ 30,00000 to finance its expansion program. It has following three options available to finance their requirement:

- They can raise 30000 equity of Rs100 each.
- Issue 30000 debentures of ₹100 each and having 6% interest rate.
- Issue of 30000 8% preference shares of ₹100 each

Its current earnings before interest and taxes is ₹10,00000. Determine earnings per share in all the three options and suggest which option is best for the company. Assume 50% corporate tax rate.

Solution:

	Option 1	Option 2	Option 3
EBIT	1000000	1000000	1000000
less: Interest	-	180000	-
Earning after interest but before tax	1000000	820000	1000000
Less: Tax 50%	500000	500000	500000
Earnings after tax (EAT)	500000	320000	500000
Less: preferential dividend	-	-	240000
Earnings available for the equity shares	500000	320000	260000
No of equity shares	50000	20000	20000
EPS	10	16	13

EPS is earnings available to equity shares divided by numbers of equity shares. As EPS is highest in second option and lowest in first option so, John Ltd should raise funds by issuing 30000 6% debentures of ₹100 each in order to finance its expansion plan. By doing so, they can raise earnings of the equity shareholder without diluting their control on the business.

Example 7.3

XYZ ltd has ₹ 6,00,000 equity shares at ₹100 each in its existing capital. The company has some modernization plans and wants to raise ₹4,00000. It has the following alternatives available:

- All equity shares
- Equity shares of ₹2,00,000 and debentures ₹2,00,000 (₹100 per debenture, 10% rate of interest)
- All debentures at 10% rate of interest

NOTES

- ₹ 2,00,000 from equity shares and ₹2,00,000 by issuing 8% preference shares of ₹100.

XYZ's earnings before interest and taxes are ₹ 2,00,000 and assume corporate taxes 50%. Calculate EPS and suggest which source of financing the company should opt for.

Solution:

	Plan 1	Plan 2	Plan 3	Plan 4
EBIT	200000	200000	200000	200000
less: Interest	-	20000	40000	-
Earning after interest but before tax	200000	180000	160000	200000
Less: Tax 50%	100000	90000	80000	100000
Earnings after tax (EAT)	100000	90000	80000	100000
Less: preferential dividend	-	-	-	16000
Earnings available for the equity shares	100000	90000	80000	84000
No of equity shares	10000	8000	6000	8000
EPS	10	11.25	13.33	10.5

Above calculation shows that EPS is maximum in plan 3 which is all debt plan. So, the XYZ company should finance its expansion plan through raising debt. After plan 3, plan 2 gives the second highest EPS.

Financial breakeven point

This concept is important in designing capital structure. Financial breakeven point is that level of earnings before interest and taxes (EBIT) which is equal to the fixed financial charges (interest and preference dividend). At this level of EBIT, earnings per shares are equal to zero. If the EBIT is less than the financial breakeven point then EPS should be negative, therefore fixed interest bearing sources should be reduced in the capital structure. So, companies always try to maintain their EBIT beyond financial breakeven point to earn returns for the equity shareholders. Financial breakeven point is calculated by using following formulas:

1) When capital structure has equity shares and debt only.

   Financial breakeven point is equal to the interest payable on the debt.

2) When Capital structure has equity shares, preference shares and debt only.

Financial breakeven point = Interest + (Dividend on preference shares/ (1-t))

Suppose, fixed interest for a company is ₹30,000 and preference dividend is ₹10,000 (assume tax rate is 50%) then, financial breakeven point is :

$$= 30000 + \frac{10000}{1-.5}$$

$$= 50000$$

So, ₹50,000 is the financial breakeven point for the company.

NOTES

Point of indifference

This point refers to that level of EBIT where earnings per shares of two financial plans are equal. It means two financial plans give same earning per shares. Following formula is used to calculate the level of EBIT.

$$\frac{(X - Int_1)(1-t) - PD)}{S_1} = \frac{(X - Int_2)(1-t) - PD)}{S_2}$$

X = breakeven level of EBIT

T = tax rate

S_1 = number of equity shares in alternative 1

S_2 = number of equity shares in alternative 2

Int_1 = interest payable under alternative 1

Int_2 = interest payable under alternative 2

Example 7.4

Beta company has a new project of diversification which needs a capital outlay of ₹600 lacs which can be raised by issuing equity share capital of ₹100 each or by issuing equity shares of ₹400 lacs at ₹100 per shares and ₹200 lacs loan can be raised having interest rate of 15%. Assume tax rate as 50%. Calculate indifference point in these two alternatives of financing.

Solution:

Indifference level of EBIT by using above mentioned formula:

$$\frac{(X-0)(1-.5)-0)}{600} = \frac{(X-30)(1-.5)-0)}{400}$$

By solving above equation for X, we will get X = 90. So, 90 lacs is the level of EBIT where these two alternative financing plans give equal level of earnings per shares.

Check Your Progress

1. State the forms of capital structure of a company.
2. What is financial breakeven point?

7.3 DETERMINATES OF CAPITAL STRUCTURE AND OPTIMUM CAPITAL STRUCTURE

NOTES

Determination of an optimum capital structure is significant for a company. An appropriate mix of debt and equity should be there in capital structure. The major benefit of using debt in capital structure is tax advantages but its biggest disadvantage is financial distress which includes all the problems from small liquidity crisis to the bankruptcy of the company. Further, the increase in the leverage or using more debt in capital structure leads to more financial distress. So a proper care should be taken while designing capital structure. Following are the few factors which should be kept in mind while deciding about the capital structure:

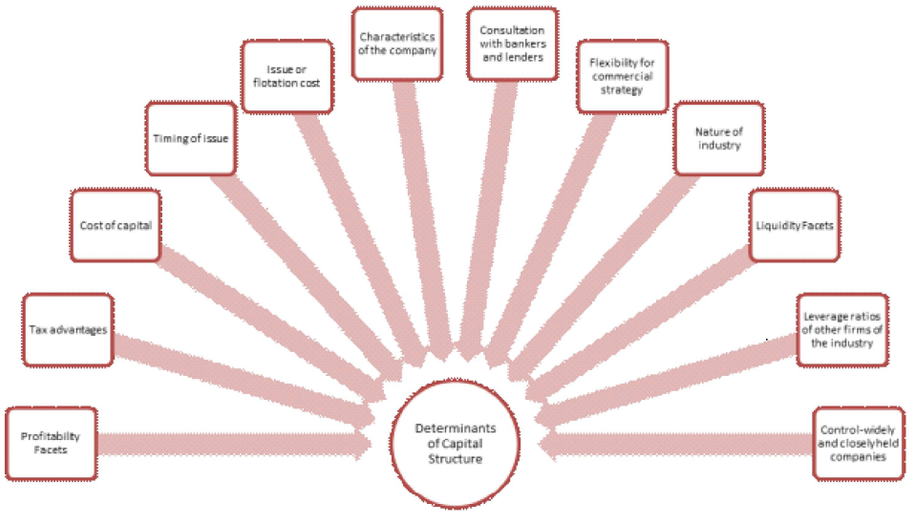


Fig. 7.1 *Determinants of Capital Structure*

1. Tax advantages

Companies can avail tax advantages by using more debt in capital structure and generate more returns on the equity portion of capital.

2. Cost of capital

Different sources of finance have different cost of capital. Foremost objective of a firm is to keep its overall cost of capital at minimum level. Among all types of financing sources (debt equity and preference shares), debt is the cheapest source of finance as interest is tax deductible.

NOTES

3. Profitability facets

It includes study of EBIT-EPS analysis of the company. At various levels of earnings before interest and taxes (EBIT) have different earnings per shares (EPS) and the ultimate objective of a business is to give maximum returns to the equity shareholders. Through EBIT-EPS analysis one can get a complete idea about the level of earnings that a firm should achieve to give maximum returns. Under this analysis, a comparison of various alternatives of financing plans is conducted under various assumptions of EBIT. A firm has different options to finance their funds requirements. It can go for all equity scheme, all debt scheme or a mix of debt/ equity/ preference shares. The financing plan selected by firm depends on the level of earnings available to the equity shareholders i.e. EPS. A plan which gives maximum EPS should be selected.

Example 7.5

XYZ ltd has ₹ 6,00,000 equity shares at ₹100 each in its existing capital. Company has some modernization plans and it wants to raise ₹4,00,000. It has following alternatives available :

- All equity shares
- Equity shares of ₹2,00,000 and debentures ₹2,00,000 (₹100 per debenture, 10% rate of interest)
- All debentures at 10% rate of interest
- ₹ 2,00,000 from equity shares and ₹2,00,000 by issuing 8% preference shares of ₹100.

XYZ's earnings before interest and taxes are ₹ 2,00,000 and assume corporate taxes 50%. Calculate EPS and select the best source of financing that the company should opt for.

Now assume that there are following predictions available for the EBIT estimation:

1. ₹ 80,000 (8% of the total investment i.e. ₹10,00,000)
2. ₹ 1,40,000 (14% of the total investment i.e. ₹10,00,000)
3. ₹ 2,40,000 (22% of the total investment i.e. ₹10,00,000)
4. ₹2,80,000 (25% of the total investment i.e. ₹10,00,000)

NOTES

The EBIT-EPS analysis in the above EBIT expectations is shown in Table 7.1.

Table 7.1 *EBIT-EPS Analysis at Different Levels of EBIT*

1) When EBIT is Rs.80,000				
	Plan 1	Plan 2	Plan 3	Plan 4
EBIT	80000	80000	80000	80000
less: Interest	-	20000	40000	-
Earning after interest but befor tax	80000	60000	40000	80000
Less: Tax 50%	40000	30000	20000	40000
Earnings after tax (EAT)	40000	30000	20000	40000
Less: preferential dividend	-	-	-	16000
Earnings available for the equity shares	40000	30000	20000	24000
No of equity shares	10000	8000	6000	8000
EPS	4	3.75	3.333333	3
2) When EBIT is Rs.1,40,000				
EBIT	140000	140000	140000	140000
less: Interest	-	20000	40000	-
Earning after interest but before tax	140000	120000	100000	140000
Less: Tax 50%	70000	60000	50000	70000
Earnings after tax (EAT)	70000	60000	50000	70000
Less: preferential dividend	-	-	-	16000
Earnings available for the equity shares	70000	60000	50000	54000
No of equity shares	10000	8000	6000	8000
EPS	7	7.5	8.333333	6.75
3) When EBIT is Rs.2,20,000				
EBIT	220000	220000	220000	220000
less: Interest	-	20000	40000	-
Earning after interest but before tax	220000	200000	180000	220000
Less: Tax 50%	110000	100000	90000	110000
Earnings after tax (EAT)	110000	100000	90000	110000
Less: preferential dividend	-	-	-	16000
Earnings available for the equity shares	110000	100000	90000	94000
No of equity shares	10000	8000	6000	8000
EPS	11	12.5	15	11.75
4) When EBIT is Rs.2,50,000				
EBIT	250000	250000	250000	250000
less: Interest	-	20000	40000	-
Earning after interest but before tax	250000	230000	210000	250000
Less: Tax 50%	125000	115000	105000	125000
Earnings after tax (EAT)	125000	115000	105000	125000
Less: preferential dividend	-	-	-	16000
Earnings available for the equity shares	125000	115000	105000	109000
No of equity shares	10000	8000	6000	8000
EPS	12.5	14.375	17.5	13.625

The above table gives a complete analysis of EBIT-EPS. One can compare all the financing plans at different levels of EBIT and select the best option available to the company. By studying the level of EPS, one can make a proper mix of equity, debt and preference securities in the capital structure. In Plan 3, an increase in EBIT (₹80,000 to ₹ 2,50,000) results more than increase in the EPS (3.33 to 17.5). So it's better to go for debenture issue if the business conditions are favorable and EBIT is going to increase as proved in the above case. Thus with the help of EBIT-EPS analysis companies can draft their capital structure as per the requirement and prevailing business conditions.

Another tool to design capital structure is study of indifference point (as discussed above) which tells us about the breakeven point of two financing plans.

4. Liquidity facet

EBIT-EPS analysis is a measure to test the earnings per share at various levels of earnings. But this analysis is not complete as it does not tell us about the firm's ability to pay fixed charges because payment of fixed interest charges depends on the cash flows available to meet such charges. Therefore, in addition to the profitability analysis cash flow analysis is also significant to design capital structure. Lack of liquidity leads to bankruptcy because when company borrows more than its capacity and fails to pay interest charges on it then lender clutches the assets of the company and endanger its existence. Thus study of cash flows of the company is of most significance to the company in designing capital structure. Sometimes, it may be possible that the company is earning good profits but it is out of cash or does not have sufficient cash to pay its fixed interest charges. Reason for this insufficiency of cash may be, higher level of inventory, high receivables, more investment in fixed assets etc.

Cash flows analysis gives some advantages over the EBIT-EPS analysis. These are:

- This analysis concentrates on the solvency of the company in adverse circumstances.
- This analysis takes into consideration changes in balance sheet and other cash flows not depicted in the profit and loss account.
- It also gives a brief about the financial resources inventory which a company has at a particular point of time.
- It evaluates the financial distress of the company.

Companies use various methods to do cash flows analysis in order to assess their liquidity positions. Some of which are discussed below:

Ratio of fixed charges to net cash inflow: This ratio is calculated to find out the coverage of fixed interest charges including principal to net cash inflows. Greater this ration, more will be the amount of debt that company can use in its capital structure as company has multiple time cash inflows to pay its fixed interest charges.

NOTES

Cash budget: This is another method to study the cash flows of a company. Companies used to prepare their cash budget which shows whether cash inflows are sufficient to cover their fixed obligations or not. The basic purpose of preparing cash budget is to find out the deviation of expected cash flows and actual cash flows. All of the above information can be used to find out the insolvency limit tolerable to the top management.

Gordon Donaldson suggested a technique to study cash flows of a company when recession prevails. Generally, firms meet their fixed obligations in terms of interest and principal. But during adverse conditions, companies are not able to meet this obligation and are exposed to the risk of bankruptcy of risk of financial distress. Therefore, it is important to study cash flows very carefully when there are chances of prevailing recession conditions.

Following example makes this process clear that how one can study cash flows during recession.

Example 7.6

Suppose Beta Ltd is planning its capital structure. Current debt equity ratio of beta is 20 debt and 80 % equity shares. The company is planning to raise further debt but is confused that whether it should maintain its existing proportion of debt and equity, raise more debt or raise less debt. Beta Ltd is strong in its business and has wide variety of products, Therefore, it is less affected by the business cycle. Following table shows its cash flows and sales forecast for four years:

Sales	117	122	112	128
Profit after tax (PAT)	6	8	7	7
Sources of funds				
Operations	22	23	23	23
Working Capital	3	(0.6)	3	(1.2)
total	**25**	**22.4**	**26**	**21.8**
Use of funds				
Plant and machinery	(5.9)	(7)	(10)	(12)
Taxes	(4)	(4.5)	(5)	(6)
Lease rentals payments	(1.8)	(2.4)	(2.5)	(2)
Interest payments	(1.9)	(2)	(2)	(2)
Repayment of debts	(1.6)	(1.6)	(1.5)	(1.5)
Dividends	(2.8)	(2.8)	(2.8)	(3)
Others payments	(1)	(0.7)	(1.2)	(0.5)
Total	**(19)**	**(21)**	**(25)**	**(27)**
Balance cash available	6	1.4	1	(5.2)

Now, let us suppose that recession is going to prevail in the economy and it is expected that the sales of the company will be reduced by at least 10% and selling prices will be decreased by 3%. To have better understanding all the expenses should be cover under three headings:

- Operating (sales revenue and cash operating expenses)
- Non-operating (capital outlays and change in working capital)
- Financial flows (lease rentals payments, interest payments, payments of debt, taxes and dividends)

So by using above categories and information of sales and selling price one can easily estimate the amount of cash inflows and have better understanding of the use of debt in capital structure. Hence it can be stated that cash flow analysis is important for the liquidity study of the company in designing its capital structure.

4. Control

Another consideration in designing capital structure is the control of shareholders. Lenders do not have direct influence on the control of company but they can put some restriction on the use of funds, cash requirements and other activities of the management through the agreement of lending. If company defaults in the payment of interest or repayment of loan amount only then lender can take some legal action against the company. But lender cannot participate in the function of a company. Likewise, in case of preference shares, they do not have any direct influence on the decision making. They do not have voting rights as equity shareholders have. So if management is ready to dilute existing equity shareholder's control then they will go for equity financing and if management wants to retain the existing equity shareholders control then they will go for debt or preference shares financing.

Largely held companies and closely held companies

When the company is promoted by the entrepreneurs then they believe in more control over the management of company. In closely held company, control is important consideration in designing capital structure. In such cases, few shareholders or a group of shareholders purchase all the new issued securities to retain the control of the company with them. For such companies, raising money through IOP is very difficult as they think that their control will be reduced. IPO issue is very hectic process for such companies as every person wants to retain control. Such companies rely on the preference shares of debt instruments to raise further money. Moreover, if closely held companies can guarantee a wide distribution of shares then they need not to worry about the dilution of control.

In case of widely held company, the companies can issue right share to avoid the dilution of control of existing shareholders. But if existing shareholders are ready to dilute their control then they can go for new issue. Even for widely held companies control is not a big issue and many of the investors are not interested

NOTES

in the management of the company. These shareholders are not interested in attending meetings, dividend payments and operations. If these shareholders are not satisfied with the performance of a company, they simply sell their shares. Thus, the best way to control the shareholders is to give them best returns.

5. Leverage ratios of other firms of the industry

Industry norms for the proportion of debt and equity in the capital structure is yet another factor which affects the capital structure design. Sometimes other firms in the industry do not use appropriate debt-equity mix but this comparison of debt-equity mix of the company's capital structure with that of industry will give an idea about the soundness of the capital structure. It also works as a red signal for the company's management that there must be something wrong with the debt-equity mix of the company.

6. Nature of industry

Another important factor which affects the capital structure decision is the nature of the industry. The level of financial leverage a firm should opt depends on the nature of industry in which that firm is working. If industry sale is affected by the business cycles and fluctuates more, then firm should have less financial leverage because they already have high level of operating leverage. Firm which has seasonal demands (like firms producing refrigeration, television, machine tools and so on) should have conservative financial policy and rely more on equity financing then on debt. Demand for these products is flexible which causes fluctuations in their sales and makes them more risky. Contrary to this, firms which have inelastic demands (e.g. non-durable consumer goods, items of habitual use (tobacco products), inexpensive items etc.) can rely more on debt financing as their demand and sales are stable.

Companies having severe competition should rely more on equity financing than on debt financing. Public utility companies (electricity, gas, water supply etc.) do not have severe competition so they can rely more on debt financing in their capital structure as their sales are more stable and predictable.

Stages of life cycle of the industry also have influence on the capital structure designing. If the industry is in its initial stage then firm should rely more on equity financing not on debt. But when it comes to the growth stage then debt financing can be used with the equity as in this stage firm needs more cash and sales and profits both are increasing in a very fast manner. Thus, at this stage firms are in a position to repay their debts and meeting fixed liabilities.

7. Retain manoeuvrability or flexibility for commercial strategy

It refers to the firm's ability to adjust its capital structure as per the requirements of the funds. If firm needs more funds then it must be in a position to raise more funds. When a firm has excess of funds it is in a position to repay its loan. Therefore,

it is important for firms to pick that financial plan in which such types of adjustments are possible. A proper forecast of such changes should be made before designing the capital structure. This flexibility is also known as 'financial slack' which includes unused debt capacity, excess liquid assets, unutilized line of credit and access to various untapped sources of funds. Higher the debt capacity of the firm, higher is the unused debt capacity.

If a firm relies more on debt financing at present time and if in future it needs more debt then, it has to pay more interest rate as its debt capacity has already been used to its fullest. In that case, firm has to issue equity shares but their cost will also be very high as by using more debt in capital structure firm has already increased its financial risk which again causes higher cost of equity. Thus in order to safeguard its operating flexibility, firms are advised to issue equity shares in its initial stages of business and use debt financing at later stages of business.

8. Consultation with bankers and lenders

Another way to design capital structure and proportion of various securities in the overall capital is to seek out the opinion of bankers, investment analysts, investment bankers and various lenders. These experienced investment analysts have expertise and have excess to the information available in the capital market and can give fair opinion to the company regarding their capital structure designing. Similarly, opinion of the prospective investors and lenders play a significant role in designing capital structure. Thus, their opinion regarding the types of securities which they can buy is awfully helpful to the financial manager in planning capital structure.

9. Timing of issue

Timing of the public issue is an important element in designing capital structure. Public issue for funds should be made at a time when capital market, financial market and overall economy are in better condition. Various government policies are also important in this regard. Two basic policies, monetary and fiscal policy are of most importance. To boost economy in the recession, government follows a cheaper policy and to curb inflation it follows a dearer policy. If the financial manager feels that the debt is going to be costly, then they will avail debt in the present scenario. If there are expectations of decrease in interest rates then company can postpone its debt requirements to get the benefits of decrease in interest rates. But if the company is already using a high level of debt then it cannot raise more debt due to increased cost of borrowing and restrictions imposed by the existing lenders.

10. Characteristics of the company

The credit standing and size of the company are other important factors in designing capital structure. In case of small and large companies, financial manager's choice of sources of finance is limited. Because in case of small firms they have to rely

NOTES

more on the owner's equity as their borrowing capacity is less. Moreover, small firms are more risky than the large firms from investors' point of view. Consequently, small firms do not have swift access to the different types of securities and are in fragile bargaining position which leads to limited sources of raising funds. Firms enjoying large credit standing among investors are in a better position to raise funds and that is as per their choice.

11. Tax planning

Tax planning is another factor which affects the capital structure planning. Interest on debt is tax deductible but the dividend company has to pay dividend taxes. Thus, while designing its capital structure financial manager gives due consideration to the tax payment of the company in different alternatives.

12. Issue or flotation cost

When funds are externally raised, the companies have to pay flotation cost or issue cost. Generally, cost of flotation for debt is less than the cost of flotation for equity. Because of this reason companies go for debt instead of equity shares. Cost of raising debt is also less in comparison to the commercial paper or public debt. So economies of scale are high for the debt source having high fixed costs. This is the reason why companies go for the debt instruments. The issue cost will decline as companies go for large amount of debt. Therefore, issue cost or cost of flotation is another major consideration in designing the capital structure.

Check Your Progress

3. What is the major benefit and biggest disadvantage of using debt in capital structure?
4. What does greater ratio of fixed charges to net cash inflow indicate?

7.4 THEORIES OF CAPITAL STRUCTURE

As discussed in the previous sections, capital structure decisions are basically related to deciding the mix of long term sources of finance which has a direct impact on the objective of wealth maximization. The decision about mix of debt and equity has been a complex decision. Both types of components have their own merits and demerits. The equity capital is the owner's funds and no fix obligation is there on the part of the company to pay regular dividend to equity shareholders. However, being the most risky capital the cost of this component is generally higher than other components. The better alternative to this component is use of cheaper debt. The cost of debt is generally lesser than other components because of lesser risk involved with it. Moreover, the interest payment on debt is a tax deductible expenses, therefore it helps to increase the overall value of shareholders.

NOTES

But the firm has to bear a consistent obligation of fixed interest on the debt capital which may reduce the liquidity position of the firm. In case of liquidity crunch, the use of debt has very tender impact on the overall financial performance of the firm.

The important point of discussion is that whether the changes in the mix of debt and equity in the capital structure of the business really affect the overall cost of capital. The financial managers spend lots of time in deciding the mix of debt and equity to reduce the overall cost of capital and to maximize the wealth of shareholders. There is a diverse opinion of experts in this regard. A group of expert says that the financial leverage decisions, capital structure decisions or mix of debt and equity decisions do not affect the overall cost of capital. However, the other panel says that these types of decisions are significant and certainly affect the overall cost of capital or weighted cost of capital. Broadly speaking, the theories of capital structure decisions have been divided into two categories. These are:

- Relevant theories
- Irrelevant theories

The relevant theorists say that the capital structure decisions or financial leverage decisions are relevant and these decisions affect the weighted average cost of capital which in turn affects the value of shares. The irrelevant theorists have opposite view. They say that changes in the mix of debt and equity in capital structure will not make any change in overall cost of capital. Hence, the value of share capital will remain despite any mix of debt and equity. The theories of capital structure are based on following assumptions. Some of the assumptions were removed later to improve the model. In capital structure theories, we will study the impact of change in debt on value of firm and overall cost of capital. Some experts say that degree of leverage has impact on the value of firm and overall cost of capital while some say these are independent of each other. Firm can use any proportion of debt and equity and this proportion will not affect the value of firm and overall cost of capital.

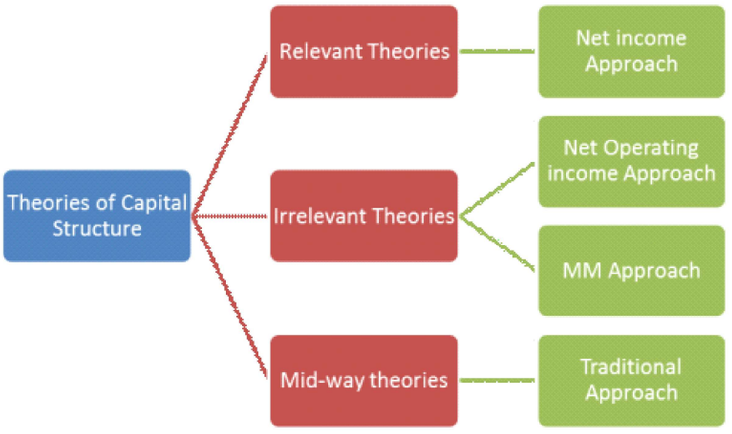


Fig. 7.2 *Theories of Capital Structure*

NOTES

1. Net income approach

This approach is given by David Durand who said that this approach is a relevant approach of capital sturuture. According to this approach, as firm increases the degree of financial leverage, its overall cost of capital decreases and market value of firm increases. In other words, as firm increases debt proportion of capital structure, its market value increases and increase in debt leads to decrease in WACC of the firm. Degree of financial leverage can be measured by the debt/ equity ratio. Increase in this ratio indicated more use of debt by the firm and it leads to more value to the firm with less overall cost of capital.

This approach is based on few assumptions. These are as follows:

- There are no taxes.
- Cost of debt is always less than the cost of equity or overall cost of capital.
- Financial risk remains constant i.e. use of more debt does not change the risk perception of the debt holder or equity holders. The increase in proportion of debt in capital structure of a firm does not lead to the increase in cost of debt and cost of equity. These two remain constant.

When firm uses cheap source of finance i.e. debt and replaces dearer source of finance i.e. equity, this gives benefit to the firm in the form of decrease in the overall cost of capital which leads to increase in the value of firm. Thus, according to this approach when firm increases its degree of leverage, its value increases and overall cost of capital decreases.

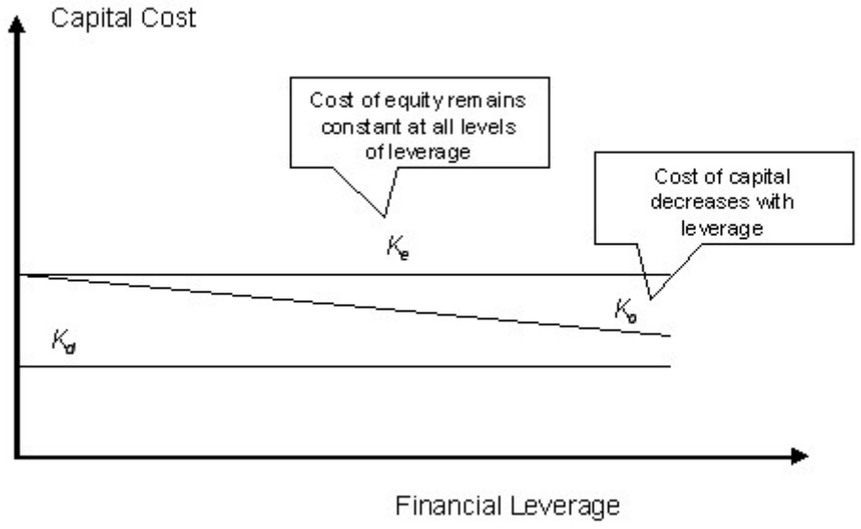


Fig. 7.3 *Net Income Approach*

As per this approach, a firm can have optimum capital structure by having a shrewd mix of debt and equity where overall cost of capital of the firm is minimum and value of the firm is maximum. When firm achieves this level of capital structure,

its market price per share would be maximum. If there is no debt in capital structure (zero leverage level), then overall cost of capital would be equal to the equity capitalization rate. If firm has 100% debt in capital structure then overall cost of capital will be equal to the cost of debt and at this level, degree of financial leverage would be one.

This can be explained by taking an example.

Example 7.7

Suppose, ABD ltd is expecting to have operating profits of ₹ 1,00,000 and the company has ₹ 2,00,000 10% of debt in the capital structure. The equity capitalisation rate of the company is 12.5%. Case 1 is given. Case 2, suppose company increases its degree of financial leverage by increasing the proportion off debt in capital structure. Company raises ₹ 1,00,000 additional debt which raises the existing level of debt to ₹ 3,00,000. Case 3, company retires ₹1,00,000 debt which reduces it financial leverage.

	Case 1	**Case 2**	**Case 3**
10% Debt	₹ 200000	₹ 300000	₹ 100000
EBIT (expected net operating profits)	100000	100000	100000
Less Interest of debentures	20000	30000	10000
Earnings available for the equity shareholders (NI)	80000	70000	90000
Equity Capitalization rate is 0.125			
Market Value of Equity (E) NI/k_e	640000	560000	720000
Market Value of Debt (D)	200000	300000	100000
Total value of the firm V=(E+D)	**840000**	**860000**	**820000**
Overall Cost of Capital of the firm k_o = EBIT/V0	**11.90476**	**11.62791**	**12.19512**

Alternatively, overall cost of capital can also be calculated as:

$$k_o = k_d(D/V) + k_e(E/V)$$

$$k_o = 0.10\,(200000/840000) + 0.125\,(640000/840000) = 2.38 + 9.524 = \mathbf{11.904}$$

$$k_o = 0.10\,(300000/860000) + 0.125\,(560000/860000) = 3.488 + 8.1395 = \mathbf{11.627}$$

$$k_o = 0.10\,(100000/820000) + 0.125\,(720000/820000) = 1.2196 + 10.976 = \mathbf{12.1952}$$

In the above table, we can see that as the company increases its debt proportion in capital structure and increases it by ₹ 100,000, its market value increases to ₹ 8,60,000 which proves that the increase in debt proportion of a firm leads to increase in market value of the firm. But at the same time, overall cost of capital which is **11.90476%** in case 1 decreases to **11.62791%** which shows that when firm increases debt in capital structure, its overall cost of capital decreases and value of firm increases.

NOTES

In case 3, firm has reduced its debt proportion and reduces it by ₹ 100,000. This decrease in debt causes decrease in value of firm and increase in overall cost of capital. Here, value of firm has reduced to ₹ 8,20,000 and overall cost of capital has increased to **12.19512%.**

After discussing about this approach at the end, we come to the conclusion that this approach states that if company has 100% debt in its capital, it can have minimum level of overall cost of capital and this situation of the company is called optimum capital structure. But in practical scenario, this situation is rare as no firm/ company can have only debt in capital structure.

Consider the following example to understand the net income approach in a better way.

Example 7.8

Particulars	Scenario A	Scenario B	Scenario C
Project Cost	2000	2000	2000
Sources of Finance			
Equity(Book Value)	1800	1000	200
Debt(Book Value)	200	1000	1800
Capitalization Rate			
Equity, r_e	20%	20%	20%
Debt, r_d	10%	10%	10%
EBIT	1000	1000	1000
Interest	20	100	180
EBT	980	900	820
	Assume No Taxes		
EAT	980	900	820
Earnings Available to Shareholders	980	900	820
Market Value of Debt(I/r_d)	200	1000	1800
Market Value of Equity(EBIT-I-Tax)/ r_e	4900	4500	4100
Total Value of Firm	5100	5500	5900
Overall Capitalization Rate, r	**19.61**	**18.18**	**16.95**

2. Net operating income approach

Net operating income approach is reverse of the earlier approach. This approach is also given by David Durand. This approach states that a firm can make changes in its debt component in capital structure and this does not have any effect on the value of firm and overall cost of capital. This approach says that firm's degree of

leverage and debt proportion decisions are irrelevant for the value of firm and overall cost of capital computation. Any increase and decrease in debt does not influence the value of firm, market price of shares and overall cost of capital. This theory has some basic assumption which is essential for its explanation. These assumptions are as follows:

- **Optimum capital structure**: As per this approach there is nothing such as optimum capital structure as degree of leverage does not have effect on the value of firm, overall cost of capital and market price of shares. Every capital structure can be an optimum capital structure.
- **Overall cost of capital**: As per this theory overall cost of capital remains constant for every level of capital structure. And the value of firm can be calculated by using following formula.

$$V = \frac{EBIT}{k_o}$$

- **Enduring value of equity**: Here value of equity is residual one and can be obtained by subtracting value of debt from the value of firm. So E = V-D.
- **Cost of debt:** Cost of debt has two components one is explicit and other one is implicit.
- **Explicit cost of debt:** It is the expressed rate of interest on debt which has a tendency to increase with every subsequent rise in debt. But here in this approach this component also remains constant as firm is able to borrow at a fixed rate of interest. Implicit cost of debt is the increase in cost of equity due to increase risk component for equity shares by having more debt in capital structure. So by having more debt in capital structure explicit cost of using more debt remains constant whereas implicit cost of debt tends to increase which cause increase in cost of equity.
- **Cost of equity capital:** following formula is used to calculate the cost of equity in this approach.

$$k_e = k_o + (k_o - k_d)\frac{D}{E}$$

When company/firm uses more debt in capital structure this thing increases risk for the equity shareholders. Therefore cost of equity increases with every subsequent increase in debt.

Now by keeping all the above mentioned assumptions in mind we will explain this approach with one example.

NOTES

Example 7.9

	Case 1	Case 2	Case 3
10% Debt	200000	300000	100000
EBIT (expected net operating profits)	100000	100000	100000
Overall cost of Capital (12.5)			
Total Value of the firm (V)	800000	800000	800000
Value of Debt (D)	200000	300000	100000
Value of Equity = (V-D)	600000	500000	700000
Equity Capitalisation rate $k_e = k_o + (k_o - k_d)\frac{D}{E}$ $k_e = 12.5\% + (12.5\% - 10\%)\frac{value\ of\ debt}{value\ of\ equity}$	13.33%	14%	12.85%
Overall Cost of Capital = k_o=k_d(D/V) +k_e (E/V) k_o=0.10(200000/800000) +0.1333 (600000/800000) k_o=0.10(300000/800000) +0.14 (500000/800000) k_o=0.10(100000/800000) +0.128 (700000/800000)	12.5%	12.5%	12,.5%

As we can see in the above table that with increase or decrease in debt overall cost of capital (12.5%) remains constant and by increase in debt amount equity capitalization rate also increases. This can be shown by the following diagram.

As shown in the diagram that the use of more and more debt is cheaper source of finance but it increases the risk involved in the equity share capital and its implicit cost increases therefore the use of cheaper debt is neutralized by the increased implicit cost of equity capital and overall cost of capital remains same. Hence the value of the firm also remains same and change in financial leverage ratio does not cause any change in value of firm that is why this approach is called as an irrelevant approach. Any capital structure decision can be called as an optimum capital structure because at all levels of financial leverage the value of firm remains same.

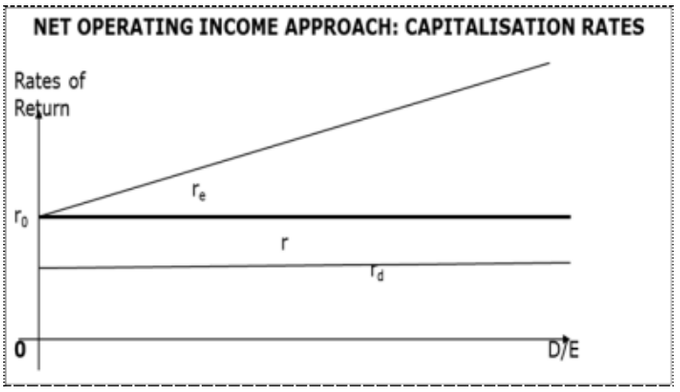


Fig. 7.4 *Net Operating Income Approach*

Consider the following example to understand net operating income approach.

Example 7.10

Particulars	Scenario A	Scenario B	Scenario C
Project Cost	2000	2000	2000
Sources of Finance			
Equity(Book Value)	1800	1000	200
Debt(Book Value)	200	1000	1800
Capitalization Rate			
Overall Cost, r	20%	20%	20%
Debt, rd	10%	10%	10%
EBIT	1000	1000	1000
Interest	20	100	180
EBT	980	900	820
	Assume No Taxes		
EAT	980	900	820
Market Value of Debt(I/rd)	200	1000	1800
Market Value of firm (EBIT/r)	5000	5000	5000
Value of Equity (Value of Firm-Value of Debt)	4800	4000	3200
Cost of Equity, r_e(EAT/Value of Equity)	**20.4**	**22.5**	**25.6**

3. Traditional Approach

This is a mid-way approach and also called as a trade off theory of capital structure. According to this theory, with the additional use of debt the overall cost of capital decreases because debt is a cheaper source of finance. But after reaching a certain level of financial leverage, the use of additional debt increases the risk of lenders as well as of equity shareholders. As extra amount of debt increases the fixed financial burden on the firm and the firm is already utilizing debt to an optimum level therefore the additional debt capital is available at a rate of interest higher than previous rate. On the other hand the risk with equity share capital increases

NOTES

beyond a point and they also start demanding higher explicit cost for their capital. As cost of both the sources of finance increases therefore overall cost of capital also increases. These effects can be seen through the following diagram also. The optimum capital structure is that where overall cost of capital is minimum at point c. Therefore this approach is called as relevant approach as capital structure decisions or financial leverage decisions affect the overall cost of capital and value of the firm.

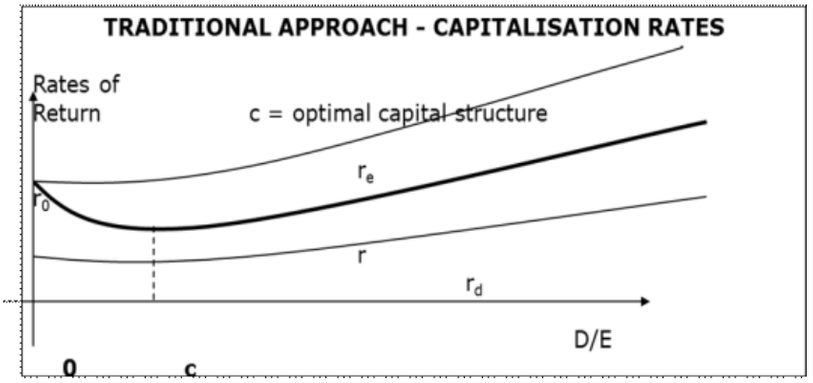


Fig. 7.5 *Traditional Approach*

Consider the following example for further explanation of this model. The following example shows that up to a certain level of use of financial leverage in the capital structure of the firm reduced the weighted average cost of capital and value of firm increases but beyond a point both debt and equity become dearer and overall cost of capital increases and it reduces the value of firm.

Example 7.11

Particulars	Scenario A	Scenario B	Scenario C
Project Cost	2000	2000	2000
Sources of Finance			
Equity(Book Value)	1800	1000	200
Debt(Book Value)	200	1000	1800
Capitalization Rate			
Equity, re	20%	20%	30%
Debt, rd	10%	11%	12%
EBIT	1000	1000	1000
Interest	20	110	216
EBT	980	890	784
	Assume No Taxes		
EAT	980	890	784
Market Value of Debt(I/rd)	200	1000	1800
Market Value of Equity(EBIT-I-Tax)/ r_e	4900	4450	2613
Total Value of Firm	5100	5450	4413
Overall Capitalization Rate, r	**19.6**	**18.3**	**22.7**

NOTES

4. M-M Approach

The previous three approaches have discussed various aspects of capital structure decisions affecting value of the firm. Modigliani and Miller have given very significant contribution to the development of capital structure theories. M-M has contributed to the irrelevant theories of capital structure but used arbitrage as the reason for same value of firm despite and mix of debt and equity. Their theory is based on the following assumptions.

- There is perfect capital market situation
- There is no transaction cost
- All investors have homogenous expectations
- There are no taxes
- All investors are rational
- All managers are rational and they take all decisions in order to maximize the wealth of the shareholders
- The individual and firm are at same levels of risk
- An individual and firm can borrow at same rate of interest
- All earnings are distributed among the shareholders.
- There is free flow of information.

$$\text{WACC for levered firm} = r_e \frac{E}{E+D} + r_d \frac{D}{E+D}.$$

$$r_e = r_0 + (r_0 - r_d) D/E$$

$$\text{WACC for levered firm} = \text{WACC unlevered firm} = r_0$$

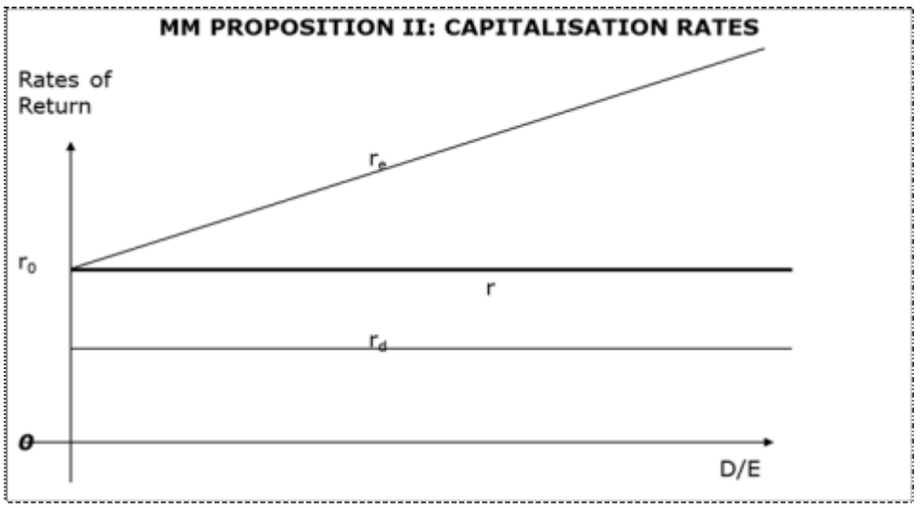


Fig. 7.6 *MM Proposition Approach*

NOTES

The M-M theory is based on the arbitrage effect. According to arbitrage effect, the investors prefer to buy the shares of undervalued firm and sell overvalued shares. This process goes on until the value of shares of both the companies become equal. Due to this arbitrage principle, if there is any imbalance in the value of firms due to capital structure then this discrepancy in the value of levered and unlevered firm is gradually settled.

	Unlevered	Levered
	All Equity	Debt and Equity
EBIT	1000	1000
Interest @ 10%		200
EBT	1000	800
Taxes (Assumed No Taxes)		
EAT	1000	800
Market Value of Debt		2000
Market Value of Equity Capitalization rate (20%)	5000	4000
Value of Firm	**5000**	**6000**

$$\text{Market value of the equity of Unlevered Firm} = \frac{\text{Earnings to equity suppliers}}{r}$$

$$= \frac{\text{Dividend}}{r} = \frac{1000}{0.2} = ₹\ 5{,}000$$

$$\text{Market value of equity of Levered Firm} = \frac{\text{Earnings to equity suppliers}}{r}$$

$$= \frac{\text{Dividend}}{r} = \frac{800}{0.2} = ₹\ 4{,}000$$

As per above example, the value of levered firm is more than the value of unlevered firm. Therefore, the investor would prefer to buy shares of unlevered firm and sell his holdings in levered firm. However, the model has assumed that both, the individual investor and firm, are at the same level of risk. Hence, the investor will borrow personal funds and will invest those funds in buying the equity shares of levered firm. The purpose of creating this homemade leverage is to bring the individual investor at the same level of risk. The individual investor will borrow funds in such a way that the proportion of his personal leverage and amount invested in equity will remain in the same proportion. Similar action will be taken by other investors also as all investors would think in the same direction due to free flow of information and homogenous expectations of the investors. This buying of stocks of unlevered firm increases the price of shares of unlevered firm and continuous selling of stocks of levered firm will bring down its prices. This process will continue until the stock prices of both the firms will become equal.

This is called homemade leverage as investor borrows the funds on personal basis to remain at the same level of risk at which the levered firm is. There can be

an opposite case also, i.e., the value of stocks of unlevered firm may be overvalued in the market and value of stocks of levered firm is undervalued. Under such circumstances, the investors will sell their holdings in unlevered firm and will start buying the stocks of levered firm. But again as per the assumption of equivalent risk level of individual and firm, the investor will invest in levered firm in debt and equity instruments in the same proportion. The following equations are used to calculate the value of firm when taxes are also imposed,

M-M Theory –value of firm (when taxes are considered)

$$V_L = V_U + T \times D$$

$$V_U = \frac{EBIT(1-T)}{r_0}$$

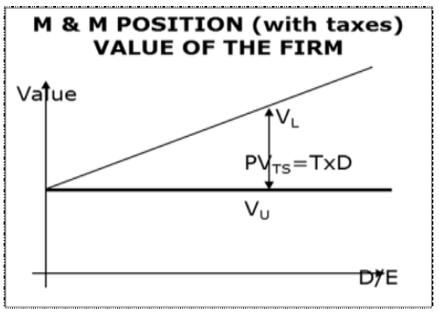
$$\begin{aligned} V_L &= V_U + \text{Value of Tax Shield} \\ &= \frac{\text{EBIT x } (1-\text{T})}{r_0} + \frac{\text{T x D x } r_d}{r_d} \\ &= \frac{\text{EBIT}(1-\text{T})}{r_0} + \text{TD} \end{aligned}$$

M-M Theory –value of equity (when taxes are considered)

$$r_e = r_0 + \frac{D}{E}(1-T)(r_0 - r_d)$$

M-M Theory –overall cost of capital (when taxes are considered)

$$WACC_L = r_e \frac{E}{D+E} + r_d(1-T)\frac{D}{D+E}$$



Capital structure planning and policy

Some companies do formal planning for designing their capital structure while some do not plan for their capital structure and just raise funds. These companies can achieve success in short run. However, they are not successful in long run. They have to pay the price for not planning their capital structure properly.

NOTES

Moreover, by raising funds in an unplanned way they cannot get the advantage associated with the use of debt. Thus, due to the advantages of planning capital structure companies usually plan their funds and take advantages of using debt in capital structure. Hypothetically, a financial manager should plan an optimum capital structure for the company. The optimum capital structure is that mix of debt and equity where market value of the firm is at its maximum level and its overall cost of capital is at its minimum level. However, in practice, it is very difficult to find out the optimum capital structure and sometimes it is even impossible. Various factors affect the capital structure determination. These factors are different for different industries and even different for the two companies in the same industry. All these factors are complex, psychological and quantitative in nature and do not always follow theory as capital market is not perfect. Therefore, chief finance officer of a company always set a target capital structure instead of the optimum capital structure.

Before deciding about the capital structure of a company, financial manager has to study various elements of the capital structure. These are:

Capital mix: It is important to determine the proportion of debt and equity. For this purpose, financial managers study the debt ratios, debt-service coverage ratios and fund flow statement to analyze the capital mix of the company.

Maturity and priority: Financial manager tries to find a match in the asset structure and debt used in financing of these assets.

Next is to study about the financial market segment which company is going to strike for raising funds. After the above study, financial manager uses FRICT analysis (flexibility, risk, income, control and timing) for designing a target capital structure.

Check Your Progress

5. Who formulated the net operating income approach?
6. What are the major approaches of capital structure?

7.5 MANAGEMENT, OPERATING AND COMBINED LEVERAGE

Leverages, developed on the concept of marginal costing system, are more useful than breakeven point for planning purpose.

The term 'leverage', in science and engineering, is an action of a lever or a mechanical advantage of a lever. In finance, the term 'leverage' has somewhat similar meaning. It is also known as 'gearing' (in UK and Australia). Leverage acts as a lever on the profits of a company when sales change.

Usually variability of profit is more than that of sales revenue because fixed costs remain constant. Fixed costs create a leverage effect. Firms incur operating fixed costs and financial fixed costs (interest expense). As a result, different types of leverages are present in the cost structure of a firm.

Types of Leverages

There are three types of leverages, namely,

- Degree of operating leverage (DOL)
- Degree of financial leverage (DFL)
- Degree of total leverage (DTL)

Operating fixed costs create an operating leverage measured as the 'degree of operating leverage' (DOL) and interest expense creates financial leverage measured as the 'degree of financial leverage' (DFL). The combined effect of DOL and DFL is captured in the 'degree of total leverage' (DTL).

Applications of Leverages in Managerial Decisions

Unlike breakeven point, leverages support some short-term planning decisions and also long-term investment and financing decisions. The decisions supported by leverages are listed below:

- Useful in preparation of budgets and planning for achieving targets
- Useful in strategic investment decision for taking calculated investment risk
- Useful in strategic financing decision for taking calculated financial risk

Measurement of Operating and Financial Leverage and their Effects on Profit

This section will deal with the measurement of operating and financial leverage.

Degree of Operating Leverage (DOL)

Degree of operating leverage measures the relationship between the rate of change in sales revenue and the rate of change in operating profit (EBIT or earnings before interest and tax). The formula for DOL is:

$$\text{DOL} = \frac{\text{Contribution}}{\text{EBIT}} \qquad (7.1a)$$

Alternatively,

$$\text{DOL} = \frac{\%\text{ change in EBIT}}{\%\text{ change in Sales Revenue}} \qquad (7.1b)$$

NOTES

Example 7.12(a): Operating leverage calculation: Company A and Company B have been operating in the same industry and in the same market since last year. Both are quite comparable in terms of investment, products and capacity. The selected financial data of these two companies are given below:

Particulars	Company A	Company B
Sales revenue	₹ 1,00,000	₹ 1,00,000
– Variable costs	60,000	20,000
= Contribution	40,000	80,000
– Operating fixed costs	20,000	60,000
= Operating profit (EBIT)	20,000	20,000

Calculate the degree of operating leverage for each company using both the methods.

Solution:

Method 1: Using Equation 7.1a

DOL: Company A = 40,000 ÷ 20,000 = **2**

DOL: Company B = 80,000 ÷ 20,000 = **4**

Method 2: Using Equation 7.1b

Assuming a 10% increase in the sales revenue of both the firms,

DOL: Company A = 20% ÷ 10% = 2

DOL: Company B = 40% ÷ 10% = 4

Particulars	Company A			Company B		
	Original	New	Δ %	Original	New	Δ %
Sales revenue	₹ 1,00,000	₹ 1,10,000	10%	₹ 1,00,000	₹ 1,10,000	10%
– Variable costs	60,000	66,000		20,000	22,000	
= Contribution	40,000	44,000		80,000	88,000	
– Operating fixed costs	20,000	20,000		60,000	60,000	
= Operating profit (EBIT)	20,000	24,000	20%	20,000	28,000	40%

Δ % means percentage change

If sales revenue of Company A changes by 1 per cent, the EBIT would change by 2 per cent. In case of Company B, a 1 per cent change in sales will result in a 4 per cent change in operating profit. This change occurs because operating fixed costs remain constant even if sales change.

Degree of Financial Leverage (DFL)

Degree of financial leverage measures the relationship of rate of change in operating profit (EBIT) with the rate of change in PBT (profit before tax) and with PAT (profit after tax). The formula for DFL is:

$$DFL = \frac{EBIT}{PBT} \qquad (7.2a)$$

Alternatively,

$$DFL = \frac{\% \text{ change in PBT or PAT}}{\% \text{ change in EBIT}} \quad (7.2b)$$

NOTES

Example 7.12(b): Financial leverage calculation:

We will continue example 7.12(a). The additional data for Company A and Company B are given below:

1. Both the firms are in 35% marginal tax rate.
2. Capital structure of these firms are as below:

Source of funds	Company A	Company B
10% debt	—	1,60,000
Equity	2,00,000	40,000
Capital employed	2,00,000	2,00,000
Note that the capital employed is equal to total assets		

Calculate the degree of financial leverage using both the methods.

Solution: First, let us complete the costing profit and loss accounting in marginal costing format.

Particulars	Company A	Company B
Sales revenue	₹ 1,00,000	₹ 100,000
– Variable costs	60,000	20,000
= Contribution	40,000	80,000
– Operating fixed costs	20,000	60,000
= Operating profit (EBIT	20,000	20,000
– Interest expense	—	16,000
= Profit before tax (PBT)	20,000	4,000
– Tax @35%	7,000	1,400
Profit after tax (PAT)	13,000	2,600

Method 1: Using Equation 7.2a

DFL: Company A = 20,000 ÷ 20,000 = 1

DFL: Company B = 20,000 ÷ 4,000 = 5

Method 2: Using Equation 7.2b

Assuming a 10% increase in the sales revenue of both the firms,

DFL: Company A = 10% ÷ 10% = 1

DFL: Company B = 50% ÷ 10% = 5

Particulars	Company A			Company B		
	Original	New	Δ %	Original	New	Δ %
= Operating profit (EBIT)	20,000	22,000	10%	20,000	22,000	10%
– Interest expense	—	—		16,000	16,000	
= Profit before tax (PBT)	20,000	22,000	10%	4,000	6,000	50%
– Tax @35%	7,000	7,700		1,400	2,100	
Profit after tax (PAT)	13,000	14,300	10%	2,600	3,900	50%

Δ % means per cent change

NOTES

If the EBIT of Company A changes by 1 per cent, PBT and PAT will change by 1 per cent. In case of Company B a 1 per cent change in EBIT will result in 5 per cent change in net profit. Interest expense, the result of financing decision, is fixed. That causes the financial leverage effect.

Debt-equity as leverage

When we use the terms 'degree of financial leverage', it means what we discussed so far. However, the term 'leverage' is often used to indicate debt-equity ratio or its variants. In this context, the following two equations are used to denote the financial leverage:

$$\text{Financial Leverage} = \frac{\text{Debt}}{\text{Equity}}$$

Alternatively,

$$\text{Financial Leverage} = \frac{\text{Total Assets}}{\text{Equity}}$$

These two expressions denote the same. The second one is just first one plus one, as the numerator (total assets) in second equation is nothing but debt plus equity.

You may also find the following formula for financial leverage:

$$\text{Financial Leverage} = \frac{\text{Return on Equity}}{\text{Return on Assets}}$$

However, the degree of financial leverage is more meaningful and helpful in managerial applications.

Degree of Total Leverage (DTL)

The degree of total leverage is the combined effect of change in sales on the net profit of the firm. The formula for the degree of total leverage is,

$$\text{DTL} = \text{DOL} \times \text{DFL} \tag{7.3a}$$

Alternatively,

$$\text{DTL} = \frac{\text{\% change in PET or PAT}}{\text{\% change in Sales Revenue}} \tag{7.3b}$$

Example 7.12(c): *Total leverage calculation*

Calculate the degree of total leverage in the previous example using both the methods.

Solution:

Method 1: Using Equation 7.3a

DTL: Company A = 2 × 1 = 2

DTL: Company B = 4 × 5 = 20

Method 2: Using Equation 7.3b

Assuming 10% increase in sales revenue of both the firms,

DTL: Company A = 20% ÷ 10% = 2

DTL: Company B = 200% ÷ 10% = 20

NOTES

Particulars	Company A			Company B		
	Original	New	Δ %	Original	New	Δ %
Sales revenue	₹ 1,00,000	₹ 1,10,000	10%	₹ 1,00,000	₹ 1,10,000	10%
– Variable costs	60,000	66,000		20,000	22,000	
= Contribution	40,000	44,000		80,000	88,000	
– Operating fixed costs	20,000	20,000		60,000	60,000	
= Operating profit (EBIT)	20,000	24,000		20,000	28,000	
– Interest expense	—	—		16,000	16,000	
= PBT	20,000	24,000	20%	4,000	12,000	200
– Tax @ 35%	7,000	8,400		1,400	4,200	%
= Profit after tax (PAT)	13,000	15,600	20%	2,600	7,800	200 %

Δ % means percentage change

This implies that when sales revenue changes by one per cent, net profit (PAT) of Company A will change by two per cent only, but that of Company B will change by 20 per cent.

Note carefully that,

- Fixed costs act as magnifying glasses, which enlarge or shrink the size of profits with the change is sales revenue. DOL is a measure of the magnifying capacity of the operating fixed costs, whereas DFL is the measure of the magnifying capacity of the financial fixed cost (interest).
- DOL is a measure of risk associated with the firm's investment decisions, and DFL is the measure of risk associated with the firm's financing decisions.
- DTL measures the combined effects of change in sales on firm's net profit.
- High fixed cost means high leverage and vice-a-versa.
- Leverages are calculated on the base year data. Leverages will change in a year in which sales revenue is different, even if the behaviour of the costs has remained unchanged. This is the limitation of leverages.
- The association between the change in sales and change in profit is direct and proportionate. If sales increase the profit will also increase, and if sales decline the profit will also decline, but at the faster rate.
- Thus, leverage is the measure of risk, created by the firm through its investment and financing decisions.

Leverage Approach for Determining the Ideal Debt-Equity Ratio

Here we look at the application of the concept of leverages in the determination of ideal debt-equity ratio.

NOTES

The concept of leverages is useful in determining the ideal debt-equity ratio for a firm. The ideal debt-equity ratio is the function of many internal and external variables. Uncertainty of sales revenue and expenses, degree of operating leverage, rate of interest on borrowings and willingness of financial markets for taking risk are important among them.

In the leverage-based ideal debt-equity approach, the degree of total leverage is predetermined based on judgment about the willingness of financial market to take risk. If the total leverage is more or even less than the desired by the market the share price will stay less than the fair value. If total leverage is higher than the market-desired level then it is viewed that the firm is risky and expected rate of return on its shares will increase, decreasing the value of share. The same happens if the degree of total leverage is less than market desire. Less risk means less opportunity of earning desired returns, which becomes a cause for the decline in the share prices. If the share prices remain low for a long time, a firm may become an easy target for acquisition and the new management then would restructure the firm to bring the leverages at the desired level to create the value. The exercise that a firm or new management should take up for restoring the leverage at the desired level involves several steps and restructuring of business and financing. This exercise is explained in Example 7.13 to explain this process.

Example 7.13: Determining Ideal Debt-Equity Ratio Using Leverages

There are two companies, Company-A and Company-B. Both operate in the same industry and in the same market. Both are quite comparable in terms of products and capacity. The selected financial data of these two companies are given below:

Particulars	Company-A	Company-B
Sales revenue – Variable costs	₹100,000 60,000	₹100,000 20,000
= Contribution – Operating fixed costs	40,000 20,000	80,000 60,000
= Operating Profit (EBIT)	20,000	20,000
– Interest Expense	—	16,000
Profit before Tax (PBT)	20,000	4,000

Answer the following questions:

(a) Calculate the degree of operating leverage, degree of financial leverage and degree of total leverage for both the companies.

(b) Suppose a management group MG-1 acquired Company-A and (i) set a targeted degree of total leverage 8 and (ii) decide to maintain the current degree of operating leverage. Calculate the ideal debt-equity ratio that Company-A's new management should attain. Assume that the rate of interest will continue at 10%.

NOTES

(c) Suppose a management group MG-2 acquired Company-B and (i) set a targeted degree of total leverage 8 and (ii) decide to maintain the current degree of operating leverage. Calculate the ideal debt-equity ratio that Company-B's new management should attain. Assume that the rate of interest will continue at 10%.

(d) Calculate the ideal debt-equity ratio for both the companies if interest rate drops to 8%.

Solution:

Answer (a): Leverages

	Company-A	Company-B
DOL = Contribution ÷ EBIT	40,000 ÷ 20,000 = 2	80,000 ÷ 20,000 = 4
DFL = EBIT ÷ PBT	20,000 ÷ 20,000 = 1	20,000 ÷ 4,000 = 5
DTL = DOL × DFL	2 × 1 = 2	4 × 5 = 20

Company-B is risky; its share prices will drop. Some management group can easily and cheaply take over this company. Similarly, the shares of Company-A will have hardly any activity because prices do not change much due to a very low leverage. It can also be an easy target for takeover.

Answer (b and c): Ideal Debt-Equity for Company-A and Company-B

	Company-A	Company-B
New DFL for given DTL 8 and DOL	DOL × DFL = DTL ∴ 2 × DFL = 8 DFL = 8 ÷ 2 = **4**	∴ 4 × DFL = 8 DFL = 8 ÷ 4 = **2**
Desired PBT for attaining target DFL	EBIT ÷ PBT = DFL ∴ 20,000 ÷ PBT = 4 ∴ 20,000 ÷ 4 = PBT ∴ PBT = **5,000**	∴20,000 ÷ PBT = 2 ∴20,000 ÷ 2 = PBT ∴PBT = **10,000**
Interest expense targeted	EBIT – Interest = PBT ∴ 20,000 – 5,000 = **15,000**	∴20,000 – 10,000 = **10,000**
Debt for given rate 10%	Debt = Interest Amount ÷ Interest Rate ∴ Debt = 15,000 ÷ 0.10 ∴ Debt = **1,50,000**	∴Debt = 10,000 ÷ 0.10 ∴Debt = **1,00,000**
Equity for a given capital employed	Equity = capital employed – debt ∴ Equity = 2,00,000 – 1,50,000 = **50,000**	∴ Equity = 2,00,000 – 1,00,000 = **1,00,000**
Debt-Equity Ratio	Debt : Equity = 1,50,000 : 50,000 = 3:1	= 1,00,000 : 1,00,000 = 1:1

Note that both companies have equal risk exposure, measured in terms of degree of total leverage, and still Company-A can opt for 3:1 debt-equity ratio, whereas Company-B can take 1:1 debt-equity ratio.

Answer (d): Ideal Debt-Equity for Company-A and Company-B if Interest Rate Declines

If the interest rate drops to 8%, the debt-equity ratios of both the companies will change. The calculation can be done repeating some of the last steps after we calculated affordable interest expense by both the companies.

NOTES

	Company-A	Company-B
Interest expense targeted	EBIT – Interest = PBT ∴ 20,000 – 5,000 = **15,000**	∴ 20,000 – 10,000 = **10,000**
Debt for given rate 8%	Debt = Interest Amount ÷ Interest Rate ∴ Debt = 15,000 ÷ 0.08 ∴ Debt = **1,87,500**	∴ Debt = 10,000 ÷ 0.08 ∴ Debt = **1,25,000**
Equity for a given capital employed	Equity = Capital employed – debt ∴ Equity = 2,00,000 – 1,87,500 = **12,500**	∴ Equity = 2,00,000 – 1,25,000 = **75,000**
Debt-Equity Ratio	Debt : Equity = 1,87,500 : 12,500 = 15:1	= 1,25,000 : 75,000 = 1.67:1

The affordable debt amount has increases for both the companies with decline in the interest rate and vice versa.

Note the following points:

(a) At a higher interest rate a firm could afford the lower debt-equity ratio, and a vice-a-versa.

(b) In a given market condition, the firm with relatively stable sales expectation is able to take higher degree of total leverage, and the firm with uncertainty about its sales and expenses is able to take less degree of total leverage.

(c) When the investor sentiments are dull a firm can afford to take less degree of total leverage. In times of recession, the investor sentiments are usually dull.

(d) A firm with greater ability to manage the risk can afford to take a higher degree of total leverage. A vibrant organization with a proactive management can manage its risk effectively. Market has confidence in such management and firms.

(e) The investment decisions that cause the degree of operating leverage are less flexible than the financing decisions that cause the financial leverage.

(f) In a competitive environment firms make lesser commitments on investment front and reduce the variability of sales income through the market-line diversification rather than through the product diversification. Firms go global to earn the diversification advantages.

(g) In a competitive environment firms make lesser commitments on the investment front and prefer to make greater commitment through financing decisions for attaining the required degree of total leverage.

(h) Financial commitments are easy to alter at less cost and time.

(i) Developed financial markets facilitate efficient allocation of funds, requiring firms to quickly adjust to changing financial markets. This makes firm's financing decision very dynamic. Therefore, in a

developed financial market economy the firms have to be active in changing their risk profile and changing their financing quickly.

(j) The developed financial markets also offer a mechanism for financial risk management though the market operations. The derivatives market offers the opportunities of swaps and trading in other financial derivatives for a quick and painless shift in the financial structure of a firm.

(k) Firms therefore rely more on flexible financial approach with fast adjustments. The financial sector reforms permit such flexibility through many developments, including buying-back of shares by the firms, call options on bonds and derivative products.

One would realize from this discussion how important it is to understand and apply the concept of leverages in managing the investment and financing decisions.

Check Your Progress

7. What are the different types of leverages?
8. How is degree of total leverage calculated?

7.6 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Capital structure of a company can be any of the following (a) equity shares, (b) equity and preference shares, (c) equity shares and debentures and (d) equity, preference and debentures
2. Financial breakeven point is that level of earnings before interest and taxes (EBIT) which is equal to the fixed financial charges (interest and preference dividend).
3. The major benefit of using debt in capital structure is tax advantages but its biggest disadvantage is financial distress which includes all the problems from small liquidity crisis to the bankruptcy of the company.
4. The ratio of fixed charges to net cash inflow is calculated to find out the coverage of fixed interest charges including principal to net cash inflows. Greater this ration, more will be the amount of debt that company can use in its capital structure as company has multiple time cash inflows to pay its fixed interest charges.
5. David Durand formulated the net operating income approach.
6. The major approaches of capital structure are net income approach, net operating income approach, MM approach and traditional approach.

NOTES

7. There are three types of leverages: degree of operating leverage, degree of financial leverage and degree of total leverage.
8. The degree of total leverage is the combined effect of change in sales on the net profit of the firm. The formula for the same is

   DTL = DOL X DFL

7.7 SUMMARY

- Funds are required in order to run a business smoothly and successfully. Finance plays an important role right from the inception of business to its end i.e. winding up.
- Capital structure of a company refers to the composition or make-up of its capitalization and it includes all long-term capital resources viz. loans, reserves, shares and bonds.
- Financing a firm's assets is a significant decision in every business. There should be a proper mix of debt and equity in financing all the assets.
- The concept of financial breakeven point is important in designing capital structure. Financial breakeven point is that level of earnings before interest and taxes (EBIT) which is equal to the fixed financial charges (interest and preference dividend).
- Point of indifference refers to that level of EBIT where earnings per shares of two financial plans are equal. It means two financial plans give same earning per shares.
- Capital structure decisions have direct impact on the overall valuation of the firms. If firms are successfully able to decide about their optimum capital structure then they can have maximum value.
- The financial managers spend lots of time in deciding the mix of debt and equity to reduce the overall cost of capital and to maximize the wealth of shareholders.
- Broadly speaking, the theories of capital structure decisions have been divided into two categories. These are relevant theories and irrelevant theories.
- According to net income approach, as firm increases the degree of financial leverage, its overall cost of capital decreases and market value of firm increases.
- According to traditional approach, with the additional use of debt the overall cost of capital decreases because debt is a cheaper source of finance.
- Some companies do formal planning for designing their capital structure while some do not plan for their capital structure and just raise funds. These companies can achieve success in short run.

NOTES

- Determination of an optimum capital structure is significant for a company. An appropriate mix of debt and equity should be there in capital structure.
- Ratio of fixed charges to net cash inflow is calculated to find out the coverage of fixed interest charges including principal to net cash inflows.
- Industry norms for the proportion of debt and equity in the capital structure is yet another factor which affects the capital structure design.
- Another important factor which affects the capital structure decision is the nature of the industry.
- Retain manoeuvrability or flexibility for commercial strategy refers to the firm's ability to adjust its capital structure as per the requirements of the funds.
- Timing of the public issue is an important element in designing capital structure. Public issue for funds should be made at a time when capital market, financial market and overall economy are in better condition.
- Leverages, developed on the concept of marginal costing system, are more useful than breakeven point for planning purpose.
- Fixed costs create a leverage effect. Firms incur operating fixed costs and financial fixed costs (interest expense). As a result, different types of leverages are present in the cost structure of a firm.
- There are three types of leverages, namely, Degree of operating leverage (DOL), Degree of financial leverage (DFL) and Degree of total leverage (DTL).

7.8 KEY WORDS

- **Capital structure:** Also known as permanent sources of financing, it is the combination of debt and equity securities.
- **Leverage**: It is the use of various financial instruments or borrowed capital, such as margin to increase the potential return of an investment.
- **Business risk:** It is the possibility that a company will have lower than anticipated profits or experience a loss rather than taking a profit.

7.9 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short-Answer Questions

1. What are the types or forms of capital structure?
2. What is point of indifference?

NOTES

3. What are the advantages of cash flow analysis over EBIT-EPS analysis?
4. Write a short note on the net income approach of capital structure.
5. Why is traditional approach called trade-off theory of capital structure?
6. Mention the elements of capital structure which need to be studied before deciding about the capital structure of a company.
7. What are the decisions supported by leverages?

Long-Answer Questions

1. Define capital structure. Also discuss the various determinants of capital structure of an optimum capital structure.
2. Explain the irrelevant theories of capital structure.
3. Examine the MM approach of capital structure.
4. Describe the measurement of operating and financial leverage and their effects on profit.
5. Discuss the leverage approach for determining the ideal debt-equity ratio.

7.10 FURTHER READINGS

Patel, Bhavesh. 2014. *Fundamentals of Financial Management*. New Delhi: Vikas Publishing House.

Khan, M.Y. and Jain, P.K. 2007. *Financial Management- Text Problems and Cases.* New Delhi: Tata McGraw-Hill.

Chandra, Prasanna. 2004. *Financial Management: Theory and Practice.* New Delhi: Tata McGraw-Hill.

Kulkarni, P.V. and B. G. Satyaprasad. 2002. *Financial Management.* New Delhi: Himalaya Publication House.

UNIT 8 CAPITAL BUDGETING

NOTES

Structure

8.0 INTRODUCTION

Capital budgeting and capital rationing decisions are very important for the effective working of an organization. Capital is required in order to run a business successfully. These decisions help in maximizing the profit at minimum possible cost. In this unit, you will learn about the meaning, nature and types of capital investment and the methods of appraisal under certainty conditions. The basis of international capital budgeting will also be discussed.

8.1 OBJECTIVES

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

- Explain the meaning, nature and types of capital investment
- Describe the methods of appraisal under certainty conditions: PBP, ARR, IRR and NPV techniques
- Discuss basic and international capital budgeting

8.2 CAPITAL INVESTMENT AND BUDGETING: MEANING, NATURE AND TYPES

Capital budgeting decisions are long-term decisions of a firm which are related to fixed assets of the business. Fixed assets are the assets which have a medium to long period of life. These assets generate returns to the business. The initial outflow

NOTES

of funds is huge in case of fixed asset investment decisions or capital budgeting decisions. The returns or cash flows generated by these assets last for many years in future. Therefore, the capital budgeting decisions are the decisions in which initial outlay of cash generates a series of cash inflows. These are also known as capital expenditure decisions. The following are the features of capital expenditure or capital budgeting decisions:

- These decisions are taken for fixed assets of business.
- Generally, the life of this project is more than one year.
- The amount invested in capital budgeting decisions is generally huge and the returns generated are also in a series of cash inflows for various years.
- These decisions are more risky than other decisions because of longer life of the assets.
- The capital budgeting decisions are also termed as fixed assets investment decisions, fixed assets management decisions, capital expenditure decisions, capital expenditure management decisions and long term investment decisions etc.

Fixed asset investment or capital expenditure decisions are related to the long term investment decisions as benefits from this investment are expected to be received in the near future but investment in these decisions have to be made today. Capital expenditure decisions are also called non-flexible and non-reversible long term investment decisions as these involve huge amount of capital investment which generates returns in future over a period of time. Once these decisions are made, it is very difficult (or nearly impossible) to revert such investments decisions. Some examples of the capital budgeting decisions or fixed asset investment decisions are as follows:

- Cost of acquisition of fixed or permanent assets (plant and machinery, land and building, furniture and fixture etc.)
- Cost of replacement, expansion, improvement and alteration in the fixed assets
- Cost incurred on the research and development
- Cost of modernization of the existing fixed assets and so on.

Capital budgeting techniques are used to evaluate these decisions. Capital budgeting is a technique to evaluate various investment alternatives available to the business. It involves complete planning and control of long term capital expenditure decisions. The features of capital budgeting can be summarized as follows:

- It involves huge investment today and benefits from this investment are going to happen in the near future over a series or years.
- Such types of decisions are irreversible in nature i.e. once taken it is very difficult to revert them back.

- Firms earning capacity is dependent on such type of decisions.
- These are long term decisions and non-flexible in nature.

Capital budgeting process is a complex process which starts from the identification of the investment proposals and ends at performance review. It involves various steps like evaluation of various alternatives of investment with various techniques of capital budgeting, selecting the best alternative, final approval of the selection, implementing the decisions taken and so on.

NOTES

Importance of Capital Budgeting Decisions

The following points will discuss the importance of capital budgeting decisions:

1. **Affects the growth and long term profitability of business:** The choice of a specific capital expenditure decision will have impact on a long term basis. For example, if a company has two choices to buy a machinery for its manufacturing plant, the selection of one machinery will automatically reject the other one. The whole production efficiency and effectiveness will depend upon that machine till the life of that machine. Hence, the future revenues and profitability depends upon the choice of capital expenditure decisions made by finance managers. Therefore, such decisions are important as these are going to affect the profitability position of the company for many years.
2. **More risky**: The capital budgeting decisions are basically related to fixed assets investment decisions which have a longer life. Therefore, making all forecast analysis at present for future expected returns from that capital budgeting decision is very difficult. The longer the life of fixed asset, the more is the uncertainty in the forecast of cash flows from that machine and hence more risky is to make the decision. Therefore, it can be said that the capital budgeting decisions are more risky as these are taken considering a longer future perspective in mind.
3. **Difficult to reverse**: It is not easy to reverse capital budgeting decisions. If a long term investment decision is taken and later on it is found to be a wrong decision, then there may not be market available for these second hand fixed assets. Even if there is a market for selling these assets then there will be some decrease in the value of fixed asset in comparison to its original price. Hence, some loss has to incur by the firm to reverse such decisions. That is why it is said that some cost is involved in reversing the capital budgeting decisions.
4. **Huge funds are involved**: The capital budgeting decisions involve huge investment, therefore, these decisions become more relevant. The firm has to raise funds from various sources of capital to finance such decisions that is why these decisions have great impact on liquidity and profitability of the business.

NOTES

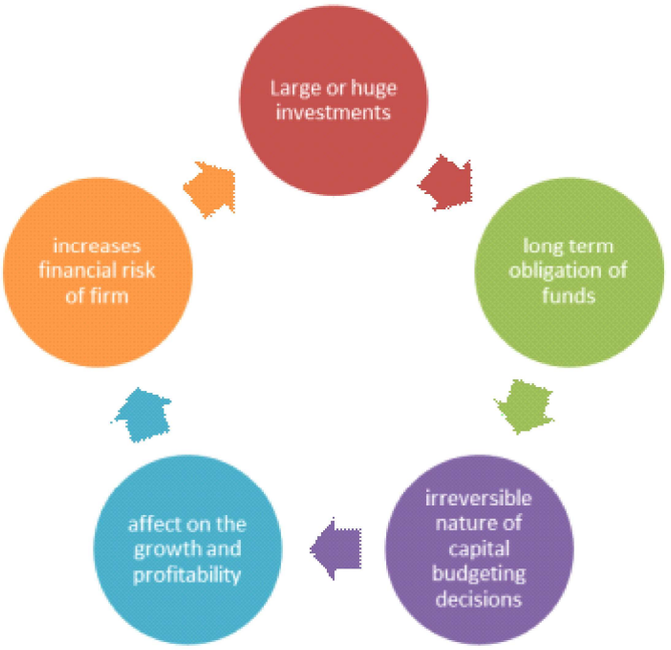


Fig. 8.1 *Importance of Capital Budgeting Decisions*

In a nutshell, we can say that the ultimate outcome of the capital budgeting process is the allocation of available resources to various profitable alternatives. Such decisions involve various economic and non- economic contemplations. Amongst all these issues, profitability of the alternative is the most important factor.

Capital Budgeting Process

The process of capital budgeting ends with the selection of that project which helps to obtain the objective of a finance manager, i.e., to maximize the wealth of the shareholders. It is a complex process as too much cost is involved and these decisions have implications for a longer period. Considering the importance of capital budgeting decisions as discussed above, it becomes vital to follow a systematic approach while taking any capital budgeting decision. The following steps are considered in a capital budgeting decision:

- **Identification of idea:** First of all, it is essential to identify why and where the long term investment decision is required to be taken. Identification of idea of a capital budgeting decision has special relevance as no further process can be followed without having a clear idea. The idea for investment in various long term alternatives can be obtained from inside or outside the firm.
- **Finding the alternatives:** Once the idea has been generated, then the next step is to find out the alternatives available for that. For example, there

is a need to install some automated machine in the production process. Then there can be various alternatives available for such a machine. A comprehensive list is to be made in which all these alternatives are mentioned.

- **Analysis of various alternatives:** Once all alternatives are identified, then there is a need to calculate projected cash inflows and cash outflows involved in each alternative. All cash inflows and outflows need to be discounted at a reasonable rate to adjust for the time value of money.
- **Selecting the best alternative:** Once the analysis of present value of cash inflows and cash outflows is done, then the project giving highest net cash inflows will be preferred than others. Under capital rationing (discussed later on in this chapter) conditions, other parameters may be more relevant than just looking at the present value of net cash inflows.
- **Taking the investment decision and follow-up:** The investment decision for best alternative is taken by the finance managers. Taking an investment decision does not complete the capital budgeting process. It is the responsibility of the finance manager, who has taken the capital budgeting decision, to ensure that the project selected for capital expenditure decision is generating the expected cash inflows. If some deviations are identified then necessary steps should be taken for this.

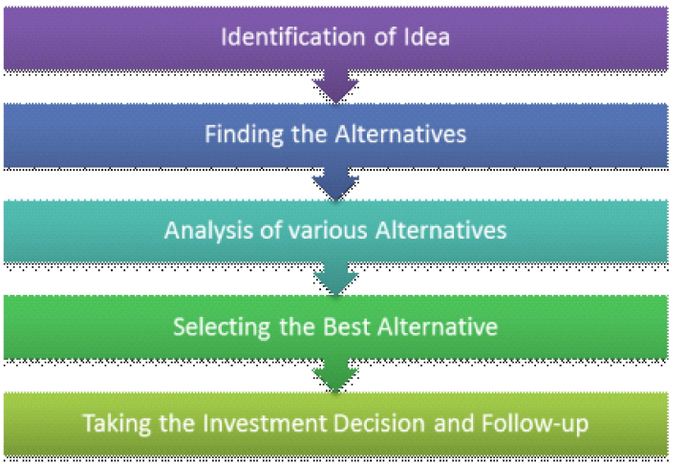


Fig. 8.2 *Steps Involved in Capital Budgeting Decisions*

8.2.1 Evaluation Criterion under Different Types of Capital Investments

In case of capital budgeting decisions, it is important to understand the difference between independent and mutually exclusive projects. An independent project is that project whose series of cash flows does not have an impact on the acceptance or rejection of other projects. However, in case of mutually exclusive projects, the

NOTES

cash flows generated from one project can be affected by acceptance of other project. Mutually exclusive projects are competitive to each other. If there are several independent projects, then all independent projects meeting the acceptance criterion may be accepted by the firm. But in case of mutually exclusive projects, if more than one project meets the decision criterion for acceptance then all such projects cannot be accepted and only one project is required to be accepted. Under such circumstances, the finance manager looks into the initial outlay of all mutually exclusive projects, their estimated life, their estimated cash flows and other strategic factors while selecting the best project. The ultimate objective of selection of each project is to maximize the wealth of shareholders.

Acceptance/rejection criterion

There are various techniques under capital budgeting decisions. These different techniques provide different criterion for acceptance of a project. If a project is accepted as per the selected criterion, then the company can take investment decisions for the same. In case of independent projects, all projects meeting acceptance criterion can be considered for investment purpose depending upon the availability of funds with company. In case of mutually exclusive projects, the project which gives the highest profitability as per selected criterion is accepted.

Check Your Progress

1. Mention any two examples of capital budgeting decisions.
2. What is the purpose of capital budgeting process?

8.3 METHODS OF APPRAISAL UNDER CERTAINTY CONDITIONS: PBP, ARR, IRR AND NPV TECHNIQUES

There are various methods/techniques of evaluation of investment decisions or capital budgeting decisions. Broadly, all these techniques are categorized on the basis of time value of money aspect. These techniques are also known as discounted cash flow (DCF) techniques or time adjusted techniques. However, there is another category of techniques which does not take time value of money concept in consideration, and are known as non-discounted cash flow (DCF) techniques. These techniques are also known as traditional methods of capital budgeting decisions or investment decisions.

NOTES

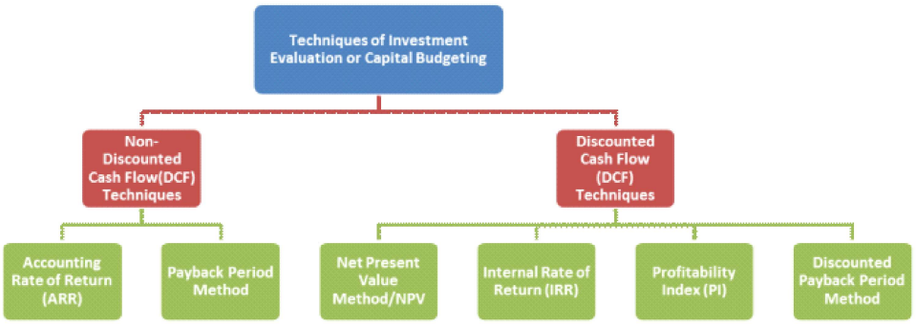


Fig. 8.3 *Techniques of Investment Evaluation*

Accounting Rate of Return or Average Rate of Return (ARR)

The accounting rate of return method is the only method which is based upon accounting profits rather than cash flows. It is also called as average rate of return method. According to this technique, the expectations of profits play important role, therefore the cost of initial project in relation to average profit is required to be examined. The ARR method states the relationship between the average profits and average investments. The following formula is used to calculate ARR. The ARR method is used in different forms by different practitioners.

$$ARR = \frac{Average\ Profits}{Initial\ Investments}$$

or

$$ARR = \frac{Average\ Profits}{Average\ Investments}$$

Where

$$Average\ Profit = \frac{Profit\ After\ Tax}{Life\ of\ Investment}$$

$$Average\ Investments = \frac{Book\ Value\ at\ the\ end\ of\ year\ 1 + Book\ Value\ at\ the\ end\ of\ life}{2}$$

Or

$$Average\ Investments = Net\ Working\ Capital + Salvage\ Value + \frac{1}{2}(Initial\ Cost\ of\ Machine - Salvage\ Value)$$

or

$$Average\ Investments = \frac{Initial\ Investment + Scrap\ Value + Working\ Capital}{2}$$

NOTES

or

$$Average\ Investments = \frac{B.V.(year\ 0) + B.V.(year\ 1) + B.V.(year\ 2) \ldots \ldots}{Years\ of\ Investment + 1}$$

Example to understand average rate of return method

Example 8.1

A project requires an investment of ₹ 5,50,000 and has a scrap value of ₹ 40,000 at the end of 6th year. The project is expected to yield a profit after depreciation and taxes during 6 years of ₹, 50,000, ₹75,000, ₹ 60,000, ₹ 65,000, ₹ 40,000 and ₹30,000.

Calculate the average rate of return on the project.

Solution:

$$Average\ rate\ of\ return = \frac{Average\ Annual\ Profit}{Net\ Investment\ in\ the\ project}$$

Average profit of the project = (50000 + 75000 + 60000 + 65000 + 40000 + 30000)/6

= ₹53,333

Total investment in the project = ₹ 5,50,000 – ₹ 40,000 = ₹ 5,10,000

$$Average\ rate\ of\ return = \frac{53,333}{5,10,000} X\ 100 = 10.46\ \%$$

Example 8.2

Suppose a project (expected life is 5 years) requires an initial investment of ₹ 8,00,000 and has a scrap value of ₹ 40,000 at the end of the project (after 5 years). Its expected profits after depreciation and tax for 5 years are ₹80,000, ₹90,000, ₹ 60,000, ₹ 70,000 and ₹ 20,000.

Calculate average rate of return on the project.

Solution:

Total profits = 80,000+90,000+90,000+70,000+60,000 = ₹ 3,90,000

Average Annual Profits = ₹ 3,90,000 / 5 = ₹ 78,000

Net investment in the project = ₹8,00,000 – Rs40,000 (salvage value)

= ₹ 7,60,000

Accounting rate of return or average rate of return

= (₹ 78,000 / Rs7,60,000) × 100 = 10.26%

Decision rule: A target average rate of return is always set for an organization. If ARR of a project is more than this target rate then it is accepted and if ARR is less than target rate then it is rejected. In the above example cost of capital of the

company is 10%, the company can accept this project as ARR is higher than this percentage.

Merits and demerits: This method is relatively easy to apply as information required to use this method is easily available from financial statements of the firm. But this method suffers from various drawbacks which makes it least preferred method too. This method is not based on cash flows but considers accounting profits to calculate ARR. The accounting profits as a decision criterion suffers from many weaknesses as it can be a biased indicator too. Moreover, this method does not consider the time value of money and profits of all time periods are given equal importance but in reality the money value of accounting profit in year one is definitely more than the money value of same profit in year two because we all know it very well that value of present money is always more than value of money in some time in future.

NOTES

Converting accounting profits in cash flows: It has already been discussed, why cash flows are better measurement criteria in comparison to accounting profit in order to meet the objective of wealth maximization. Therefore, if accounting profits are given then there is a need to make necessary adjustment in accounting profits to get the cash flows. The following adjustments should be taken into account.

Converting Accounting Profits in Cash flows

If accounting profits are given then there is a need to make necessary adjustment in accounting profits to get the cash flows. The following adjustments should be taken into account.

Determination of Cash Inflows

	Years			
Particulars	**1**	**2**	**…….**	**N**
Cash sales				
Less-Cash Operating Cost				
Cash Inflows before Depreciation and Tax				
Less-Depreciation				
Cash Inflows before Tax after Depreciation				
Less-Tax				
Earnings After Tax (EAT)				
Add-Depreciation				
Cash inflows after Tax(CFAT)				
Add-Salvage Value (in nth year)				
Add-Recovery of Working Capital (in nth year)				

Cash Outflows = Cost of New Project + Installation Cost ±Working Capital Requirements

Payback Period (PBP)

Payback period method is frequently used to get a rough idea about the selection of a project. This method is based on cash flows rather than accounting profit. Therefore, to calculate cash flows, necessary adjustment for non-cash items is required to be made in the accounting profits. The payback period means the time period a project takes to pay back its total or initial investment. In other words, if a project requires an initial investment of INR one lakh and project generates cash

NOTES

flows of INR 75,000, INR 25,000 and INR 30,000 for year one, two and three respectively then time period of 2 years will be known as payback period when the project will be paying back its initial investment, i.e., INR one lakh back. This method is also known as pay off period or pay out period method.

In case of equal cash flows, i.e., annuity,

$$Payback\ Period = \frac{Cash\ Outlay\ of\ the\ Project\ or\ Initial\ Investment\ in\ Asset}{Annual\ Cash\ Inflows}$$

In case of unequal cash flows, the payback period is calculated by computing cumulated cash flows. And payback period is that period when the cumulated cash flows are equal to initial investment outlay.

$$Payback\ Period = \frac{Cash\ Outlay\ of\ the\ Project\ or\ Initial\ Investment\ in\ Asset}{Annual\ Cash\ Inflows}$$

Decision rule: As per payback period method, the project which has a shorter payback period is preferred over its competitive projects.

Merits and demerits: This method is simple to understand and more practical than the previous method, i.e., ARR as it is based upon cash flow analysis rather than accounting profits. Further, the major drawback of this method is that it does not consider the time value of money which is the most crucial aspect of any financial decision. Also, this method does not give any importance to cash flows generated after the payback period. Many times a project having little longer payback period has better cash inflows after payback period. Hence, this method does not give importance to that.

Another drawback of this method is that it does not give importance to the pattern of cash flows. For example, if two projects have a life of three years and both require initial investment of INR one lakh. If project one generates cash flows of INR 75,000, INR 25,000 and INR 30,000 for year one, two and three respectively and project two generates cash flows of INR 25,000, INR 75,000 and INR 30,000 for year one, two and three respectively then both the projects will have same payback period of two years but project one may be better as it generates higher cash flows in year one which may have more value than cash flows generated in the second year.

The merits and demerits can be summarized as follows:

Advantages

- Simple to calculate and easy to understand
- Less labor and time is required to calculate payback
- Best suited to the firms which are suffering from shortage of cash or whose liquidity position is not good.
- Reduces the loss of obsolescence

Disadvantages

- Does not consider the cash flows after the payback period
- Completely ignores time value of money concept
- Difficulty in determination of acceptable payback period
- Do not take into consideration the cost of capital

Examples of Payback Period Method

Example 8.3

A project costs ₹ 2,00,000 initially followed by a stream of ₹ 30,000 annually for next 10 years. Calculate pay-back period for this project.

Solution:

$$Pay-back\ period = \frac{Initial\ Outley\ of\ the\ project}{Annual\ Cash\ Flow} = \frac{200000}{30000} = 6.67\ years$$

Example 8.4

Compute payback period for a project having initial investment of ₹ 4,00,000 and annual cash inflows are as follows:

Years	Cash Inflows
1	79,000
2	87,000
3	83,000
4	97,000
5	89,000
6	79,000
7	56,000

Solution:

In this case, total cash outlay is ₹ 4,00,000 and total cash inflow for first four years are ₹ 3,46,000. Remaining 54,000(400000-346000) will be covered in the fifth year. So, 54000/89000 = 0.6 multiplied by 12. Therefore, the total payback period in this case will be 4 years and 7 months.

Example 8.5

Following three projects require an equal initial outlay of ₹ 1,50,000 and have equal life of 6 years. Company Omx is confused that which project it should pick as all these projects are mutually exclusive i.e. company can select only one project at a time not all.

NOTES

Years	Cash Inflows
1	79,000
2	87,000
3	83,000
4	97,000
5	89,000
6	79,000
7	56,000

Solution:

Payback period for Project M = 3 years (1,14,000) + (36,000/44,000) * 12
= 3 years 9 months

Payback period for Project N = 4 years (1,46,000) + (4,000 /32,000) * 12
= 4 years 1.5 months

Payback period for Project O = 2 years (1,42,000) + (8,000/ 50,000) * 12
= 2 years 1.92 months

Ranking of the project is as follows;

1) Project O
2) Project M
3) Project N

Example 8.6

Following information is related to a project, cost of which is ₹ 60,000 with a zero scrap value at the end of 5th year. Yearly profit of the company is as follows.

Years	1	2	3	4	5
Profit before depreciation and tax	12000	18000	35000	28000	32000

Company follows a straight down method of depreciation. Assume tax rate to be 50%. Calculate payback period for the above machinery.

Solution:

In this problem, net profit is given and for the purpose of calculation of payback period we need cash flows associated to a project.

Years (1)	**Profit before depreciation and tax (2)**	**Depreciation (3)**	**Profit after depreciation before tax (4)**	**Tax (50%) (5)**	**Net profit / Profit after tax (6)**	**Cash flows (7 = profit after tax + depreciation)**
1	12000	12000	0	0	0	12000
2	18000	12000	6000	3000	3000	15000
3	35000	12000	23000	11500	11500	23500
4	28000	12000	16000	8000	8000	20000
5	32000	12000	20000	10000	10000	22000

Payback period = 3 years + (9500/20000)*12 = 3 years 5.7 months

Example 8.7 (mixed stream of cash inflows)

Calculate payback period for a project which requires initial investment of ₹ 20,000 and is expected to generate cash inflows of ₹ 4000, ₹ 8000, ₹ 6,000 and ₹ 4,000 in the coming four years.

NOTES

Solution:

Total cash outflow = ₹ 20,000 and

Total cash inflow = Rs4,000 + ₹ 8,000 + ₹ 6,000 = ₹ 18,000

In this example, the payback period is somewhere between 3 to 4 years i.e. more than 3 years but less than 4 years.

To calculate exact number of years we use following formula:

Remaining investment divided by the cash inflow of current year.

(₹ 2,000/ ₹ 4,000)X 12 = 6 months

So the payback period for this project is 3 years and 6 months.

Example 8.8 (comparison of multiple projects)

Suppose there are three projects and each project requires an initial investment of ₹ 40,000. You are required to rank these projects on the basis of payback period method and suggest which project is acceptable and why?

Years	Project Beta (₹)	Project Gamma (₹)	Project Theta (₹)
1	2,000	2,000	10,000
2	4,000	8,000	20,000
3	8,000	14,000	15,000
4	10,000	16,000	20,000
5	16,000	-	-

Solution:

Pay back for project beta = 5 years (total inflow ₹ 40,000)

Pay back for project Gamma = 4 years (total inflow ₹ 40,000 (2,000 + 8,000 + 14,000 + 16,000))

Payback for project Theta = 2 years 8 months (10,000/15,000) × 12= 8 months)

So the ranking for the projects is project theta, project gamma and project beta.

Net Present Value (NPV)

The net present value or popularly known as NPV method is a method which considers the time value of money. This is the most preferred method to take investment decisions. Under this method, cash flows are used for analysis and hence it is more realistic method. According to this method, NPV or Net Present Value is the difference between present values of cash inflows minus present value of cash outflows. To calculated present value of cash inflows and cash outflows,

NOTES

cost of capital, i.e., k_o is considered as discounting factor. The cost of capital is also known as cut-off rate or hurdle rate. The following steps need to be followed to calculate NPV of a project.

- First of all determine the initial outflows of investment decision.
- Second, determine the cash flow series throughout the life of investment/ project. For this, make necessary adjustments in accounting profit for non-cash items.
- Third, determine the cost of capital to discount cash flows.
- Fourth, calculate the present value of cash inflows and present value of cash outflows in case of multiple times cash outflows in different years.
- Fifth, calculate the difference between present value of cash inflows and present value of cash outflows.
- Last, check whether the difference in present value of cash inflows and present value of cash outflows is positive or negative. In case, it is positive then the project is accepted or vice-versa.

$$\textbf{\textit{Net Present Value (NPV)}} = \textbf{\textit{Present Vlaue (PV) of Cash Inflows}} - \textbf{\textit{Present Vlaue (PV) of CashOutflow}}$$

$$\text{NPV} = \left[\frac{C_2}{(1+k)} + \frac{C_2}{(1+k)^2} + \frac{C_3}{(1+k)^3} + \cdots \ldots\ldots\ldots + \frac{C_t}{(1+k)^n}\right] - C_0$$

Decision rule: If NPV of a project is positive then it can be accepted and if NPV of a project is negative then it is rejected. In case of NPV = zero, then the project may or may not be accepted by finance managers which is based upon non-financial benefits of project. And in case of many competitive projects, a project with highest NPV will be accepted.

Merits and demerits: There are many merits of using NPV method for investment evaluation. First, it is based upon cash flows rather than accounting profits. Second, it considers present value of money concept and hence is a more realistic method. Third, it considers all cash flows throughout the life of project rather than a few as considered in case of payback period method. Last but not the least, it focuses on the wealth maximization objective of business as it is based upon cash flow analysis.

Demerits of NPV method are, first, it is a time consuming method as lots of calculations are required to be done. Second, calculation of cost of capital under changing risk and uncertainty conditions may be a challenge for finance managers. Third, in case two projects having unequal life are required to be compared then some further changes in the NPV method need to be done as it cannot be applied as it is. Fourth, in case there is a difference in the initial investment of two projects meant for same purpose, then this technique may not give good result.

NOTES

Example 8.9

Balco Ltd is a successful firm in the manufacturing sector and currently has 42% of the market shares. This company wants to expand its production capacity as in current financial year they have a target of increasing their market shares to 50%. They have following three options to invest. They will pick a project which will meet the objective of the shareholder's wealth maximization. Company wants to invest in one of the following three projects. Initial outlay for all these projects is ₹ 16,00,000. Life of the all these project is 8 years.

Years	Project R	Project S	Project T
1	350000	405000	545000
2	410000	435000	415000
3	430000	255000	495000
4	570000	395000	405000
5	450000	315000	335000
6	320000	395000	240000
7	210000	355000	280000
8	270000	290000	195000

Solution

Years	Cash Flows for Project R	Present Value Factor (PVF) at 10%	Discounted cash inflows
1	350000	0.909	318150
2	410000	0.826	338660
3	430000	0.751	322930
4	570000	0.683	389310
5	450000	0.621	279450
6	320000	0.564	180480
7	210000	0.513	107730
8	270000	0.467	126090
			2062800

Net present Value (NPV) for project R = PV of cash inflows – PV of Cash outflows

= ₹ 20,62,800 – ₹ 16,00,000

NPV for Project R = ₹ 4,62,800

NOTES

Years	Cash Flows for Project S	Present Value Factor (PVF) at 10%	Discounted cash inflows
1	405000	0.909	368145
2	435000	0.826	359310
3	255000	0.751	191505
4	395000	0.683	269785
5	315000	0.621	195615
6	395000	0.564	222780
7	355000	0.513	182115
8	290000	0.467	135430
			1924685

Net present Value (NPV) for project S = PV of cash inflows – PV of Cash outflows

= ₹ 19,24,685 – ₹ 16,00,000

NPV for Project S = ₹ 3,24,685

Years	Cash Flows for Project T	Present Value Factor (PVF) at 10%	Discounted cash inflows
1	545000	0.909	495405
2	415000	0.826	342790
3	495000	0.751	371745
4	405000	0.683	276615
5	335000	0.621	208035
6	240000	0.564	135360
7	280000	0.513	143640
8	195000	0.467	91065
			2064655

Net present Value (NPV) for project T = PV of cash inflows – PV of Cash outflows

= ₹ 20,64655 – ₹ 16,00,000

NPV for Project T = ₹ 4,64,655

Ranks of the Projects

1	Project T	NPV ₹ 4,64,655
2	Project R	NPV ₹ 4,62,800
3	Project S	NPV ₹ 3,24,685

As per the NPV method, Balco Ltd should invest in Project T as the Net present value is the highest in this case followed by Project R and Project S.

NOTES

Example 8.10

A company is considering following four projects G, S, T and U. Cash inflows and cash outflows related to these project are shown in the following table. Life of all the projects is equal i.e. 5 years. Take 14% as discount rate. Rank all these projects by using NPV method.

Years	Project G	Project S	Project T	Project U
0	50000	60000	55000	65000
1	11000	15500	6400	21300
2	17000	14500	8700	19900
3	20000	17500	9300	23500
4	22000	20500	11100	19500
5	19000	8500	18500	18500

Solution:

Years	Project G	Present Value Factor (PVF) at 14%	Present Values of Cash Flows	
0	50000			
1	11000	0.877	9647	NPV for Project G = PV of cash inflows – PV of Cash outflows = ₹ 59,105 – ₹50,000 = ₹9,105
2	17000	0.769	13073	
3	20000	0.675	13500	
4	22000	0.592	13024	
5	19000	0.519	9861	
			59105	
	Project S	Present Value Factor (PVF) at 14%		
0	60000			
1	15500	0.877	13593.5	NPV for Project S = PV of cash inflows – PV of Cash outflows = ₹53,104 – ₹60,000 = (-ve) ₹6,896
2	14500	0.769	11150.5	
3	17500	0.675	11812.5	
4	20500	0.592	12136	
5	8500	0.519	4411.5	
			53104	
	Project T	Present Value Factor (PVF) at 14%		
0	55000			
1	6400	0.877	5612.8	NPV for Project T = PV of cash inflows – PV of Cash outflows = ₹34753.3 – ₹55,000 = (-ve) ₹20,246.7
2	8700	0.769	6690.3	
3	9300	0.675	6277.5	
4	11100	0.592	6571.2	
5	18500	0.519	9601.5	
			34753.3	
	Project U	Present Value Factor (PVF) at 14%		
0	65000			
1	21300	0.877	18680.1	NPV for Project U = PV of cash inflows – PV of Cash outflows = ₹70,991.2 – ₹65,000 = ₹5,991.2
2	19900	0.769	15303.1	
3	23500	0.675	15862.5	
4	19500	0.592	11544	
5	18500	0.519	9601.5	
			70991.2	

NOTES

From the above calculation, it is clear that Project S and Project T have negative NPV so company should reject these two projects.

Other two projects, Project G and Project U, are giving positive NPV and project G (₹ 9,105) gives higher NPV in comparison to Project U (₹ 5,991.2). So company should prick Project G out of all four projects.

Example 8.11

Aman limited is a leading manufacturer of automotive components. Suppose you have recently joined Aman Limited as a financial analyst reporting to Mr. John, the CEO of the company. He has provided you the following information about two projects X and Y that are being considered by the executive committee of Aman ltd:

- Project X is an extension of an existing line. Its cash flow will decrease over time.
- Project Y involves a new product. Building its market will take some time and hence its cash flow will increase over time.

The expected cash flows of the two projects are as follows:

	Project X	Project Y
Initial investment	₹40,000	₹60,000
Estimated Life of Projects	5 years	5 years
Scrap Value	₹5000	₹8,000

The profits before depreciation and after taxes (cash flows) of the above two alternatives are as follows:

Years	Project X	Project Y
1	₹ 6,000	₹15,000
2	₹8,000	₹20,000
3	₹15,000	₹25,000
4	₹20,000	₹15,000
5	₹10,000	₹5,000

Calculate net present value of the projects and suggest Mr Aman that which project is acceptable and why? Assume cut off rate is 10%.

Solution:

Calculation of NPV for Project X and project Y

Years	CI for Project A	PV factor at 10%	PV of Net Cash Flows X	CI for Project B	PV factor at 10%	PV of Net Cash Flows Y
1	6000	0.909	5454	15000	0.909	13635
2	8000	0.826	6608	20000	0.826	16520
3	15000	0.751	11265	25000	0.751	18775
4	20000	0.683	13660	15000	0.683	10245
5	10000	0.62	6200	5000	0.62	3100
5(Scrap Value)	5000	0.62	3100	8000	0.62	4960
Total			46287			67235

Net Present Value for Project X = ₹ 46,287 – ₹ 40,000 = ₹ 6,287

Net Present Value for Project Y = ₹ 67,235 – ₹ 60,000 = ₹ 7,235

As NPV for project Y is more so Project Y should be selected and project X should be rejected as it has less NPV.

NOTES

Example 8.12

Beta company is considering an investment proposal which has an initial investment of ₹ 4,00,000 with an expected life of 5 years and no salvage value. The company follows straight line method of depreciation. Corporate tax rate is 40%. Following table shows the earnings of the company before depreciation and before taxes:

Years	Earnings before depreciation and taxes	Present value factor at 10%
1	140000	0.909
2	160000	0.826
3	240000	0.751
4	180000	0.683
5	120000	0.621

Solution:

Earnings before depreciation and taxes	Depreciation (straight line method)	Earnings before taxes (EBT)	Amount of Tax @40%	Earnings after tax (EAT)	Cash Flows (Earnings after tax before depreciation
140000	80000	60000	24000	36000	116000
160000	80000	80000	32000	48000	128000
240000	80000	160000	64000	96000	176000
180000	80000	100000	40000	60000	140000
120000	80000	40000	16000	24000	104000

Cash Flows	PV at 10%	
116000	0.909	105444
128000	0.826	105728
176000	0.751	132176
140000	0.683	95620
104000	0.621	64584
		503552

So net present value is

NPV = ₹ 5,03,552 – ₹ 4,00,000

NPV = ₹ 1,03,552

NOTES

Present Value Table

(PV of Rupee one payable or receivable for 15 years at different discount rate)

n	9%	10%	11%	12%	13%	15%	17%	18%	19%	20%
1	0.917	0.909	0.901	0.893	0.885	0.870	0.855	0.847	0.840	0.833
2	0.842	0.826	0.812	0.797	0.783	0.756	0.731	0.718	0.706	0.694
3	0.772	0.751	0.731	0.712	0.693	0.658	0.624	0.609	0.593	0.579
4	0.708	0.683	0.659	0.636	0.613	0.572	0.534	0.516	0.499	0.482
5	0.650	0.621	0.593	0.567	0.543	0.497	0.456	0.437	0.419	0.402
6	0.596	0.564	0.535	0.507	0.480	0.432	0.390	0.370	0.352	0.335
7	0.547	0.513	0.482	0.452	0.425	0.376	0.333	0.314	0.296	0.279
8	0.502	0.467	0.434	0.404	0.376	0.327	0.285	0.266	0.249	0.233
9	0.460	0.424	0.391	0.361	0.333	0.284	0.243	0.225	0.209	0.194
10	0.422	0.386	0.352	0.322	0.295	0.247	0.208	0.191	0.176	0.162
11	0.388	0.350	0.317	0.287	0.261	0.215	0.178	0.162	0.148	0.135
12	0.356	0.319	0.286	0.257	0.231	0.187	0.152	0.137	0.124	0.112
13	0.326	0.290	0.258	0.229	0.204	0.163	0.130	0.116	0.104	0.093
14	0.299	0.263	0.232	0.205	0.181	0.141	0.111	0.099	0.088	0.078
15	0.275	0.239	0.209	0.183	0.160	0.123	0.095	0.084	0.074	0.065

Internal Rate of Return (IRR)

This method also comes under discounted cash flow techniques. The internal rate of return (IRR) is also termed as 'trial and error method', 'discounted rate of return method', 'yield method', 'time adjusted rate of return method' , 'marginal efficiency of capital', 'marginal productivity of capital' and 'discounted cash flow method'. It is also based on cash flows and considers time value of money concept. The internal rate of return is that rate which equates the present value of cash inflows and present value in cash outflows in terms of initial investment or investment made in a phased manner. In other words, it is that rate where NPV, i.e., net present value, of a project is zero.

IRR is that rate where NPV = 0

OR

$$\left[\frac{C_2}{(1+r)} + \frac{C_2}{(1+r)^2} + \frac{C_3}{(1+r)^3} + \cdots \ldots \ldots \ldots + \frac{C_t}{(1+r)^n}\right] = C_0$$

Formula for IRR

In case of conventional cash flows,

$$CO_0 = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t} + \frac{S_n + W_n}{(1+r)^n}$$

$$Zero = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t} + \frac{S_n + W_n}{(1+r)^n} - CO_0$$

In case of unconventional cash flows,

$$Zero = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t} + \frac{S_n + W_n}{(1+r)^n} - \sum_{t=1}^{n} \frac{CO_0}{(1+r)^t}$$

NOTES

Where

CF_t = cash inflows during different time periods

r = internal rate of return

S_n = Salvage Value

W_n = working capital adjustments

CO_0 = cash outflow during different time periods

The IRR can be calculated in two ways:

- By trial and error method
- By calculating pay-back period

Trial and error method: According to trial and error method, a finance manager through his past experience and judgments can try any discounting factor to calculate present value of cash inflows and outflows. If at this discounting rate, the NPV is found positive then there is a need to increase the discounting factor. This process should be continued as long as the decision maker does not get NPV = Zero. On the contrary, if at a random discounting rate, the NPV is found negative, then the decision maker should reduce it and keep on doing this trial and error until NPV = Zero is not obtained. The trial and error method is quite simple and with the use of excel and other softwares, it is easy to run trial and error method to obtain IRR. To apply trial and error discounting factor, a finance manager can begin with discounting factor obtained in the step one mentioned below. Rest of the process is same as mentioned in the above paragraph.

Computing IRR by calculating pay-back period: Under this method, the following steps are required to be followed.

- Calculate payback period to obtain present value factor.

  When there is equal annual cash flows over the life of the project:

$$Pay\ Back\ Period = \frac{Initial\ Outlay}{Annual\ Cash\ Flows}$$

  The value of payback period obtained above needs to be located in present value of annuity table (also provided in annexure) against the life of project (in years).

  When there is unequal annual cash flows:

$$Pay\ Back\ Period = \frac{Initial\ Outlay}{Annual\ Cash\ Flows}$$

NOTES

- This payback period is also called as fake payback period as it gives the rough estimation of required rate of return.
- Then locate the present value factor in present value of annuity table that is equal to or near to the life of capital expenditure or project.
- The corresponding value of discounting factor can be used to calculate IRR. If the exact value cannot be located against a specific discounting factor then there is a need of locating two values in which the calculated fake payback period will lie. In such a case, there will be two discounting factors within which the required rate of return will lie.
- By using any of the following formula, the IRR can be calculated.

$$IRR = r - \left(\frac{PV_{CO} - PV_{CFAT}}{\Delta PV}\right) \times \Delta r$$

Where,

r = Any of the two interest rates located in present value table (higher rate or lower rate)

PV_{CO} = Present value of cash outflow

PV_{CFAT} = Present value of cash inflows (Annuity x Discounting Factor)

ΔPV = Difference in calculated present values of inflows

Δr = Difference in Interest rates

Or

$$IRR = r - \left(\frac{PB - DF_r}{DF_{rL} - DF_{rH}}\right)$$

Where,

r = Any of the two interest rate located in present value table(higher rate or lower rate)

PB = Payback period

DF_r = Discount factor for interest rate t

DF_{rL} = Discount rate for lower interest rate

DF_{rH} = Discount rate for lower interest rate

Example 8.13

A project costs ₹ 1,00,000 and is expected to generate cash flows of ₹ 27,500 annually for next 5 years. With this given information you are required to calculate internal rate of return (IRR) of this project.

Solution:

In such type of problems, following steps should be used to calculate the IRR of the projects:

1. First of all, calculate fake payback period by using cash flow information. Here, payback is 3.636 (₹ 1,00,000/ ₹ 27,500).
2. Now by using the present value of an annuity table of rupee one, we can locate 3.636 corresponding to year 5. Discount factor closest to 3.636 is 3.696 (11% rate of interest) and 3.605 (12% rate of interest). The actual value of IRR lies between these two rates 11% and 12%.
3. Now apply following formula to calculate the exact value of IRR.

$$IRR = r - \frac{PB - DF_{RT}}{DF_{LRT} - DF_{HRT}}$$

Here, *r* is any of the two rates which have been selected in above step (2), PB is ayback period, DF_{RT} is discount factor for interest rate *r*, DF_{LRT} is discount factor for lower interest rate, DF_{HRT} is discount factor for higher interest rate.

$$IRR = 11\% - \frac{3.636 - 3.696}{3.696 - 3.605} = 11\% - (-0.659) = 11.659\%$$

or

$$IRR = 12\% - \frac{3.636 - 3.605}{3.696 - 3.605} = 12\% - (0.341) = 11.659\%$$

IRR is same in above two cases. So any of the rates can be used to calculate IRR.

Second Method of IRR

$$IRR = Lower\ rate + \frac{PV\ of\ CI\ at\ LR - PV\ of\ CO}{PV\ of\ CI\ at\ LR - PV\ of\ CI\ at\ HR}$$

Here, PV of CI at LR is present value of cash inflows at lower rate, PV of CI at HR is present value of cash inflows at higher rate.

In this problem,

PV_{CFAT} (11%) = ₹ 27,500 X 3.696 = ₹ 1,01,640

PV_{CFAT} (12%) = ₹ 27,500 X 3.605 = ₹ 99137.50

By using above equation,

$$IRR = 11\% + \frac{101640 - 100000}{101640 - 99137.50} = 11\% + \frac{1640}{2502.50} = 11\% + 0.65 = 11.65\ \%$$

Decision rule:

A project which has IRR more than cut off rate or hurdle rate or overall cost of capital is accepted. In case two projects have IRR more than cut off rate and firm needs only one of these two projects then the project with higher cut-off rate is accepted.

NOTES

Merits and demerits: The IRR methods are appreciated because of certain reasons. One, it is based on cash flow information which is a realistic parameter. Second, it considers the time value of money aspect which adds further value to the usage of this method. Third, it is easy to understand and implement. The term internal rate of return seems to be more understandable to different stakeholders than NPV. And last, it is oriented towards the wealth maximization goal of the firm.

However, some people count it as a tedious method as calculation of fake payback period and following further steps to calculate IRR is quite complex. Further, in case of non-conventional cash flows, there can be multiple IRRs as output and it is difficult to take decisions under such circumstances. Also, in case of mutually exclusive projects, the IRR method does not give good results.

Example 8.14

Rank following projects by using NPV and internal rate of return (IRR) methods. Assume 17% as the discount rate for all these projects. Initial investment in these projects is ₹ 16,00,000 and this is same for all the projects.

Years	Project Alpha	Project Beta	Project Gamma
1	350000	405000	545000
2	410000	435000	415000
3	430000	255000	495000
4	570000	395000	405000
5	450000	315000	335000
6	320000	395000	240000
7	210000	355000	280000
8	270000	290000	195000

Solution:

Years	Project Alpha	Present Value Factor (PVF) at 17%	CI for Project Alpha	Present Value Factor (PVF) at 19%	
1	350000	0.855	299250	0.84	294000
2	410000	0.731	299710	0.706	289460
3	430000	0.624	268320	0.593	254990
4	570000	0.534	304380	0.499	284430
5	450000	0.456	205200	0.419	188550
6	320000	0.39	124800	0.352	112640
7	210000	0.333	69930	0.296	62160
8	270000	0.285	76950	0.249	67230
			1648540		**1553460**

NPV = ₹ 16,48,540 – ₹ 16,00,000 = ₹ 48,540

For the calculation of IRR, following formula can be used. (17% and 19% are two returns for the calculation of the IRR)

$$IRR = Lower\ rate + \frac{PV\ of\ CI\ at\ LR - PV\ of\ CO}{PV\ of\ CI\ at\ LR - PV\ of\ CI\ at\ HR}$$

NOTES

IRR Project Alpha = 17% + (₹ 16,48,540 – ₹ 16,00,000) / (₹ 16,48,540 – ₹15,53,460)

IRR Project Alpha = 17% + 0.511 = 17.511%

Years	Project Beta	Present Value Factor (PVF) at 17%	CI for Project Beta	Present Value Factor (PVF) at 15%	
1	405000	0.855	346275	0.87	352350
2	435000	0.731	317985	0.756	328860
3	255000	0.624	159120	0.658	167790
4	395000	0.534	210930	0.572	225940
5	315000	0.456	143640	0.495	155925
6	395000	0.39	154050	0.432	170640
7	355000	0.333	118215	0.376	133480
8	290000	0.285	82650	0.327	94830
			1532865		1629815

NPV for Project Beta = ₹ 15,32,865 –₹ 16,00,000 = (-ve) ₹ 67,135

As NPV is negative for this project so we have lowered interest rate for this project in order to calculate IRR.

$$IRR = Lower\ rate + \frac{PV\ of\ CI\ at\ LR - PV\ of\ CO}{PV\ of\ CI\ at\ LR - PV\ of\ CI\ at\ HR}$$

IRR Project Beta=15% + (₹ 16,29,815 - ₹ 16,00,000) / (₹ 16,29,815 – ₹ 15,32,865)

IRR Project Beta = 15% + (-0.308) = 14.692%

Years	Project Gamma	Present Value Factor (PVF) at 17%	CI for Project Gamma	Present Value Factor (PVF) at 20%	
1	545000	0.855	465975	0.833	453985
2	415000	0.731	303365	0.694	288010
3	495000	0.624	308880	0.579	286605
4	405000	0.534	216270	0.482	195210
5	335000	0.456	152760	0.402	134670
6	240000	0.39	93600	0.335	80400
7	280000	0.333	93240	0.279	78120
8	195000	0.285	55575	0.233	45435
			1689665		1562435

NPV for Project Gamma = ₹ 16,80665 – ₹ 16,00,000 = ₹ 80,665

$$IRR = Lower\ rate + \frac{PV\ of\ CI\ at\ LR - PV\ of\ CO}{PV\ of\ CI\ at\ LR - PV\ of\ CI\ at\ HR}$$

NOTES

IRR Project Beta = 17% + (₹ 16,89,665- ₹ 16,00,000) / (₹ 16,89,665 – ₹15,62,435)

IRR Project Beta = 17% + (0.705) = 17.705%

	NPV	Ranks	IRR	Ranks
Project alpha	₹ 48,540	2	**17.511%**	2
Project Beta	(-ve) Rs. 67,135	Not acceptable	**14.692%**	3
Project Gamma	Rs. 80,665	1	**17.705%**	1

Example 8.15

With the help of the following information, calculate IRR for the given project.

Initial investment	₹ 6,000
Life of the asset	4 years
Estimated net annual cash flows	
1	1,500
2	2,000
3	3,000
4	2,000

Solution:

The present value of net cash inflows at 14% and 15% discount rate gives one positive NPV and other negative NPV which shows that the IRR lies between the 14% and 15% rates. Calculation of which is as follows:

Cash inflows	PV factors at 14%	PV at 14%	Cash inflows	PV factors at 15%	PV at 15%
1500	0.877	1316	1500	0.869	1304
2000	0.769	1538	2000	0.756	1512
3000	0.674	2022	3000	0.657	1971
2000	0.592	1184	2000	0.571	1142
		6060			5929

Now with the help of interpolation method we can find the exact value of IRR.

IRR = 14 + (60/60+71) = 14.45%

Profitability Index (PI)

This method also comes under the discounted cash flow techniques. It is also called as Benefit-Cost Ratio (B/C ratio). The profitability index is used as a substitute of NPV method under certain circumstances. It uses the same information as used in NPV method. But the profitability index is a relative measure rather than an

absolute measure like NPV. It means it is presented as a ratio of present value of cash inflows and present value of cash outflows.

$$Profitability\ Index(PI) = \frac{Present\ Value\ of\ Cash\ Inflows}{Present\ Value\ of\ Cash\ Outflows}$$

NOTES

Profitability Index =Present value of Cash Inflows / present value of cash outflows

This method tells that for a unit of rupee investment, how much cash inflows are generated by the project.

Decision rule: A project with PI more than one is accepted and if it is less than one then it is rejected. A project having PI equal to one may or may not be accepted by the finance manager which is dependent upon other non-financial or indirect benefits associated with the project. If the present value of cash inflows is more than present value of outflows only then it will have PI more than one. This situation is similar when NPV of a project is positive. Similar to this, if present value of cash inflows is less than present value of cash outflows then PI of that project will be less which is similar to a situation when NPV of a project is negative. Having PI equal to one means a state of zero NPV. Hence, both the methods have similarities.

But relevance of PI is more when there is a situation of capital rationing. As discussed earlier, capital rationing is a situation where the firm has restriction (both internal and external) on the access of capital therefore under such circumstances, the finance managers want that each rupee invested by them must give highest return and instead of using NPV method which is an absolute measure, the PI measure is preferred. If a firm has unlimited funds to use then NPV method can be preferred by the managers in place of profitability index method.

Merits and demerits: Like other time adjusted techniques, this method has some common merits like others. One, it is based upon concept of time value of money. Second, it is based upon cash flow analysis. Third, it is better criterion under capital rationing situation than NPV method. The only challenge in using PI is sometimes it is due to additional calculation as a relative measure.

Example 8.16

Calculate profitability index of the following three projects and rank these on the basis of PI. Assume 10% is the discount rate. In all these projects, cash outlay is different as in Project, A ₹ 10,000, Project B, ₹ 20,000 and Project C, ₹ 30,000.

Years	Project A	Project B	Project C
0	10000	20000	30000
1	5000	24000	50000
2	4000	35000	65000
3	6000	26000	39000
4	3000	23000	55000
5	5500	45000	68000

NOTES

Solution:

Years	Project A	Present Value Factor at 10%	PV of CI
0	10000		
1	5000	0.909	4545
2	4000	0.826	3304
3	6000	0.751	4506
4	3000	0.683	2049
5	5500	0.621	3415.5
			17819.5
	Project B	Present Value Factor at 10%	PV of CI
0	20000		
1	24000	0.909	21816
2	35000	0.826	28910
3	26000	0.751	19526
4	23000	0.683	15709
5	45000	0.621	27945
			113906
	Project C	Present Value Factor at 10%	PV of CI
0	30000		
1	50000	0.909	45450
2	65000	0.826	53690
3	39000	0.751	29289
4	55000	0.683	37565
5	68000	0.621	42228
			208222

PI for Project A = **17819.5 / 10000 = 1.79**

PI for Project B = **113906 / 20000 = 5.69**

PI for Project C = **208222 / 60000 = 3.47**

Example 8.17

A firm is considering a investment proposal which involves a initial investment of ₹2,00,000. This project has expected life of 7 years and no salvage value. The profitability index of the project is 1.182 at a discount rate of 12%. Calculate annual cash inflows of this project if the present value of an annuity of ₹ 1 for 7 years is 4.5638 (rate is 12%).

Solution:

$$\textbf{Profitability Index} = \frac{\textbf{Present value of Cash Inflows}}{\textbf{present value of cash outflows}}$$

1.182 = Present value of cash inflows / 2,00,000

Present value of cash flows = 2,36,400

Present value of cash flows = Annual Cash inflows X PV of an annuity for ₹ 1

2,36,400 = Annual cash inflows × 4.5638

Annual Cash Inflows = 51.799 or 51800 app.

Example 8.18

The Zaro Company is planning to buy a plant and machinery. Two alternatives (option A and Option B) are available for the company. Initial investment in these two alternatives is ₹ 8,00,000 each. Following table shows the earnings after tax for the two options A & B:

Years	Option A	Option B
1	80000	240000
2	240000	180000
3	160000	270000
4	280000	180000
5	260000	90000

Calculate its net present value and profitability index and suggest which option is better.

Project B, Project C and Project A is the sequence of acceptability of these projects.

Solution:

Years	Cash inflows for option A	Cash inflows for option B	PV factor	PV for Option A	PV for Option B
1	80000	240000	0.91	72800	218400
2	240000	180000	0.83	199200	149400
3	160000	270000	0.75	120000	202500
4	280000	180000	0.68	190400	122400
5	260000	90000	0.62	161200	55800
				743600	748500

NPV for Option A = ₹ 7,43,600 – ₹ 7,00,000 = ₹ 43,600

NPV for Option B = ₹ 7,48,500 – ₹ 7,00,000 = ₹ 48,500

So as per NPV method Option B should be accepted.

Profitability index for option A = ₹ 7,43,600 / ₹ 7,00,000 = 1.06229

Profitability index for option B = ₹ 7,48,500 / ₹ 7,00,000 = 1.06929

Again it has been proved that Option B is more acceptable than Option A.

Example 8.19

Jackson Ltd is comparing two projects J and K. Both these projects have different life, Project J is of 10 years and Project K is of 8 years. Initial investment in these two projects is also different. Project K is less risky so company wants to have 10 per cent discount rate for this project. Whereas Project J is more risky so company wants to have 13% discount rate for this.

NOTES

Years	Cash Inflows of Project J	Cash Inflows of Project K
0	15000	17000
1	2500	3975
2	2700	4250
3	3050	3670
4	3600	3820
5	2950	4900
6	1850	3580
7	2250	4650
8	3200	3550
9	3150	-
10	2050	-
	Discount rate 11%	Discount Rate 13%

Jackson Ltd considers NPV methods to evaluate various projects. For these projects, company is thinking of using other methods of project evaluation too. You are required to calculate the following for above two projects:

1. NPV
2. Profitability Index
3. Discounted Payback period

Solution:

Years	Cash Inflows of Project J	Present Value Factor (PVF) at 11%	PV of CI	
0	16000			
1	2500	0.900	2250.00	
2	2700	0.811	2189.70	
3	3050	0.731	2229.55	
4	3600	0.658	2368.80	
5	2950	0.593	1749.35	
6	1850	0.535	989.75	
7	2250	0.482	1084.50	
8	3200	0.434	1388.80	
9	3150	0.391	1231.65	
10	2050	0.352	721.6	
	27300		16203.70	1.012731

Years	Cash Inflows of Project K	Present Value Factor (PVF) at 13%	PV of CI	
0	17000			
1	3975	0.885	3517.88	
2	4250	0.783	3327.75	
3	3670	0.693	2543.31	
4	3820	0.613	2341.66	
5	4900	0.542	2655.80	
6	3580	0.481	1721.98	
7	4650	0.425	1976.25	
8	3550	0.376	1334.80	
	32395		19419.43	1.142319

- NPV of Project J = PV of CI – PV of CO = ₹ 16203.70 – ₹ 16000 = ₹ 203.70

  NPV of Project K = PV of CI – PV of CO = ₹ 19419.43 – ₹ 17000 = ₹ 2419.43

  As per NPV method Project K is acceptable.

- Profitability Index (PI) = (PV of Cash inflows / PV of Cash outflows)

  Profitability Index (PI) Project J = $\frac{16203.70}{16000} = 1.01$

  Profitability Index (PI) Project K = $\frac{19419.43}{17000} = 1.14$

  On the basis of PI technique again, project K is acceptable as its PI value is more than one which means it will give higher shareholder's wealth.

- Discounted Payback period

  Project J = 9 years + (16000 -15482.10) / 721.6 = 9 years and 8.5 months

  Project K = 6 years + (17000 – 16108.38) / 1976.25= 6 years and 5.4 months

  This technique also supports Project K.

Example 8.20

Dips Company is considering a proposal to buy new equipment. The cost of the new equipment is ₹20,00,000 with a working capital of ₹ 1,20,000. The expected life of the project is 5 years without any salvage value. The policy of the company is to charge depreciation on straight line method. Company is giving you the estimated value of their earnings before depreciation and taxes/ before tax cash flows

Year	1	2	3	4	5
Before Tax cash flows	750000	895000	975000	800000	890000

NOTES

Assume tax rate to be 35%. For such company, opportunity cost of capital (discounting rate) is 9%. Calculate the following:

- Payback Period
- Discounted Payback Period
- Net Present Value
- Profitability Index

Solution

Calculation of cash flows after tax but before depreciation is shown in the following table.

Year	Before Tax cash flows	Depreciation	Earnings before taxes	Tax (35%)	Earnings after tax	Cash flows after tax
1	750000	400000	350000	122500	227500	627500
2	895000	400000	495000	173250	321750	721750
3	975000	400000	575000	201250	373750	773750
4	800000	400000	400000	140000	260000	660000
5	890000	400000	490000	171500	318500	718500

total Cost of the project is ₹ 20,00,000 + ₹ 1,20,000 = ₹ 21,20,000

• Payback period

Year	Cash flows after tax
1	627500
2	721750
3	773750
4	660000
5	718500

Payback period = 2 years (₹ 13,49,250) + (770750 / 773750) = 2 years and 11.96 month

Or we can say that approximately in 3 years the initial investment of the project will be returned.

• Discounted Payback Period

Year	Cash flows after tax	Present Value Factor at 9%	PV of CI
1	627500	0.917	575417.5
2	721750	0.842	607713.5
3	773750	0.772	597335
4	660000	0.708	467280
5	718500	0.650	467025

Discounted Payback period = 3 years (CI till 3 years ₹ 1780466) + (2120000-1780466)/ 467280

= 3 years + (339534/ 467280) = 3 years 9 months

- **Net Present Value (NPV)**

Year	Cash flows after tax	Present Value Factor at 9%	PV of CI
1	627500	0.917	575417.5
2	721750	0.842	607713.5
3	773750	0.772	597335
4	660000	0.708	467280
5	718500	0.650	467025
		PV of All Cash Inflows →	**2714771**

NPV = Present Value of Cash Inflows – Present Value of Cash Outflows

NPV = ₹ 27,14,771 – ₹ 21,20,000 = ₹ 5,94,771 (positive NPV so project should be accepted)

- **Profitability Index**

$$PI = \frac{PV\ of\ Cash\ inflows}{PV\ of\ Cash\ outflows} = \frac{2714771}{2120000} = 1.28$$

As per the above calculation the PI value of the project is more than one which means that company can invest in this project and it will add value to the shareholders wealth.

Discounted Payback Period (DPBP)

Discounted payback method is not a new method, but it has brought improvement in payback method which is considered as a traditional method. In case of discounted payback method, the cash flows are first discounted with cut-off rate and their present value is calculated. Once the present value of cash flows is available, then these discounted cash flows are used to calculate payback period. Rest of the calculation method of payback period and decision rule remains same as discussed earlier.

Examples of Discounted Payback Technique

Example 8.21

Compute discounted payback period for a project having initial investment of ₹ 3,80,000 and annual cash inflows are as follows:

Years	Cash Inflows
1	79,000
2	87,000
3	83,000
4	97,000
5	89,000
6	79,000
7	56,000
8	35,000

Assume 10% as the discounting rate or cost of capital for discounting purpose.

Solution:

NOTES

Years	Cash Inflows	Present Value Factor (PVF) at 10%	Discounted Cash Flows
1	79,000	0.909	71811
2	87,000	0.826	71862
3	83,000	0.751	62333
4	97,000	0.683	66251
5	89,000	0.621	55269
6	96,000	0.564	54144
7	88,000	0.513	45144
8	76,000	0.467	35492

Now in first 5 years total ₹ 3,27,526 will be recovered and balance ₹ 22,474 will be recovered from the cash inflows of 6th year.

Discounted payback period = 5 years + (22474/54144)*12 = 5 years 5 months

In addition to above mentioned method, one more method is also popular. This method is known as terminal value method.

Terminal Value Method

The terminal value method gives further importance to the timing of occurrence of cash inflows and cash outflows. This method is based upon the assumption that every year cash inflows generated from the project are re-invested at cut-off rate. These cash inflows are now compounded with this cut-off rate or hurdle rate. Therefore, to calculate the present value of cash inflows, in place of discounting them and calculating present value, it is important to consider the compounding factor to know the total cash flows generated by the project. For example, if a project has an initial investment of INR 50,000 and life of five years and hurdle rate is 10 percent. If in first year, the project generates INR 10,000, INR 15,000, INR 30,000, INR 17,000 and INR 8,000 for year one, two, three, four, and five respectively. Then this method says that the cash inflows generated at the end of year one will be re-invested at 10 percent rate of interest and will be compounded for four years. And similar to this, cash inflows of year two will be compounded for three years, cash inflows of year three will be compounded for two years, cash inflows of year four will be compounded for one year and cash flows generated at the end of year five will not be re-invested as the life of project is five years. Consider the following example for this.

Example 8.22

Silver Stone Pvt. Limited has a project which has a life of five years. The initial capital outlay required for the project is INR 1,00,000. The project has a life of five years. In these five years, the project is expected to generate cash inflows of INR 35,000 every year. The expected rate of interest for different years are as under. The cost of capital is 10%.

Year End	Rate of Interest in Percent
1	8
2	8
3	8
4	6
5	6

Solution

Year	Cash Inflows (INR)	Rate of interest(percent)	Years for investment	Compounding Factor	Total Compounded Sum (INR)
1	35000	8	4	1.36	47600
2	35000	8	3	1.26	44100
3	35000	8	2	1.166	40810
4	35000	6	1	1.06	37100
5	35000	6	0	1	35000
				Total	204610
Present Value of Total compounded Sum at cut-off rate (cost of capital, i.e. 10%)					=204610 × 0.621 =127062.81

Now the present value of compounded re-invested cash flows will be compared with the present value of cash outflows. If it is positive, then the project will be accepted. In this example, present value of cash outflows is INR 1,00,000 and present value of compounded reinvested cash inflows is INR 1,27,062. Therefore, the net terminal value (NTV) is 27,062 and so the project is accepted.

Comparison of NPV and IRR

Conventional and Non-Conventional Cash Flows

Conventional cash flows are those cash flows where initial cash outflows are followed by a series of cash inflows. In this case, the cash outflows occur only in the beginning. Non-conventional cash flows are those cash flows where cash outflows occur at different time intervals and it is followed by a series of cash inflows.

Example: Conventional cash flows

Time Period	Cash Flows
t = 0	(100000)
t = 1	50,000
t = 2	35,000
t = 3	15,000
t = 4	20,000
t = 5	25,000

Example of Non-conventional cash flows

Time Period	Cash Flows
t = 0	(100000)
t = 1	50,000
t = 2	35,000
t = 3	(60000)
t = 3	45,000
t = 4	30,000
t = 5	55,000

In first case, the cash outflows of INR 1,00,000 occurs in the beginning only which is followed by only inflows of cash while in the second case, the cash outflows are occurring in the beginning as well as in third year. So first is the case of conventional cash flows and second is the case of non-conventional cash flows.

NOTES

NPV Vs IRR

In this section, we will discuss about the net present value method and internal rate of return method of capital budgeting techniques. Both these techniques are similar in a sense that these two are modern techniques of capital budgeting which takes time value of money into consideration. In other words, these two techniques are discounted cash flow techniques.

Similarity between NPV and IRR

These two techniques would give similar results in case of conventional cash flows stream and independent projects. Conventional cash flow stream is a combination of cash inflows and cash outflows where one cash outflows is followed by a stream of subsequent cash inflows. e.g.

Year	0	1	2	3
Cash flows	-20000	8000	11000	15000

Independent project means company/firm can pick more than one project simultaneously. Investment in one project is not dependent on the investment in other project. Independent projects do not compete with each other and company can pick more than one project in one go.

Both NPV and IRR give similar results in conventional and independent projects. The major reason for this similarity is that decision criteria in both the techniques meet the objective of shareholder's wealth maximization. In NPV, projects having positive NPV would be accepted and in IRR projects having rates more than cut off rate would be accepted. So both these techniques will lead to the objective of shareholder's wealth maximization. Following diagram shows that when NPV is more than zero IRR is also positive and more than cut off rate. When NPV is negative then IRR is also less than the cut of rate. This is the reason that both these techniques give similar results.

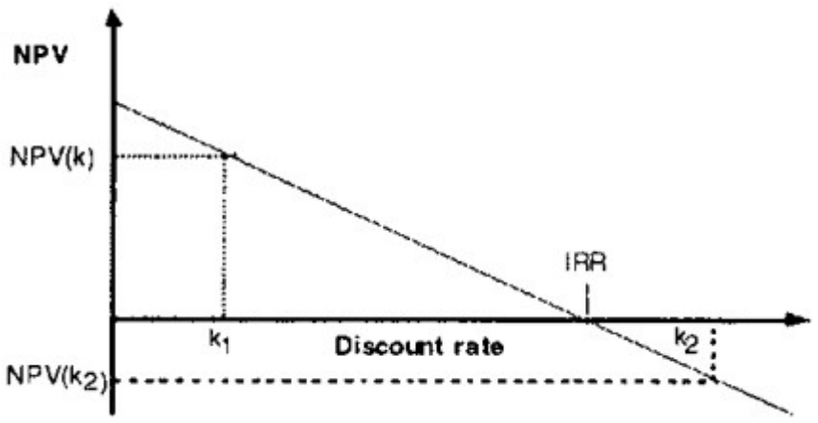


Fig. 8.2 *NPV and IRR*

NOTES

Differences between NPV and IRR

In some cases, Net present value (NPV) and Internal rate of return (IRR) may give conflicting or contradicting results. Particularly, this may take place in case of mutually exclusive projects. Mutually exclusive projects means projects competing with one another and company can pick one of the competing projects not all of them or few of them in one go. In mutually exclusive projects, Net Present Value (NPV) may recommend one project but IRR may recommend other project. The difference in net present value (NPV) and internal rate of return (IRR) can occur due to any of the following situation or reasons:

- Difference in cash flows patterns
- Difference in the initial investment of the projects under consideration
- Different life of the projects/ unequal life of the project
- Multiple rates of internal rate of return
- Reinvestment rate assumption of IRR

Net Present Value (NPV) and Profitability Index (PI)

Net present value (NPV) and profitability index (PI) are two different techniques of capital budgeting. Net present value (NPV) depicts the difference in present value of cash inflows and present value of cash outflows whereas profitability index (PI) is the ration of present value of cash inflows and present value of cash outflows. Both these techniques are discounting techniques of capital budgeting. When there is a difference in the initial investment of the mutually exclusive projects profitability index (PI) gives more reliable result of the selection of the project. This can be explained by following example.

Years	Project A	Project B	PVF at 10%	PV of CI of Project A	PV of CI of Project B
0	10000	100000		-10000	-100000
1	5000	40000	0.909	4545.45	36363.64
2	3000	25000	0.826	2479.34	20661.16
3	3500	35000	0.751	2629.60	26296.02
4	4000	25000	0.683	2732.05	17075.34
5	2000	30000	0.621	1241.84	18627.64
				13628.29	119023.79
			NPV	3628.29	**19023.79**
			PI	**13628.29/ 10000 = 1.36**	119023.79/ 10000 0 = 1.19

As shown in the above table, Project B is acceptable on the basis of net present value (NPV) method as it has maximum net present value while Project A

is acceptable if we consider profitability index (PI) method. In such situation, when projects have different initial investment, profitability index (PI) gives more reliable results.

NOTES

Check Your Progress

3. State the uses of average rate of return method.
4. What are the two demerits of payback period method?
5. What is the difference between profitability index and net present value?
6. What do you mean by internal rate of return?

8.4 BASIC AND INTERNATIONAL CAPITAL BUDGETING

You have already learnt about the basics of capital budgeting in the unit, in this section, let's discuss the concept of international capital budgeting.

Anybody who brings together the factors of production and who sells the real goods and services is likely to find opportunity of earning profit. Land, labour, capital and entrepreneurship are the factors of production. They must combine for creating business opportunity. In the early phase of economic development, these production factors are mobility shy. Immobility is caused by lack of infrastructure facilities. Location, size and span of operation of firms largely depend on degree of mobility of these factors of production.

The concept of business has been completely transformed within a very short period of last century and a half in the history of human civilization. It has grown up from a totally localized (at village level) cottage business to transnational and transcontinental business. This transformation of business has come as a natural evolution for the materialistic man. Especially after the Second World War, the face of business has changed to make it globally present, and today the whole world is on the verge of becoming a global village due to improved transportation and communication. This has changed the complexity and risk exposure of business. At the same time, it has offered an opportunity of earnings. Today's economic growth is not just factor driven, but is innovation driven. The emergence of innovation driven economic growth has changed the shape of local and global businesses.

The term 'globalization' has gained popularity in the last two decades or so. Several countries opened up their economic boundaries, initially at the behest of World Bank and International Monetary Fund. The process of motivating (some call it compelling) mechanism currently is organized through World Trade Organization. Many countries stumbled, some shied away initially and then felt the compulsion of staying with the trend, middle-income class flourished where the

trend of globalization could be brought on rail, income-disparity widened, one generation saw cultural-shock, communist ran away and US style capitalist smiled.

The globalization has come as a boon for businesses (businesses in developed countries in particular), though many activists are questioning true economic advantage to individuals, especially in underdeveloped and developing nations. Businesses, as usual, ride on waves. Last wave was of information technology and dot-com industry. With the turn of century the bubble burst, several dot-com firms failed, investors lost money, and employees lost jobs and hard-earned retirement savings. Could a similar thing happen with the current trend of globalization? Possibly yes, and, therefore, the investors have to be careful about it; businesses have to be cautious about it.

The term 'globalization' has gained popularity in India after the formal announcement of economic liberalization in the year 1991. However, it does not mean simply that foreign capital and goods have easier access to India. It means also that Indian companies must go global, expand abroad, and become multinationals in their own right.

In the past two decades, we are withering that Indian businesses have done a marvellous job in going global with different forms and aggression and have earned high degree of visibility and respect the world over.

Basic Strategic Analysis

A firm must decide on the appropriate posture that it can take. Strategic Position and Action Evaluation (SPACE) model, 'Strategic Investment Decisions and Project Ideas', could serve a very good purpose in determining the right posture that a firm must assume at any given point of time. Globalization would hardly be a best fit for a firm which has to assume a defensive posture; and each of the other postures could help in determining the form of global presence.

Growth direction decision, based on product-market matrix and sustainable growth rate decision with profit constraint model as well as managerial constraint model, must be made for determining the exact direction of growth and desired rate of growth of the firm. A firm can grow in related or new markets keeping the same product line if product is sold due to marketing strength, or can grow by adding related or new product to sell it to the present market if current product is sold on the product strength. The sustainable growth rate model, especially one with managerial constraint, helps in evaluating whether the firm is organizationally ready to tackle the managerial issues arising out of intended global reach. Within this framework of strategic planning one must add strategic considerations for going global.

Capital Budgeting Exercise in Going Global

The basic tasks in the capital budgeting exercise for going global are the same as in a domestic capital budgeting problem. The tasks involved are:

1. Determining the form of global presence

NOTES

2. Developing a decision model for the evaluation of risky project cash flow, which further involves the following issues:
   (a) Selecting method of evaluation
   (b) Deciding on a minimum condition criterion
   (c) Deciding whether to separate an investment decision from a financing decision.
3. Determining the size and risk of relevant costs and benefits associated with a capital investment proposal, which involves issues like,
   (a) Defining and interpreting what is 'relevant' cash flow
   (b) Classifying costs and benefits in logical groups
4. Developing a 'what if' model for studying the risk of project cash flow and accounting for it in the decision model
5. Determining the effects of working capital management on the net cash flow

In the following sections, various issues related to these tasks involved in international capital budgeting decisions are examined.

Determining the Form of Global Presence

There are several ways a firm can have global presence, starting from being either an exporter or importer of goods and services to establishing subsidiaries in foreign countries. A small list of alternative forms of global presence is,

Exports	Joint ventures
Licensing	Management contracts
Technology transfer	Manufacturing lease
Foreign subsidiaries	Other forms of business alliances.

If the country of firm's location enjoys a location-specific advantage then a firm might like to be just an exporter of goods and services. As opposed to it, if the country of firm's location does not anymore enjoy a location-specific advantage than it must consider being an importer of goods and services. The location-specific advantage or lack of it is for which specific goods and services and not as a country as a whole. A firm which is exporter to several nations might consider other globalization options for reaping internalization advantages too. The tax-structure difference, distances and transportation cost and such other factors lead to generating an internalization advantage for a widely exporting firm. So would it be true for a firm aggressively importing from other nation or nations? Acquiring control over the source of imported goods could possibly offer a better price and guaranteed supply, the internalization advantages. The control over import-chain can be acquired through several ways. Management contracts, partnerships and manufacturing lease with supply contract are some examples of it.

NOTES

Technology transfer and manufacturing lease is an initial step for the firms who widely export, but the home-country does not offer any location-specific advantage and the time and the cost of international transportation becomes an issue as a competitive exporter. The absence of location-specific advantage in home country makes the current technology obsolete. This technology and machines could be leased to an aspiring manufacturer abroad, where location-specific advantage is terrific. Against the lease rental the goods are bought and exported to the markets of the lessor firm. This arrangement gives control over the price and quality, and also ensures a quicker delivery to the global market locations.

A firm, which enjoys the ownership specific advantage and also sees the location-specific advantage in some country, may go for licensing arrangement or other contractual resource transfer. It may also opt for exporting technology with or without equity participation. For example, these firms, subject to the specific strength and environmental opportunities, work out joint ventures, collaborations, management contracts, etc. These are the forms of business alliances. Gradually the firm may lose its location-specific and internalization advantages, though it may continue enjoying strong ownership advantage. That is the time when it will go for setting up foreign subsidiaries to regain these lost advantages.

If the firm has interest in the market of the target country, this manufacturing lease arrangement is not desired. The firm would like to have its direct control over the market. In that case initially a joint venture could be formed with a complementary partner in host country. Other forms of management contracts are just memorandum of understanding and not binding on either party, but signed if mutual benefit is seen. These are a little riskier proposition than a joint venture for the naïve party of the two. Joint ventures do not provide great internalization advantage because of significant role of the local partner in running the affairs of business. However, joint venture is an effective route for finally making physical presence of the firm in the host country. Selection of joint venture partner and managing joint venture to the achievement of the end goal is very crucial. Though in joint ventures a foreign firm and a domestic firm make partnership and form a separate company to run a joint business, both the partners have their own agenda to promote. A foreign firm may like to understand the market, culture and host of other non-quantifiable factors and finally create a market presence; whereas, the domestic partner is interested in acquiring the technology and other management skills. As a result, a joint venture is broken when one of the joint venture partners realizes the intended benefits. A smart player derives greater benefit, and the one who sees joint venture as a lifetime marriage regrets.

The ultimate form of globalization is a subsidiary of a foreign parent firm. A subsidiary is set up for a long-term presence in the market and also for deriving internalization advantages of global network of a global firm.

NOTES

Evaluation of Globalization Options

Going to the location of immobile or mobility shy factors of production and tapping opportunities arising out of imperfect market situation there with a view to deriving cost and price advantage would require a thorough evaluation of foreign capital investment proposals. The cost advantage could further increase if the firm can book tax advantage and currency exchange advantage. Sales can improve through image boosting caused by multinational presence. Distribution of market risk over various economies may bring steadiness in operations and results.

Idea generation of a global project is the result of the general strategic analysis and the strategic analysis in the specific context of global-presence as discussed in the previous sections. Other issues are:

1. Developing a decision model for the evaluation of a risky project cash flow, which further involves issues like, selecting a method of evaluation, deciding on the minimum-condition criterion and deciding whether to separate an investment decision from the financing decision.
2. Determining the size and risk of the relevant costs and benefits associated with the capital investment proposal, which involves issues like, defining and interpreting what is the 'relevant' cash flow, classifying the costs and benefits in logical groups, and developing a 'what if' model for studying the risk of the project cash flow and accounting for it in the decision model, and
3. Determining the effects of working capital management on the net cash flow.

Cash flow estimate

Two issues are pertinent to the cash flow estimate for an international investment project. One, determining the 'relevant' cash flows for the parent firm and two, classification of cash flow. These issues are described below:

What are relevant cash flows?

Basic principles of project cash flow determination are identical in both domestic as well as international financial management. Only incremental or relevant cash flow should be recognized for evaluation of projects.

Whose cash flow must be projected; subsidiary's cash flow or parent firm's cash flow? The two will be different. Therefore, economically viable foreign subsidiary need not be equally attractive to the parent organization. A financial analyst of the parent firm would consider a few points while determining relevant cash flows of foreign investment:

1. The parent firm is acting as an investor when it takes the decision to set up a foreign subsidiary. The investment commitment is quite long term with almost no moral option of backing out in subsidiary alternative in particular.

NOTES

2. Disinvestments of shareholding in the subsidiary may badly affect the image of the whole enterprise, especially if disinvestment is done in a disparate situation. But this may not be true in case of joint ventures.
3. The parent firm will get returns from the subsidiary in tangible form depending on the earnings of the subsidiary along with other factors like growth of subsidiary, domestic tax laws on dividend payment, law for repatriation of dividend and foreign exchange rate movement.
4. Finally, incremental cash return to the parent firm is relevant cash flow, irrespective of the size of the shareholding in the foreign subsidiary. However, if the parent firm has kept the shareholding adequate for acquiring management control over the foreign subsidiary, then the parent firm can control the dividend policy and inter-firm transactions. This will reduce the uncertainty on dividend payments.

The foreign capital investment decision increases the parent firm's stake manifold because it combines two roles into one, as an investor and as managers. Therefore, the foreign capital investment decision should become feasible only if economic viability is ensured for the project (subsidiary) as well as the investor (parent), both existing in different countries.

There may be certain incremental intangible costs and benefits involved in the foreign capital investment decision. They are related to change in the total risk and impact on the goodwill of the enterprise. These factors are considered along with financial feasibility while taking a final decision.

Classification of cash flow

Proper classification of project cash flows is an essential requirement especially for doing risk analysis outlined in the subsequent section. Cash flows can be classified in three different ways, the combination of which would give eight cash flow streams with varying degrees of risk.

1. *Dependent vs Independent*: Project dependent cash flows are directly identified with project activity; whereas, project independent cash flows include ripple-effect cash flows, which may occur elsewhere in the whole enterprise in the form of change in tax liability, benefits from inter-firm transfers or foreign exchange advantage/disadvantage etc.
2. *Contractual vs Non-contractual*: Some cash flows are contractual or committed in nature, whereas, the others can be non-contractual or discretionary. Contractual cash flow is inescapable because it is the result of earlier commitment.
3. *Equilibrium vs Disequilibrium*: Riskiness of cash flows in different currency will depend on the economic situation of either equilibrium or disequilibrium. Cash flows will have to be classified on this basis also. Lessard (1981) analyses each combination of cash flow type and proposes approach required for tackling each one of them.

NOTES

Project specific cash flows can best be estimated from the subsidiary's viewpoint. Cash flows independent of the project may be estimated by parent firm's managers with a broad view of the overall activities and position of multinational firm.

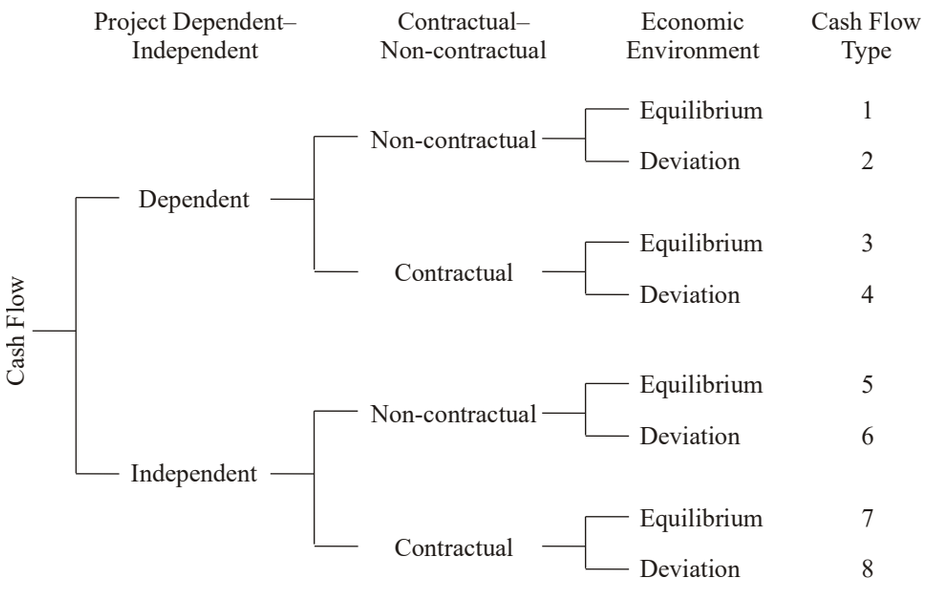


Fig. 8.3 *Types of Cash Flow*

Similarly, contractual and non-contractual cash flows make a difference in analysis from the viewpoint of the parent organization. Even if government interference and exchange rates create unfavourable conditions, a firm cannot escape from a contractual responsibility. They are riskier than non-contractual cash flows. Risk exposure involved in a contractual cash flow may be much less in case of equilibrium position in economic environment, than in case of a disequilibrium position. Similarly, the risk exposure of other cash flow types will also require a parent firm to discount each one of them duly adjusted for inflation and risk, before they are expressed in terms of a single currency.

Cash flow in the equilibrium market condition, of non-contractual nature and independent of project can be discounted at a nominal rate and then it can be converted into a single currency base using current sport rate for currency exchange. Cash flow from the disequilibrium market, but contractual in nature and independent of project will require an adjustment in the real cash flow estimates because the cash flow will become riskier due to purchase price disparity. Alternatively, a higher (risk adjusted) discount rate will have to be used. Similarly discounted value of this type of cash flow will have to be converted into a single currency base after accounting for the expected change in real rate of exchange.

Likewise, independent contractual cash flows in equilibrium market can be discounted using the nominal borrowing rate in the local capital market. If equilibrium does not exist, the offshore borrowing rate can be applied. Project dependent

cash flows of either contractual or non-contractual nature from either equilibrium or disequilibrium markets will also require an adjustment of different amounts of risk premium and conversion into a single currency base at either the spot exchange rate or the expected exchange rate, as warranted by each specific case.

Selecting a method of evaluation

Once the form of global presence is decided, a feasible investment plan is generated. Conceptually, the net present value (NPV) rule is considered to be superior to all other capital budgeting evaluation techniques. Accounting based method and other discounted or non-discounted cash flow based methods are not found to be in full confirmation with the corporate financial objective of shareholder wealth maximization. However, pragmatic criteria for evaluation of foreign capital investment proposals demand a number of unconventional approaches. Some of them observed or opined by researchers/authors are listed below:

1. Hout, Porter and Rudden (1982) observed that:
   - Major foreign investment projects were accepted by multinationals with zero or negative return on investment, and zero or negative net present value
   - Financial performance targets vary widely among foreign subsidiaries
2. Polk, Meister and Lawrence (quoted by Holland 1993) observed that 'earnings to sales' (i.e., margin ratio) is generally applied by firms (or for the projects) with the following characteristics
   - Firms in consumer-non-durable goods (like manufacturing and trading food, drugs, tobacco, home equipment, small appliances, etc.)
   - Projects in which investment in manufacturing facility is less as compared to investment in current assets.
   - If project meets with the above two characteristics, the parent company would like to invest primarily in a wholly owned subsidiary or in a subsidiary in which they own the majority of shares; rather, than in joint ventures with foreign partners.
3. In the opinion of the same authors, in case of a project proposal, which is highly capital intensive, the parent company would prefer to invest in joint ventures rather than wholly or mostly owned foreign subsidiary and try to benefit mostly from internalization advantage. If subsidiaries are set up, they will have larger long-term liabilities either to parent company or to financial institutions.

A thumb rule for evaluation can be developed. If a vast market opportunity exists in any economy (which is true of developing economies) which is likely to continue for a relatively longer period without much competition from efficient firms, then theoretically sound decision criteria like the net present value need not be followed. Any discounted cash flow technique may distort the outcome of

NOTES

model in a situation of the long life of a project and a high discount rate. The profit criterion is enough to serve the purpose of financial evaluation of such a proposal. Joint ventures, management contracts and licensing arrangements must be evaluated based on the NPV as they involve short-term interest in arrangement. However, there would be several non-quantifiable costs and benefits emerging from such arrangements, especially in a joint venture, and the evaluation of those factors must get supremacy over the calculated NPV in making the final choice.

Minimum condition criterion

Decision regarding cut-off is the major issue involved in capital budgeting decision, especially, when discounted cash flow techniques are employed for evaluation of proposals. Though conceptually opportunity cost of capital is the best discount rate, for all practical purposes required rate of return (RRR) is applied as cut-off. RRR is calculated using pre- and post-project WACC of the firm. RRR captures change in overall risk profile, if any.

The WACC is the function of capital structure and cost of each individual form of financing. The ideal capital structure for a proposed subsidiary must be worked out keeping in mind the local constraints like statutory restrictions on foreign shareholding, tax laws on interest and dividend, need for improving accessibility to local capital market, thrust for corporate image and other such factors. The sources of financing should also be selected carefully with a view to minimize weighted average cost of capital for the subsidiary.

As a thumb rule for financing of firm's global operations, it can be suggested to

- employ only local funds for reducing risk of operating funds if capital market is efficient in the host economy and
- the parent firm should invest in stock and bonds of foreign subsidiary or encourage inter-firm transfer if domestic capital market in the country of subsidiary is less efficient.

In general, funds should flow from efficient market to less efficient market. Shrewd finance managers of global firms would arrange for issue of shares and bonds in most efficient market anywhere in the world for financing a subsidiary in a less developed economy.

The WACC calculation for the purpose of determination of the discount rate is based on the assumption that all individual projects are identical, or the new project is identical to the aggregate firm as it currently exists. This means that, the total risk of project portfolio will not change if the new project is accepted, and that the pattern of financing will not change after financing the new project, whereas, the foreign investment decision is more likely to change the risk profile of the parent firm.

NOTES

This indicates that the decision regarding financing of a subsidiary has tremendous implications on the profitability of an investment proposal through its impact on WACC. Also the business and financial risk influence the go-no-go criterion. Therefore, the theory related to the cut-off decision assumes a different degree of relevance when it is applied to the international investment decision.

Some unique issues related to WACC determination arise for firm's globalization decisions. They include:

- the questions of whose capital structure should be taken into account, the subsidiary's capital structure or the parent firm's capital structure or aggregate for the entire enterprise
- the methods of how to calculate cost of each type of funds, especially cost of equity funds, for the firm, parent or subsidiary or the entire enterprise

One suggestion is that the cost of each type of fund shall be calculated for each firm of enterprise and then the weighted average cost of capital be calculated taking into account the capital structure of the whole enterprise. Difficulties will be encountered in calculating the cost of equity of each firm in the multinational. The problem will be more intricate if the equity capital is raised from the entire world and the shares are traded on various stock exchanges in different currencies.

The theoretical solution of this difficulty lies in the application of the capital asset pricing model (CAPM) for the calculation of the expected rate of return from the proposed project. However, CAPM remains theoretical when applied to project-investment rather than for securities-investments. Even when the CAPM is applied for determining cost of equity, then some more issues will arise. For example, systematic relationship between the return from a security and the market may not exist due to a weak market structure, world capital market in an efficient form seems to be very unrealistic and, therefore, beta calculation, needed for the application of CAPM, will become unrealistic. However, a multinational firm with a larger presence in the global market can take the market index of a representative economy as a reasonable surrogate for calculating the cost of equity. If historical data is used for getting the expected return, then it should be adjusted for removing the effects of non-operating cash flow. Moreover, the adjustment for difference in capital structure as well as changing risk would be warranted. J. B. Holland (1993) suggested that:

- Managers estimating discount rates for overseas projects may initially assume that projects arising in politically unstable regimes require a higher risk premium than those recommended for comparable domestic projects
- However, if capital markets are segmented (which is usually the case) foreign projects may provide otherwise unattainable diversification benefits to the parent firm's shareholders. As a result, the lower discount rate can be used to reflect the benefits of diversification.

NOTES

Is the investment decision independent of the financing decision?

Financing and investment decisions remain isolated from each other, because a firm cannot enhance its value through capital structure decision in a perfect capital market. However, even among the free economies, less developed countries and developing countries invariably experience government interference in the capital market mechanism. The size of foreign capital is restricted, foreign equity holding is capped, areas of investment are either directly restricted or indirectly guided through fiscal policies, subsidies, project specific funds, location specific incentives and industry specific soft loan. This creates a dependency of the investment decision and the financing decision on each other.

Financing cash flows dependent on investment decision should be merged with project cash flows. The rest of free finance sources and cash flows related to them can be considered for calculation of WACC. This WACC can be adjusted for various types of risk for discounting the cash flows and calculating the net present value.

Check Your Progress

7. What are the various ways in which a firm can have global presence?
8. Which type of capital budgeting technique evaluation technique should be used in case of joint ventures, management contracts and licensing arrangements?

8.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Evaluation of cost of acquisition of fixed or permanent assets and cost incurred on the research and development are the two examples of capital budgeting decisions.
2. The process of capital budgeting ends with the selection of that project which helps to obtain the objective of a finance manager, i.e., to maximize the wealth of the shareholders.
3. Average rate of return method states the relationship between the average profits and average investments.
4. The two demerits of payback period method are that it does not consider the cash flows after the payback period and completely ignores time value of money concept.
5. The profitability index is used as a substitute of NPV method under certain circumstances. It uses the same information as used in NPV method. But the profitability index is a relative measure rather than an absolute measure like NPV.

6. Internal rate of return (IRR) is the interest rate at which the net present value of all the cash flows (both positive and negative) from a project or investment equal zero. It is used to evaluate the attractiveness of a project or investment.
7. There are several ways a firm can have global presence, including being an exporter or importer, licensing, joint ventures, management contracts, technology transfers, foreign subsidies etc.
8. Join ventures, management contracts and licensing arrangements must be evaluated base don the NPV as they involved short-term interest in arrangement.

8.6 SUMMARY

- Capital budgeting decisions are long term decisions of a firm which are related to fixed assets of the business.
- The capital budgeting decisions are also termed as fixed assets investment decisions, fixed assets management decisions, capital expenditure decisions, capital expenditure management decisions and long term investment decisions etc.
- Capital budgeting is a technique to evaluate various investment alternatives available to the business. It involves complete planning and control of long term capital expenditure decisions.
- Capital budgeting process is a complex process which starts from the identification of the investment proposals and ends at performance review.
- The process of capital budgeting ends with the selection of that project which helps to obtain the objective of a finance manager, i.e., to maximize the wealth of the shareholders.
- Identification of idea of a capital budgeting decision has special relevance as no further process can be followed without having a clear idea.
- In case of capital budgeting decisions, it is important to understand the difference between independent and mutually exclusive projects.
- There are various methods/techniques of evaluation of investment decisions or capital budgeting decisions.
- Broadly, all these techniques are categorized on the basis of time value of money aspect. These techniques are also known as discounted cash flow (DCF) techniques or time adjusted techniques.
- The accounting rate of return method is the only method which is based upon accounting profits rather than cash flows. It is also called as average rate of return method.
- According to this technique, the expectations of profits play important role, therefore the cost of initial project in relation to average profit is required to be examined.

NOTES

- A target average rate of return is always set for an organization.
- Payback period method is frequently used to get a rough idea about the selection of a project. This method is based on cash flows rather than accounting profit.
- This method is simple to understand and more practical than the previous method, i.e., ARR as it is based upon cash flow analysis rather than accounting profits.
- The net present value or popularly known as NPV method is a method which considers the time value of money. This is the most preferred method to take investment decisions. Under this method, cash flows are used for analysis and hence it is more realistic method.
- If NPV of a project is positive then it can be accepted and if NPV of a project is negative then it is rejected. In case of NPV = zero, then the project may or may not be accepted by finance managers which is based upon non-financial benefits of project.
- The internal rate of return (IRR) is also termed as 'trial and error method', 'discounted rate of return method', 'yield method', 'time adjusted rate of return method' , 'marginal efficiency of capital', 'marginal productivity of capital' and 'discounted cash flow method'.
- According to trial and error method, a finance manager through his past experience and judgments can try any discounting factor to calculate present value of cash inflows and outflows.
- The profitability index is used as a substitute of NPV method under certain circumstances. It uses the same information as used in NPV method. But the profitability index is a relative measure rather than an absolute measure like NPV.
- Discounted payback method is not a new method, but it has brought improvement in payback method which is considered as a traditional method.
- In some cases, Net Present Value (NPV) and Internal Rate of Return (IRR) may give conflicting or contradicting results.
- The concept of business has been completely transformed with a very short period of last century and a half in the history of human civilization.
- The basis tasks in the capital budgeting exercises for going global are the same as in a domestic capital budgeting problem.
- Various issues related to international capital budgeting include determining the firm of global presence, evaluation of globalization options, cash flow estimate, selecting a method of evaluation, minimum condition criterion, etc.

8.7 KEY WORDS

- **Capital budgeting decisions:** It refers to the long-term decisions of a firm which are related to the fixed assets of the business.
- **Discounted cash flow techniques:** These are methods of appraisal of investments in which takes into consideration time value of money concept.
- **Net present value (NPV):** It is the difference between the present value of cash inflows and the present value of cash outflows.
- **Internal rate of return:** It is the rate which equates the present value of cash inflows and present value in cash outflows in terms of initial investment or investment made in a phased manner.
- **Payback period:** It means the time period a project takes to pay back its total or initial investment.

NOTES

8.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short-Answer Questions

1. List the features of capital expenditure decisions.
2. Give some examples of capital budgeting decisions.
3. What are independent and mutually exclusive projects?
4. What are the merits and demerits of using ARR method or appraisal?
5. How is payback period and discounted payback period calculated?
6. What are the steps involved in capital budgeting exercise in going global?
7. Write a short note on selecting a method of evaluation.

Long-Answer Questions

1. Explain the importance of capital budgeting decisions.
2. Describe the steps considered in a capital budgeting decision.
3. Explain the IRR method of appraisal.
4. What do you mean by net present value? How does it contribute to capital budgeting decisions?
5. What are the differences and similarities between net present value and internal rate of return?
6. Discuss cash flow estimates in international capital budgeting.
7. Explain the minimum condition criterion in case of international capital budgeting.

8.9 FURTHER READINGS

NOTES

Patel, Bhavesh. 2014. *Fundamentals of Financial Management*. New Delhi: Vikas Publishing House.

Khan, M.Y. and Jain, P.K. 2007. *Financial Management- Text Problems and Cases.* New Delhi: Tata McGraw-Hill.

Chandra, Prasanna. 2004. *Financial Management: Theory and Practice.* New Delhi: Tata McGraw-Hill.

Kulkarni, P.V. and B. G. Satyaprasad. 2002. *Financial Management.* New Delhi: Himalaya Publication House.

NOTES

BLOCK III
SOURCES OF FINANCE

UNIT 9 UNCERTAINTY AND RISK MODELS

Structure

9.0 INTRODUCTION

In an earlier unit, you have learnt that risk analysis is the process through which perceived risk gets expression, preferably in numbers, so that the same can be meaningfully incorporated in the decision making process.

Risk analysis is a 3-stage process.

- Identifying critical sources of risk
- Measuring risk, and
- Incorporating risk in decision making

This classification is made for easy understanding, but they are not strictly followed in many cases. Room for a subjective decision is necessary because risk is a perception. In this unit, only certain aspects like Sensitivity analysis, decision rules, simulation models and tax related aspects will be discussed.

NOTES

9.1 OBJECTIVES

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

- Explain the concept of sensitivity analysis
- Discuss the different decisions rules including decision tree and risk adjusted measures
- Describe simulation analysis
- Discuss tax considerations in investment and cost of capital decisions

9.2 SENSITIVITY ANALYSIS

In the management of risks, management by exception is the rule. Many variables may be uncertain, but only a few may matter. The endeavour should be to first identify the sources of risk that matter. Prior knowledge of critical success factors, based on others' experiences, may be taken as a necessary input in the identification of sources of risk. But, a method of systematic study is also available in the sensitivity analysis.

Sensitivity analysis is a technique in which the sensitivity of returns to the change in one particular variable is studied. The philosophy that 'only a few factors may warrant attention' is embedded in the sensitivity analysis. The vital few have to be identified, as they finally matter for the success. Sensitivity analysis is more significant in the context of project investments that companies make.

The sensitivity analysis technique is also called 'what if' analysis because it involves a process of recalculating the net present value if a particular factor turns out to be at a different level than originally estimated. Sensitivity analysis is carried out in four ways:

- Percentage change approach
- Accounting breakeven point approach
- Net present value breakeven point approach
- Pay-off matrix

First three approaches are generally adopted at the time of project feasibility study. These three approaches do not require prior knowledge of key factors for a project. Rather, in these approaches, first the important factors are identified based on sensitivity of returns to them, and then the question is asked; 'To what extent are any of these factors likely to change?'

The pay-off matrix takes a different approach. The analyst is expected to have studied the most adverse scenario and the most favourable scenario, along with the likely scenario, for each important factor before she can construct a pay-off matrix. Net present values are then calculated for every scenario of all factors

and presented in a matrix form. This gives the realistic picture of variation in returns because variations in factors are considered at a realistic level.

9.3 DECISION RULES

NOTES

Before you learn about simulation analysis, it is important to be aware about certain risk measurement decision rules. Types of risk measurement can be discussed in three parts: techniques of measuring risk, decision rules, and finally, some more tools of measure cum decisions. You have already learnt about the techniques of measuring risk in Unit 3. Therefore, only decision rules are going to be discussed in this section.

Four different decision rules are discussed in this section. They include (a) E-V rule, (b) Coefficient of variation, (c) Stochastic measures, and (d) Decision tree approach. The weaknesses of these decision rules are discussed. This justifies the need for an advanced technique of simulation, which is discussed thereafter.

9.3.1 E-V Rule or Mean Variance Rule

Expected return and variance (or standard deviation) are compared for taking a decision. It is also called the 'mean-variance' rule. As per the mean-variance rule, the decision is taken by evaluating investment on the basis of expected return and variance. Standard deviation is also used in place of variance. As per the rule, one project will be selected over another if one of the following two conditions hold true:

- Select a project with higher (or equal) expected return but less risk; or
- Select a project with lesser (or equal) risk but higher expected return.

Refer to Figure 9.1. Applying these conditions to the risk-return profiles of four different projects depicted in Figure 9.1, any one will select Project A over Project B and Project C over Project D. But, between Project A and Project C, Project C is preferred and between Project B and Project D, Project D is preferred.

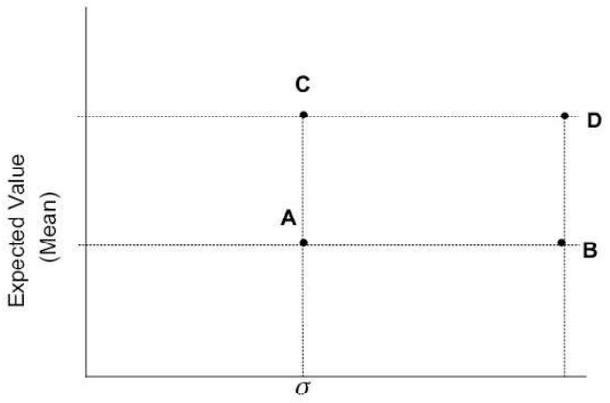


Fig. 9.1 *E-V Rule and its Weakness*

NOTES

Weaknesses There are two obvious limitations of the EV rule. One, it does not help when one project has higher risk but also higher returns; and two, it ignores the size of projects. Between Project A and Project C, which one would you prefer? The *E-V* rule cannot answer this.

9.3.2 Co-efficient of Variation

Co-efficient of variation (CV) removes the limitation of E-V rule, because CV is a measure of risk per unit of return. The CV rule recommends the selection of a project whose risk per unit of return is the least. In other words, the CV rule says 'accept the project with the least co-efficient of variation. It takes into account the size of projects. However, this rule also has two limitations. One, it assumes that one expects the same premium per unit of risk at all levels of risk; implying an assumption that a decision maker is risk-neutral with a linear sloping utility curve. This is not true. Another limitation of the CV rule is clearly observed in the data given in Table 9.1, which pertains to the two alternative projects:

Table 9.1 *Limitations of CV Rule*

Project A		Project B	
Return	Probability	Return	Probability
5	1	8 18	0.5 0.5
ER = 5 s = 0 *CV* = 0		*ER* = 13 s = 5 *CV* = 0.385	

Project B is riskier than Project A as per standard deviation and co-efficient of variance, as is seen in the Table 9.1. The expected return is considered in co-efficient of correlation, but still common sense dictates that Project B, and not Project A, is preferable. The minimum return offered by Project B is higher than the risk-free return offered by Project A. Project B does not appear to be risky by any means though statistically it is risky.

Readers must have noticed that both the decision rules we discussed can be applied only if alternative projects are under comparison. In that situation too, the decision rules are not fool-proof.

9.3.3 Certainty Equivalent and Risk-Adjusted Return Measures

Risk is adjusted in the numerator (cash flow) of the NPV calculation through the certainty equivalent method. A rational investor is risk averse. She is weighing risk against return. She is attaching a premium for the risk. If the cash flow of a risky project does not offer commensurate return the investor will prefer risk-free investment and opt for a certain return. This behaviour of the risk averse investor demonstrates the 'attitude towards risk', which can be explained with the help of utility function. A concave curve displays the typical characteristics of a risk averse

NOTES

investor. Let us consider the concave utility curve in Figure 9.2A and try to understand the meaning of certainty equivalence.

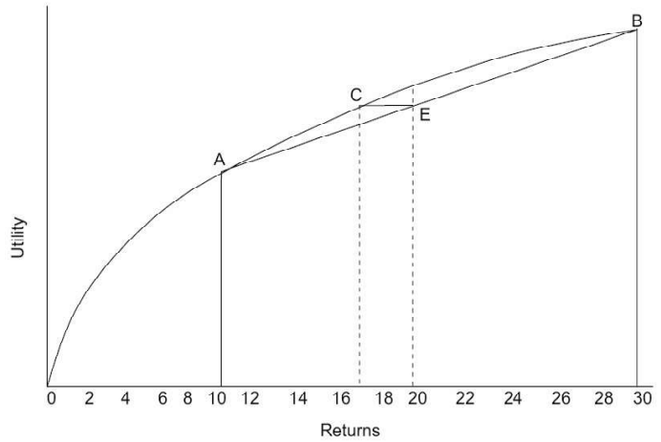


Fig. 9.2A *Utility Curve and Certainty Equivalence*

The numbers in Figure 9.2A are as follows:

A project offers an annual cash flow of ₹10 with 0.5 probability and ₹30 with 0.5 probability. The expected cash flow is ₹20 (10 × 0.5 + 30 × 0.5). Standard deviation is 10. Draw a linear line from point A on utility curve corresponding ₹10 to a point B on the utility curve that corresponds ₹30 cash flow. Thus you get a line AB. Line AB cuts the expected cash flow (₹20) line at point E. Draw a horizontal line from the point E to find a point C on the utility curve. The cash flow at point C on the utility curve is the certainty equivalent to the risky expected cash flow of ₹20. Read cash flow corresponding to point C, you get ₹17. Thus, in this case, ₹17 is the certainty equivalent cash flow for a risky cash flow of ₹20. This implies that the two projects given in the Table 9.2 are considered equal from the risk-return trade-off view point:

Table 9.2 *Application of Certainty Equivalence*

	Project X		Project Y	
	Cash Flow	**Probability**	**Cash Flow**	**Probability**
	10 30	0.5 0.5	17	1.0
ER S	20 10		17 0	

The expected cash flow of ₹20 from Project X is considered equal to ₹17 certain cash flow. For the investor in this example, the certainty equivalent factor can be calculated as below:

$$CEF = \frac{\text{Certainty Equivalent Cash Flow}}{\text{Expected Value}} \qquad (9.1)$$

Where, CEF = certainty equivalent factor
= 17 ÷ 20
= 0.85

NOTES

∴ Certainty Equivalent Cash flow = Expected value × certainty equivalent factor (9.2)

The larger the dispersion (variation) the lower will be the certainty equivalent value and, hence, lower the risk adjusted net present value. Observe this fact in Figure 6.5B, which depicts two alternatives, Project X_1 and Project Y_1. Project X_1 offers the risk-free expected NPV of ₹9 whereas Project Y_1 carries the risk. Project Y_1 can generate either zero NPV ($\frac{1}{3}$ probability) or ₹30 NPV ($\frac{2}{3}$ probability). Thus, the expected return from the Project Y_1 is ₹20 ($0 \times \frac{1}{3} + 30 \times \frac{2}{3}$).

In Figure 9.2B, we can read that the certainty equivalent of Project Y_1's risky returns of ₹20 is equivalent to the risk-free return of ₹9 offered by Project-X_1. Thus, for the investor, on consideration of the concave utility curve given in Figure 9.2B, Project X_1 and Project Y_1 both are equal from their risk-return perspective. For Project-$Y_{1,}$ the certainty equivalent quotient (factor) is 0.45 (i.e. 9 ÷ 20).

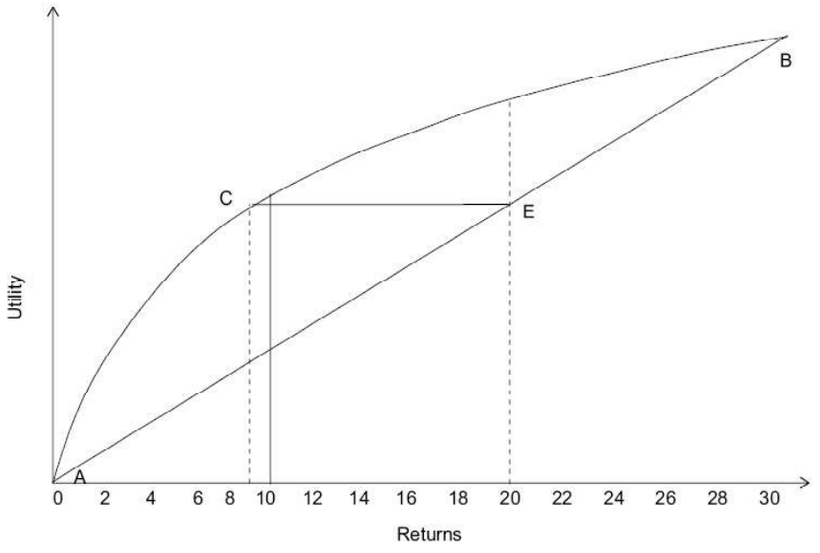


Fig. 9.2B *Certainty Equivalence Drops if Dispersion (Risk) is Increased*

When the cash flow (numerator in the formula of NPV) is lowered with the certainty equivalent factor, the risk-free rate should be used for discounting; otherwise double counting of the risk will occur.

The certainty equivalent concept has a strong theoretical backing, but, in practice, certainty equivalent values can be obtained only through highly subjective and intuitive judgment. This renders the CE method practically irrelevant. However, sub-consciously this seems to find its way in project analysis. Most study groups who are assigned the responsibility of evaluating the costs and benefits of projects tend to keep an allowance of uncertainty in their estimates. Understating benefits and overstating costs, as well as provision for a large contingency amount, are the reflections of a mind-set, which unknowingly practices certainty equivalence.

9.3.4 Decision Tree Analysis

This is an application of E-V rule for dealing only with a particular type of investment problem. Some investment options involve a set of decisions from alternatives in the future point of time. A future decision would be dependent on today's decision. Many decision nods in future make a tree of decisions. The decision tree approach comes handy in deciding about projects with such features.

For example, an oil company owns drilling rights in a given area, and the company faces a decision of whether or not to make seismic test which would indicate the chances of finding oil in that area (Levy and Sarnat, 1995). This decision has to be made at Stage 1 given in Figure 9.3. There are two alternatives at Stage 2. They are: either to sell its drilling rights or to drill. Figure 9.3 gives the decision tree and the outcomes associated with each branch of the tree.

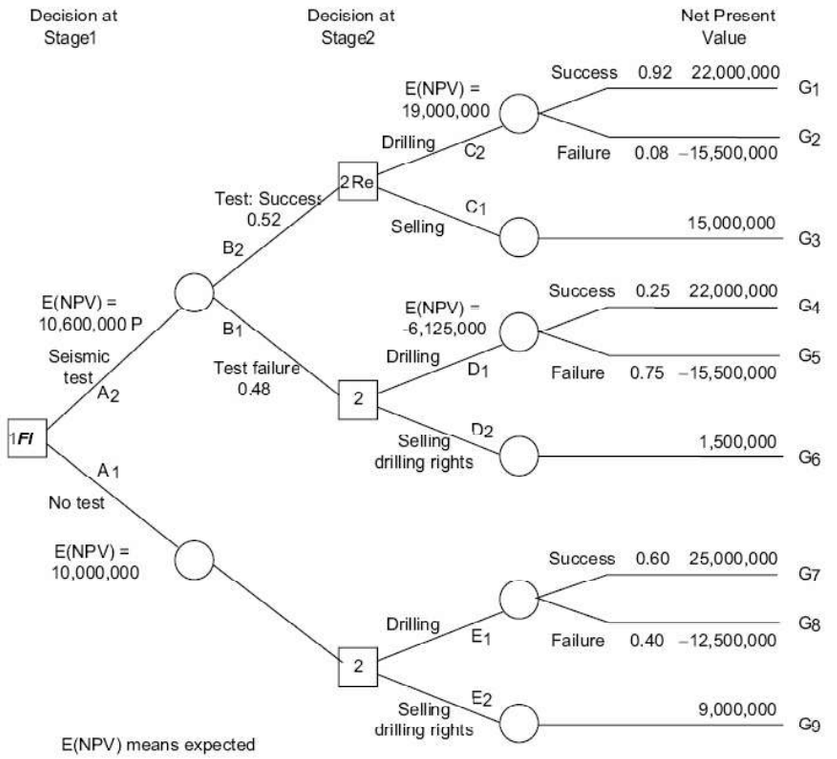


Fig. 9.3 *Decision Tree Model for Oil Drill Problem with Decision Nods and Possible Outcomes Associated with Each Branch of the Tree*

This problem contains sets of alternative decisions at different points in time, and that the decision taken today has a bearing on decisions to be taken in the future. In this situation, we need to first rollback the tree from the end and eliminate those branches which are not acceptable. The following three steps are described in the context of the decision tree problem depicted in Figure 9.3, with a view to identifying unnecessary branches.

(a) If they have selected A_2 and B_2, then should they select C_2 or C_1? The risks and returns on these two branches are,

C_1: ER = 15 C_2: ER = 19 {i.e. $(0.92 \times 22) + (0.08 \times -15.5)$}

$\sigma = 0$ $\sigma = 10.17$

C_2 is riskier than C_1, but it also offers higher returns. Therefore, C_1 and C_2 both seem to be the potential choice. Both offer positive expected return, and one does not obviously seem to be better over the other as per the EV rule.

(b) If A_2 B_1 is selected then should they select D_1 or D_2?

D_1: ER = – 6.125 {i.e. $(0.25 \times 22) + (0.75 \times -15.5)$} D_2: ER = 1.5

$\sigma = 16.24$ $\sigma = 0$

Applying the EV rule, D_2 is the obvious choice. D_1 is rejected because D_2 offers positive expected return (higher than that of D_1), and it is not risky.

(c) If A_1 is selected at Stage 1 then at Stage 2 the choice is between E_1 and E_2.

E_1: ER = 10 ({i.e. $(0.6 \times 25) + (0.4 \times -12.5)$} E_2: ER = 9

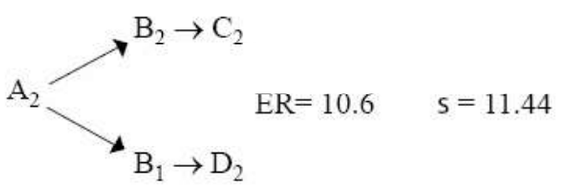
$\sigma = 18.37$ $\sigma = 0$

Again both E_1 and E_2 seem to be the potential choices, as no one can be rejected on the basis of the EV rule.

In the first rollback of the model up to decision Stage 2 we could eliminate one decision alternative (D_1) which had two branches (G_4 and G_5). Now, we should further rollback the model to bring it to Stage 1 of decision making. But in this rollback process, alternative D_1 with branches G_4 and G_5 should not be considered.

At decision Stage 1 now, the following decision alternatives, along with their expected returns and risk, are available:

(a) Strategy 1



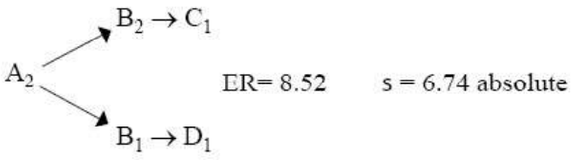
The expected return and standard deviation of Strategy 1 are

Strategy 1:

$$ER = (0.52 \times 0.92 \times 22) + (0.52 \times 0.08 \times 15.5) + (0.48 \times 1.5)$$
$$= 10.6$$

$$s = \sqrt{0.52 \times 0.92(22 - 10.6)^2 + 0.52 \times 0.08(-15.5 - 10.6)^2 + 0.48 \times (1.5 - 10.6)^2}$$
$$= 11.41$$

(b) Strategy 2



Strategy 2: $ER = (0.52 \times 15) + (0.48 \times 1.5)$

$$= 8.52$$

$$s = \sqrt{0.52 \times (15 - 8.52)^2 + 0.48 \times (1.5 - 8.52)^2}$$
$$= 6.74$$

(c) Strategy 3:

$A_1 \rightarrow E_1$ ER= 10 $\sigma = 18.37$

Strategy-3: $ER = (0.60 \times 25) + (0.40 \times -12.5)$

$= 10.0$

$$s = \sqrt{0.60 \times (25 - 10.0)^2 + 0.40 \times (-12.5 - 10.0)^2}$$
$$= 18.37$$

(d) Strategy 4:

$A_1 \rightarrow E_2$ ER = 9 $\sigma = 0$

Strategy 4: $ER = (1.00 \times 9)$

$= 9.0$

$$s = \sqrt{1.00 \times (9 - 9)^2}$$
$$= 0.00$$

Table 9.3 *Expected Returns and Standard Deviations of Alternative Strategies*

	Strategy 1	Strategy 2	Strategy 3	Strategy 4
Expected Return ER	10.60	8.52	10.00	9.00
Standard Deviation s	11.41	6.74	18.37	0.00

NOTES

Make pair comparison and check whether any of the strategy can be dropped applying the EV rule. Strategy 1 has more risk and also more returns compared to Strategy 2; therefore none can be dropped. The EV comparison of Strategy 1 and Strategy 3 indicates that Strategy 3 must be dropped, as its returns are less but risk high. Strategy 4 cannot be dropped when compared with Strategy 1. But, between Strategy 2 and Strategy 4, we can drop Strategy 2 because of its low returns and high risk. Thus, through pair comparison, we are able to drop Strategy 2 and Strategy 3 and reduce the list of acceptable alternatives to two; Strategy 1 and Strategy 4.

Now, one may calculate CV and select the strategy with the least CV. The CV of Strategy 1 is 1.08 (11.41 ÷ 10.6) and that of Strategy 4 is 0. Thus, based on CV rule one may select Strategy 4. However, for a risk averse decision maker an additional return of 1.60 (10.60 – 9.0) from Strategy 1 may be worth the additional risk of 11.41 (11.41 – 0) as compared to Strategy 4.

The roll-back model of decision tree uses the EV rule and the CV rule. One may, in fact, calculate the CV for all possible branches and select the one with the least CV to find the same answer. The role back model is educative.

9.4 SIMULATION ANALYSIS

Sensitivity analysis suffers from two basic limitations; it ignores probabilities and it considers change in only one variable at a time. In real life, all critical variables are likely to vary from its forecast. A decision maker may not feel confident if all critical factors are not included in a single analysis and that too with probabilities assigned. Sensitivity analysis, therefore, cannot be applied if the decision maker wants to get a full picture of the risk before making a decision. The simulation method is prescribed as a solution.

Monte Carlo simulation, in particular, is very useful in project risk analysis. It is a complex method and hence use of computers and special purpose software becomes a necessity. How is the Monte Carlo simulation carried out? The procedure is listed below:

1. Establish a relation between net present value and project parameters and exogenous variables affecting the NPV. This is basically the calculation of NPV or IRR using all variables, which is done in any project analysis whether risk is studied or not.
2. Forecast various outcomes and assign probabilities to them.
3. Ideally take all possible permutations-combinations of all possible outcomes of all variables, and calculate the NPV or the IRR for each one of them. Taking all permutations-combinations may be extremely difficult and for real life application, it may not be needed either. Therefore, take a few but statistically significant number of randomly selected permutations-combinations (iterations).

4. For each of the iterations select a value for each forecast parameter.
5. Calculate the NPV (or IRR) for the values of parameters selected in each iteration.
6. Repeat steps 4 and 5 for the iterations selected.
7. Now NPVs are available for the selected iterations. Plot the frequency distribution of the net present values obtained for all the iterations.

The occurrence (outcome) will be random and not predetermined. Therefore, the concept of random number exists. Two features are combined in Monte Carlo simulation;

- It has a realistic assumption that some or all variables may change but randomly. It considers values for several possibilities of outcomes; any one of them could become a reality. But large number of parameters and associated parameters would mean an almost infinite numbers of permutations and combinations.
- Random number selection pays due attention to the probabilities. Thereby, even if number of runs (iterations) is less than total permutations-combinations, the resultant frequency distribution is fairly representative. A large number of runs is, therefore, advisable.

Let us look at the frequency distributions of the net present values of three imaginary projects. Three simulations, one each for projects A, B and C are carried out and resultant three simulation graphs are superimposed on each other in Figure 9.4.

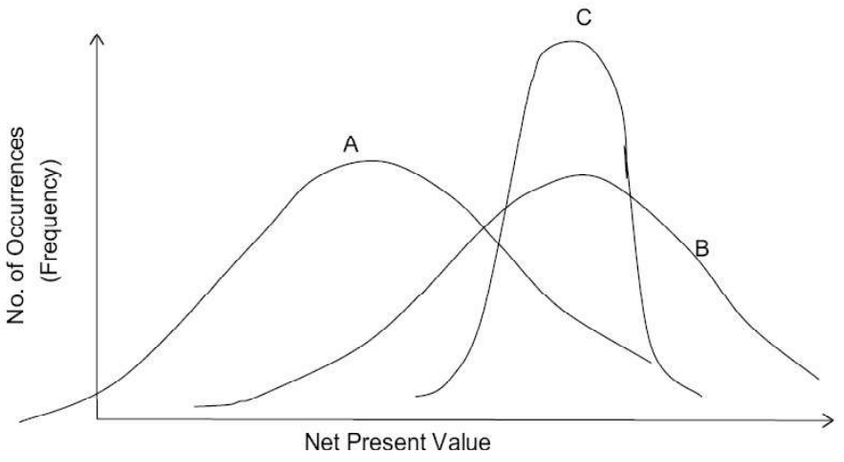


Fig. 9.4 *Simulation Result of Three Projects*

Decision rules The Monte Carlo simulation method gives the profile of outcomes with due recognition of probabilities. But, decision rules are not given, nor can they be prescribed. However, if the expected return and standard deviation are calculated, then some decision guideline can be drawn. The basic rules and approaches still remain

NOTES

the same as in the EV and the CV rules. In the cases charted in Figure 9.4 the following observations and decisions may be considered:

1. Project B seems to have a clear edge over Project A. Project B has a higher expected value (Project B is on the right of A, a stochastic model) and almost equal dispersion (or standard deviation) as compared to Project A.
2. Between Project B and Project C, the risk perception of the decision maker will have a significant effect on the choice. Project C is less risky though it seems to be giving an expected net present value almost equal to that of B. The chances of earning that expected NPV is higher (see the height of peak) in case of Project C. But, some decision makers who are confident of 'making things happen' would definitely like to pay attention to the chance of earning a higher NPV (they look at the right of the graph). One may look at the left, at the right, at the height, and also at the dispersion. The final decision will depend upon what alarms them and what lures them. The decision maker may seek support to the graphic visual, and obtain some or all of the following statistical data related to all the projects for taking a decision.
   - Maximum NPV (right of graph)
   - Minimum NPV (left of graph)
   - Standard deviation of NPV (dispersion of the NPV curve)
   - Expected NPV, and Z-value

Simulation does not provide the decision rule. However, its value lies in its comprehensiveness. It may be difficult to use, but with the easy availability of computer programmes and computer skills, the simulation models have started finding users in industry, especially in problems where probabilities can be assigned, like product development in the consumer non-durable segment. Simulation is quite successful in giving a comprehensive picture of the project risk. A pictorial presentation adds value.

9.5 TAX CONSIDERATIONS IN INVESTMENT DECISIONS AND COST OF CAPITAL DECISIONS

The cash flows that are related to capital budgeting decisions are after tax cash flows only. The after tax cash flows that result from a project are the only relevant incremental cash flows. These after tax cash flows would not occur if the project is not undertaken. The annual cash flow from a project will result in increase in the taxable profit. Therefore, the cash flow from a project also affects the tax liability of the firm. The increase in tax liability will be equal to the cash inflow multiplied

by the tax rate. Or, the net cash inflow will be equal to cash inflow before tax multiplied by tax rate (1– tax rate). Therefore, the relevant cash flow for a capital budgeting decision is the cash flow net of the incremental tax liability. Hence, capital budgeting analysis and decision-making should be done in after-tax terms. This implies that all items that affect taxes, even non-cash item such as depreciation should be considered with equal importance.

You have already learnt about tax implications in capital structure decisions. Therefore only leasing aspects in investment decisions is discussed in this section.

Leasing *vs* Investment: Evaluation and Tax Implementations

There are a large number of issues to take into consideration at the time of purchasing equipment, buildings or vehicles. The most primary question that arises is whether to lease or to buy? Both alternatives have benefits and drawbacks depending on a specific business scenario.

To be able to make the finest decision in any specified circumstances, we would have the following questions in mind:

For how long should the asset be retained? If the asset is to be kept for a short period, it can be concluded that it is better to lease it rather than buy it and then try to resell it when it is no longer required. One may want to check for a buyout option once the lease has expired, if one prefers to retain the asset after the original lease has expired.

Which is more suitable for one's needs—new or used equipment? Is new equipment required, or can the old equipment be used? Generally, the price of used equipment is low, as compared to a new one. On one hand, money can be saved on the cost price, but there may be no option to lease it. On the other hand, new equipment is easily available either for purchase or lease.

Analysis of the cost/benefit of the new *vs* used equipment is another significant task. This is particularly important at the time of a new beginning. Large investments on new equipment in the initial phase can put an excessive burden on the flow of money and funds. A small beginning might be better and can raise one's capital possessions as one's profits rise and can sustain growth.

What is the frequency of change in technology with this asset? In case of assets that turn obsolete within a short span of time, it is advisable to go for short leases instead of long ones. In this manner we have the most recent technology at our disposal, particularly if this technology is crucial for the business. If a company is not dependent on the most modern technology, it will often be more economical to modernize one's technology products a little less repeatedly, for instance, once in every three years.

What are our financing alternatives for purchasing *vs* leasing? Purchasing has a tendency to necessitate an elevated monetary expenditure initially in addition to having to finance our purchase by a lender. On the basis of our state

NOTES

of affairs, this might not be a practicable decision if the cash reserves are not adequate. Leasing in general requires less down payment and the monthly installments are also usually smaller.

What are the tax-related advantages of buying *vs* leasing? It is important to take into consideration every related tax consequences for both choices as they communicate about our exacting business circumstances. There is usually a tax benefit associated with leasing where one can take away the full lease payment with immediate effect. A tax professional should be consulted since every type of lease has a distinctive accounting for tax objectives as to how much one gets to subtract as an expenditure on one's profit/loss statement.

In cases of purchase and funding assets, it is only possible to subtract the interest in the form of an expense. The principal amount that is being paid on the loan is not regarded as a taxable deduction in the profit/loss statement—it is seen as a reduction of one's loan accountability.

The processes of leasing as well as purchasing are beneficial to companies. For making the right decisions it is important to know the company's specific needs and purpose of the asset. Answers to the questions above will help ensure that we make the best choice for our situations.

Cost of capital = cost of equity + cost of debt + cost of preference share (in proportion of their fund). Generally, financial managers use the cost of capital (refer as WACC) as a benchmark or a qualifying criterion for selecting the new projects of a company or evaluating the existing projects also.

It is to be noted that the concept of cost of capital has been discussed in detail in Unit 6. Also, the relevance of cost of capital in investment decisions has been highlighted in Unit 6.

Check Your Progress

1. Why is sensitivity analysis also called 'what if' analysis?
2. What is another name for E-V rule?
3. What renders certainty equivalent concept practically irrelevant?
4. Give an example of an industry where simulation analysis is used.
5. What is the nature of cash flows that are related to capital budgeting decisions?

9.6 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The sensitivity analysis technique is also called 'what if' analysis because it involved a process of recalculating the net present value if a particular factor turns out to be at a different level than originally estimated.

2. The E-V rule is also called the 'mean-variance' rule.
3. The certainty equivalent concept has a strong theoretical backing, but, in practice, certainty equivalent values can be obtained only through highly subjective and intuitive judgment.
4. The simulation models have started finding users in the industry, especially in problems where probabilities can be assigned like product development in the consumer non-durable segment.
5. The cash flows that are related to capita budgeting decisions are after tax cash flows only. The after tax cash flows that result from a project are the only relevant incremental cash flows.

9.7 SUMMARY

- In the management of risks, management by exception is the rule. Many variables may be uncertain, but only a few may matter. The endeavour should be to first identify the sources of risk that matter.
- Sensitivity analysis is a technique in which the sensitivity of returns to the change in one particular variable is studied. Sensitivity analysis is more significant in the context of project investments that companies make.
- Types of risk measurement can be discussed in three parts: techniques of measuring risk, decision rules, and finally, some more tools of measure cum decisions.
- Four different decision rules include E-V rule, Coefficient of variation, Stochastic measures and Decision tree approach.
- Expected return and variance are compared for taking a decision. It is also called the 'mean-variance' rule.
- The Co-efficient of variation rule removes the limitation of E-V rule because CV is a measure of risk per unit of return. The CV rule recommends the selection of a project whose risk per unit of return is the least.
- Risk is adjusted in the numerator (cash flow) of the NPV calculation through the certainty equivalent method.
- Decision tree analysis is an application of the E-V rule for dealing only with a particular type of investment problem. Some investment options involved a set of decisions form alterative in the future point of time. Many decision nods in future make a tree of decisions.
- Sensitivity analysis cannot be applied if the decision maker wants to get a full picture of the risk before making a decision. The simulation model is prescribed as a solution. Monte Carlo simulation, in particular, is very useful in project risk analysis.

NOTES

- Simulation does not provide the decision rule. However, its value lies in its comprehensiveness.
- The cash flows that are related to capital budgeting decisions are after tax cash flows only. The after tax cash flows that result from a project are the only relevant incremental cash flows. The cash flow from a project affects the tax liability of a firm.
- To be able to make the finest decision in any specified circumstances, we would have the following questions in mind: for how long should the asset be retained, which is more suitable for one's needs? What is the frequency of change in technology with this asset, etc.

9.8 KEY WORDS

- **Sensitivity analysis:** It is a technique in which the sensitivity of returns to the change in one particular variable is studied.
- **Mean-variance rule:** It is a decision rule as per which, the decision is taken by evaluating investment on the basis of expected return and variance.
- **Co-efficient of variance:** It is a decision rule which recommends the selection of a project whose risk per unit is the least.
- **Monte Carlo simulation:** It is a useful method in project risk analysis which gives a profile of outcomes with due recognition of probabilities.

9.9 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short-Answer Questions

1. Write a short note on the meaning and ways of carrying out sensitivity analysis.
2. What are the weaknesses of the E-V rule?
3. Briefly explain the co-efficient of variation rule and how it overcomes the limitations of the E-V rule.
4. What are the limitations of sensitivity analysis?
5. Briefly discuss tax considerations in investment decisions.

Long-Answer Questions

1. Explain the certainty equivalent and risk-adjusted return measures.
2. Describe the concept of decision tree analysis.
3. Discuss the procedure and decision rules in Monte Carlo simulation.

9.10 FURTHER READINGS

Patel, Bhavesh. 2014. *Fundamentals of Financial Management*. New Delhi: Vikas Publishing House.

Khan, M.Y. and Jain, P.K. 2007. *Financial Management- Text Problems and Cases.* New Delhi: Tata McGraw-Hill.

Chandra, Prasanna. 2004. *Financial Management: Theory and Practice.* New Delhi: Tata McGraw-Hill.

Kulkarni, P.V. and B. G. Satyaprasad. 2002. *Financial Management.* New Delhi: Himalaya Publication House.

NOTES

UNIT 10 WORKING CAPITAL MANAGEMENT: DEFINITION AND OBJECTIVES

Structure

10.0 INTRODUCTION

Fixed assets acquired through capital expenditure can be put into operation only if some support capital is provided. This support capital required for operational needs of the business is christened in many ways. C. W. Gerstemberg (1959) called it 'circulating capital' and Hasting (1966) called it 'short-term funds'. However, most commonly it is known as 'working capital'.

This unit deals with the meaning, approaches and nature of working capital. It also discusses the concept of operating cycle of working capital.

10.1 OBJECTIVES

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

- Discuss the concept, types and approaches of working capital
- Explain the components of the working capital
- Describe the importance of working capital management

- Discuss the financing and conservative approaches
- Examine the determinants and factors affecting working capital requirements
- Assess the estimation of working capital requirement
- Explain the different sources of working capital finance

NOTES

10.2 WORKING CAPITAL: CONCEPT AND TYPES

The term 'working capital' has attracted a few debatable interpretations. According to some authors (Kenneth, 1938; Baker and Mallet, 1949; Meed, 1933) working capital is nothing but the total current assets. They advocate that current assets should be considered as working capital because it is the current assets which help to earn profits. Financing aspects should not be mixed up with working capital. Working capital is required for operational purpose, so total current assets are more meaningful. How much capital is employed in supporting operations is a different issue. This kind of opinion continued till the fifties (Meed, 1933; Bogen, 1957).

The meaning of working capital has now changed to 'excess of current assets over current liabilities (Guthmann, 1964).' Bombay Stock Exchange Official Directory as well as the Annual Survey of Industries also subscribe to this concept of working capital. It is also known as '*quantitative concept' of working capital* (Husband and Dockery, 1957). The main argument is that what matters in the long run is the surplus of current assets over current liabilities and not the absolute amount of current assets. It is useful in assessing financial position of the enterprises and also helpful to the investors and creditors to judge financial soundness and margin of safety. It is a dependable source to meet contingencies since the firm has no obligation to return this amount.

Though the difference of opinion regarding the two concepts of working capital still persist, reconciliation between the two has been attempted by calling the first concept (working capital means total current assets) '*gross working capital'* and the second one '*net working capital'* (Kuchhal, 1985). The debate is more of an academic nature. In practice the concept of 'net working capital' is used when the purpose is to find out the financial position and the concept of 'gross working capital' is used while judging the operating effectiveness of working capital. More often, when reference is made to the terms 'working capital' it means net working capital.

Working Capital Approaches

Working capital concepts can be explained through three approaches for understanding the working capital (primarily the current assets). These three approaches are:

- Working capital cycle approach

NOTES

- Pipeline approach, and
- Cash tank approach

Each of these approaches explains the circulating or flowing nature of the working capital.

Working capital cycle approach

The components of gross working capital are depicted in a cyclical form as in Figure 10.1.

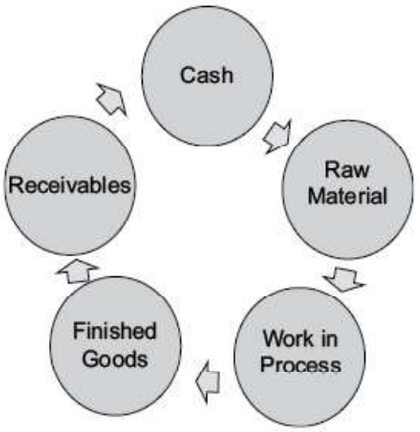


Fig. 10.1 *Cycle of Current Assets Components*

Figure 10.1 explains the circulatory nature of current assets, wherein the initial cash is used to purchase raw materials, which becomes the work-in-process when processing begins. After processing, the same turns into finished goods, which become receivables on being sold on credit. When collected the receivables turn back into cash, and thus the cycle goes on.

Net working capital cycle: The working capital cycle shown in Figure 10.1 is actually the gross working capital cycle or the current asset cycle. Each next form of a current asset item is attained through spending more money in carrying out appropriate value-addition activity on it. These additional expenses also have some unpaid portion too, which are payables, but not recognised in the gross working capital cycle. Figure 10.1 can be improvised to include various payables that come naturally with any business operation, and we get Figure 10.2, that depicts the net working capital cycle.

The difference between the current assets and current liabilities constitutes the 'net working capital', which is also often called just the 'working capital'. The depiction of net working capital can be done by juxtaposition of the cycle of current assets and that of current liabilities. Figure 10.2 depicts in its centre the current assets cycle, which is the same as in Figure 10.1 and on its periphery, various payables to form the net working capital cycle.

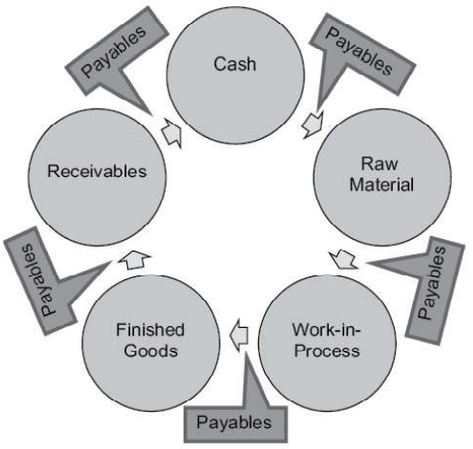


Fig. 10.2 *Net Working Capital Cycles*

This net working capital can be positive, indicating the net investment made by the company in bridging the gap between current assets and current liabilities. While the finance made available by the payables is cost free and as a part of prudent business customs, the conscious financing of net working capital has some cost, as they are funded through external sources.

Net working capital can also be negative. When current liabilities are more than current assets, working capital would be negative. Depending upon the business and when the accounts are closed, working capital can be either negative or positive and only coincidentally can be exactly zero.

Pipeline approach

Working capital is like water flowing in a pipeline or blood flowing in the blood vessels. The diagrammatical presentation of pipeline approach of working capital is shown in Figure 10.3.

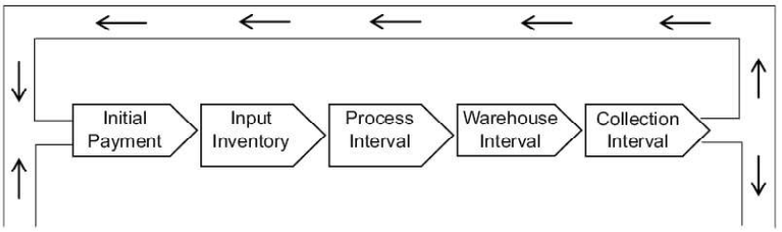


Fig. 10.3 *Pipeline Approach of Working Capital*

The pipeline explains cash flowing from the left side bottom into the business processes with initial payments for purchases, which gets into the inventory to go into processes. The produced goods remain in warehouse and then in receivables. These are all called intervals after which cash is turned back into cash. While this flow goes on some cash enters into the pipeline and also flows out of it through

NOTES

non-operating decisions of the firm. The examples of non-operating decisions that create cash flow include dividend payments, issue of capital, retirement of capital, use of cash for investment in fixed assets, etc.

Cash tank approach

The cash tank theory or approach explains the pipeline theory in somewhat more details. The diagrammatic representation of cash tank method is given in Figure 10.4.

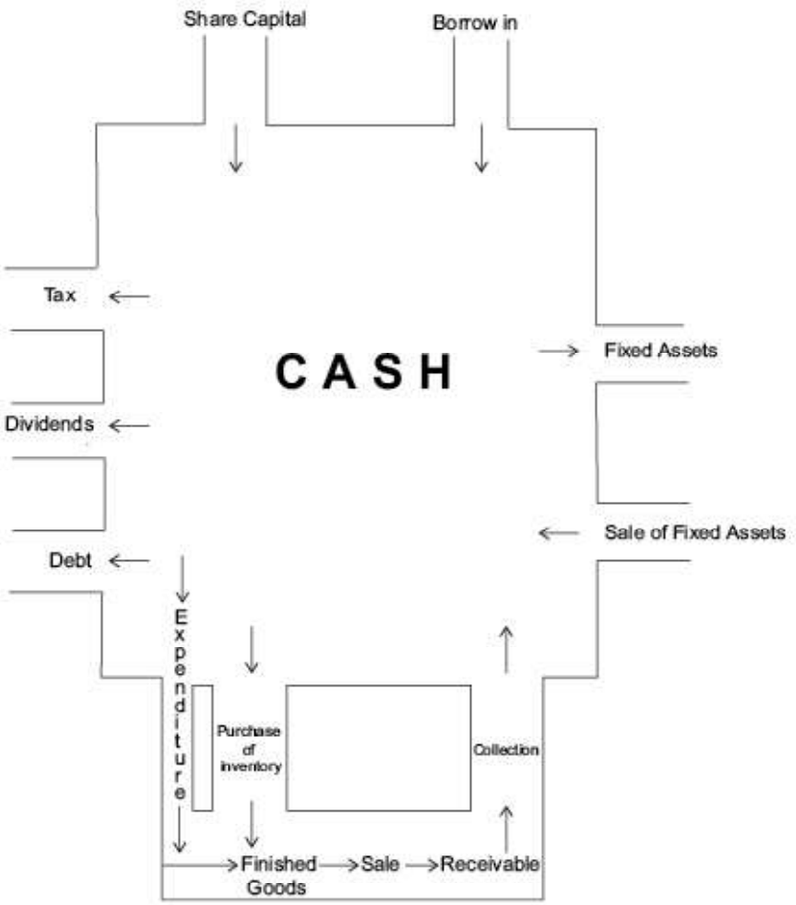


Fig. 10.4 *Cash Tank: A Treasury Approach for Working Capital Management*

The cash-tank shown in Figure 10.4 is self-explanatory. A cash-tank of a firm is like the heart which is pumping working capital for its effective circulation. Overflowing as well as dried up tank both cause disturbances in routines. Veins and arteries are spread throughout the organization. They pass through every department and individual before the cash goes back to the tank. The amount of cash which goes back to the tank should be greater than the amount which was

pumped out. The firm must earn profit and more importantly it must collect money from debtors. The extra cash so generated should be used efficiently rather than allowing the same to remain in the cash tank. The extra cash can be initially used for short-term investments like marketable securities and then for long term growth, i.e., for further investments in fixed assets. If extra fat is allowed to circulate in veins and arteries, cholesterol is formed which proves fatal at times.

The **working capital cycle approach** begins with the given cash on hand. It does not illustrate the sources of cash and implies that once the cash gets into the cycle there is no further infusion of cash nor takeout of cash from the cycle. The **net working capital cycle** explains the current liabilities along with the cycle of current asset. The **pipeline approach** considers the inflow into the pipeline as well as outflow of cash from the pipeline, but does not narrate the sources of inflow and applications of outflow. The **cash tank approach** is more comprehensive as it shows the sources and uses of funds that affect the flow of cash in the operations.

Components of Working Capital

The components of working capital are discussed in two parts, namely components of current assets and components of current liabilities after which the calculation of working capital is briefly explained in Table 10.1.

Components of Current Assets

A firm has to keep cash on hand with a view to meet its expenses. First, a firm has to buy raw materials using this cash. Some more cash is injected to convert the raw materials into semi-finished goods and then into finished goods. The finished goods are converted into receivables when some more spending of money results into the sales of the finished goods. If sales are on credit, additional expenses would be required to make collections and when collected the receivables get converted into the cash. Now the cash is again available for purchase of raw materials. These components and their cycle are depicted in Figure 10.1 on cycle of current asset components.

Components of Current Liabilities

At every stage of the current asset cycle someone is financing a part of the investment needed for the current assets. For example,

- Raw material is purchased on credit and thus, the suppliers finance the investments in raw material inventory for the credit period extended by them.
- When the raw material is processed to get work-in-process and finally finished goods, several value adding expenses are not paid immediately and they remain unpaid for some time. For example, workers and other employees are paid after the month gets over, electricity bill is paid after a

NOTES

lapse of time, and so is true about all other expenses associated with value adding processes.

- Efforts and expenses are incurred in converting the finished goods in to receivables. Some of these expenses associated with warehousing, marketing and selling are not paid immediately as per the terms of payment with these parties.
- Though payment terms are well spelt out in the credit sales, firms do incur expenses in collecting money from them. They may be in the form of discounts, phone calls and bank commissions for realization of cheques deposited. Phone bills are paid after the cycle of bill, which remain as unpaid for some time and finance some part of the assets.

Thus, almost every party that is involved in the operations of the business directly or indirectly finance to an extent part of business activity. They have to be paid when due and therefore, these constitute the 'current liabilities', which acts as an automatic financing of current assets by virtue of business practices of every business. Figure 10.2 of net working capital cycle depicts these current liability components on the periphery of it.

Calculation of Net Working Capital

The working capital components and calculations are shown in Table 10.1.

Table 10.1 *Calculation of Working Capital*

	Inventory • Raw Materials • Work-in-progress • Finished Goods • Spares and Parts
+	Receivables • Sundry Debtors (accounts receivables) • Other Receivables
=	Total Current Assets (Gross Working Capital)
-	Current Liabilities • Accounts Payables • Other Liabilities (payables) • Provision for Tax
=	(Net) Working Capital

Table 10.1 gives the calculations of net working capital using the components depicted in Figures 10.1 and 10.2.

Importance of Working Capital

Working capital's role in the business can be compared with the functions of blood in a body. Working capital must keep circulating in the business. Inadequate working capital is like a low blood pressure, which may deprive various organs of much needed oxygen and various business activities may suffer adversely. Less working capital might disturb the payment schedule, affect the dividend policy adversely, opportunities of low price or quantity discount or cash discount may not be grabbed.

High blood pressure is equally bad for a body and so is true for working capital in the business. Excessive working capital means capital is unproductively tied up, which is counter-productive and that reduces the profitability of the business. It also results in extra and unnecessary costs like interest, wastage, bad-debts and other undesirable expenses. High working capital pulls down investment turnover ratio, reducing the return on investment and reduced shareholders' profit. If the situation of excessive working capital continues for some time it might mislead the dividend and investment decisions. This could be suicidal.

Working capital investment has duel impact of the profitability ratios also. Look at Example 10.1.

Example 10.1: Profit effect of working capital investment

A company has extracted the following data from the budget that is prepared for the next year:

	Original
Fixed Assets	7,00,000
Working Capital	3,00,000
Net Assets	10,00,000
Debt (0.15)	5,00,000
Equity	5,00,000
Net Worth	10,00,000
Sales	6,00,000
Operating Expenses	4,00,000
Interest Expense	75,000
Profit Before Tax	1,25,000
Tax (0.35)	43,750
Profit After Tax	81,250

It was decided immediately after preparing the above budget that the working capital can be reduced by ₹100,000 through various measures without affecting sales and operations. The funds released with the reduction in working capital will be used for repaying the debt.

Reconstruct the given numbers with the change in the working capital. Also calculate the profits and profitability ratios before and after the change effected in the working capital.

Solution: The reconstructed selected budgeted data is as below:

	Original	Revised
Fixed Assets	7,00,000	7,00,000
Working Capital	3,00,000	2,00,000
Net Assets	10,00,000	9,00,000
Debt (0.15)	5,00,000	4,00,000
Equity	5,00,000	5,00,000
Net Worth	10,00,000	9,00,000
Sales	6,00,000	6,00,000
Operating Expenses	4,00,000	4,00,000
Interest Expense	75,000	60,000
Profit Before Tax	1,25,000	1,40,000
Tax (0.35)	43,750	49,000
Profit After Tax	81,250	91,000

The amount of ₹100,000 released from the reduction in working capital is used for the reduction in the debt. As a result interest expense has declined and net asset and net worth have declined. The profitability ratios before and after the reduction in working capital are as below:

Profitability Ratio	Formula	Original	Revised
Profit Margin	$\frac{\text{Profit After Tax}}{\text{Sales}}$	$\frac{81,250}{6,00,000} = 13.54\%$	$\frac{91,000}{6,00,000} = 15.17\%$
Return on Net Assets	$\frac{\text{Profit After Tax}}{\text{Net Assets}}$	$\frac{81,250}{10,00,000} = 8.13\%$	$\frac{91,000}{9,00,000} = 10.11\%$
Return on Equity	$\frac{\text{Profit After Tax}}{\text{Equity}}$	$\frac{81,250}{5,00,000} = 16.25\%$	$\frac{91,000}{5,00,000} = 18.20\%$

Thus, all profitability ratios have increased as a result of control of working capital. Profit after tax has increased and along with the net assets. Return on net asset ratio has dual effect on the profitability.

Some useful numbers about the working capital of non-government non-finance public limited companies in the years 2009–10, 2010–11 and 2011–12 were as given in Table 10.2.

Table 10.2 *Selected Financial Ratios of the Select 3,041 Public Limited Companies, 2009–10 to 2011–12*

(Per cent)

	Selected Financial Ratios	2009–10	2010–11	2011–12
1	Current assets to current liabilities*	1.3	1.4	1.4
2	Quick assets to current liabilities	65.0	64.0	63.0
3	Current assets to total net assets	45.5	48.0	49.4
4	Sundry creditors to current assets	24.6	23.4	22.9
5	Sundry creditors to net working capital	99.8	83.5	83.0
6	Inventories to sales	16.5	17.0	16.4
7	Sundry debtors to sales	15.6	15.8	16.4

* Actual ratio of current assets to current liabilities.

Current assets represented 49.4 per cent of net assets in the year 2011–12, which shows increasing trend in the current ratio to the net assets over the previous two years. This large percentage of investment must draw attention of management for efficient management them. Inventory is 16.4 per cent of sales whereas receivables (sundry creditors) are at 22.9 per cent of current assets, enough justification why efficient management of inventory and receivables is vital. However, almost one-fourth of the current assets are financed by sundry creditors.

This is enough to prove the importance of working capital management. Working capital management function becomes all the more crucial because:

(a) Working capital should not be that high which may reduce the profitability in terms of return on investment.

(b) It should not be that low which may either hinder operational activity or result in a liquidity crisis.

(c) No standard is available which may suggest a fair level of working capital.

(d) The components of working capital are such that can never be controlled by one man or one department.

Ideal Level of Working Capital

While in case of profits more the merrier, in case of working capital 'not a penny more not a penny less' is desirable. That means not a single extra penny should be invested in the working capital, at the same time even a penny less is not good. Just the right amount of investment is advocated. The right amount is determined by several unique factors at any given point in time.

If storage time is zero, production cycle time is zero, and sales are against only cash then there is no inventory and no receivables on the balance sheet. If management uses the surplus cash efficiently then a firm is not even required to have a cash balance on hand, making a zero current asset situation. If the business also enjoys credit from suppliers and for other expenses then the presence of current liabilities will give a negative working capital, which means cost free short-term cash flow for the business.

However, more often working capital is positive. It is therefore, necessary to understand what is a 'not a penny more not a penny less' level of working capital for a business. The factors responsible for current assets and current liabilities determine the *ideal* level of working capital.

Functions for Working Capital Management

A balanced flow of working capital is desirable for the smooth operation of a business. Managerial tasks involved in the management of working capital can be divided into four areas as follows:

(a) **Planning:** Estimating the working capital requirement for a plan period.

(b) **Monitoring and control:** Establishing certain norms and policies of working capital and also designing a proper information system to ensure proper feedback for better control.

(c) **Organizational system:** Building an organization system for better coordination of people having influence on working capital.

(d) **Financing:** Financing the working capital keeping in view its impact on profitability and liquidity.

The agility of company management on these functions is very essential for the successful management of working capital.

Planning for the Working Capital Requirement

Planning is important, especially for the working capital because the working capital level is fluctuating from time to time, though a steadily increasing level is experienced over the long period.

Since, no standards regarding the size of working capital are available for the planning of the working capital, one needs to understand the planning in two phases namely,

(a) Understanding the determinants of working capital and their influence, and based on that

(b) Estimating the working capital requirement using the suitable method(s).

The understanding of the factors responsible for the working capital, discussed earlier, is essential because those factors are unique for each company. The benchmarks must be developed against those benchmarks rather than from competing companies or industry average.

Check Your Progress

1. What does the pipeline approach of working capital does not narrate?
2. What acts as an automatic financing of current assets by virtue of business practices of every business?
3. Mention examples of extra and unnecessary costs which result due to excessive working capital.

10.3 FINANCING APPROACHES AND CONSERVATIVE APPROACHES

There are two types of financial needs of a company: one, short-term and two, long-term. The working capital need is also of two types: one short-term and two, long-term or core. Therefore, it is important to decide what type of working capital need should be funded with what type of funds. The policy selection has an impact

NOTES

of certain parameters due to the nature of working capital and also the nature of short-term and long-term financing.

There are three types of financing policies, namely,

- Moderate financing policy
- Aggressive financing policy, and
- Conservative financing policy

Moderate financing policy

There are two segments of working capital, core and fluctuating. Within one year the core may remain constant and fluctuating portion may show volatility with changing seasonality over the weeks and months. A firm may adopt a policy wherein the entire core portion is financed through the long-term sources of funds and fluctuating portion with the short-term sources. This policy is a moderate financing policy.

Figure 10.5A has depicted the fixed assets and working capital. The fixed assets and core working capital are financed through the long-term sources, whereas the remaining needs of working capital is met with access to the short-term sources as and when needed.

The moderate working capital financing policy follows the matching principle and attempts to match long-term requirement with the long-term sources and short-term requirement with short-term sources. The liquidity related anxiety and stress would be less in moderate financing policy as compared to the aggressive policy.

Usually, the core portion of working capital is included in the project cost when the new project is undertaken and financed through the long-term sources. Subsequently, as the core portion increase it is funded through retained earnings and thus, the moderate policy continues.

Aggressive financing policy

In aggressive financing policy only a part of core working capital is financed through the long-term sources of funds. That means the entire fluctuating portion of working capital requirement as well as some part of core are financed with the short-term sources. Figure 10.5B has depicted this.

The firms that begins with moderate financing policy is likely to move to an aggressive financing policy if their management is consciously and constantly not funding the increasing requirement of core working capital with the long-term sources like retained earnings.

Aggressive policy has potential of using less expensive and less restrictive short-term sources of funds, but would require a strong cash management.

Conservative financing policy

In conservative policy a firm is funding even a part of fluctuating working capital with the long-term sources. Only a part of fluctuating working capital is funded

through the short-term sources. Figure 10.5C depicts the conservative policy of financing the working capital.

The conservative policy takes away the stress of managing liquidity every moment, though might increase cost especially associated with the time-being excess liquidity. If the firm is able to park the excess money in marketable securities the cost associated with the excess liquidity can also be removed.

The art of raising short-term funds as and when needed is at the test in the aggressive financing policy, whereas the art of investing excess fund is at the test in the conservative policy.

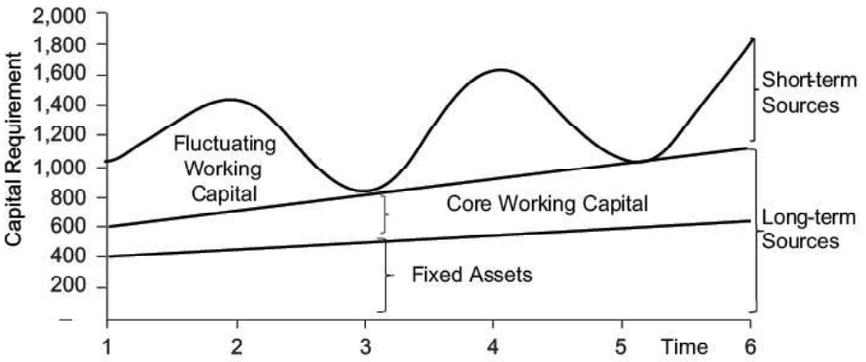


***Fig. 10.5A** Moderate Working Capital Financing*

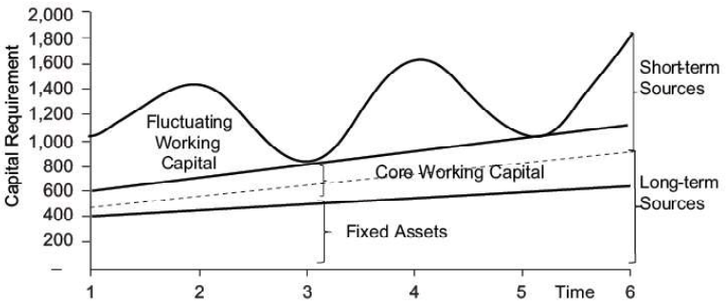


***Fig. 10.5B** Aggressive Working Capital Financing*

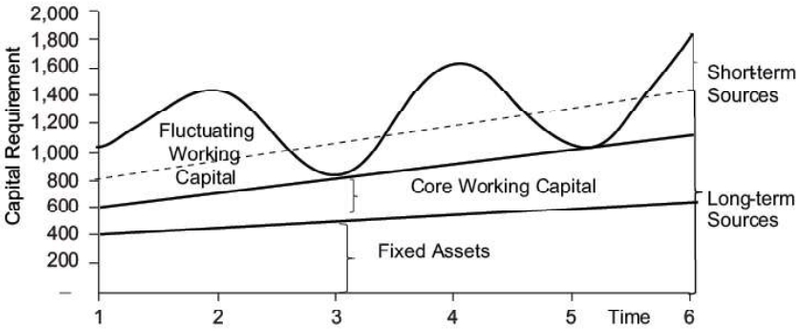


***Fig. 10.5C** Conservative Working Capital Financing*

Check Your Progress

4. Which principle is followed by moderate working capital financing policy?
5. What is the nature of working capital in inflationary environment?

10.4 DETERMINANTS AND FACTORS AFFECTING WORKING CAPITAL REQUIREMENTS

Several factors are responsible for the presence of working capital of a firm. Most important of them can be grouped in three categories namely, (a) external factors, (b) firm specific situation and (c) firm's policy. The factors under these categories are briefly discussed now.

(a) External factors

Any firm is subject to the external environment, and required to adjust its working capital in the context of those factors.

Vagaries in supply of raw materials: Supply of some raw materials may be uncertain, especially agricultural produce like cotton for textile mills. The supply and the prices of these products are very uncertain, creating constant imbalances between the supply and demand. If a firm decides to buy the annual requirement during the season, the inventory investment would be very high. Alternatively, a firm may decide to buy options and future contracts, at a premium, for a delivery at a different time, at a predetermined price, it would pay some premium or price for such contracts. This is possible only if option and future markets exist in the product category.

Business customs: Business custom is an essential parameter that determines the working capital. A firm operating in a product market with scarce supply is likely to ask for cash payment on sales implying fewer current assets. Likewise, if the bought out items are in an over-supply situation a buying firm can negotiate longer terms of credit from the vendors and suppliers to enjoy more credit and have more current liabilities.

Nature of business: Some firms are current asset intensive. At any given point of time a trading firm has a large amount of merchandise on hand whereas a service oriented firm is more likely to operate with little working capital.

Seasonality: Most businesses are subject to seasonal ups and down in sales revenue and also working capital. They observe the inventory pattern that is very low at the end of the season, and piling up to the maximum just before the start of the season. The seasonality pattern may vary from product to product, but it remains part of every business.

Position of business cycle: As seasonality is within the year, over a long period every market observes a business cycle, which expands and contracts over the time. This cycle of expansion and contraction cycle has intermediate phases of peak and trough. The working capital level will be different in every phase of the business cycle, depending upon how well these phases are predicted and managed.

Price levels: Inventory value, receivables and creditors are the functions of quantity and price. Even if the quantity level remains the same the value may increase if the prices increase. Therefore, in an inflationary environment funds are increasingly tied up in the working capital.

Shifts in demand of product: Shift in demand of product is a common experience of businesses. Those who do not timely sense the shift in demand are likely to acquire raw material and also produce the goods, which would get sold slowly. This will increase the level of inventory as they become slow or non-moving inventory.

(b) Firm-specific situation

Each firm has to recognise its own situation and frame its working capital norms and policies accordingly.

Size of the firm: Small firms are more likely to have more working capital needs as compared to the size of operations than the larger firms. This may be generally true as smaller firms are at a disadvantage in purchase-item market as well as end-product market due to their weak bargaining powers.

Age of the firm: Older firms enjoy more credibility than the newer and younger firms. Credibility allows the firm to enjoy credit on purchases and are also able to do business on competitive credit terms to sell their goods and services.

Creditworthiness: Firms who are able to build good credit are likely to enjoy working capital advantage. Their payment terms are favourable. Firms build their creditworthiness through timely payment of dues and of course with good operating results and financial health. Management competence and ethical behaviour also help in building creditworthiness.

Stage in product life cycle: A firm with a matured product is likely to have the least working capital. During the introduction, growth and decline phases the working capital investment is expected to be higher.

Production cycle time: Production cycle time ties up the input resources for that much time along with the expenses incurred at different stages of production. Shorter the production cycle time lesser the work-in-process and semi-finished goods. Production time is partly the result of choice of technology and partly the result of the level of efficiency in planning the production.

Production processes: The layout of the production processes and balance among all the processes have effect on the level of semi-finished inventory and work-in-process. Complexity and imbalance in the processes build up the inventory of semi-finished goods.

Synchronization between production and sales: An environment where there is perfect synchronization between the sales and production would ensue in the least finished goods inventory, whereas a lack of coordination may result into either stock-out situation or excessive inventory of finished goods.

Synchronization between purchase and production: A well-synchronized purchase and production functions reduce the raw material inventory and also the chance of production outage due to non-availability of raw material.

Operating efficiency: Higher degree of operating efficiency means lower cost of production and lower wastage, which would mean a smaller inventory of semi-finished and finished goods.

(c) Firm's policies

Several business policies individually and collectively affect the level of working capital. Important of them are briefly outlined below:

Purchase policies: Raw material inventory level is determined by all policies related to materials. For example, a firm buying locally will naturally have less inventory as compared to a firm that buys nationally and internationally. This is because of the lead time needed for the replenishment of stock. Buying from wholesaler *vs.* retailers, the ordering quantity, ordering level, point of inspection for incoming goods, inspection policy and several factors related to materials have a significant impact on the investments in raw materials.

Credit policy and collection efficiency: Credit is a policy. A firm that follows a tight credit policy will have less receivable, if collection is also efficient. Lax collection efforts cause increase in receivables.

Distribution network: A firm selling goods to the sole-selling agent will have much less inventory of finished goods inventory as compared to those who also own retail stores. The length of the distribution network and efficiency in distribution jointly determine the inventory of finished goods.

Production policies: Producing in anticipation of demand is a less favourable policy for working capital management as compared to producing against demand. This may be the business policy to an extent depending upon the business practices and the firm's situation.

Dividend policy: A firm paying liberal dividend is likely to have less cash on hand, though this would be true depending upon the source of cash flow used for the dividend payments and also the efficiency in cash management.

Depreciation policy: Depreciation is an expense and a part of it gets into the value of semi-finished and finished goods inventory. A depreciation policy that charges higher amount of depreciation (written down value method) earlier would report a higher value of inventory in the initial period and less towards the end of depreciable life of the assets. For this reason, valuation of inventory of new firms is more likely to be higher than that of established firms.

10.5 ESTIMATING THE WORKING CAPITAL REQUIREMENT

Many factors affecting working capital show unstable behaviour over even a narrow span of time. That poses a major challenge to the finance manager's predictive powers. Working capital, therefore, cannot be estimated based on benchmarking with other competing firms. The concept and some methods for estimating the working capital of any business are suggested as follows:

Planning and control techniques include the following:

1. Conventional methods like:
    - o Ratio analysis
    - o Fund flow analysis
2. Advanced methods like:
    - o Element-wise analysis
    - o Statistical methods
    - o Operations research methods, and
    - o Operating cycle approach

(i) Conventional methods

Conventional techniques for determining and monitoring the working capital use accounting techniques like ratio analysis and fund flow analysis. Here, some useful ratios have been discussed.

Ratio analysis: Conventionally, the ratios are established some association between the working capital with either sales or assets. Thus, we get two sets of working capital ratios.

Some balance sheet ratios are,

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Currrent Liabilities}} \quad (10.1a)$$

$$\text{Quick Ratio} = \frac{\text{Current Assets-inventory}}{\text{Currrent Liabilities}} \quad (10.1b)$$

$$\text{CA to TA} = \frac{\text{Current Assets}}{\text{Total Assets}} \quad (10.1c)$$

$$\text{WC to TA Ratio} = \frac{\text{Working capital}}{\text{Total Assets}} \quad (10.1d)$$

$$\text{Inventory to CA} = \frac{\text{Inventory}}{\text{Current Assets}} \quad (10.1e)$$

$$\text{Receivables to CA} = \frac{\text{Receivables}}{\text{Current Assets}} \quad (10.1f)$$

Likewise, cash, inventory and receivables can be compared with the net working capital or with total assets too. Sometimes net assets numbers are used instead of total assets. In these balance sheet ratios of working capital we are looking for a reasonable structure of current asset items with another item of balance sheet, may it be the working capital, current assets, total assets or net assets.

These ratios suffer with several limitations. Deriving requirement of working capital from the total assets or total working capital is not justified as they are not the drivers of working capital items.

Some sales based ratios are,

$$\text{WC to Sales} = \frac{\text{Working capital}}{\text{Sales}} \quad (10.2a)$$

$$\text{CA to Sales} = \frac{\text{Current Assets}}{\text{Sales}} \quad (10.2b)$$

$$\text{Cash to Sales} = \frac{\text{Cash}}{\text{Sales}} \quad (10.2c)$$

$$\text{Inventory to Sales} = \frac{\text{Inventory}}{\text{Sales}} \quad (10.2d)$$

$$\text{Receivables to Sales} = \frac{\text{Receivables}}{\text{Sales}} \quad (10.2e)$$

$$\text{Payables to Sales} = \frac{\text{Payables}}{\text{Sales}} \quad (10.2f)$$

These are also called *turnover ratios*. Sales based estimate of working capital is also less reliable because sales can be a determinant of receivables but not for other current asset items. However, sales based ratios are better than asset based ratios.

Firms use some standards to estimate the working capital requirements, and also used the same standards for monitoring the working capital efficiency. Let us take an example.

Example 10.2: Estimating working capital based on ratios

A firm has developed the following standards for the working capital:

- Total net working capital 20 per cent of sales.
- Current ratio: 3
- Inventory turnover ratio:: 8

NOTES

- Receivables turnover ratio: 6
- Remaining cash on hand and in bank

If the budgeted sales is ₹1 crore, calculate:

(a) Net working capital

(b) Current assets

(c) Current liabilities

(d) Inventory

(e) Receivables and

(f) Cash on hand

Solution:

(a) Net working capital = 0.2 × 1,00,00,000 = ₹20,00,000

(b) Current assets:

- Current asset is thrice the current liabilities. This may happen when the difference between the current assets and current liability (working capital) is two times the current liabilities. Means Re. 1 current liabilities; ₹3 current assets and ₹2 net working capital.
- Therefore, the current asset must be ₹30,00,000 (current liabilities ₹10,00,000 and net working capital ₹20,00,000)

(c) Current liabilities:₹10,00,000

(d) Inventory: Sales ÷ Inventory turnover ratio = 8. Therefore, 1,00,00,000 ÷ 8 = ₹12,50,000 inventory

(e) Receivables: Sales ÷ Receivables turnover ratio = 7.5. Therefore, 1,00,00,000 ÷ 6 = ₹16,66,667

(f) Cash on hand: 30,00,000 – 12,50,000 – 16,66,667 = ₹83,833

This may be the efficient level of working capital provided the standards used are based on the best internal benchmarking against the policies.

Funds flow analysis Cash-to-cash cycle alone would not be sufficient to explain the phenomena related to working capital. There are many cracks and manholes through which the cash would flow in and out. Capital servicing, tax payment, purchase of fixed assets, retirement of some assets, issue of capital and acceptance of loan immediately affects the circulation of cash. Cash-to-cash cycle can be understood in its entirety only if fund flow analysis is made. Fund flow analysis explains the flow of funds from and to all the directions and throws light on from where the funds have been obtained and where they have been applied. Fund flow analysis is not useful in planning of the working capital, but it helps to have a better control which is very useful.

(ii) Non-conventional or advanced methods

Non-conventional techniques adopt a more logical approach for forecasting the working capital. Element-wise analysis, use of statistical methods, operations research methods and operating cycle approach are common under this category.

Element-wise analysis: Various components of working capital may have an association with different factors. For example, raw materials with consumption cost or production rate, finished goods with cost of production and receivables with sales. It is advisable to take each component, and estimate them separately based on their respective relationship with relevant items of profit and loss account or balancesheet. This is a refinement over the ratio approach. The element-wise analysis is used in the operating cycle approach for the forecast of working capital.

Statistical methods: If a perfect linear relationship is assumed between working capital and some other items of financial statements, then management's ability to manage current assets is denied (Ramamurthy, 1976). This is the limitation of ratio analysis. Statistical methods are theoretically the best methods and they can be more effective in working capital projection. A firm can study the correlation of each working capital component with various financial and non-financial factors. Multiple regression analysis can also be considered to understand changes in working capital with changes in more than one factor simultaneously. Estimate of driving factors can provide lead in planning of each component. Such study must be repeated at a frequent interval of time because of fast changing environment.

Operations research method: Many researchers have attempted OR based estimates of working capital planning because optimum working capital exists with several conflicting objectives and constraints. Optimization techniques like linear programming and goal programming are among the few which can be mentioned as important tools for planning of the working capital.

Operating cycle approach: Conventional methods do not take into account ever-changing form of working capital components. All components are inter-dependent and hence a cyclical process develops. Cash, after it is converted into raw material, work-in-process, finished goods and receivables, is again turning into the cash. This has been depicted in Figure 10.1. Cash input and cash output do not equate with each other, because of profit or loss, and also because of collection rate. Operating cycle method considers all the forms of cash collectively and gives a single criterion for estimating and controlling working capital. Operating cycle method possesses some inherent characteristics so that alternative courses of actions for reducing working capital are revealed. It has been realized, due to the evolution of operating cycle method, that standard of ratios (like a standard current ratio of 2) cannot be relied upon. Operating cycle concept suggests that the optimum level of working capital can be determined by the operating funds needed for completing one operating cycle.

Check Your Progress

6. What are the conventional methods used for estimating the working capital requirement?
7. What are turnover ratios?

10.6 SOURCES OF WORKING CAPITAL FINANCE

The choice of various sources of financing follows the financing-mix decision. In the categories of long term and short term sources of funds wide options are available to companies. The selection should be done after analysing a few factors. Cost of the funds includes cost of capital, cost of misalignment between cash inflow and cash outflow, cost of not utilizing cash effectively, cost of using cash inadequately and administrative costs. The reliability of various sources of funds may be varying, some sources give better manoeuvrability or flexibility than other, some of the sources bring restrictions on business along with the funds. Legal aspects also have to be observed. All these factors should be analysed while choosing a right type of source from long term and short term categories of sources of funds. Unit 4 presented various sources of long-term funds. Here, therefore, we will discuss sources of short-terms funds.

Sources of Short-term Funds

There are several sources of short-term funds, important among which are listed below:

- Internal sources
  - o Accrued liabilities
  - o Accounts payables
- Market finance
  - o Commercial paper
  - o Factoring
  - o Forfaiting
  - o Public deposits
- Inter-corporate deposits
- Bank financing
  - o Overdraft
  - o Cash credit
  - o Bill discounting

- o Note lending
- o Letter of credit
- o Line of credit (fixed or revolving)
- o Export financing
- o Special purpose financing

10.6.1 Internal Sources

Accrued liabilities and accounts payable are the two internal sources of short-term funds available for financing the current assets. These funds can be easily accessed, they are part of normal business operations, and if used within the business custom, they are free of cost.

Accrued liabilities: The accounts are kept on accrual basis. For example, salary is accrued and becomes payable only when it is due. Electricity, water and other resources are consumed, but paid only after the bill is received and that too on the due date. Accrued liabilities fund the current asset. Some firms attempt to delay these payments in the situation of cash crunch. Such acts can spoil the image of the company.

Accounts payables: Purchases are often not paid immediately. That creates accounts payables. If paid as per the terms, accounts payable would be the free fund. Some argue that the suppliers do build the loss of interest on credit terms in their price. This is true to an extent as many suppliers would be willing to offer goods at reduced price if paid in advance or on purchase. Occasional delay in payment to suppliers may not cause much harm to the company, but repeated delay can cause ill-effect on creditworthiness. Suppliers may get hesitant to supply next order, or if they do, then charge premium price.

10.6.2 Market Finance

Let's discuss the types of market finance in this section.

Commercial papers (CPs) Commercial papers are issued by the companies in the primary money market for financing the current assets. Commercial paper is in a way a promissory note which gives 'promise to pay maturity sum on a due date'.

Some important points regarding the commercial paper are as follows:

- RBI regulates the commercial papers.
- Corporates, primary dealers and all-India financial institutions are eligible to issue CP.
- An eligible firm with (a) tangible assets of ₹4 crore and more, (b) sanctioned working capital limit and (c) classification as 'standard asset only can issue CP.
- Companies with A2 or equivalent credit rating for CP only can issue them.

NOTES

- Maturity period cannot be less than 7 days and not more than one year as per the RBI requirement.
- Par value is ₹5,00,000 and multiple of it.
- Commercial papers are traded on the OTC market.
- Issued at discount and repaid at par. Because of this the interest rate is decided by the market mechanism.
- CPs are not backed by any collaterals.
- Issue of CP has to be just informed to RBI.

Usually, firms with high quality debt rating will easily sell the commercial papers at affordable cost. The procedure is simple, no collateral needed are the advantages. However, the CP cannot be refunded early even if the issuing firm has surplus money, and refund cannot be postponed beyond the maturity date if the firm has no cash on hand on the maturity date.

Factoring Accounts receivables pay on due date only. Any quicker payment from them would require convincing and offer of cash discount. This may be expensive. The ***factoring*** product allows the firms to sell their accounts receivable to a third party (factor), usually a bank at a discount. Thus, factoring is the process of converting accounts receivables into the cash before the due date through a third party. Some features of factoring services in India are,

- Banks and corporations established by Parliament are eligible to provide factoring services. Any others company can commence factoring services after obtaining registration as non-banking finance company from RBI.
- Usually a factor pays 80% of the discounted value of the accounts receivables on the date of agreement. The remaining 20% is paid when the customer pays the dues. Initial amount may be higher than 80% in some cases.
- The responsibility of collection can be either with the client company or with the factor depending upon the agreement.
- Factoring can be two types (a) recourse factoring and (b) non-recourse factoring. In recourse factoring client is responsible to collect money and give it to the factor. That means the credit risk is on the client and not on the bank. Therefore, recourse factoring is cheaper than non-recourse factoring. In non-recourse factoring the factor buys out the accounts receivables and is responsible for collection as well as bad debt. Non-recourse factoring, therefore, is expensive for the client. Bank, having several branches as well as collection mechanism, is in a better position to make higher rate of collection and fewer bad debts. In India non-recourse factoring services are not present.

Factoring is usually a more expensive form of short-term financing than any other sources. The cost may vary from 1.5% to 3% per month. This is one of the reasons that the factoring has been still a very small market in India. Only small and new firms with less financial strengths use factoring services.

Forfaiting Forfaiting involves purchase of accounts receivables from exporters by a forfaiter. An exporter is enabled to receive cash against the export from the forfaiting agent, who in turn will get payment from the buyer firm abroad. Forfaiting is like international non-recourse factoring with a small difference that the forfaiting is done for a particular export, whereas factoring involves a pool of accounts receivables.

- Forfaiting is 100% financing without recourse to the seller of the debt.
- The debt is in the legally enforceable form and transferable payment obligation like bill of exchange, promissory note, letter of credit or note of purchase agreement.
- There may be a support for the payment obligation through the bank guarantee, but not always so.
- If the transaction is in the major currency of the world the forfaiting becomes easy.

Public deposits These are the deposits collected by the firms from the public. Any company registered under the Companies Act, whether public company or private, is eligible to accept public deposit within the ambit of rules. Though public deposit is truly a medium term fund, it is largely useful in financing the current assets. The important points about public deposits are,

Public deposits are short-term as well as medium term.

- Before the Companies Act 2013, any company, public or private, was allowed to accept public deposit without any restriction on size. But now, the companies with less than ₹100 crore net worth and less than ₹500 turnover cannot accept public deposits.
- The Companies Act 2013 allows companies to accept public deposits for three months to three years.
- The amount of public deposit cannot exceed 10% of paid up capital and free reserves. This limit is decided by the central government in consultation with RBI.
- Public deposits were unsecured, but the Companies Act 2013 provides for security as well as insurance scheme for the public deposits.
- Depositors usually get higher return than the bank deposits. The company get deposits at the rate than lower than bank loan, without any collateral. Cost of administering public deposit is much less than any other sources of medium term funds.

10.6.3 Inter-corporate Deposits

The deposit taken by one company from the other is inter-corporate deposit. The companies with funds surplus are allowed to extend deposits to other firms with paucity of funds.

- ICD is unsecured and therefore risky for depositing company. However, a depositing company may get higher returns.
- This option is useful for the companies with low rating.
- Amount cannot exceed 60% of paid up capital and 100% of free reserves.
- There is no organised market for the ICD.
- Usually the maturity period of ICD can be either (a) 3-months, or (b) six-months or (c) they can be call deposits, which can be withdrawn at short notice, usually 24 hours. Up to one year ICD is allowed, but it is not common.
- Call and put options can be built of the ICD.

10.6.4 Types of Assistance by Commerical Banks

Bank finance is available in different forms. Important of them are:

- Bank overdraft
- Cash credit
- Bill discounting
- Note-lending
- Letter of credit
- Line of credit (fixed or revolving)
- Export financing
- Special purpose financing

Bank overdraft: An individual or a company with the current account or savings account with a bank may request a bank to grant overdraft facility. If overdraft facility is extended to the customer then the customer can withdraw more money than the balance in the account, subject to the limit on overdraft. Means, the account balance would go negative. The bank would charge fee for extending such facility and also would charge interest on the overdrawn amount, while giving interest (where applicable) on the positive balance in the account.

Cash credit: Cash credit account is a separate account from the deposit account unlike in overdraft. The cash credit account operates just like a current account. It has an upper limit of credit as may be approved by the bank. Client can write cheques against the cash credit account and also deposit money in this account. Cash credit limit is fixed against the security of commodities and debt owned by the client, as per the norms prescribed by the RBI appointed committees from time to time.

Bill discounting: Bill discounting is a mechanism by which a company can get money against the accounts receivables before they become due. The selling company would write a bill (a kind of promise to pay), which is accepted by the vendor (accounts receivable). This bill is discounted with the bank. The borrower gets the discounted value of the bill amount. Therefore it is called bill discounting. The bank will collect the amount of bill from the customer upon the due date. If the bill payment is delayed then the bill is reverted back on the borrower. Relationship with bank makes it quick and affordable short-term financing for the company. A particular client of the company has agreed to pay the amount on due date to any party that presents the bill, acts has a good security reducing the default risk and the cost.

Note lending: Note lending is similar to commercial paper. In this the firm in need of short term funds issues promissory note of not more than 90 days, against which bank provides funds.

Letter of credit: Letter of credit popularly known as LC is one in which a bank agrees to pay liability after credit period. LC is given for inland as well as export transaction. LC offers credit even when buyer and seller do not know each other and therefore credit transaction between them is not possible. The LC is a bank guarantee to the seller that he would get paid by the bank even if the buyer fails to pay. Buyer's bank issues the letter of credit and seller's bank pay to the seller after confirming that seller has completed his entire obligation under the contract. There are different types of letter of credits.

Line of credit (LOC): A customer may need different types of short-term loans from a bank. The bank would, therefore, after assessing the need and creditworthiness of the customer, grant a line (amount) of credit as per the lending norms prescribed by RBR. Bank would offer different short-term loans under this line of credit and within the limit determined. If a customer has got the LOC approved, he can access various types of short-term funds very quickly. Effectively this fund would be at the discretion of the borrower. LOC may be secured with collateral or unsecured.

Revolving credit arrangement: Most line of credits are revolving. Revolving line of credits means the upper limit is fixed within which the client firm can withdraw the amount and payback as many times as possible for a period for which the line is approved.

Export financing Export finance means financial assistance extended by banks for promoting export of goods outside the country or region. These schemes especially encourage MSMEs to expand their reach to the global market and earn valuable foreign exchange. Export finance scheme is available at pre-shipment stage as well as post-shipment stage of export.

Loans and advances granted by financial institutions for the activities leading to the shipment of goods is the pre-shipment stage. The pre-shipment stage export financing schemes include,

(a) Packing credit and

NOTES

(b) Advance payment (advance against cheque/draft)

The pre-shipment finance is extended exporters so that they can:

- Procure raw materials.
- Carry out manufacturing process.
- Provide a secure warehouse for goods and raw materials.
- Process and pack the goods.
- Ship the goods to the buyers.
- Meet other financial cost of the business.

The post-shipment finance aims at financing the export sales receivable after the date of shipment of goods to the date of realisation of export proceeds. Various schemes of post-shipment finance include:

(a) Export Bills purchased/discounted.

(b) Export Bills negotiated

(c) Advance against export bills sent on collection basis.

(d) Advance against export on consignment basis

(e) Advance against undrawn balance on exports

(f) Advance against claims of Duty Drawback.

The post-shipment finance can be secured or unsecured

Special financing schemes In India certain industries are provided special support due to the nature of these industries. They are either small scale industries or dependent on weather (like agri-business). The schemes vary for different target groups but they are providing working capital finance. The readers may search for such special schemes.

Check Your Progress

8. What is factoring?
9. Name the source of short term fund which is a bank guarantee to the seller that he would get paid by the bank even if the buyer fails to pay.

10.7 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The pipeline approach considers the inflow into the pipeline as well as outflow of cash from the pipeline but does not narrate the sources of inflow and applications of outflow.
2. Current liabilities act as an automatic financing of current assets by virtue of business practices of every business.

3. Excessive working capital results in extra and unnecessary costs like interest, wastage, bad debts and other undesirable expenses.
4. The moderate working capital financing policy follows the matching principle and attempts to match long-term requirement with the long-term sources and short-term requirement with short-term sources.
5. In an inflationary environment, funds are increasingly tied up in the working capital.
6. The conventional methods used for estimating the working capital requirement are the following:
   (i) Ratio analysis
   (ii) Fund flow analysis
7. Turnover ratios measure the efficiency of investments made by the organization in the form of revenues and the cost of sale generated during a period of time.
8. Factoring is the process of converting accounts receivables into the cash before the due date through a third party.
9. The letter of credit is a source of short term fund which is a bank guarantee to the seller that he would get paid by the bank even if the buyer fails to pay.

10.8 SUMMARY

- The term 'working capital' has attracted a few debatable interpretations. On one side, the argument is that working capital is required for operational purpose, so total current assets are meaningful. On the other side, the argument is that what matters in the long run is the surplus of current assets over current liabilities and not the absolute amount of current assets.
- Though the difference of opinion regarding the two concepts of working capital still persist, reconciliation between the two has been attempted by calling the first concept 'gross working capital' and second one 'net working capital'.
- Working capital concepts can be explained through three approaches for understanding the working capital. These three approaches are: working capital cycle approach, pipeline approach and cash tank approach.
- The components of working capital are discussed in two parts namely components of current assets and components of current liabilities.
- Working capital's role in the business can be compared with the functions of blood in a body. Working capital must keep circulating in the business.
- The factors responsible for current assets and current liabilities determine the ideal level of working capital.

- Managerial tasks involved in the management of working capital can be divided into four areas: planning, monitoring and control, organizational system and financing.
- There are three types of financing policies: moderate, aggressive and conservative financing policy.
- Several factors are responsible for the presence of working capital of a firm. Most important of them can be grouped in three categories: external factors, firm specific situation and firm's policy.
- The concept and some methods for estimating the working capital of any business are suggested as follows: planning and control techniques include conventional methods like ratio analysis and fund flow analysis and advanced methods like element-wise analysis, statistical methods, operations research methods and operating cycle approach.
- The choice of various sources of financing follows the financing-mix decision. In the categories of long term and short term sources of funds wide options are available to companies. The selection should be done after analysing a few factors.
- Important sources of short term funds can be categorised as: internal sources, market finance, inter-corporate deposits and bank financing.

10.9 KEY WORDS

- **Working capital:** Also known as net working capital, it is the difference between the current assets and current liabilities.
- **Current Assets:** It refers to cash and other assets that are expected to be converted to cash within a year.
- **Current liabilities:** It refers to the liabilities or short-term financial obligations which are due to be paid in the operating cycle or within one fiscal year of the firm.
- **Operating cycle:** It refers to the period taken by the firm to convert inventories into cash.

10.10 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short-Answer Questions

1. What are the components of working capital?
2. What is ideal level of working capital?
3. List the functions of working capital management.

4. How does firm's policy affect working capital requirements?
5. What are the factors to be considered before selecting a source of working capital?
6. Mention the internal sources of short-term funds.
7. Write a short note on inter-corporate deposits.
8. What are commercial papers?

Long-Answer Questions

1. Explain the approaches of understanding the concept of working capital.
2. Examine the types of financing approaches/policies.
3. Describe the external and firm specific situations affecting working capital requirements.
4. Explain the features of factoring, forfaiting and public deposits.
5. Discuss the types of assistance by commercial banks for working capital finance.

10.11 FURTHER READINGS

Patel, Bhavesh. 2014. *Fundamentals of Financial Management*. New Delhi: Vikas Publishing House.

Khan, M.Y. and Jain, P.K. 2007. *Financial Management- Text Problems and Cases.* New Delhi: Tata McGraw-Hill.

Chandra, Prasanna. 2004. *Financial Management: Theory and Practice.* New Delhi: Tata McGraw-Hill.

Kulkarni, P.V. and B. G. Satyaprasad. 2002. *Financial Management.* New Delhi: Himalaya Publication House.

UNIT 11 INVENTORIES AND RECEIVABLES MANAGEMENT UNDER CONDITIONS OF CERTAINTY AND UNCERTAINTY

Structure

11.0 INTRODUCTION

As mentioned in the previous unit, there are many ways of estimating working capital requirements. One of the advanced methods of the same is operating cycle approach. Contrary to the other methods which do not take into account the dynamic nature of working capital, as per the operating cycle approach, the operating funds needed for the completion of one operating cycle is the ideal or optimum level of working capital. In this unit, you will learn about the concept of operating cycle approach and the techniques used for its calculation.

The components of working capital (i.e. current assets and liabilities) can be understood as elements like raw material, work-in-progress, inventories, finished stock, receivables, cash and payables. In this unit, you will also learn about inventory and receivables management. Inventory management involves various forms of inventory used in a business. Inventory is very essential for the smooth functioning

of the business. It is a link in the production and distribution process. A firm has to maintain an ideal balance of inventory so that it will not disturb production and distribution process.

Maintaining adequate, qualified accounting staff can be difficult. Budget cuts, increased turnover and changing economic situations make it challenging for small and large businesses to keep the personnel they need and ensure that invoicing and payment processing is not interrupted or delayed. In such cases, it is very important to analyse accounts payable processing and accounts receivable management.

11.1 OBJECTIVES

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

- Explain the concept and techniques of operating cycle
- Discuss the planning of funds and management of assets under inventory management
- Describe the techniques of inventory management
- Discuss the concept of receivables management

11.2 OPERATING CYCLE AND TECHNIQUES

Operating cycle concept suggests that the optimum level of working capital can be determined by the operating funds needed for completing one operating cycle. The duration of operating cycle is equal to the number of days for which cash is tied up in the stages of the operating cycle, starting from cash on hand to acquisition of raw material, processing and selling the goods and realization of proceeds from sundry debtors. The number of days' credit allowed by creditors will have to be set off in the process.

There are two ways the operating cycle period is calculated—(a) based on sales and (b) based on appropriate costs that determine the value of current assets and current liabilities. We will discuss both in the following section.

Operating cycle time (based on sales): The sales based operating cycle period uses the average (or year-end) values of items in current assets and current liabilities to calculate the sales equivalent amount that has been tied up with each item. The sum of all periods of current assets less the sum of period of each current liability item is the operating cycle time.

	Name	Equation	Equation No.
1.	Inventory period	$\frac{\text{Average Inventory}}{\text{Daily Sales}}$	(11.1a)
2	Receivables period	$\frac{\text{Average Receivables}}{\text{Daily Sales}}$	(11.1b)
3.	Cash period	$\frac{\text{Average Cash}}{\text{Daily Sales}}$	(11.1c)
4.	Credit period	$\frac{\text{Average acconts payables}}{\text{Daily Sales}}$	(11.1d)
5.	Operating cycle period	Equations 11.1a + 11.1b + 11.1c – 11.1d	(11.1e)

where, Average value = (opening value + closing value) ÷ 2

Daily sales = Sales ÷ 365

Notes:

(a) Some use the year-end values of items of current assets and current liabilities for the calculation of operating cycle period. That may be simple and convey the concept accurately, the average based operating cycle period is little better in accuracy, as the level of these item change gradually over the period.

(b) Some take 360 days in a year rather than 365.

(c) All types of inventory (raw material, semi-finished goods, work-in-process and finished goods) can be combined into one when sales based operating cycle is calculated, because the sales is a common divisor for all items.

(d) For the same logic, one can even take the average of all current assets and divide by the daily sales to get current asset period.

It is apparent that the amount of working capital required at any point in time is governed by the speed with which this cash cycle is sustained. Faster the cycle (i.e., smaller cycle period), lesser is the investment in working capital.

Operating cycle time (based on cost): A firm can calculate the operating cycle period by dividing the amount of every item in current assets and current liabilities by the cost at which they are determined. In this case the denominator is changed to represent the underlying costs for every item of current assets and current liabilities. The operating cycle time under this method is calculated as follows:

	Name	Equation	Equation No.
1.	Raw material inventory period	$\frac{\text{Average Raw Material Inventory}}{\text{Daily Purchase}}$	(11.2a)
2.	Finished goods inventory period	$\frac{\text{Average Finished Goods Inventory}}{\text{Daily Cost of Production}}$	(11.2b)
3.	Receivables period	$\frac{\text{Average Receivables}}{\text{Daily Cost of Sales}}$	(11.2c)
4.	Cash period	$\frac{\text{Average Cash}}{\text{Daily Expenses}}$	(11.2d)
5.	Credit period	$\frac{\text{Average acconts payables}}{\text{Daily Purchase}}$	(11.2e)
6.	Operating cycle period	Equations 11.2a + 11.2b + 11.2c + 11.2d – 11.2e	(11.2f)

Note:

(a) Semi-finished goods may be added into the finished goods at the equivalent value.

(b) Receivables period is often calculated using the daily sales with an argument that once finished goods are sold the selling value is due to the firm and therefore, that is the firm's money, which remains invested in receivables. However, the counter argument is that credit sales is a business custom and also the firm's policy; therefore, cost of sales is what is invested in the receivables by the firm.

(c) Daily expenses are calculated by taking value added expenses (cost of sales less material consumed).

Investment in raw material is at the rate of cost of purchase. Therefore, it is more appropriate to calculate the days for which a rupee remains invested in the raw material rather than daily sales. Likewise, a rupee remains invested in the finished goods inventory at the rate of cost at which it is produced. Receivables shall be calculated at cost of sales (some calculate it at sales value). Cash balance is for meeting the expenses. Therefore, cash days are calculated at the daily expense rate. Credit period is calculated at the cost of purchase.

The sales based operating cycle is simple in calculation. The appropriate cost based operating cycle probably explains the cycle time of a rupee invested in operations more convincingly. However, the solved example will bring out its limitations that ensue from the simple addition of days even though each component days are calculated using different denominator.

Example 11.1: Calculation of operating cycle period

Selected financial data of XYZ Company Limited is given below for the successive years:

XYZ Company Limited

₹ in crores

Items	2018–19	2019–20
Sales	2,72,000	3,70,000
Raw materials consumed	1,16,000	2,00,000
Purchase	1,20,000	1,25,000
Cost of Production	1,80,000	2,20,000
Selling & distribution expenses	50,000	52,000
Current assets	1,25,000	1,50,000
Inventories: Raw Material	26,000	25,000
Inventories: Finished Goods	30,000	35,000
Receivables	50,000	55,000
Cash and bank balance	19,000	35,000
Current liabilities & provisions	80,000	90,000
Sundry Creditors	80,000	90,000
Total assets	1,20,000	1,40,000
Working Capital	45,000	60,000

Calculate the operating cycle period using sales a basis as well as appropriate cost as the basis. Discuss from the calculations the (a) results under both the methods and also (b) the working capital trend over the two successive periods. You may take year-end values rather than the average figures.

Solution: Operating cycle period on sales basis

2018–19: Daily sales = 272,000 ÷ 365 = 745.21

2019–20: Daily sales = 370,000 ÷ 365 = 1,013.70

	Formula	2018–19	2019–20
RM Inventory Period	$\frac{\text{RM Inventory}}{\text{Daily Sales}}$	$\frac{26,000}{745.21} = 34.89$ days	$\frac{25,000}{1,013.70} = 24.66$ days
FG Inventory Period	$\frac{\text{FG Inventory}}{\text{Daily Sales}}$	$\frac{30,000}{745.21} = 40.26$ days	$\frac{35,000}{1,013.70} = 34.53$ days
Receivables Period	$\frac{\text{Receivables}}{\text{Daily Sales}}$	$\frac{50,000}{745.21} = 67.10$ days	$\frac{55,000}{1,013.70} = 54.26$ days
Cash Period	$\frac{\text{Cash}}{\text{Daily Sales}}$	$\frac{19,000}{745.21} = 25.50$ days	$\frac{35,000}{1,013.70} = 34.53$ days
Creditors Period	$\frac{\text{Creditors}}{\text{Daily Sales}}$	$\frac{80,000}{745.21} = 107.35$ days	$\frac{90,000}{1,013.70} = 88.78$ days
Operating Cycle		34.89 + 40.26 + 67.10 + 25.50 – 107.35 = **60.4 days**	24.66 + 34.53 + 54.26 + 34.53–88.78 = **59.2 days**

Discussion

- There is overall 1.2 day reduction is operating cycle. That means now the amount equivalent to sales is remaining invested in the working capital less by 1.2 days a reduction from 60.4 days to 599.2 days.
- The company enjoys less credit now and also hold more cash than previous year, the overall reduction in the operating cycle period is largely due to efficient handling of raw material and finished goods inventory as well as receivables.
- Management of current assets, except cash, has improved on all fronts in the year 2019–20 as compared to the previous year.

Operating cycle period on appropriate cost basis

Daily purchase

2018–19: Daily purchase = 120,000 ÷ 365 = 328.77

2019–20: Daily purchase = 125,000 ÷ 365 = 342.47

Daily cost of production

2018–19: Daily cost of production = 180,000 ÷ 365 = 493.15

2019–20: Daily cost of production = 220,000 ÷ 365 = 602.74

Daily cost of sales

2018–19: Daily cost of sales = 230,000 ÷ 365 = 630.14

2019–20: Daily cost of sales = 272,000 ÷ 365 = 745.21

Daily expenses

2018–19: Daily expenses = (180,000 + 50,000 -116,000) ÷ 365 = 312.33

2019–20: Daily expenses = (220,000 + 52,000 - 200,000) ÷ 365 = 197.26

	Formula	2018–19	2019–20
RM Inventory Period	$\frac{\text{RM Inventory}}{\text{Daily Purchase}}$	$\frac{26,000}{328.77} = 79.08$ days	$\frac{25,000}{342.47} = 73.00$ days
FG Inventory Period	$\frac{\text{FG Inventory}}{\text{Daily Cost of Prod.}}$	$\frac{30,000}{493.15} = 60.83$ days	$\frac{35,000}{602.74} = 58.07$ days
Receivables Period	$\frac{\text{Receivables}}{\text{Daily Cost of Sales}}$	$\frac{50,000}{630.14} = 79.35$ days	$\frac{55,000}{745.21} = 73.80$ days
Cash Period	$\frac{\text{Cash}}{\text{Daily Expenses}}$	$\frac{19,000}{312.33} = 60.83$ days	$\frac{35,000}{197.26} = 177.43$ days
Creditors Period	$\frac{\text{Creditors}}{\text{Daily Purchase}}$	$\frac{80,000}{328.77} = 243.33$ days	$\frac{90,000}{324.47} = 262.80$ days
Operating Cycle		79.08+60.83+79.35+60.83–243.33 = **36.76 days**	73.0+58.07+73.8+177.43–177.8 = **119.50 days**

Discussion

- A rupee invested in the operating cycle remains invested in it for 36.76 days in the year 2018–19. This period has significantly increased to 119.50 days.
- The increase in days is due to cash on hand, which is disproportionately higher in the year 2019–20.
- All current assets, other than cash, have a declined cycle period.
- Creditors period has increased somewhat.

One would note that the cost based operating cycle is higher than the sales based operating cycle. A visual inspection of the absolute numbers of each working capital items and sales would convince the reader that there is some difficulty with the specific expense based operating cycle. The denominator is small and they are different for different items of working capital. The small denominator for cash on hand gives a very long cycle time for the cash. Also, the operating cycle period is simply the addition of all current asset items cycle period less that of current liabilities. Each of these items is calculated using the different denominator, which is illogical mathematics.

The application of operating cycle concept has duel objectives: (a) to budget the total funds needed to conduct a period's manufacturing and selling operations, and (b) to derive budgets for individual working capital items. Before the beginning of each period therefore the operating-cycle- period-based working capital budgets should be used for cross checking and/or for modifying the budgets as derived by using ratios (Gupta, 1978).

Operating cycle theory is not new anymore. Still very few large companies in the private sector use it for the planning of working capital. It was mostly used by high growth companies as against the low growth companies. The thumb rules like working capital as percentage of either production or sales is more common in practice for working capital planning.

Check Your Progress

1. What is the duration of operating cycle equal to?
2. What is the amount of working capital required at any point in time governed by?

11.3 INVENTORY MANAGEMENT: PLANNING OF FUNDS THROUGH THE MANAGEMENT OF ASSETS AND VARIOUS TECHNIQUES USED

The focus of inventory management is on maintaining optimum level of inventory for smooth running of the operations and meeting the demand of the final product in time. In case of inventory there is a time lag between ordering of inventory and receiving it. By having sufficient inventory, firm can protect itself from price fluctuation and unseen demand of the product. The ultimate objective of inventory management is to ensure the availability of inventory as and when there is a requirement of it.

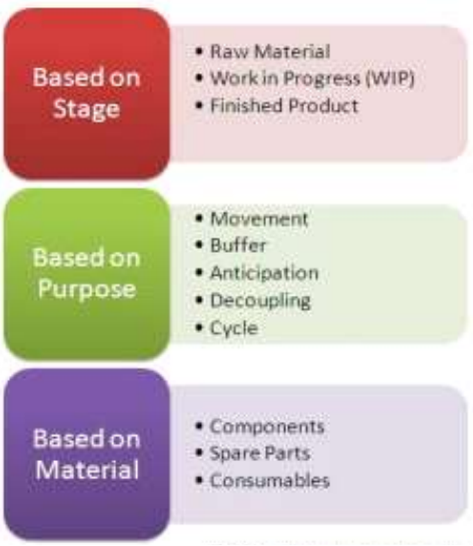


Fig. 11.1 *Inventory Management*

Inventory is commonly known as stock of goods or list of goods. Following are the components of inventory.

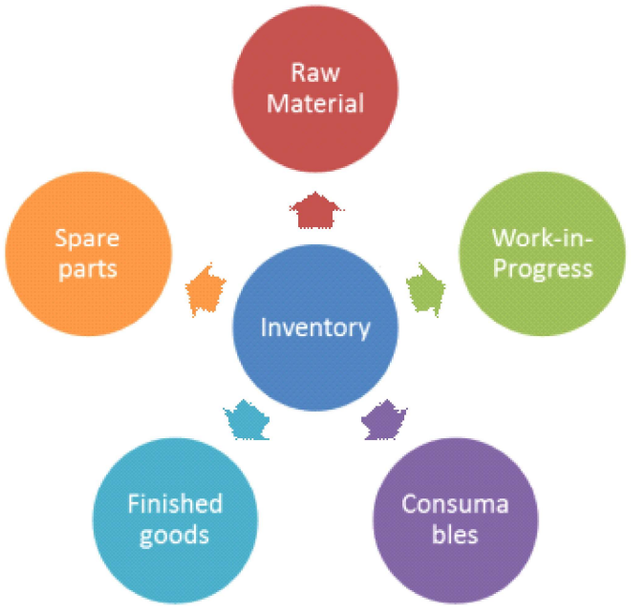


Fig. 11.2 *Components of Inventory*

Raw Material: it is the major part of the inventory. Firms are required to carry out their production process smoothly for this they need to have sufficient inventory in their stock.

Work-in-progress: This is the stage of material after RM and before finished goods. Quantity of work in progress is dependent upon the entire manufacturing process.

Consumables: This inventory is not directly related to the manufacturing process but firms need to have such kind of inventory for the smooth functioning of the production process.

Finished goods: To meet unseen demand of the product of the firm such kind of inventory is required in the organization. If the production of the firm is on order basis then firm is not required to have large quantity of finished goods. But if the demand of the product is uncertain then firm is required to have a minimum number of finished goods.

Spare Parts: This is also the part of inventory. Although its amount is not much but firm need spare part for the smooth production process.

Purpose and benefits of holding inventory

There are four motives of holding inventory:

- **Transaction motive:** Firms need inventory to make sure that their transactions are not halted or stopped.
- **Precautionary motive:** Sometimes, firms need inventory to ensure that they can effectively manage their production and sales during unexpected periods of boom and bust.
- **Speculative motive:** Firms also tend to hold inventories in anticipation of price fluctuations which would impact the production and sale of goods and services.

Tools and Techniques of Inventory Management

Inventory management is required for the smooth and uninterrupted production process so that demand of the product is timely met. Inventory management also has some costs. These are holding cost, ordering cost, risk of obsolescence, risk of price decline and risk deterioration in quality. For many firms more than 80% of the investment in current asset is in inventory. An efficient inventory management includes following question: What to buy? When to buy? At what price to buy? Where to store inventory? What quantity to order and so on? An inventory management includes all these questions and their answers. Different departments of the firm have conflicting interests in the inventory management. As finance manager say firm should have fewer amounts in inventory, purchase department say firm should have large level of raw material etc. The inventory management is required to have to support smooth production process without any delay in fulfilling orders. Different types of techniques are used for this. A brief discussion of all these techniques is as follow:

1. **Determinants of various stock levels:** Firm should carry an optimum level of inventory to minimize its cost and for this purpose firms use following levels:

Minimum Level	Re-order Level – (Normal consumption normal Re-order period)
Re-order Level	Maximum Consumption X Maximum re-order period
Maximum Level	Re-order level + Re-order quantity – (Minimum Consumption X minimum re-order period)
Danger Level	Average Consumption X Maximum re-order period for emergency purchase
Average Stock Level	Minimum stock level + ½ of re-order quantity

2. **Determination of Safety Stock:** It is also called buffer stock which a firm has to manage at any cost. Inventory stock fluctuates over time and purchase of inventory may take more time then estimated. For such type of situations firm have to manage safety stock for itself. This level protects firm from

stock out situations. A firm consider two types of costs for the determination of safety stock. These two types of costs are stock out cost and carrying cost.

3. **Ordering System of Inventory:** A firm can follow different type of ordering system. It can be fixed order quantity system, fixed period order and Single order followed by scheduled part of delivery.

4. **Economic Order Quantity:** This technique is used to know what should be the size of the order. Firm should decide an optimum order quantity which is not high or less so that firm can control cost. EOQ is the idle size of the order which is economical and viable. At this level of inventory carrying cost and ordering cost are equal.

   Carrying cost: Cost of capital invested in inventories, cost of storage, loss of material due to depreciation and obsolescence, cost of insurance and cost of spoilage in handling material.

   Ordering Cost: Cost of staff, transportation cost, inspection cost and cost of stationary etc

   The following formula is used to calculate EOQ.

$$EOQ = \sqrt{\frac{2AO}{I}}$$

   A is Annual consumption of inventory in rupee.

   O is Cost of placing an order.

   I is inventory carrying cost for one unit.

5. **ABC Analysis:** This is the most important technique of inventory management which is used by maximum companies in real life. In this technique inventory is divided in three parts. One is less in number but the value is very high. Third one more in quantity and value is very less. Second one is the average number and average investment. Following table will show all these three categories.

Class	No of Items	Value of items
A	10%	70%
B	20%	20%
C	70%	10%

   There may be some variation in this method in some business organisations but ultimate idea is to divide all inventories in three categories to have better control of them. This technique helps firm to concentrate more on more valuable material and less on less valuable material.

6. **VED Analysis:** This technique is known as vital-essential and desirable technique of inventory management. This technique is applicable in spare parts. ABC technique of inventory management is not applicable for spare part here VED technique is used. The vital spare parts are must for the smooth functioning of the business. The non-availability of vital part will stop the production process. Essential material is also required for the business but not as important as vital spare parts are. Desirable material is not necessary to keep with the business firm. If possible firm can avoid its storage and order such material as and when there is requirement of it emerges. Essential thing for this technique is dividing the spare parts in three categories. Therefore, due care should be taken to understand and divide spare parts in these three categories.

7. **Inventory Turnover Ratio:** To know the efficiency level in the usage of inventory this method is used. This ratio is also called stock velocity ratio and calculated as:

   Inventory Turnover Ratio = sales/average inventory or Cost of goods sold/ average inventory cost

   This turnover ratio should not be too much high or too much low e.g. if it is 3 months means firm is somewhere ordering unnecessarily and it is pilling the stock of raw material. If this ratio is 4-5 day then there is some problem in order size and in this situation ordering cost will increase. So firms have to take due care of this ratio to have effective inventory management.

8. **Aging Schedule of Inventory:** One of the important techniques of inventory management is aging schedule in which inventory is dividing according to the period of their holding. Performa of aging schedule of inventory can be as follows:

Item code	Age Classification	Date of Acquisition	Amount	Percentage of total inventory
0001	0-10 days	30 April	50000	20
0002	11-20 days	20 April	40000	16
0003	21-30 days	10 April	50000	20
0004	30-45 days	25 March	60000	24
0005	45-60 days	10 March	30000	12
0006	2 months and more old	10 February	20000	08
			2,50,000	100

9. **Inventories Reports:** This method is also used to control and manage inventory of the firm. Management of the business should be informed about the current status of the inventory by preparing periodic reports. On the basis of these reports management take corrective measure to have more control on inventory.

10. **Just in Time (JIT) Inventory Control System:** Toyota company first use this techniques in Japan in 1950 but this technique is firstly used by US companies in 1980s. These days this technique is very important to reduce inventory cost. As per this technique firms produces only the needed quantity at the required time. As per CIMA definition off JIT is "a technique for the organization of workflows to allow rapid, high quality flexible production whilst minimizing the manufacturing work and stock level." This technique has two basis aspect one is just in time purchase and second one is just in time production. As per this technique delivery of material purchased is in such a way that delivery matches with the requirement of the material. The basic philosophy of this technique is that firm should maintain a zero level of minimum level of inventory and firms should rely on supplier of the product for the supply of material as per the requirement of it.

Following are the basic principles of the JIT technique:

- Minimum level of inventory and less cost of inventory
- Minimum lot size
- Elimination of waste and non-value added services
- Manufacturing the right product at right time
- Continuous flow of production
- Ensure timely delivery of products both inside and outside of the business organization

Above mentioned list of techniques are not exhaustive, in practical life firms are using very different techniques to manage inventory. But JIT, ABC and EOQ are the most popular techniques of inventory management and almost every firm is using this technique.

11.3.1 Inventory Management: Under Certainty and Uncertainty

To understand the concept of inventory management under certainty and uncertainty conditions, we will take up two techniques Economic Order Quantity and Continuous Review System.

Economic Order Quantity (EOQ)

Economic order quantity (EOQ) is an optimal quantity for minimizing the total material cost, i.e., ordering cost, carrying cost and stock-out cost under various conditions. Table 11.1 shows the conditions under which EOQ can be decided. We will discuss three models of EOQ, i.e., Model 1, Model 2 and Model 3 while Model 4 is dropped as it is beyond the scope of the unit. Solved examples of each model are also given for better understanding of the concepts.

Table 11.1 *Various Models of EOQ under Different Conditions*

	Instantaneous Order receiving	**Non-Instantaneous Order receiving**
Without Stock-out cost	EOQ (Model 1)	EOQ (Model 2)
With Stock-out cost	EOQ (Model 3)	EOQ (Model 4)

EOQ (Model 1)

EOQ model 1 is also known as basic EOQ model. The following are the assumptions and restrictions for this model based on which the formula to calculate EOQ is derived:

- Demand is known with certainty and is constant over time.
- No shortages (stock-out) cost are allowed.
- Lead time for the receipt of orders is constant.
- The order quantity is received all at once and instantaneously.

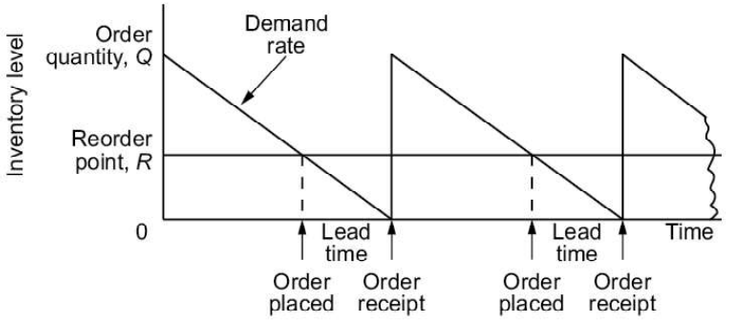


Fig. 11.3 *Inventory Order Cycle in EOQ (Model 1)*

For the inventory order cycle as shown in Figure 11.3 there is no stock-out cost. Orders placed are filled instantaneous. Instantaneous means that all the ordered quantities are received at the same time and in the same quantity. For example, if a materials manager placed the order quantity of 50 units then 50 units are received not in the different batches of some other quantity.

Determination of EOQ (Model 1)

The carrying cost is usually expressed on a per unit basis of time, traditionally one year. Annual carrying cost equals carrying cost per unit per year time average inventory level:

If carrying cost per unit per year = C_c and average inventory = $Q/2$ then annual carrying cost can be written as multiplication of cost per order (C_o) and the number of orders per year as shown below in Equation 11.3.

$$\text{Annual carrying cost} = C_c Q/2 \qquad (11.3)$$

Similarly, if the number of orders per year, with known and constant demand, D, is D/Q, where Q is the order size, the annual ordering cost can be written as a simple multiplication of ordering cost and number of orders in a year as shown below:

$$\text{Annual ordering cost} = C_o D/Q \tag{11.4}$$

Therefore, one can write the total annual material cost as the sum of the annual inventory carrying cost and annual ordering cost as shown below in Equation 11.4.

$$TC = C_o \frac{D}{Q} + C_c \frac{Q}{2} \tag{11.4}$$

Where,

TC = Total inventory cost

C_o = Ordering cost

C_c = Inventory carrying cost

Q = Order quantity

D = Demand

In Equation 11.4, the only variable is Q; while other quantities such as C_o and D are constant parameters (remember that in this model we have assumed no stock-out cost). Relative magnitude of the ordering cost is dependent on the order size. On differentiating the Equation 11.4, we will get the optimal quantity (Q_{opt}) that will give the least possible total inventory cost from the Equation 11.4. The *EOQ* model is robust because Q is a square root and errors in the estimation of D, C_c and C_o are dampened. *EOQ* (i.e., Q_{opt}) occurs where the total inventory cost curve is at minimum value and the carrying cost equals ordering cost as shown in Figure 11.4.

$$TC_{\min} = \frac{C_o D}{Q_{opt}} + C_c \frac{Q_{opt}}{2}$$

$$Q_{opt} = \sqrt{\frac{2C_o D}{C_c}} \tag{11.5}$$

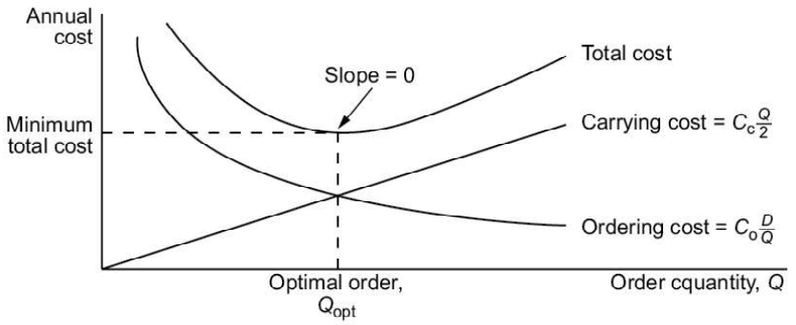


Fig. 11.4 *EOQ Cost Model*

EOQ (Model 2)

EOQ Model 2 considers the non-instantaneous receiving of order and the assumption that orders are received all at once is relaxed. This model is also known as *gradual usage* or *production lot size* model. The order quantity is received gradually over time and the inventory is drawn on at the same time it is being replenished (Figure 11.5).

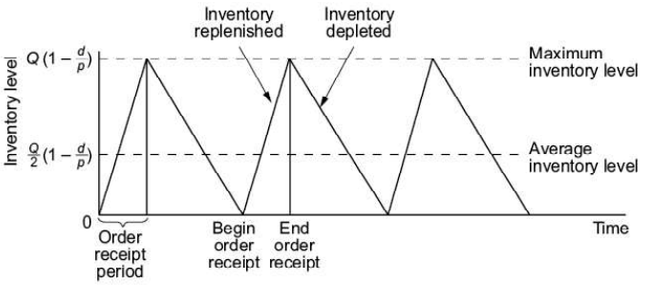


Fig. 11.5 *EOQ Model with Non-instantaneous Order Receipt*

To formulate the EOQ Model 2, we need to introduce two new terms, i.e., *p* and *d*. *p* is assumed to be the daily rate at which the order is received over time. While d is the daily rate at which inventory is demanded. We can analytically formulate the inventory model for Q_{opt} in Model 2.

The ongoing analysis is based on the same fundamental principle of adding total annual inventory carrying cost and total annual ordering cost. In this case, the annual inventory cost and annual ordering cost are given as:

Maximum inventory level = *Q(1 - d/p)* (Figure 11.5) and, therefore, the average annual inventory level would be *Q(1 - d/p)/2*. Hence, we can calculate the total annual inventory carrying cost by multiplying the inventory carrying cost and average inventory level.

$$\text{Total inventory carrying cost} = C_c\, Q/2\,(1 - d/p) \qquad (11.6)$$

Similarly, we can calculate the total annual ordering cost from Equation 11.7.

$$\text{Annual ordering cost} = C_o D/Q \qquad (11.7)$$

Hence, the total inventory cost for Model 2 would be given as Equation 11.8.

$$\text{Total Inventory cost} = C_o D/Q + C_c Q/2(1 - d/p) \qquad (11.8)$$

In Equation 11.8, Q is the variable and other terms D, d, p, C_o, and C_c are known and are thus constants. On differentiating Equation 11.8 with respect to Q, we get Q_{opt} which is given in Equation 11.9.

$$Q_{opt} = \sqrt{\frac{2C_o D}{C_c(1 - d/p)}} \qquad (11.9)$$

EOQ (Model 3)

EOQ Model 3 considers the instantaneous receiving of order with shortage cost (i.e., the assumption of no shortage cost is relaxed). This model assumes that there will be some shortages and hence the model will consider shortages cost besides inventory carrying and ordering cost. The order quantity is received instantaneously as it was discussed in EOQ Model 1.

The graphical representation of this model is shown in Figure 11.6.

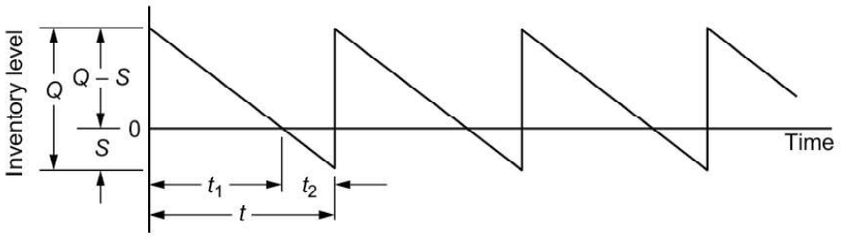


Fig. 11.6 *EOQ Model with Shortages Cost*

To formulate the analytical model in this case, we need to introduce C_s (shortage cost per unit of item) and S (amount of shortage). EOQ (i.e., Q_{opt}) for the Model 3 occurs where total inventory cost curve is at minimum value as shown in Figure 11.7.

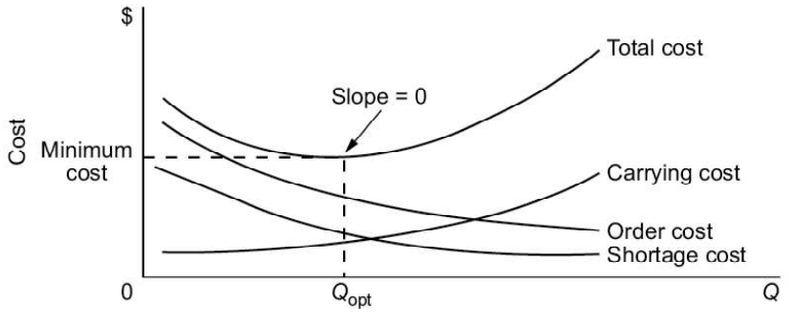


Fig. 11.7 *Cost Model with Shortages*

The development of analytical model is based on the same fundamental principle of adding total annual inventory carrying cost, total annual ordering cost and total shortage cost. Given below are Equations 11.10 to 11.12 for total shortages costs, total inventory carrying cost and total ordering cost. The total inventory cost is given by Equation 11.13.

$$\text{Total shortage costs} = C_s(S^2/2Q) \quad (11.10)$$

$$\textit{Total carrying costs} = C_c(Q - S)2/2Q \quad (11.11)$$

$$\text{Total ordering costs} = C_oD/Q \quad (11.12)$$

$$\textit{Total inventory cost} = C_s(S2/2Q) + C_c(Q - S)2/2Q + C_oD/Q \quad (11.13)$$

Equation 11.13 contains two variables Q, S and other terms are constant C_s, D, C_o. On differentiating Equation 11.13 with respect to Q keeping s as constant, and then differentiating Equation 11.13 again with respect to S, keeping Q as constant, we get Equation 11.14 and Equation 11.15 after differentiating Equation 11.13.

$$Q_{opt} = \sqrt{\frac{2C_o D}{C_c}\left(\frac{C_s + C_c}{C_s}\right)} \tag{11.14}$$

$$S_{opt} = Q_{opt}\left(\frac{C_c}{C_c + C_s}\right) \tag{11.15}$$

Q_{opt} and S_{opt} are the optimal quantity of *EOQ* and shortage level that minimize the total inventory cost.

Example 11.2: The annual demand for an item is 3200 parts. The unit cost is ₹6 and the inventory carrying charges are estimated as 25% per annum. If the cost of one procurement is ₹150, find (i) economic order quantity, (ii) time between two consecutive orders, (iii) number of orders per year, and (iv) the optimal cost.

Solution: Given

D = 3200 units per year, Carrying cost (C_c) = 25% of unit cost
= 0.25 × 6, Ordering cost (C_o)
= ₹150

Hence,

(i) $EOQ = \sqrt{2DC_o/C_c} = \sqrt{2} \times 150 \times (3200/6) \times 0.25 = 800$ units

(ii) Time between two consecutive orders
$= EOQ/D = Q^*/D = 800/3200$
years $= 800 \times 12/3200$ months
$= 3$ months

(iii) Number of orders per year $D/Q_* = 3200/800 = 4$

(iv) Optimum cost = (Annual Demand)(Price of unit item) + $\sqrt{2DC_oC_c}$
$= 6 \times 3200 + \sqrt{2} \times 3200 \times 150 \times 6 \times 0.25$
= ₹20,400

Continuous Review System

In practice, one of the most serious limitations of the *EOQ* model is the assumption of known and constant demand. In a real situation, the demand is never fixed and constant. That is why the application of *EOQ* model becomes very limited. In order to formulate an inventory model that can handle the changing/flexible demand and no stock-out, the materials manager is required to review the stock level continuously. Therefore, a *continuous inventory review model* is presented here.

In a continuous review model, the stock position is monitored continuously or after each transaction. When a stock position drops to a predetermined order point, or reorder point, a fixed quantity is placed on order. Since the order quantity is fixed, the time between orders varies, depending on the random nature of demand. The continuous review inventory model is also known as *fixed-order-quantity inventory model*. Based on this, it can be defined that when the stock position drops to the reorder point say *R*, a fixed quantity say *Q* is ordered. A graphical representation of this kind of system is shown in Figure 11.8.

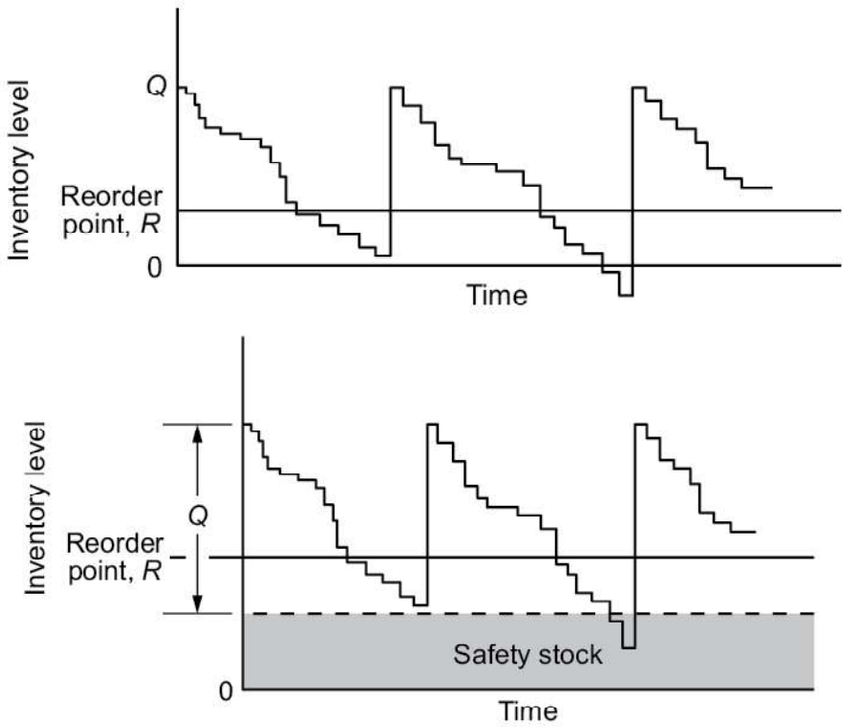


Fig. 11.8 *Inventory Model with Uncertain Demand without and with Safety Stock*

The stock position drops on an irregular position basis until it reaches the reorder point R, where an order for *Q* units is placed. The order arrives later, after a lead time L, and the cycle of usage, reorder, and stock receipt is then required. The continuous review inventory model is totally based on two parameters, i.e., *Q* and R. The calculation of *Q* is based on the *EOQ* (any *EOQ* model discussed in this chapter) model taking average demand for D (in an actual situation *Q* and *R* must be determined simultaneously but the process of *Q* and *R* determination simultaneously is more complicated and beyond the scope of the unit). However, applying *EOQ* for calculating average demand for the continuous review inventory model is a reasonable assumption and a good approximation. The calculation of reorder point *R* is based on Equation 11.16.

$$R = m + s \tag{11.16}$$

The value of *m* can be also determined from the multiplication of average demand with lead time. Hence, *m* can be also replaced as *m* = avg.*d* * L.

The calculation of safety stock is based on Equation 11.17.

$$S = \underline{z}a \tag{11.17}$$

Where, *R* is reorder point, *m* is mean (average) demand over lead time, and *s* is safety stock (or buffer stock), *z* is safety stock, and a is standard deviation of demand over the lead time.

Now, the combined equation can be written as in Equation 11.18.

$$R = m + z\alpha\sqrt{L} \tag{11.18}$$

The demand over lead time is graphically shown in Figure 11.9.

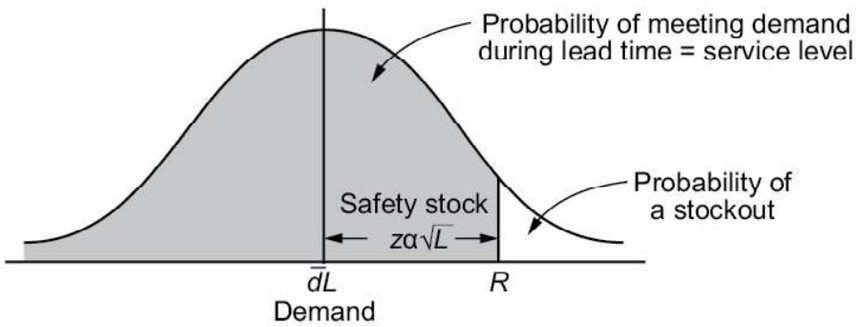


Fig. 11.9 *Demand over Lead Time*

Example 11.3: A food packaging company's warehouse distributes a certain type of breakfast food to retailers. The breakfast food has the following characteristics:

Average demand = 200 cases per day

Lead time = 4 days for resupply from the vendor

Standard deviation of daily demand = 150 cases

Desired service level = 95%

S = ₹20 per order, C_c = 20% per year, C_o = ₹20 per order, cost of case = ₹10 per case.

Solution: In this case, a continuous inventory model is used and the warehouse is opened for 5 days in a week and 50 weeks a year or 250 days a year. Then the average annual demand = 250 (200) = 50,000 cases per year. The *EOQ* can be calculated using *EOQ* Model 1 equation.

$$Q_{opt} = \sqrt{\frac{2 * 20 * 50000}{10 * 0.2} = 10^6} = 1000$$

The average demand per lead time is 200 cases a day for 4 days, therefore, $m = 4\ (200) = 800$ cases. The standard deviation of demand over the lead time is units. The 95 5 service level requires a safety stock of $z = 1.65$ which can be seen from a normal curve of any statistics book. Thus, we have

$$R = m + z\alpha\sqrt{L} = 800 + 1.65(300) = 1295$$

So, the continuous inventory review model will place an order of amount $Q = 1000$ cases every time when the stock level reaches 1296 cases, i.e., when $R = 1295$ cases.

11.4 RECEIVABLES MANAGEMENT

Account receivables constitute an important place in current assets. Companies are required to sell their products not only on cash basis but on credit basis too. Receivables are also known as accounts receivables, customers receivables, trade receivables, and book debts. To increase their sales, companies are required to sell their products on credit too. This credit sale depends on credit policy of the company/firm. The customers from whom receivables or book debts have to be collected in the future are called trade debtors or debtors. Credit sale involves risk. Cash sales of a business are totally risk free. However, credit sales are made today in the hope that amount of credit sale will be recovered in the future without much loss. In credit sales, the buyer of the product receives the right to use that product for which he can pay in future. In India, debtors have a major portion of the current asset of the firm. Credit sales (debtors) constitute at least one third portion of the current assets of the firms. Credit sales block firm's funds in debtors. So, firms have to finance their requirement of funds through loans from banks and financial institutions. Therefore, trade debtors involve investments of the firms, so it should be carefully analysed.

Receivables management is focused towards various issues related to credit policy of the business. The key issues involved in receivables management are as under:

- **Terms and conditions for credit sales:** A firm's investment in debtors depends on the volume of sales and collection policy. Investment manager can make changes in the investment in debtors by changing the terms and conditions of credit sales i.e. through change in credit policy. Credit policy of a firm is dependent on credit standards, credit terms and collection efforts. If firm follows a liberal credit policy then it should have large investment in debtors.
- **Duration for credit sales:** It refers to the duration given to debtors within which they are allowed to make payment of their purchase.
- **Collection policy:** It involves the detailed procedure that a firm is going to follow to collect cash from the debtors.

The main objective of a firm's credit policy is to maximize the shareholders wealth by increasing sales which leads to the improvement in profitability. Increase in sales leads to increase in operating profits as well as increase in investment and cost. Firms have to maintain a trade off in incremental cost and incremental benefits from the increased sales. A liberal credit policy may result in more credit sales but simultaneously block the funds of the business and risk might increase. A tight credit policy has opposite effects. Therefore, cost benefit analysis based on liquidity-profitability trade-off must be done. You will learn more about it in Unit 12.

Check Your Progress

3. What are the costs involved in inventory management?
4. What can ABC technique of inventory management be not used for?
5. State the basic philosophy of JIT inventory control system.
6. Why is the application of EOQ model very limited?
7. State the main objective of a firm's credit policy.

11.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The duration of operating cycle is equal to the number of days for which cash is tied up in the stages of the operating cycle, starting from cash on hand to acquisition of raw material, processing and selling the goods and realization of proceeds from sundry debtors.
2. The amount of working capital required at any point in time is governed by the speed with which this cash cycle is sustained. Faster the cycle (i.e., smaller cycle period), lesser is the investment in working capital.
3. Some of the costs involved in inventory management including holding cost, ordering cost, risk of obsolescence, risk of price decline and risk deterioration in quality.
4. ABC technique of inventory management is not applicable for spare parts, here VED technique is used.
5. The basic philosophy of the JIT inventory control system is that the firm should maintain a zero level of minimum level of inventory and firms should rely on supplier of the product for the supply of material as per the requirement of it.
6. In practice, one of the most serious limitations of the EOQ model is the assumption of known and constant demand. In a real situation, the demand is never fixed and constant. That is why the application of EOQ model becomes very limited.

7. The main objective of a firm's credit policy is to maximize the shareholders wealth by increasing sales which leads to the improvement in profitability.

11.6 SUMMARY

- Operating cycle concept suggests that the optimum level of working capital can be determined by the operating funds needed for completing one operating cycle.
- There are two ways the operating cycle period is calculated: (a) based on sales and (b) based on appropriate costs that determine the value of current assets and current liabilities.
- The focus of inventory management is on maintaining optimum level of inventory for smooth running of the operations and meeting the demand of the final product in time.
- Components of inventory include raw material, work-in-progress, consumables, finished goods and spare goods.
- There are many different tools and techniques of inventory management including determinants of various stock levels, determination of safety stock, ordering system of inventory, economic order quantity, ABC analysis, VED Analysis, Inventory Turnover Ratio, etc.
- Economic Order Quantity is an optimal quantity for maximizing the total material cost, i.e., ordering cost, carrying cost and stock-out cost under various conditions. There are many different models of EOQ depending on the varied instantaneous order receiving and stock-out cost conditions.
- In order to formulate an inventory model that can handle the changing/flexible demand and no stock-out, the materials manager is required to review the stock level continuously.
- Account receivables constitute an important place in current assets. Companies are required to sell their products not only on cash basis but on credit basis too. Receivables are also known as accounts receivables, customers receivables, trade receivables, and book debts.

11.7 KEY WORDS

- **Inventory:** It is commonly known as stock of goods or list of goods.
- **Carrying cost:** It refers to the cost incurred for holding inventory.
- **Ordering cost:** It refers to the cost of creating and processing an order.
- **Economic Oder Quantity:** It is an optimal quantity for minimizing the total material cost, i.e., ordering cost, carrying cost and stock-out cost under various conditions.

11.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short-Answer Questions

1. What are the objectives of the application of operating cycle approach?
2. Compare sales-based and cost-based operating cycle.
3. What are the components of inventory?
4. What are carrying and ordering costs?
5. Write a short note on VED analysis.
6. List the basic principles of the JIT inventory model.
7. What is receivables management?

Long-Answer Questions

1. Describe the techniques of calculation of operating cycle period.
2. Explain the major tools and techniques used in inventory management.
3. Discuss the different models of Economic Order Quantity model of inventory management.
4. Examine the concept of the continuous review system of inventory management.

11.9 FURTHER READINGS

Patel, Bhavesh. 2014. *Fundamentals of Financial Management*. New Delhi: Vikas Publishing House.

Khan, M.Y. and Jain, P.K. 2007. *Financial Management- Text Problems and Cases.* New Delhi: Tata McGraw-Hill.

Chandra, Prasanna. 2004. *Financial Management: Theory and Practice.* New Delhi: Tata McGraw-Hill.

Kulkarni, P.V. and B. G. Satyaprasad. 2002. *Financial Management.* New Delhi: Himalaya Publication House.

NOTES

BLOCK - IV
WORKING CAPITAL AND DIVIDEND POLICY

UNIT 12 CASH AND LIQUIDITY MANAGEMENT

Structure

12.0 INTRODUCTION

Cash is the important current asset for the operations of the business. It is the basic input needed to keep the business running on a continuous basis; it is also the ultimate output expected to be realized by selling the service or product manufactured by the firm. The firm should keep sufficient cash, neither more nor less. Cash shortage will disrupt the firm's manufacturing operations while excessive cash will simply remain idle, without contributing anything towards the firm's profitability. Thus, a major function of the financial manager is to maintain a sound cash position. Cash management is concerned with the managing of: (*i*) cash flows into and out of the firm, (*ii*) cash flows within the firm, and (*iii*) cash balances held by the firm at a point of time by

financing deficit or investing surplus cash. In this unit, we will discuss the cash and liquidity management, along with the alternative credit variables. We will also focus on tax considerations in remittances and purchases.

NOTES

12.1 OBJECTIVES

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

- Explain the cash and liquidity management
- Discuss the alternative credit variables
- Describe the tax considerations in remittances and purchases

12.2 CASH AND LIQUIDITY MANAGEMENT

Cash is the lifeblood of business enterprise. Its steady and healthy circulation throughout the entire business operation is the basis of business solvency. The management of cash and marketable securities is an important area of working capital management, since by effectively managing these liquid resources, the financial manager can maintain desired levels of liquidity and at the same time generate a return on temporarily idle funds. Cash, like any other assets of the company, is a source of profit; hence the emphasis should be on the right amount of cash, at the right time, at the right place and at the right cost.

Motives for keeping cash

A business needs enough cash on hand and in marketable securities for various purposes. These purposes or motives for cash on hand can be grouped in three parts, namely,

(i) Transaction motive

(ii) Precautionary motive

(iii) Speculative motive

1. Transaction motive

A business enters into many transactions for which cash is paid and received. Buying resources, paying wages, paying electricity bill, paying taxes, paying to suppliers, buying fixed assets, repaying loans, payment of dividends, and many such transactions use cash. Selling on cash, collections from receivables, selling assets, issue of shares and bonds and such other transactions bring cash for the business. It is unlikely that the time, amount and place of cash receipt and cash payment would perfectly match for the receipt and payment of cash for all transactions. When there is excess of receipt over the payment, the business will sit on idle funds and lose opportunity earnings on it. If the payment is in excess of receipt at any point in time, the business will have liquidity crisis. Firms need to

have plans for investment of temporary surplus funds and also for financing the temporary deficit of cash.

2. Precautionary motive

Some firms are less attuned to take risk and prefer to keep more cash on hand to meet unforeseen circumstances. Precautionary motive reduces the stress level, though the firm would lose the opportunity income on the extra cash kept on hand, and often spend more simply because cash is on hand.

3. Speculative motive

Some businesses temporarily keep extra cash on hand and in marketable securities, if they have some projects in the near future. Cash-rich firms often are in look out for merger candidates to satisfy their appetite for the growth. It may also be possible that a firm may keep extra cash on hand if some opportunity has expected to come for making profitable investment of short-term or long-term nature.

In any case, a firm should aim to rotate the cash-to-cash cycle faster so that total investment in operating assets is kept at minimum without any additional exposure to risk in terms of profit as well as liquidity.

12.2.1 Facets of Cash Management

Cash management includes the following aspects of management:

1. Cash Planning
2. Managing the cash flows
3. Investing surplus cash
4. Optimum cash level

Fig. 12.1 *Aspects of Cash Management*

Cash planning: Cash budgeting and cash forecasting

Cash planning is a technique to plan and control the use of cash. Firms use a cash budget for such purposes. A projected cash flow statement can be prepared for this purpose. Generally, firms prepare the cash budget in advance to forecast cash inflows and cash outflows. Cash forecasting and budgeting are used for cash planning.

- Cash budget is the most significant device to plan for and control cash receipts and payments.
- Cash forecasts are needed to prepare cash budgets.

NOTES

Cash budget

The cash budget is prepared to forecast the cash requirement and control its spending in business. The cash inflows and cash outflows from various sources are assessed and the surplus and deficit cash is determined from the balance. Cash budgets can be prepared on daily, weekly, monthly or quarterly basis depending upon the requirement of business.

Cash forecasting

Cash forecasting is required in order to anticipate cash requirement for operations and for managing the surplus. Cash forecasting has short-term and long-term methods at its disposal:

- **Short-term cash forecast:** This forecasting methods include:
  - o The receipt and disbursements method
  - o The adjusted net income method
- **Long-term cash forecast:** Long term cash forecasting is done to assess the financial requirement for capital projects. This forecast for cash can only be done after receiving the requirement of long term funds by all divisions of the business.

The following is an example of a cash budget.

Example 12.1

From the following information prepare cash budget for the month of July, August, September and October:

Months	Sales (credit)	Purchase	Wages and Salaries	Manufacturing expenses	Administrative Expenses	Selling and Distribution Expenses
April	650000	630000	25000	10000	9000	1500
May	650000	730000	35000	12000	8000	1600
June	550000	550000	30000	14000	9500	1100
July	680000	650000	32000	13000	8500	1000
August	710000	550000	32000	16000	7500	1300
September	730000	600000	28000	10000	8000	1400
October	680000	600000	33000	12000	7000	1000

- The customers are allowed a credit period of three months.
- A dividend is payable of ₹ 30,000 in the month of September.
- In the month of August firm is required to incur one capital expense. Firm is required to buy one plant and machinery of ₹1, 00,000.

- The creditors allow a credit of three months.
- Wages and salaries are paid on the first of next month.
- There is a lag of one month in the payment of other expenses.
- Cash in hand on 1st July 2014 is ₹ 100000.

Solution:

	July	August	September	October
Receipts				
Opening Balance of Cash	**100000**	**295400**	**100900**	**44100**
Cash receipts from debtors	650000	650000	550000	680000
total Cash available	750000	945400	650900	724100
Payments				
Payments made to creditors	630000	730000	550000	650000
Wages and Salaries	30000	32000	32000	28000
Manufacturing Expenses	14000	13000	16000	10000
Administrative Expenses	9500	8500	7500	8000
Selling and Distribution Expenses	1100	1000	1300	1400
Dividend Payment				
Purchase of Plant and Machinery		100000		
Total Expenses	684600	884500	606800	697400
Closing Balance of Cash	**65400**	**60900**	**44100**	**26700**

Managing cash collections and disbursements, and investing surplus cash

In the following sections, we will discuss ways to manage cash collections and disbursement.

Accelerating cash collections

To have proper cash balance, firms tries to accelerate their cash collection. For this, firms commonly follow these two methods:

- **Decentralized collections:** By setting multiple collection centers, firm can speed up their cash collection and use that money to finance their cash flows.
- **Lock-box system:** In this system, firms have lock-boxes at different locations. The objective of this is also to speed up their cash collections.

Controlling disbursements

Controlled disbursement is a method via which an institution increases its funds for the purposes of investments or the payment of debts. This method capitalizes on the availability of cash and makes the most out of it during the time it is present in the money market. It controls the flow of checks in a banking system.

Disbursement or Payment Float: Firms should linger on their cash payment as much as they can. For that duration, firms can use that money to make payments. This method is a bit harmful for the goodwill of the firm. So, firms should take due care in postponing the payment to any creditor. They should make payments only through cheques and as frequently as possible.

By using the following methods, firms can accelerate collections of cash (Figure12.2):

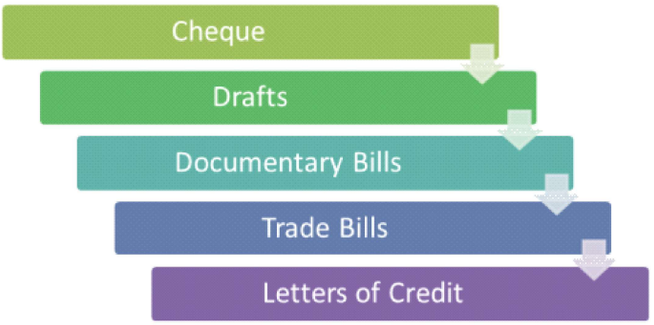


***Fig. 12.2** Cash Collection Instruments in India*

Investing surplus cash

The profits that have been accumulated overtime by firms is a good opportunity for cash management. The surplus cash can be invested in the most ideal fashion, so that the firm can grow exponentially and reap even more benefits.

Determining the optimum cash balance

The optimum cash balance is a vital part of cash management because that is how firms calculate their requirements of cash and other things in advance. This is how they plan whether they are to move ahead with their investments or are they to go down other roads. The meaning of the models is right there in the name. Their primary function is to provide firms with the ability to develop a system using which they can preserve the most ideal cash balance for themselves. The cash budget is prepared also keeping in mind this very notion because shortage of cash is very problematic.

1. William J. Baumol's Model: Cash balance under certain conditions

The model developed by Baumol is applicable in certain conditions. These conditions require a firm which is able to forecast cash requirements with certainty. Throughout the year, firms incur cost and receive cash from various sources. So, firms hold an average cash balance (Figure 12.3).

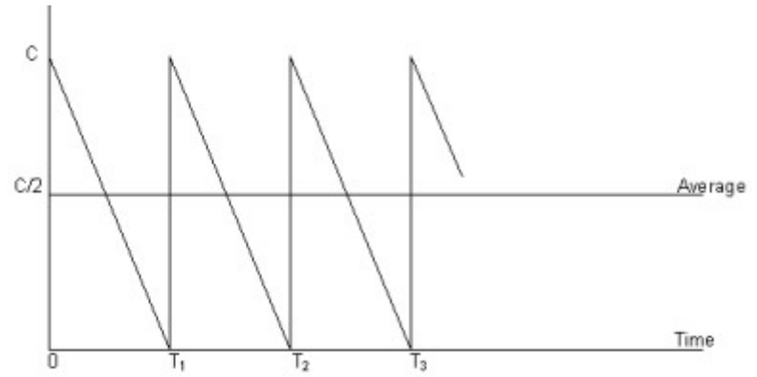


Fig. 12.3 *Average Cash Balance*

This model is based on some assumptions. These assumptions are as follows:

(a) Transaction cost of converting securities into cash remains constant.

(b) Opportunity cost of capital remains constant.

(c) The cash requirements of the firm are known with certainty.

(d) Cash outflows of the firm (cash disbursement) of the firm are known and certain.

This technique resembles Economic Order Quantity (EOQ) of inventory management. EOQ is the quantity where carrying cost/holding cost and ordering cost is minimized. Similarly the optimum cash balance is the tradeoff between transaction cost (cost of converting marketable securities into cash) and opportunity cost of holding cash. The point of optimum cash balance is when these two costs are equal.

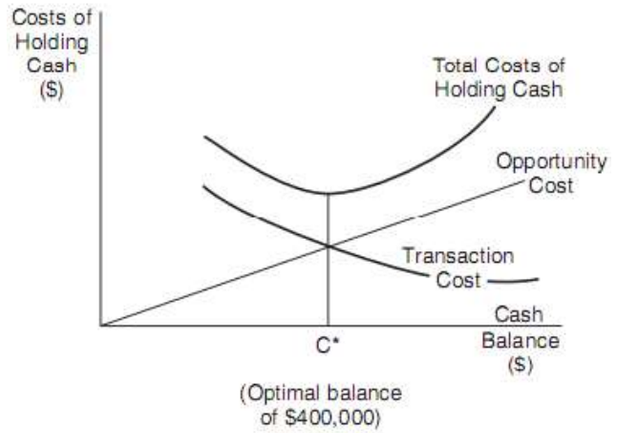


Fig. 12.4 *Optimal Cash Balance*

NOTES

Following formula is used to calculate the amount of optimum cash balance.

$$Optimum\ Cash\ balance\ (C) = \sqrt{\frac{2A\ F}{O}}$$

In this equation, C is optimum cash balance, A is annual cash disbursement/ requirement, F is fixed cost per transaction and O is the opportunity cost of holding cash. This method can be explained with the help of following example.

Example 12.2

Annual cash requirement of Jolly Ltd. is ₹ 20 lakh. The company has marketable securities in lot size of ₹ 50,000, ₹ 1, 00,000, ₹ 1, 50,000 and ₹ 2, 00,000. Cost of conversion of marketable securities per lot size is ₹ 1,000. The company has 8% opportunity cost of capital on its securities. Calculate optimum cash balance by using Baumol's model.

Solution:

Calculation of lot size by using Baumol's model

Here, Annual cash requirement is ₹ 20 lakh, F fixed cost per transaction is ₹ 1000, O is the opportunity cost of holding cash which is 0.08.

$$Optimum\ Cash\ balance\ (C) = \sqrt{\frac{2A\ F}{O}}$$

$$Optimum\ Cash\ balance\ (C) = \sqrt{\frac{2\ x\ 2000000\ x1000}{0.08}} = ₹\ 223607$$

2. **Miller and Orr Model of Optimum Cash Balance**

One of the biggest limitations of Baumol's model is that it assumes certain business conditions. Baumol's model assumes the firm is able to forecast its cash requirement, its timings and size of cash flows with certainty. In practice however, cash flows are difficult to estimate. Cash flows are not certain and fixed. These are flexible. To meet such type of uncertainty, Miller and Orr gave a model of optimum cash balance. In this model, there is one upper control limit and lower control limit. With this, there is one return point. When the firm keeps on paying its dues and cash balance hits the lower limit then the firm is required to sell a few marketable securities to increase cash balance to the previous level. Now, suppose there are continuous cash inflows and cash balance hits upper control limit. Then it's time to invest in marketable securities. These two limits upper and lower limit are the action point of the firm's financial manager.

Following formula is used to calculate the difference in upper limit and lower limit.

$$Z = 3\left(\frac{3}{4}x\frac{Transaction\ cost\ x\ variance\ of Cash\ Flows}{per\ day\ interest\ rate}\right)^{\frac{1}{3}}$$

Return point = Lower Limit + (Spread (Z))/3

The above mentioned method can be used to calculate the optimum cash balance requirement of a firm.

Example 12.3

A company has a policy of maintaining a cash balance of ₹ 2, 00,000. Standard deviation of daily cash balance is ₹ 20, 000. The interest rate on daily basis is 0.02%. The transaction cost of each sale or purchase of is ₹ 100. You are required to calculate upper and lower control limit by using these information.

Solution:

$$Z = 3\left(\frac{3}{4}x\frac{Transection\ cost\ x\ variance\ of Cash\ Flows}{per\ day\ interest\ rate}\right)^{\frac{1}{3}}$$

$$Z = 3\left(\frac{3}{4}x\frac{50\ x\ (20000)^2}{0.0002}\right)^{\frac{1}{3}}$$

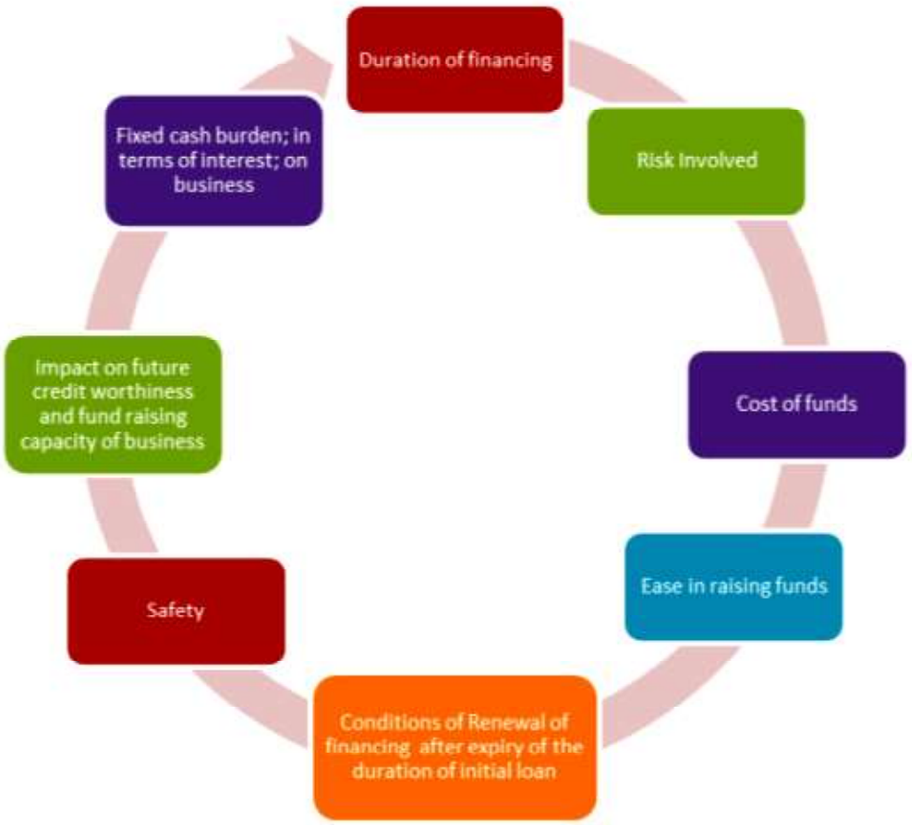


Fig. 12.5 *Short-term vs. Long-term Investment Avenue*

NOTES

NOTES

Check Your Progress

1. Why is the management of cash and marketable securities an important area of working capital management?
2. What do you mean by decentralized collections?
3. What do you mean by cash planning?
4. What is the primary purpose of optimum cash balance models?

12.3 CREDIT POLICY

Trade credit should not be granted just because the firm needs to make sales, or just because the customer wants to purchase on credit. It has to be a part of well-thought of credit policy. Goals of credit policy, effect of granting credit, factors affecting credit policy and credit terms must be understood before designing a credit policy, within which credit can be granted after adhering to the laid out procedure and evaluation.

12.3.1 Objectives of the Credit Policy

Credit facility is normally extended with a view to achieving the following objectives:

(a) Maximize profitable sales

(b) Minimize the lock up of working capital funds

(c) Maximize profitability

(d) Maintain shortest feasible collection period

(e) Ensure lowest possible level of bad debt losses

(f) Offer tailor made financial arrangements

It is aptly clear from the above list that many of the objectives are in conflict with each other when looked at in a short time span. In the long-term, the objective of credit sales must be to earn profits.[1]

A company, therefore, should have a clearly defined credit policy, credit appraisal system, credit control, and collection methods for achieving the above mentioned objectives. Receivables constitute a significant component of working capital and as such require the same type of planning and control as inventory.

12.3.2 Effects of the Credit Policy

A credit policy has the impact on the items listed in the 'objectives of credit policy'. A good credit policy may increase sales and profits without significantly increasing the investment in working capital and without much loss on bad debt. It can still build a dedicated client base if the credit policy allows customised credit to suit

the financial plans of clients. For that the credit evaluation and collection efforts must be efficient.

A credit policy has to draw a balance between the business custom and client needs on one side and the wrong signals that can be sent out through the credit policy on the other side. Very lenient credit policy and lax credit collection may immediately increase sales but may also increase investment in working capital and loss due to bad debt. Moreover, it would convey a weakness of the company and send wrong signals about the quality of the goods and services. In that case only financially distressed client will come to the company for purchase and good accounts would stay away out of fear of low quality and supply failure anytime.

12.3.3 Factors Affecting the Credit Policy

A firm must consider several factors before framing a credit policy. Following are explained the significant factors that a company may like to keep into account:

- **Business custom:** Every business in a given region develops certain customs. Credit expectation is one of them. A company's credit policy has to remain around the credit custom for that business. Credit policy completely away from the business custom would be accepted by customers only if the company has to offer some other very strong point, say quality or relationship.
- **Cash position:** A firm with large cash on hand may prefer to benefit their customer with extra days' credit and may remove the cash discount. Investment in receivables may be a profitable alternative than investing surplus funds in marketable securities.
- **Seller's reputation:** A company with very high reputation in terms of quality, consistency, timely delivery, after-sales services, and ethical collection method can follow a tight collection policy without jeopardising the prospect for sales. Often some clients take pride in doing business with reputed suppliers and are willing to accept less favourable credit terms and pay on time.
- **Strategic relationship with client:** Some clients are strategically important. For a small business, a large and reputed client is important. Their names as their clients can bring more business. Sometimes a client can give more business later on and therefore strategically important for the firm.
- **Strategic price differentiation:** If a business is not offering differential price in the same market segment, the favourable credit terms can be offered to create price differentiation, so that a customer can be retained without compromising on pricing policy.
- **Budget goals:** Firms target for higher profits or sales growth as per the situation, as their budget goal. The credit policy for attaining the goal of higher profit and that for achieving the goal of sales growth cannot be the same. Credit policy is an active decision variable, along with other, for

NOTES

significant sales growth. Profit goal also would require an active credit policy but with different emphasis wherein profit is central rather than sales.

- **Quality of competition:** The quality of competition chosen by either the firm or its competitor cannot be ignored in determining the credit policy. One-upmanship with a competitor can be achieved through the aggressive credit policy.
- **Cost-benefit analysis:** Everything else being equal, the credit policy should be based on pure cost-benefit analysis. Benefits from credit policy accrue from increased sales and costs are incurred in many forms like interest on investment in receivables, collection expenses and bad debt.

12.3.4 Determining Credit Policy

Subject to the evaluation of various factors affecting the credit policy of a firm, the cost advantage is considered important.

Costs associated with credit

The working capital will increase; total asset will increase; net profit may reduce by the interest expense net to tax and return on total assets may decline as a result of granting credit for sales. However, this is only one side of the picture. We should build advantages of credit sales too. If with the credit policy sales are expected to increase that must be factored. The costs associated with the trade credit can be grouped in to categories namely,

- Carrying costs
- Opportunity cost (loss of contribution from reduced sales)

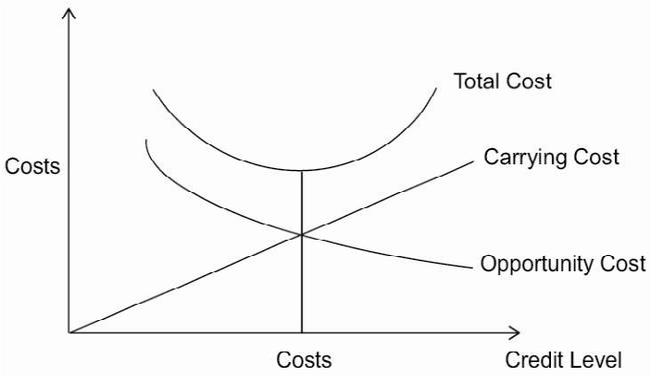


Fig. 12.6 *Optimum Credit Level*

Carrying costs are incurred when credit is granted on sales. It comprises expenses like,

- Interest on investment in receivables
- Credit investigation expenses

NOTES

- Monitoring expenses
- Collection expenses, and
- Bad debt losses.

Collection expenses would include administrative costs as well as actual collection costs. Opportunity costs ensue from loss of contribution from the lost sales due to refusal of credit to clients. These two categories of costs associated with credit decision move opposite to each other with the change in credit period. Therefore, the ideal credit period is when the total cost of credit is the minimum. When both the types of costs are equal, as depicted in the Figure 12.6, the total credit costs is the minimum.

Example 12.4: Net Advantage of Credit Sales (No Cash Discount)

Ilani Company has not been offering any credit so far. The following are the estimates if no credit is approved and entire sales are on cash only:

- Sales: ₹50,00,00,000 (₹50 crore)
- Total assets ₹ 60,00,00,000 (₹60 crore)

The marketing manager has come up with the proposal that the credit policy be determined and implemented with a view to increase sales. His proposal and estimates are as follows:

- Extend credit by 30 days without any provision for the cash discount for the early payment
- This will increase sales by 10 per cent.
- The finance manager provided the following information:
- Interest rate is 15 per cent
- Marginal tax rate is 30 per cent
- Contribution to sales is 40 per cent (40 paise per rupee sales)
- Despite credit policy there will be 25 per cent of total sales in cash, only 75 per cent of sales will be on credit.
- The average order size is ₹5,00,000
- Expected bad debt will be 2 per cent of total credit sales

In his opinion this credit policy will increase the sales by 10 per cent

Calculate,

(a) New investment needed in the receivables.

(b) Additional total and net to tax interest expenses.

(c) Increase in sales, total assets and contribution

(d) Total incremental costs in total and net to tax

(e) Net advantage of credit sales

(f) Calculate the incremental return on total assets for the proposal of offering credit, and comment whether the credit policy worth accepting.

Solution:

NOTES

The grant of credit will increase the need for funds.

(a) The investment in receivables would be,

$$\text{Receivables} = 55,00,00,000 \times 0.75 \times \frac{30}{365} = ₹3,39,04,110$$

(b) Interest Expense: total and net to tax

Interest before tax = 3,39,04,110 × 0.15 = ₹50,85,616

Interest net to tax = 50,85,616 × (1 - 0.3) = ₹35,59,932

(c) Increase in sales, contribution and total assets

Increase in sales = 50,00,00,000 × 0.1 = ₹5,00,00,000

Increase in total assets = New receivables ₹3,39,04,110

Increase in contribution = 5,00,00,000 × 0.4 = ₹2,00,00,000

(d) Incremental costs

Carrying costs

- Interest expense is calculated in answer (b) above

  Collection expenses:

- Total number of orders: 55,00,00,000 ÷ 5,00,000 = 1,100

  Credit sales orders: 1,100 × 0.75 = 825

  Collection costs: 825 × 5,000 = ₹41,25,000

- Bad debt = Credit sales × 0.02

  = 55,00,00,000 × 0.75 × 0.02

  = 82,50,000 pre-tax

  = 82,50,000 × (1 - 0.3) = ₹ 57,75,000 post tax

Carrying costs	Total	Net to tax
Interest	50,85,616	35,59,932 [50,85,616 × (1 - 0.3)]
Collection costs	41,25,000	28,87,500 [41,25,000 × (1 - 0.3)]
Bad debt	82,50,000	57,75,000 [82,50,000 × (1 - 0.3)]
Total carrying costs	1,74,60,616	**1,22,22,432**

(e) Net advantage of credit sales

Additional contribution net to tax	2,00,00,000 × (1 - 0.3)	1,40,00,000
Carrying costs net to tax	1,74,60,616 × (1 - 0.3)	1,22,22,432
Net advantage of credit sales		**17,77,658**

(f) Incremental return on total assets

$$\text{Incremental ROA} = \frac{\text{Net advantage of credit sales}}{\text{Increase in receivables}} = \frac{17,77,658}{33,904,110} = 5.24\%$$

There is a positive return on total assets on the incremental basis. This is the return generated in addition to the interest expense, and therefore, thought the incremental ROA might look small, the proposed policy is worth accepting, if other parameters have no strong arguments against it.

Example 12.5: Net Advantage of Credit Sales (Cash Discount)

In the case of Ilani Company given in example 18.1, the finance manager is proposing that instead of 'net 30' credit policy a '1/10 net 30' policy can be introduced. His estimate is that, '1/10' will be availed by half of the receivables, which will reduce the investment requirement. This will not affect the sales or rate of bad debt or the price of cash sales, or any other thing.

Calculate the financial worth of this proposal over the one proposed by marketing manager and determine which of the two policies would make better sense.

Solution:

Calculating receivables under 1/10 net 30 policy:

Total credit sales = 55,00,00,000 × 0.75 = 41,25,00,000

Those who avail 1/10 cash discount: ₹20,62,50,000 (41,25,00,000 ÷ 2)

Those who pay on net 30: ₹20,62,50,000 (41,25,00,000 ÷ 2)

∴ Total receivables would be,

$$20,62,50,000 \times \frac{10}{365} + 20,62,50,000 \times \frac{30}{365} = 56,50,685 + 1,69,52,055 = 2,26,02,740$$

Thus, receivables will reduce by: 3,39,04,110 – 2,26,02,740 = ₹1,13,01,370

Savings of interest post-tax = 1,13,01,370 × 0.15 × (1 - 0.3) = ₹11,86,644

The amount of discount offered = 20,62,50,000 × 0.01 = ₹20,62,500

Loss of net profit under '1/10, net 30' policy = discount ₹20,62,500 – Post-tax interest savings ₹11,86,644 = ₹8,75,856.

The policy proposed by finance manager is not acceptable of financial grounds.

Building time value concept

Grant of credit causes delayed receipt of payments. But, we did not build the time value concept in the previous examples. This is because we charged interest expense on the cash that will be invested in the receivables as a result of grant of credit. This largely takes care of time value effect, especially when the cash flow is occurring within a short period. However, if we want to be precise, we can build the time value concept for which some modifications would be needed as follows:

1. Add back interest in the net advantage of credit sales.
2. Add receivables in it to get gross cash inflow from the decision. Since the amount invested in receivables is collected along with the net advantage, this assumption is more appropriate.

NOTES

3. Discount the gross incremental cash flow of one credit policy over the other by the cost of capital to get the net present value of the gross cash flow from the debit policy.

However, this is not really necessary for the evaluation of credit policy for reasons like,

- Financing sources for working capital (therefore, receivables) are different from the financing sources from which the cost of capital is derived.
- As a consequence, the appropriate discount rate would be the interest rate on short-term sources used for financing the working capital.
- If the cost of short-term fund (interest expense) is charged to the proposed policy, there remains no need for discounting. The impact of not applying the discounting mechanism will have a very insignificant effect, which too will hardly change the preference among the alternative credit policies under evaluation.

Example 12.6: Applying the Time Value Concept to the Credit Policy Decision

Use the data and solution of Example 12.4 and calculate the net advantage of credit sales in present value terms. Would your answer be different from what you found in the Example 12.4?

Solution: In Example 12.4 the net advantage of credit sales is ₹17,77,658 after charging interest expense. Therefore, before charging the interest expense the net advantage of credit sales will be,

Net advantage before interest expense:

₹17,77,658 + ₹50,85,616 = **₹68,63,185**

Gross cash flow along with the collection of receivables:

₹68,63,185 + 3,39,04,110 = **₹4,07,67,295**

Cash flow of this project:

At Day 0	Investment in Receivables	-3,39,04,110
At Day 30	Gross cash inflow	4,07,67,295

Thus, giving credit will increase the value of the firm. The decision with the present value concept does not change in favour of an alternate policy of not granting the credit.

Long-term effects of credit policy

Liquidity and costs represent one side of the picture in the context of the credit policy. It is important to take the long-term view when a credit policy is designed. (a) If a buyer is new but important, the company may like to build relationship for

which granting of credit may be necessary contrary to the current credit policy. (b) When the buyer's business is new and management competent, giving them financial support through grant of credit may be little risky but rewarding in long term; by doing so you are developing a committed customer. (c) If grant of credit can build loyal customer base, the default risk of customer will reduce, expenses on credit check and collection will also reduce; and loyal customers do understand your firm's temporary liquidity problem and is willing to make early payment. These long-term advantages, that bring stable growth is sales, reduced risk and reduced costs cannot be ignored. After all, businesses are run based on relationships and not on cold calculation of profits.

12.3.5 Types of Policies

A firm may adopt one of the following four types of credit policies:

- **Cash only policy:** A firm may insist on cash sales only and grant no credit to any customer. Often advance payment is insisted or delivery is made against the cash payment in full. When a firm enjoys unparalleled reputation, adoption of this policy is possible.
- **Tight credit policy:** A company may offer very little window for the payment of dues against invoice and follow a tight credit policy. In the tight credit policy cash discount may or may not be offered. The idea is to discourage the credit.
- **Liberal credit policy:** Credit is granted for longer period than the industry norms in liberal credit policy. A firm with idle cash and without profitable investment alternatives may adopt such policy, or a firm which is targeting capturing the market share.
- **Selective credit policy:** The most practical policy is 'selective credit' policy. Policy has to be flexible to handle different situations. At any given time there will be a mix of customers, some new, some doing business with the firm since long, some important and some with doubtful financials and credibility. Every customer cannot be offered the same credit terms. Also, the firm's liquidity and profitability situation may change from time to time. Accordingly, the firm's priority may change between the liquidity, profitability and market share. The selective credit policy allows flexibility in taking credit decision based on the firm's priority as well as the profile of a given customer.

Check Your Progress

5. What should be understood before designing credit policy?
6. Mention any four objectives of extending credit facility.
7. What do you mean by collection expenses and opportunity costs?

NOTES

12.4 CREDIT MANAGEMENT AND EVALUATION ALTERNATIVE CREDIT VARIABLES: METHODS AND FUNCTIONS

In establishing an optimum credit policy, the financial manager must consider the important decision variables which influence the level of receivables. As stated in the preceding section, the major controllable decision— variables—includes the following: Credit standards and analysis, Credit terms and Collection policy and procedures.

12.4.1 Credit terms

Credit policy comprises credit terms, which includes the credit period, cash discount if any, mode of payment, and penalty clauses. The expression of credit terms is usually as follows:

Expression of credit terms:

(a) Net 45

(b) 2/10, n/30

In the first expression, the full amount is payable within 45 days. In the second expression of credit policy, if the due amount is paid in 10 days, a 2 per cent discount is available, otherwise the full amount is payable in 30 days.

Period

The latest period by when the full payment must be made is the credit period. There may be two credit periods; one an early date, if any for availing cash discount and two the final period when the full payment must be made. The period is usually counted from the date of invoice, unless otherwise stated in the invoice.

Cash discount

Some companies offer cash discount on early payment because they need early cash. In that case the initial part of the credit terms uses the expression say, '2/10' or '1/15' in which the number 2 or 1 indicates the percentage discount and the second number 10 or 15 indicates the period of payment for availing the cash discount. The percentage is not annual rate; it is applied on the whole amount. The customer is entitled to deduct the amount of interest and pay the balance. For example, in case of '2/10, n/30' credit terms for the receivable amount of ₹10,000 the customer who is paying within 10 days will deduct ₹200 (10,000 × 0.02) and pay ₹9,800 to the company.

NOTES

Mode of payment

Mode payment must be spelt out clearly in the credit policy and in the invoice. Mode of payment can be one or more from the following alternatives:

- Cheque
- Demand Draft
- Debit card
- Electronic transfer

Small amount can be accepted in cash as per the law, but it is sometimes desirable to collect through check or demand draft or through debit card. In addition to the mode of payment, it should be clearly mentioned in the invoice, especially when cheque of demand draft payment is required, the address where the envelope containing the cheque of demand draft must be mailed. The mailing address is important when a lock-box arrangement is made with the banks, or when there is a decentralised collection in multi-branch lock-box system.

Penalty clause

If there is a delay in payment the penalty clause, usually in terms of interest on invoice amount, is often provided in the credit policy and the terms and conditions must be communicated in the invoice.

12.4.2 Credit Analysis

A firm that offers credit must design a system for credit analysis of a client and identify deserving clients from those who do not deserve the grant of credit. The financial position, past payment record and management reputation are important areas of investigation before a credit decision is taken. Some companies also develop and use mathematical and statistical tools for objective decision making.

- **Credit Information:** The company needs information for the evaluation of financial position and management reputation, before the credit check is made with banks or suppliers of the given customer.
- **Financial statements:** Income statement, balance sheet and other information included in the annual report shall be analysed for understanding the financial health of the client, as well the future plans. A customer whose profitability is good and consistent, working capital ratios within reasonable range, interest-cover ratio well above the norm and without window dressing of items, would deserve favourable credit terms, if reputation and credit check reports are favourable. One might also use credit rating of the customer's debt security and make judgment about the current and expected financial soundness.
- **Information about management and its reputation:** It is not easy to judge intentions of management and their credibility, especially for a new

NOTES

management team. It may be relatively easier if the management group has a history. It is good to do business with a management group that has consistently demonstrated ethical behaviour, even if liberal credit terms have to be extended.

- **Credit check (trade reference):** It may be desirable to contact some suppliers to the client and get information about the collection record from this client. Usually, a new customer is asked to provide the list of suppliers they deal with. From that list three to four suppliers are contacted to get the feedback on the client. This is also known as 'trade reference'.
- **Banks' reference:** If the client agrees, the company can contact the client's bank and get bank's report on client's track record on payments.
- **Past experience with the client:** If the client is a repeat buyer from the company, the credit analysis is easy because the company can rely on the past history and experience. However, if the new order is significantly large, the due diligence in terms of financial check, reputation check and credit check cannot be undermined.

Credit scoring

Companies develop credit scoring mechanism as may be suitable to them. A 'five "C" approach' is normally recommended for the appraisal of any credit proposal. These five 'C's are:

1. Character (reputation)
2. Capital (financial position)
3. Condition (industry or area)
4. Capacity (profit record and resources)
5. Collateral (security offered)

In other terms, it is an evaluation of customer's 'willingness' as well as 'ability' to pay money in time. The crux is to 'know the customer well'. The creditworthiness of a customer can be judged based on (i) trade reference, (ii) salesmen report, (iii) bank report, (iv) personal interview with customers and (v) analysis of customer's financial statements. A track record should also be maintained for the current customers so that at the time of future dealing first-hand knowledge can be gainfully applied in credit proposal evaluation.

Using credit scores or index

The descriptive nature of factors considered in the credit analysis are converted into the credit score and or index. Each of the above 5-Cs, have sub-elements in it. After analysing the information on these 5-Cs, based on the assessment, the scores are assigned and added up to get the overall score that a customer earns. The overall score then is divided into some categories ranging from 'outstanding',

'good', 'average', 'below average' and 'poor'. There may be more categories and different names to each category. The purpose is to develop a mechanism by which the good clients can be identified from not-so-good clients so that the decision whether to grant credit or not, and with what conditions, can be taken judiciously by even the middle-level managers.

Every factor of analysis will be different in terms of importance in analysis. Therefore, assignment of scores and taking the sum of them may not be adequate, unless different maximum points are assigned to every factor depending upon the importance. The scores can be converted into an index to avoid different maximums and to develop a common number. Each factor is assigned a weight with which the assigned score is multiplied and all products are added up to get an index value. Depending upon the index value the clients can be categorised.

Table 12.1 *Credit Score and Index*

Client Name: _____

Factors	Score on 10	Weight	Weighted Average	Weight	Weighted Average
Reputation	7	0.7	4.90		
Trade reference	5	0.3	1.50		
Average		1	**6.40**	0.30	1.92
Past payment record	8	0.5	4.00		
Profitability	7	0.1	0.70		
Working capital	8	0.1	0.80		
Liquidity	5	0.3	1.50		
Average			7.00	0.50	3.5
Industry and Area	6	1	6.00	0.10	0.6
Bank reference	4	1	4.00	0.10	0.4
Aggregate	50			1.00	**6.42**

Table 12.2 *Credit Risk Classification*

Category	Index Range
Outstanding	9 and above
Good	6 - <9
Average	4 - <6
Below Average	3 - <4
Poor	<3

Total score of client mentioned in Table 12.1 is 50 out of 80, whereas the credit index for this party is 6.42. According to the risk classification given in Table 12.2, this client is in 'good' category and therefore the credit can be granted. Clients with higher risk (lower category and lower index value) may be charged higher price or even denied credit.

NOTES

Sequential credit analysis

Credit analysis is always sequential, which means every credit sales request does not go through all the steps of credit analysis. Neither the details of analysis will be the same. Subsequent stages and the depth of analysis depend on information available and the assessment of creditworthiness at every stage.

If a customer is known and to whom repeat orders are served and has established a good payment record (which may be in memory only), even without any time invested in the credit analysis a firm may grant the credit. Where past track record is not available, the financials of the prospective client are obtained for checking of financial position and preliminary information about the management group is gathered. Trade reference taken only if financial check and management analysis do not give enough confidence about the creditworthiness of the client. Thus, the steps are undertaken in sequence and in required depth as per the degree of confidence developed at every stage.

Statistical analysis for credit decisions

How one can decide the weights for the factors used for the evaluation of the customer requesting credit sales? In a very rudimentary method, weights can be assigned based on judgment. One can also use statistical methods to identify the relevance and importance of various factors associated with bad debt. Multiple regression analysis may help in identifying (a) factors that are showing explanatory power explaining the bad debt and good debt, and (b) the regression coefficients which can be used as weights for each factor. Use of discriminant analysis along with that can also help in developing credit index and its cut-offs for bad credit, good credit and doubtful credits.

12.4.3 Collection and Financing

Selling is easier than collecting the dues. Uncollected sales are a big loss to a company

Collection

The success of a credit policy depends upon effective follow-up and collection of dues. The best actions for this include, keeping track of dues; sending reminders by post or telephone or e-mail or SMS; and taking some strict actions if it is not responded. If timely reminders and personal followup fail, then stopping further supply or charging penal interest or even initiating legal action could be resorted to. Some unusual tactics for quick collection are adopted in some countries. In the Philippines, several companies are sending out their collectors armed with AK-45s, while Japanese suppliers sometimes employ youths dressed in black leather jackets to settle the dues from customers. In the USA, selling debt to collection agencies, which are known for touting is common.

Financing

Some companies might like to play safe, and insist on either (a) promissory notes or (b) acceptance of bill or (c) factoring of receivables, (d) letter of credit from bank or (e) bank guarantee. This way, the chance of timely collection increases, and if cash is needed money can be obtained from bank. That gives extra flexibility.

NOTES

Lockbox system and concentration banking also can be followed for quick collection, encashment and transfer of money. Since credit sales have become a business customary the management should concentrate on its effectiveness. It could be possible only through the well-defined policy and objective, a most systematic approach in creditdecision, proper control on receivables and quick collections efforts without jeopardizing the business interest of the customers. In fact, it needs a very careful approach.

Check Your Progress

8. How are the credit terms expressed?
9. What are some of the unusual tactics employed for quick collection by some countries?

12.5 MONITORING AND CONTROL OF RECEIVABLES

Like any control function, credit control also needs two kinds of approaches: (a) sending early warning forecasts through ratios, and (b) sending full reports.

12.5.1 Ratios

Early warning forecasts include some selected ratios. Receivables level can be set in terms of a percentage of current assets or of sales of the period. The former one is not an appealing basis for planning and control of receivables. High inventory level induces a business to offer better credit to clear off the stock. In that case increased receivables even as a percentage of current assets is should be acceptable. Receivables can be planned in terms of either '% age of sales' or 'receivables turnover' or 'average collection period'. The actual also should be expressed in the same fashion so that respective sales group can understand the amount of deviation from established norms. But this kind of analysis carries many drawbacks. Break up of sales into cash and credit may not be available, seasonality of turnover is also ignored, billing terms are not given any weightage, spread of debtors is also ignored and swing in economy is not taken into account.

Receivables turnover ratio

$$\text{Receivables Turnover Ratio} = \frac{\text{Sales Revenue}}{\text{Receivables}} \qquad (12.1)$$

NOTES

Days sales outstanding

$$\text{Days Sales Outstanding} = \frac{\text{Receivables}}{\text{Daily Sales}} \tag{12.2}$$

where, Daily sales = Sales ÷ 365

One can take average receivables (and average of opening value of receivables and closing value of receivables). The ratios can be calculated on monthly or quarterly basis rather than annual basis, so that seasonality effect can be captured well.

Example 12.7: Receivables Ratios

A company's monthly sales and outstanding receivables at the end of each month of the year 20 × 3 is given below, from which calculate receivable turnovers and 'days sales outstanding' for every quarter:

Month	Sales	Receivables
January	570	1,400
February	650	1,450
March	760	**1,500**
April	720	1,600
May	650	1,700
June	450	**1,800**
July	625	1,900
August	750	2,000
September	925	**1,700**
October	430	1,500
November	450	1,400
December	500	**1,200**

Solution: Receivables turnover ratios are as follows:

Period	Receivables Turnover Ratios
Quarter 1	$\frac{570+650+760}{1,500} = \frac{1,980}{1,500} = 1.32$
Quarter 2	$\frac{720+650+450}{1,800} = \frac{1,820}{1,800} = 1.01$
Quarter 3	$\frac{625+750+925}{1,700} = \frac{2,300}{1,700} = 1.35$
Quarter 4	$\frac{430+450+500}{1,200} = \frac{1,380}{1,200} = 1.15$

Days Sales Outstanding

Period	Days Sales Outstanding
Quarter 1	$\frac{1,500}{(570+650+760)\div 90} = \frac{1,500}{22} = 68.18$
Quarter 2	$\frac{1,800}{(720+650+450)\div 91} = \frac{1,800}{20} = 90.00$
Quarter 3	$\frac{1,700}{(625+750+925)\div 92} = \frac{1,700}{25} = 68.00$
Quarter 4	$\frac{1,200}{(430+450+500)\div 92} = \frac{1,200}{15} = 80.00$
There are 90 days on Q-1; 91 days in Q-2 and 92 days each in Q-3 and Q-4. That is why these numbers are used in calculating daily sales in these quarters.	

The days sales outstanding vary between 68 and 90 days. Quarters 1 and 3 have the low days outstanding whereas the quarters 2 and four have the high days outstanding. If this pattern is observed every year then the quarterly standards should be developed for the comparison of actual data. If number of days outstanding is increasing, it shows unusual situation requiring strengthening of collection efforts, otherwise bad debt may rise.

12.5.2 Reports

For the actual effectiveness of control practices, some more reports should be generated. A few examples are:

- Older than X days receivables
- Account analysis
- Overdue Analysis
- Ageing schedule
- Collection matrix
- **Older than *X* days:** If a firm has adopted a policy of '1/10, net 30' then it may like to get report on
  (a) Per cent (or amount) of sales on cash
  (b) Per cent (or amount) of credit sales older than 10 days and
  (c) Per cent (or amount) of credit sales older than 30 days

  This is more general kind of report and hardly throws any light on the gravity of problem, if any
- **Account-wise analysis:** In some cases, accounts are few but large; or they are fewer and small but with many repeat purchases. In this case, a report can be generated on important of accounts (clients). Such report may contain the information about number of time a client has purchased in a year, average payment period, and other useful information. Account-

NOTES

NOTES

wise analysis may also emphasize on the detailed report of each and every customer buying on credit. Some customers do not pay even on the due date. The list of clients who have not paid on due date is prepared. This list is called Overdue Analysis.

- **Ageing schedule:** Age wise analysis is different from the 'older than *X* days' report. Ageing schedule is selecting more than one range of age of receivables. For example, (a) less than 15 days old, (b) 15 days to 30 days old, (c) 30 days to 45 days old, (d) 45 days to 60 days old, and (e) more than 60 days old. The range of age is company's decision. Thus ageing analysis, which is very popular, gives classification of receivables on the basis of various age groups. The aging schedule can be prepared for either all credits of the year or only the outstanding credit sales as on a particular day. The frequency of ageing schedule can be monthly or quarterly as per the need of the firm. The age group can be flexible and analysis in terms of either amount of dues or percentage due.
- **Collection matrix:** When sales and payment behaviour of clients are not constant over the period the ageing analysis and ratios may not give appropriate information. The collection matrix overcomes this limitation. The collection matrix gives details of the collection pattern of credit sales of a particular period. A sample matrix is given in Table 12.3.

Table 12.3 *Collection Matrix: Collection Percentage of Monthly Credit Sales*

Collected During	January Sales	February Sales	March Sales	April Sales	May Sales	June Sales
Same month	30	28	20	18	18	16
One month after	25	22	18	21	19	18
Two months after	20	22	30	24	25	28
Three months after	15	20	25	24	21	22
Fourth month and later	10	8	7	13	17	16
	100	100	100	100	100	100

One can clearly see the collection efficiency from this matrix. If the policy change has not happened from January to June in this year, it appears that collections have become lax and delay in collection has experienced over this six month period.

12.5.3 Management of Loans and Advance

Companies have to invest some money in 'loan and advances' to suppliers, to contractors, to employees, in the form of deposits with customs, port trust, railway, and advances for income tax. Reasons for such advances could vary from legal requirements to moral duty; and also include 'assurance of supply' and 'good relations with contractor or employees'. At times advances are extended because company has excess liquidity; that means, it is considered as a goodwill investment.

Control of loans and advances as well as collection is again a crucial job. Normally, businesses like to assign the responsibility of follow up to the division recommending the advance, and in case of default even the recommender is held responsible. If proper steps are taken, loans and advances amount can be kept to

the minimum. The steps might include proper screening of advance proposal on casetocase basis, creating authorization scheme, strict follow-up, and charging interest, if needed.

NOTES

12.6 TAX CONSIDERATIONS IN REMITTANCES AND PURCHASES

a. Tax considerations on remittances

Tax on remittances basically places a responsibility on the remitters (or the payers) to withhold a certain part of remittances towards tax liability. This is known as 'withholding tax'. Withholding tax is defined as a government requirement for the payer of an item of income to withhold or deduct tax from the payment, and pay that tax to the government.

Chapter XVII-B of the Income Tax Act, 1961, provides for deduction of tax at source on payments made by any assessee. Section 195 casts an obligation on the person responsible for payment to non-resident to deduct tax at source at the time of payment or at the time of credit of the sum to the account of the nonresident.

Withholding tax rates for payments made to non-residents are determined by the Finance Act passed by the Indian Parliament for various years. The Indian law requires all foreign companies to file return of income, with respect to income being earned from India—even if the applicable taxes have been paid in India. It is so advisable for foreign companies to initiate the process for obtaining a PAN especially if they are receiving certain royalties/fees/interest from their Indian group companies/collaborators.

b. Tax considerations in purchases

As per section 92 (1) of the Income Tax Act, 1961, income from an international transaction shall be computed having regard to the arm's length price (correct market price). And it is not only the sale price that shall be determined as per arm's length price but even the allowances for any expenses and interest arising from an international transaction will be computed evenly. This rule applies even where the international transaction shall comprise only outgoings i.e., expenses and interest.

The arm's length price is critical for companies with international operations and subsidiaries trading with each other. There is often an incentive to reduce the overall tax burden by manipulation of inter-company prices.

The definition of international transaction under the transfer pricing regulations is very wide and in this scope it includes transaction between two associated enterprises in the nature of:

- Purchase, sale or lease of tangible or intangible property, or
- Provision of services, or

Tax collected at source (TCS) at the rate of five per cent will be levied on the money remitted outside India. However, if the remittance is made out of a loan taken for higher education, the TCS rate would be 0.5 per cent of the money remitted. The Finance Act, 2020 has added a new sub-section (1G) in Section 206C in this regard. The remittances to which TCS will apply are those where money is sent outside under the Liberalised Remittance Scheme (LRS) of the Reserve Bank of India (RBI) or purchasing tour packages. LRS allows resident individuals to remit up to $250,000 every financial year to cover expenses related to travelling, medical care, studying, gifts and donations, maintenance of close relatives, among other items. Besides, the remitted sum may also be invested in bonds, debt instruments, and to buy immovable properties abroad. Individuals may also open, retain and hold foreign currency accounts with banks outside India for carrying out transactions allowed under the scheme. However, LRS does not allow purchasing and sale of foreign exchange abroad, or purchase of lottery tickets or sweepstakes, proscribed magazines and so on.

The TCS will be collected at the time of receipt of the sum, or at the time of debiting the amount payable whichever is earlier. The rate shall be further increased by Surcharge and Health & Education Cess if the buyer is a non-resident individual or a foreign corporation. TCS will be collected by the designated dealer or the seller of the package. Shah said: 'The sum paid as TCS will be allowed as credit while furnishing return of income. If there is no tax liability, the sum can also be collected as a refund.' Under the Reserve Bank of India's liberalised remittances system, individuals can remit a limit of $250,000 abroad every year.

Check Your Progress

10. What are the two kinds of approaches needed by credit control?
11. State the Receivables turnover ratio.
12. What maximum amount can be remitted abroad under the Reserve Bank of India's liberalised remittances system?

12.7 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The management of cash and marketable securities is an important area of working capital management, since by effectively managing these liquid resources, the financial manager can maintain desired levels of liquidity and at the same time generate a return on temporarily idle funds.
2. Decentralized collections refers to setting up of multiple collection centres, through which firm can speed up their cash collection and use that money to finance their cash flows.
3. Cash planning is a technique to plan and control the use of cash. Firms use a cash budget for such purposes.

4. The primary function of optimum cash balance models is to provide firms with the ability to develop a system using which they can preserve the most ideal cash balance for themselves.
5. Goals of credit policy, effect of granting credit, factors affecting credit policy and credit terms must be understood before designing a credit policy, within which credit can be granted after adhering to the laid out procedure and evaluation.
6. Credit facility is normally extended with a view to achieving the following objectives:
   a. Maximize profitable sales
   b. Minimize the lock-up of working capital funds
   c. Maximize profitability
   d. Maintain shortest feasible collection period
7. Collection expenses would include administrative costs as well as actual collection costs. While opportunity costs ensue from loss of contribution from the lost sales due to refusal of credit to clients.
8. The expression of credit terms is usually as follows:
   a. Net 45
   b. 2/10, n/30
9. Some unusual tactics for quick collection are adopted in some countries. In the Philippines, several companies are sending out their collectors armed with AK-45s, while Japanese suppliers sometimes employ youths dressed in black leather jackets to settle the dues from customers. In the USA, selling debt to collection agencies, which are known for touting is common.
10. Like any control function, credit control also needs two kinds of approaches: (a) sending early warning forecasts through ratios, and (b) sending full reports.
11. State the Receivables turnover ratio.

$$\text{Days Sales Outstanding} = \frac{\text{Receivables}}{\text{Daily Sales}}$$

12. Under the Reserve Bank of India's liberalized remittances system, individuals can remit a limit of $250,000 abroad every year.

12.8 SUMMARY

- Cash is the lifeblood of business enterprise. Its steady and healthy circulation throughout the entire business operation is the basis of business solvency.
- Some firms are less attuned to take risk and prefer to keep more cash on hand to meet unforeseen circumstances. Precautionary motive reduces the stress level.

NOTES

- In any case, a firm should aim to rotate the cash-to-cash cycle faster so that total investment in operating assets is kept at minimum without any additional exposure to risk in terms of profit as well as liquidity.
- Cash planning is a technique to plan and control the use of cash. Firms use a cash budget for such purposes. A projected cash flow statement can be prepared for this purpose.
- Controlled disbursement is a method via which an institution increases its funds for the purposes of investments or the payment of debts.
- The optimum cash balance is a vital part of cash management because that is how firms calculate their requirements of cash and other things in advance.
- Trade credit should not be granted just because the firm needs to make sales, or just because the customer wants to purchase on credit. It has to be a part of well-thought of credit policy.
- A good credit policy may increase sales and profits without significantly increasing the investment in working capital and without much loss on bad debt.
- Credit policy comprises credit terms, which includes the credit period, cash discount if any, mode of payment, and penalty clauses.
- A firm that offers credit must design a system for credit analysis of a client and identify deserving clients from those who do not deserve the grant of credit.
- In establishing an optimum credit policy, the financial manager must consider the important decision variables which influence the level of receivables.
- Credit policy comprises credit terms, which includes the credit period, cash discount if any, mode of payment, and penalty clauses.
- A firm that offers credit must design a system for credit analysis of a client and identify deserving clients from those who do not deserve the grant of credit.
- The success of a credit policy depends upon effective follow-up and collection of dues. The best actions for this include, keeping track of dues; sending reminders by post or telephone or e-mail or SMS; and taking some strict actions if it is not responded.
- Some companies might like to play safe, and insist on either (a) promissory notes or (b) acceptance of bill or (c) factoring of receivables, (d) letter of credit from bank or (e) bank guarantee.
- Like any control function, credit control also needs two kinds of approaches: (a) sending early warning forecasts through ratios, and (b) sending full reports.
- Tax collected at source (TCS) at the rate of five per cent will be levied on the money remitted outside India. However, if the remittance is made out of a loan taken for higher education, the TCS rate would be 0.5 per cent of the money remitted.

NOTES

12.9 KEY WORDS

- **Lockbox System:** It is a bank-operated mailing address to which a company directs its customers to send their payments. The bank opens the incoming mail, deposits all received funds in the company's bank account, and scans the payments and any remittance information.
- **Promissory Notes:** A promissory note is a legal instrument, in which one party promises in writing to pay a determinate sum of money to the other, either at a fixed or determinable future time or on demand of the payee, under specific terms.

12.10 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short-Answer Questions

1. Write a short note on the motives for keeping cash.
2. What are the different types of credit policies?
3. Write a short note on credit terms.
4. How is the approach of reports used for credit control?

Long-Answer Questions

1. Describe the different facets of cash management in detail.
2. Discuss the factors that affect credit policy.
3. Explain the process of credit analysis.
4. Comment on taxation of remittances and purchases.

12.11 FURTHER READINGS

Patel, Bhavesh. 2014. *Fundamentals of Financial Management*. New Delhi: Vikas Publishing House.

Khan, M.Y. and Jain, P.K. 2007. *Financial Management- Text Problems and Cases.* New Delhi: Tata McGraw-Hill.

Chandra, Prasanna. 2004. *Financial Management: Theory and Practice.* New Delhi: Tata McGraw-Hill.

Kulkarni, P.V. and B. G. Satyaprasad. 2002. *Financial Management.* New Delhi: Himalaya Publication House.

Websites

Business standard's article 'decoded: 5% tax on foreign fund transfers that may go up to 10% for some'. (September 2020)<https://www.business-standard.com/>

UNIT 13 DIVIDEND THEORIES

NOTES

Structure

13.0 INTRODUCTION

There are various theories regarding relationship between dividend distribution and value of firm. All these theories can be grouped as relevance and irrelevance theories. Proponents of relevance theories claim that dividend distribution is relevant to the value of firms i.e., there is a relationship between payment of dividend and its market value whereas proponents of irrelevance theories claim that dividend distribution does not affect the value of the firm i.e., relationship between payment of dividend and its market value does not exist. In this unit, we will discuss the assumptions and limitations of dividend theories. It will also focus on the implications and contributions of these theories in financial decision-making process.

13.1 OBJECTIVES

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

- Explain the assumptions of dividend theories
- Discuss the limitations of dividend theories
- Describe the implications and contributions of these theories in financial decision-making process

13.2 VALUATION UNDER GORDON AND WALTER THEORIES

In this section, you will learn about two major dividend relevance theories by James Walter and Myron Gordon.

NOTES

(i) Walter's Theory

Walter theory of dividend policy is considered as a relevance theory because it states that the dividend policy always affects the value of firm. Research paper of Prof. James E. Walter with the subject 'Dividend policy: its influence on the value of enterprise' was published in Journal of Finance in 1963. His research and proposed model clearly shows the relevance of dividend distribution for the valuation of firm or market price of shares. He showed the relationship between cost of capital k and rate of return r, contributing positively in the value of firm.

This model is based on the following assumptions:

- **Infinite time**: Life of a business/firm is infinite and business will last for a very long time.
- **No change in proportion of dividend and retained earnings**: (EPS and DIV remain constant). Once decisions related to the DIV and EPS have been made by the company, these decisions will be constant afterwards.
- **Total internal financing**: Firm finances its funds requirement from its retained earnings only. Firm does not issue new equity or fresh debt.
- **Constant rate of return and cost of capital:** Rate of return (r) on the firm's investment remains constant. Similarly, cost of capital for the business/ firm (k) also remains constant.
- **100% payout or retention**: Firms either distribute 100% of their earnings or they retain 100%.

As per this model, market price of a share is the sum of present value of the infinite stream of the constant dividend and present value of the infinite stream of capital gain which is presented in the following equation:

$$P = \left(\frac{Div}{k}\right) + \frac{r/k}{k}\ (EPS - Div)$$

Here, P is market price of share, Div is dividend per share, EPS is earnings per share, r is rate of return and k is cost of capital or capitalization rate. In the above mentioned equation, first part is the discounted value of all future dividend payments and second part of the equation is present value of capital gain. In nut shell, we can say that the value of a share is dependent upon the present value of all future streams of dividend and present value of all future capital gains. The above equation can be re-written as follows:

$$P = \frac{Div + \left(r/k\right)(EPS - Div)}{k}$$

This theory can be explained further with the help of following example. Three types of firms are discussed here. Growth firm, where r > k, normal firm where, r = k and declining firm, where r < k. In all these three situations, (growth, normal and declining firm) dividend policy has different impact on the market price of the shares.

NOTES

Growth Firm (r > k)	Normal Firm (r = k)	Declining Firm (r < k)
r = 20%	r = 10%	r = 5%
k = 10%	k = 10%	k = 10%
EPS = Rs.10	**Dividend Payout Ratio 50%**	
$P = \left(\frac{5}{0.10}\right) + \frac{0.20/0.10}{0.10}(10-5)$	$P = \left(\frac{5}{0.10}\right) + \frac{0.10/0.10}{0.10}(10-5)$	$P = \left(\frac{5}{0.10}\right) + \frac{0.05/0.10}{0.10}(10-5)$
P = 150	**P = 100**	**P = 75**

Now, we will consider different dividend payout ratios and see their impact on the market price of shares. In the following table, we have assumed different dividend payout ratios to see the effect of change in dividend payout ratio,

Growth Firm (r>k)	Normal Firm (r=k)	Declining Firm (r<k)
1) Dividend payout is 20%		
$P = \left(\frac{2}{0.10}\right) + \frac{0.20/0.10}{0.10}(10-2)$	$P = \left(\frac{2}{0.10}\right) + \frac{0.10/0.10}{0.10}(10-2)$	$P = \left(\frac{2}{0.10}\right) + \frac{0.05/0.10}{0.10}(10-2)$
P = 180	**P = 100**	**P = 60**
2) Dividend payout is 80%		
$P = \left(\frac{8}{0.10}\right) + \frac{0.20/0.10}{0.10}(10-8)$	$P = \left(\frac{8}{0.10}\right) + \frac{0.10/0.10}{0.10}(10-8)$	$P = \left(\frac{8}{0.10}\right) + \frac{0.05/0.10}{0.10}(10-8)$
P = 120	**P = 100**	**P = 90**
3) Dividend payout is 100%		
$P = \left(\frac{10}{0.10}\right) + \frac{0.20/0.10}{0.10}(10-10)$	$P = \left(\frac{10}{0.10}\right) + \frac{0.10/0.10}{0.10}(10-10)$	$P = \left(\frac{10}{0.10}\right) + \frac{0.05/0.10}{0.10}(10-10)$
P = 100	**P = 100**	**P = 100**

Summary table of dividend payout ratio and Market price of share

Dividend Policy	**Growth Firm (r>k)**	**Normal Firm (r=k)**	**Declining Firm (r<k)**
Dividend payout is 20%	180	100	60
Dividend Payout Ratio 50%	150	100	75
Dividend payout is 80%	120	100	90
Dividend payout is 100%	100	100	100

In the above table, it is clear that in case of growth firm as firm is increasing its payout ratio its market prices goes down. The reason for this is that firm has more growth opportunities than its investors which is clear from the relationship between cost of capital and rate of return. In case of normal firm, market price of share is irrespective of the dividend payout ratio. The reason for this is that both firm and investors have similar opportunities of investments. In case of declining firm, market price of share increases with the increase in dividend payout ratio

Summary of Results

• Growth Firm: Internal Rate More Than Opportunity Cost of Capital (r > k)	• For a growth firm optimum dividend policy is to retain 100% earnings
• Normal Firms: Internal Rate Equals Opportunity Cost of Capital (r = k)	• For a normal firm optimum dividend policy has no effect on the value of firm.
• Declining Firms: Internal Rate Less Than Opportunity Cost of Capital (r < k)	• For a declining firm optimum dividend policy is to distribute 100% earnings as dividend

NOTES

Criticism of Walter's Model

Walter's Model was criticized because:

- Rate of returns does not remain constant.
- Assumptions related to the external financing cannot be considered appropriate as firm uses both external and internal financing.
- Cost of capital does not remain constant.

(ii) Gordon's Model

Gordon's model is also based on relevance theory but he has given some more justification for it. This model was developed by Myron J Gordon in his work entitled 'The investment, financing and valuation of corporations'. This model is based on some assumptions discussed as follows:

- Firm uses only equity source of financing to finance its investment requirements.
- Cost of capital (k) and rate of return (r) remains constant in this theory too.
- No external financing and no taxes.
- Rate of retention remains constant once decided.
- Cost of capital (k) is greater than growth rate (g). This is the most important assumption of this model. If cost of capital (k) is not greater than growth rate (g) then it is very difficult to calculate the market price of the share.

As per this model, market price of a share is equal to the present value (PV) of infinite stream of dividends on that shares. This is called dividend capitalization technique of calculating market price of a share. The equation for dividend capitalization model is as follows:

$$P_0 = \frac{Div_1}{(1+k)} + \frac{Div_2}{(1+k)^2} + \frac{Div_3}{(1+k)^3} + \cdots + \frac{Div_\infty}{(1+k)^\infty} = \sum_{t=1}^{\infty} \frac{Div_t}{(1+k)^t}$$

Dividend is expected to grow in future when company retains its earnings.

$$Div_t = (1-b)EPS_t$$

NOTES

Dividend is the multiplication of (1-retention ratio) i.e. payout ratio and earnings per share. In all the equity firms, it is assumed that total earnings are reinvested/ retained so that the growth rate, g = br per period. Here, b is retention ratio and r is rate of return. When growth in dividend is incorporated in the above equation of P0, then the equation becomes,

$$P_0 = \frac{Div(1+g)}{(1+k)} + \frac{Div(1+g)^2}{(1+k)^2} + \frac{Div(1+g)^3}{(1+k)^3} + \cdots + \frac{Div(1+g)^\infty}{(1+k)^\infty} = \sum_{t=1}^{\infty} \frac{Div\ (1+g)^t}{(1+k)^t}$$

After solving above equation it will become,

$$P_0 = \frac{Div_1}{k-g}$$

or

$$\boldsymbol{P_0 = \frac{EPS_1(1-b)}{k-br}}$$

In the above equation, it is clearly depicted that there is a relationship in cost of capital, rate of return, earnings per share, retention ratio and market price of the firm. This relationship will be clearer by the following example:

Growth Firm (r > k)	**Normal Firm (r = k)**	**Declining Firm (r < k)**
r = 20%	r = 10%	r = 5%
k = 10%	k = 10%	k = 10%
EPS = Rs.10		
Retention Ratio (b) =80% Payout ratio = 20%		
$\boldsymbol{P_0 = \frac{EPS_1(1-b)}{k-br}}$		
$\boldsymbol{P_0 = \frac{10(1-0.80)}{0.10-(0.80x\ 0.20)}}$ In this case, cost of capital k is not greater then g=br=0.16. so in such case this model is not applicable. This is in consensus with the assumption of this model that k>g.	$\boldsymbol{P_0 = \frac{10(1-0.80)}{0.10-(0.80x\ 0.10)}}$ **P_0 = 100**	$\boldsymbol{P_0 = \frac{10(1-0.80)}{0.10-(0.80x\ 0.05)}}$ **P_0 = 33.33**

Let us take different retention and payout ratio to understand it better.

NOTES

Growth Firm (r>k)	Normal Firm (r=k)	Declining Firm (r<k)
1) Retention Ratio (b) = 100% Payout ratio = 0%		
$P_0 = \frac{10(1-1)}{0.10-(1x\ 0.20)}$	$P_0 = \frac{10(1-1)}{0.10-(1x\ 0.10)}$	$P_0 = \frac{10(1-1)}{0.10-(1x\ 0.05)}$
P = indeterminate	P = 100	P = indeterminate
2) Retention Ratio (b) = 60% Payout ratio = 40%		
$P_0 = \frac{10(1-0.60)}{0.10-(0.60x\ 0.20)}$	$P_0 = \frac{10(1-0.60)}{0.10-(0.60x\ 0.10)}$	$P_0 = \frac{10(1-0.60)}{0.10-(0.60x\ 0.05)}$
In this case too k is less than g.	P = 100	P = 57.15
3) Retention Ratio (b) = 40% Payout ratio = 60%		
$P_0 = \frac{10(1-0.40)}{0.10-(0.40x\ 0.20)}$	$P_0 = \frac{10(1-0.40)}{0.10-(0.40x\ 0.10)}$	$P_0 = \frac{10(1-0.40)}{0.10-(0.40x\ 0.05)}$
P = 300	P = 100	P = 75
3) Retention Ratio (b) = 10% Payout ratio = 90%		
$P_0 = \frac{10(1-0.10)}{0.10-(0.10x\ 0.20)}$	$P_0 = \frac{10(1-0.10)}{0.10-(0.10x\ 0.10)}$	$P_0 = \frac{10(1-0.10)}{0.10-(0.10x\ 0.05)}$
P = 112.50	P = 100	P = 94.75

Summary table of dividend payout ratio and Market price of share

Dividend Policy	Growth Firm (r>k)	Normal Firm (r=k)	Declining Firm (r<k)
Retention Ratio (b) = 100%	- Here k<g	100	-
Retention Ratio (b) = 80%	- Here k<g	100	33.33
Retention Ratio (b) = 60%	- Here k<g	100	57.15
Retention Ratio (b) = 40%	300	100	75
Retention Ratio (b) = 10%	112.50	100	94.75

Thus, it is clear from the above table that a growth firm should retain more, a declining firm should distribute more to have more market prices of the shares. In case of normal firm market price is indifferent towards the market price.

üGrowth Firm: Internal rate is more than the opportunity cost of capital (r > k)

- Retains 100% earnings.
- Normal Firms: Internal rate is equal to the opportunity cost of capital (r = k)

NOTES

- No effect on the value of firm.
- Declining Firms: Internal rate is less than the opportunity cost of capital (r < k)
- Distributes 100% earnings as dividend

Criticism of Gordon's Model

Gordon's Model was criticized because:

- Rate of returns does not remain constant.
- Assumptions related to the external financing. Firm uses both external and internal types of financing.
- Cost of capital does not remain constant.

Check Your Progress

1. How are the dividend theories categorized?
2. What is the basic assumption of Gordon's model of relevance theory?

13.3 DIVIDEND IRRELEVANCE UNDER M. M. THEORY: ASSUMPTIONS AND LIMITATIONS

The Miller-Modigliani theory is irrelevant theory as it claims that dividend policy of a firm does not affect the value of a firm. M-M gives an argument to support its view that the value of firm is the function of its earning which is dependent upon the investment policy not on its dividend policy. As per this theory, the value of a firm is dependent on earnings of the firm which is also dependent upon the investment decisions and investment policy of the firm. Thus, value of firm is not dependent on the dividend decisions of a firm rather it is dependent on the investment decisions which also influence the dividend decisions.

The nitty-gritty of MM hypothesis is that shareholders do not depend on the dividend for attaining cash. In the absence of flotation cost, transaction cost, taxes on the dividend and capital gain (assumption of MM hypothesis) less restriction on selling shares, investors can generate cash by selling their shares. As a result, high payout firms need not grasp higher price for their shares.

This theory is also dependent on some assumptions. A brief explanation of these assumptions is as follows:

- An assumption of perfect capital market in which investors behave rationally, there are large number of buyers and sellers, fair price of the product, free flow of information, no transaction cost and no flotation cost.
- Risk of uncertainty does not exist as per this theory. Investor can forecast future earnings and dividend with accuracy.

- Firm has fixed investment policy.
- Taxes do not exist on dividend and capital gain too.

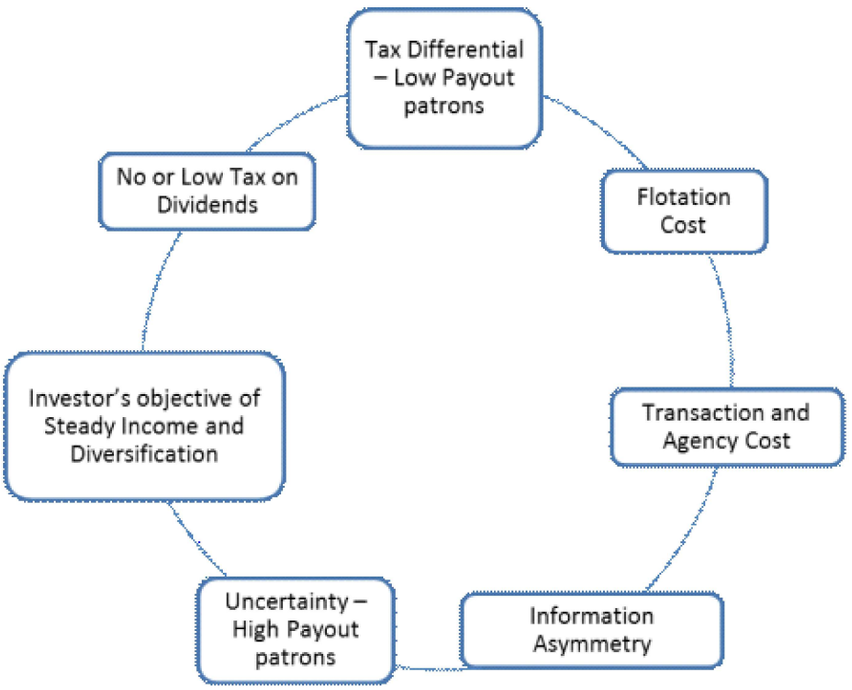


Fig. 13.1 *MM Hypothesis*

We know that the rate of return of a share includes two components, one is dividend and other one is capital gain. Therefore, return on a share r includes following:

$$r = \frac{Dividends\ and\ capital\ gain\ (losses)}{Share\ Price}$$

$$r = \frac{Div_1 + (P_1 - P_0)}{P_0}$$

As per the assumptions of MM theory, r will be equal for all shares. If it is not then investor will sell low return yielding shares and buy high return yielding shares. This buying and selling will make return on all these shares equal. MM valuation model can be re-written as follows:

$$r = \frac{Div_1 + (P_1 - P_0)}{P_0}$$

or

$$P_0 = \frac{\mathrm{Div_1 + P_1)}}{\mathrm{1 + k}} \text{ (As r = k)}$$

$$V = nP_0 = \frac{n(Div_1 + P_1)}{(1 + k)}$$

NOTES

NOTES

Now, let us suppose that firm sells m number of new shares at price P1. We can also adjust thus in the above equation at time 0,

$$V = nP_0 = \frac{nDiv_1 + nP_1 + mP_1 - mP_1)}{(1+k)}$$

$$V = nP_0 = \frac{nDiv_1 + (n+m)P_1 - mP_1}{(1+k)}$$

Above equation makes it clear that in such situations firm can issue new shares and pay dividend too unlike earlier two models of dividend. As per this model, dividend and investment policies are not mystified. The investment projects of a firm can be financed through its retained earnings or new issue of shares. New issue of shares will be calculated as follows:

$$mP_1 = Invst_1 - (NP_1 - nDiv_1)$$

Here, Invest1 is the amount of new investment by the firm, NP is net profit of the firm and is the total amount of dividend distributed on existing shares. Now, putting this equation in the above equation,

$$V = nP_0 = \frac{nDiv_1 + (n+m)P_1 - (Invst_1 - (NP_1 - nDiv_1))}{(1+k)}$$

$$V = nP_0 = \frac{\cancel{nDiv_1} + (n+m)P_1 - Invst_1 + NP_1 \cancel{- nDiv_1}}{(1+k)}$$

$$V = nP_0 = \frac{(n+m)P_1 - Invst_1 + NP_1}{(1+k)}$$

Example 13.1

Mani Ltd. has 200000 outstanding shares of ₹ 100 each currently. The firm has a net profit of ₹ 45,00,000 and wants to make new investment of ₹ 35,00,000 during the year. The firm is also thinking of declaring a dividend of ₹ 10 per share. The firm's opportunity cost of capital is 10%. Calculate the price of the share at the end of the year a) when company pays dividend b) when company does not pay dividend.

Solution:

$$P_0 = \frac{\mathrm{Div}_1 + \mathrm{P}_1)}{1 + \mathrm{k}}$$

By solving this equation for P1.

$$P_1 = P_0(1+k) - Div_1$$

When dividend is paid:

$$P_1 = 100(1 + 0.10) - 10 = 100$$

When dividend is not paid:

$$P_1 = 100(1 + 0.10) - 0 = 110$$

It is clear from the above calculation that in both the cases i.e., when dividend is paid or when dividend is not paid overall situation of the investor of Mani ltd will remain same.

The number of new shares issued by the company,

$$mP_1 = Invst_1 - (NP_1 - nDiv_1)$$

$$m105 = 3500000 - (450000 - (200000x10))$$

$$m105 = 1000000$$

$$m = 9524\ shares$$

NOTES

13.4 IMPLICATIONS AND CONTRIBUTIONS OF THEORIES IN FINANCIAL DECISION MAKING PROCESS

Any dividend policy that is adopted by a company has some definite implications. These are also called as hypothesis.

Signalling/Information content effect hypothesis

The announcement of dividends and dividend history is sending signals to the market and investors, who derive some inferences from it. Dividend decisions reveal some implied information therefore it is also called as 'information content effect'. Merton Miller and Kevin Rock suggested that dividend announcements convey tacit information to investors regarding the firm's future prospects. Findings of some researches show that increase in dividends increases the share price and reduction in dividends reduces the share price largely due to an interpretation of tacit information or signal that such changes in dividend announcements send to the market. In an asymmetric information situation the managerial knows more than the shareholders and therefore, shareholders read signals from the managerial actions.

Clientele effect hypothesis

The clientele effect hypothesis is based on the belief that managerial decisions need not be taken keeping in mind the profile of the shareholders but independent of it. This hypothesis believes that depending on the managerial decisions the shareholders of suitable profile will gravitate around the company. Clientele effect

NOTES

is another term for 'shareholder preference'. Investors invest with different purposes. Some invest in growth firm for capital gain, knowing that dividend will not be paid for a long time. Some others invest in firms that pay good dividends and provide a predictable income stream. Their choice is affected by their incomegroup, tax rates and attitude towards the risk. However, some researchers have observed that purpose of shareholding has a very little influence over the dividend decision variable. This could be due to two reasons: (i) there are no means in the hands of the company to know the purpose of shareholding and (ii) the share prices are being dominated by speculators in absence of any large shareholding groups having active trading into the shares. This has also led to the thinking that clientele effect can be created by the company through its dividend policy. If a company wants to have more small investors, it would pay constant dividends. Dividend policy that creates an opportunity for the capital gain is more likely to attract large investors.

Free cash flow hypothesis

Free cash flow hypothesis is based on the assumption that everything else being equal, a company that pays dividends from cash flows that cannot be reinvested in positive net present value projects, have higher values than companies that retain free cash flows. This implies the 'need for funds' concept. If a firm has free cash flow and no profitable projects, it is advisable to pay more dividends and vice-a-versa.

Effect on share price

The debate started with the 'dividend irrelevance' theory propagated by Modigliani and Miller was based on the effect of dividend policy on the share price. Many other researchers have given various models using a interface between the equity share prices and the dividend policy. They support the dividend relevance theory and advocate how to determine the dividend policy for maximizing the shareholder value.

As you have already learnt in the previous sections, Walter's model based on some assumptions shows that the dividend policy is relevant to the value of share, and thereby to the cost of equity. His proposals in a nutshell are:

- If $r > K_e$ the firm should adopt zero pay-out policy
- If $r < K_e$ the firm should adopt 100% pay-out policy
- If $r = K_e$ the firm should be indifferent to zero dividend and 100% pay-out policy.

Thus, full pay-out and no pay-out are the two alternatives that emerge from Walter's model. He has given the mathematical equation given in Equation 13.1.

$$P = \frac{D}{K_e} + \frac{\left(\frac{r}{K_e}\right) \times (E - D)}{K_e} \qquad (13.1)$$

NOTES

where, P = Market price of share

D = Dividend per share

r = Rate of return on firm's investments

K_e = Cost of equity

E = Earnings per share

Walter's model suffers with limitations because of its impractical assumptions that there is no external financing, earnings are constant, etc.

As already explained in an earlier section, Gordon model is somewhat different though it also supports dividend relevance theory and infers that regular dividends affect the share prices. Risk averse investors believe that income from dividend is certain than income from future capital gain. Therefore they discount the future capital gain at the higher rate. The dividends thus offer greater share value rather than the capital gain opportunity, unless capital gain opportunity outsmarts the current earnings and dividends. The mathematical formula of Gordon model is given in Equation 13.2,

$$P = \frac{E(1-b)}{K_e - br} \tag{13.2}$$

where, P = Market price of share

E = Earnings per share

b = Retention ratio (1 – pay-out ratio)

r = Rate of return on firm's investment

K_e = Cost of equity

br = growth rate of the firm (g)

This model assumes that the retention ratio *b* and rate of return *r* give growth rate of the firm, which is *br* or *g* and that the cost of equity is constant and greater than the growth rate.

These models are mentioned above to support the argument that the dividend policy has a bearing on the share price.

Check Your Progress

3. What is the basic principle of Miller-Modigliani theory?
4. What do you mean by free cash flow hypothesis?
5. What is the mathematical formula of Gordon's model?

13.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

NOTES

1. Dividend theories are categorised as relevance theories and irrelevance theories.
2. The basic assumption of Gordon's model of relevance theory is that the cost of capital (k) is greater than growth rate (g).
3. As per Miller-Modigliani theory, value of a firm is dependent on earnings of the firm which is also dependent upon the investment decisions and investment policy of the firm.
4. The free cash flow hypothesis is based on the assumption that everything else being equal, a company that pays dividends from cash flows that cannot be reinvested in positive net present value projects, have higher values than companies that retain free cash flows.
5. The mathematical formula of Gordon's model is:

$$P = \frac{E(1-b)}{K_e - br}$$

13.6 SUMMARY

- There are various theories regarding relationship between dividend distribution and value of firm. All these theories can be grouped as relevance and irrelevance theories.
- Walter theory of dividend policy is considered as a relevance theory because it states that the dividend policy always affects the value of firm.
- As per Walter's model, market price of a share is the sum of present value of the infinite stream of the constant dividend and present value of the infinite stream of capital gain.
- Gordon's model is also based on relevance theory but he has given some more justification for it. This theory was developed by Myron J Gordon in his work entitled 'The investment, financing and valuation of corporations'.
- As per Gordon's model, market price of a share is equal to the present value (PV) of infinite stream of dividends on that shares. This is called dividend capitalization technique of calculating market price of a share.
- The Miller-Modigliani theory is irrelevant theory as it claims that dividend policy of a firm does not affect the value of a firm.
- As per MM theory, value of a firm is dependent on earnings of the firm which is also dependent upon the investment decisions and investment policy of the firm.

- As per MM model, dividend and investment policies are not mystified. The investment projects of a firm can be financed through its retained earnings or new issue of shares.
- Any dividend policy that is adopted by a company has some definite implications. These are also called as hypothesis.
- The clientele effect hypothesis is based on the belief that managerial decisions need not be taken keeping in mind the profile of the shareholders but independent of it.
- Walter's model suffers with limitations because of its impractical assumptions that there is no external financing, earnings are constant, etc.

13.7 KEY WORDS

- **Payout:** It is an expected financial return from an investment over a given period of time; it may be expressed on an overall or periodic basis as either a percentage of the investment's cost or in a real dollar amount.
- **Rate of Return:** A Rate of Return (RoR) is the net gain or loss of an investment over a specified time period, expressed as a percentage of the investment's initial cost.

13.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short-Answer Questions

1. What are the assumptions of Gordon's Model?
2. Briefly explain the effects of dividend theories on share price.

Long-Answer Questions

1. Discuss Walter's theory of dividend in detail.
2. Explain the Miller-Modigliani theory with the help of an example.

13.9 FURTHER READINGS

Patel, Bhavesh. 2014. *Fundamentals of Financial Management*. New Delhi: Vikas Publishing House.

Khan, M.Y. and Jain, P.K. 2007. *Financial Management- Text Problems and Cases.* New Delhi: Tata McGraw-Hill.

Chandra, Prasanna. 2004. *Financial Management: Theory and Practice.* New Delhi: Tata McGraw-Hill.

Kulkarni, P.V. and B. G. Satyaprasad. 2002. *Financial Management.* New Delhi: Himalaya Publication House.

UNIT 14 DIVIDEND POLICY

NOTES

Structure

14.0 INTRODUCTION

The earnings of a firm are required to be distributed among shareholders as dividends. The management of a firm formulates policies in order to carry out this process. These policies are covered under dividend decisions. Dividend policy is essentially the financing policy because it determines the retained earnings. Dividend means share out of profit, or that part of net earning which is paid to shareholders. The Income Tax Act, 1961 has defined dividend under Section 2(22) as 'any distribution of accumulated profits when it entails a release of assets or part thereof'. In this unit, we will discuss the concept of dividend policy and its types, along with share valuation practices. We will also focus on factors affecting dividend decision and tax considerations in dividend decision when tax is levied at the hands of companies and recipients.

14.1 OBJECTIVES

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

- Explain the concept of dividend policy and its types
- Discuss the factors affecting dividend decision
- Describe the tax considerations in dividend decision when tax is levied at the hands of companies and recipients

14.2 DIVIDEND POLICY

NOTES

Dividend policy is only a problem for those firms with positive earnings. It is both a problem and an opportunity for such firms. It is an opportunity because by the way of distributing dividends they can satisfy the shareholders. It is a problem as well, since no solid theory has yet been developed with which optimal dividend policy can be defined.

Profit-making firms face a dilemma because they have to decide whether to give returns in cash to the shareholders, or to use the funds earned by them for further investment. Substantial cut in dividend rate, even out of the need for investment could drop the share price which is an indicator of shareholders' wealth. Investors would like to sell not only because they would not be receiving dividends, but also because of the strong perception that dividend reveals something about future earnings. Cash dividend may be viewed as a signal of future stream of dividend to investors. Contrary to that when firms concurrently pay dividends and raise capital through security issues to stockholders, there are reasons to believe that a reduction in dividend payment could lead to an increase in share value.

Therefore, whether to pay dividends or retain profits is a dilemma. If dividends give immediate cash flow to the shareholders directly from the company, the retention of money deployed in a profitable manner would increase the share price and offer the capital gain, which is usually either not taxed or taxed at lower rate and that too after the indexation only when shares are sold. This is not only a 'to-pay or not-to-pay' dilemma but the right decision would create better shareholder value, especially when shareholder expectation and company policy perfectly match with each other. The reasons for a dividend dilemma are briefly summarized as below:

- Shareholders expect adequate and regular dividends and also expect the company to retain money for future profits.
- If dividends give immediate cash to the investors, a possibility of capital gain expected from the retention of profits (rather than payment of dividends) is sometimes valued more.
- Retained profit is less expensive ownership money because it involves no issue expenditure. Readers know that less expensive funds create better value.
- Investors pay tax at the personal income tax rates on the dividend income whereas capital gain tax is usually low. The burden of either income tax or capital gain tax depends on the tax law of the nation as well as the income level of an investor.

Most companies try to balance between the payment and retention of profits and attempt to create shareholder value.

NOTES

14.2.1 Types of Dividend Policies

The dividend is paid in cash as per the legal requirements of the Companies Act, 1956 (now the new Companies Act 2013). Dividend policy is expected to keep 'shareholders' confidence' as its focal point. Shareholder confidence is built through a consistency in dividend payment. The choice of dividend policy affects the value of the enterprise. A company may like to follow any of the policies discussed below.

Fixed-rate dividend policy

When a company keeps the dividends per share constant every year, it is called a 'fixed rate dividend policy'. If profit is less, then the company would draw funds from the accumulated profits but would pay a constant rate of dividends. Shareholders get a kind of assurance about the rate of dividend, though the company's plan for reinvestment based growth would depend on the amount it is able to reinvest after paying the fixed rate.

Fixed-plus-extra dividend policy

Investors want a guarantee as well as more money if more profit is earned by the company. Also, it is very common for the shareholders to expect last dividend as the minimum for the coming year also. Therefore, some companies adopt a dividend policy that almost guarantee a fixed percentage of dividends (which is usually lower) and pay extra dividends depending on the profits. The carefully charted communication would make the shareholders realize that extra dividends cannot be for ever, or it can be variable. For example, through the action and communication a company may pay a fixed dividend of ₹5 per share and ₹1 extra in the year.

Step-up-dividend-rate policy

This is essentially a fixed-rate dividend policy but when the company sees an opportunity for permanently increasing the dividend rate, it would do so and keep the new rate constant for some time before increasing it further. Growth companies are more likely to adopt this policy. Growth brings more profits enabling the company to pay more. Many companies adopt this policy, which readers would know from the study of dividend history of any company like Microsoft.

Stable dividend payout policy

In this policy companies predetermine the portion of profit that it would like to use for the payment of dividends and would plough back the rest. As a result the dividend rate fluctuates in proportion to and in the direction of profit changes.

Example 14.1: Calculating the dividend per share

For example, a company follows a policy of 30% pay-out policy. It earned the following profits in the last three years:

2018: ₹10,00,000

2019: ₹20,00,000

2020: ₹12,00,000

If the company has 1,00,000 shares outstanding, calculate for each of the above years the amount of dividend and the dividend per share.

Solution: 2018: 10,00,000 × 0.30 = 3,00,000 Total dividends;

DPS: 3,00,000 ÷ 1,00,000 = ₹3.00

2019: 20,00,000 × 0.30 = 6,00,000 Total dividends;

DPS: 6,00,000 ÷ 1,00,000 = ₹6.00

2020: 12,00,000 × 0.30 = 3,60,000 Total dividends;

DPS: 3,60,000 ÷ 1,00,000 = ₹3.60

Thus, in the stable dividend pay-out policy the dividends as well as retained profits would vary depending on the profits.

Residual dividend policy

Companies which consider dividend decision as a part of the financing policy would like to follow the residual dividend policy. In this policy, the companies first determine the investment needs, and retain the profit accordingly. If net profit is lesser than investment requirement, no dividend is paid. In the absence of any investment opportunity, entire profit will be distributed. The dividend rate would be too fickle.

Example 14.2: Dividends in residual dividend policy

A company follows a residual dividend policy and pays dividends only if it has a surplus profit after meeting its retention requirement. The company has projected the profits and its requirements for the retention of profits as follows over the next three years:

Year	Expected Profits	Retention Required
2017	₹50,00,000	₹38,00,000
2018	₹75,00,000	₹75,00,000
2019	₹90,00,000	₹60,00,000

If the company has 150,000 outstanding shares, calculate the amount of projected dividend and dividend per share for these three years.

NOTES

NOTES

Solution:

Year (1)	Expected Profits (2)	Retention Required (3)	Projected Dividends (4 = 2 - 3)	Projected DPS (5 = 4 ÷ number of shares)
2017	₹50,00,000	₹38,00,000	₹12,00,000	12,00,000 ÷ 1,50,000 = ₹8.00
2018	₹75,00,000	₹75,00,000	Zero	Zero
2019	₹90,00,000	₹60,00,000	₹30,00,000	30,00,000 ÷ 1,50,000 = ₹20.00

Research shows that past dividend rate and industry dividend rate influence the dividend decision of a company and hence the dividend pay-out fluctuates. Most companies desired to pay a stable dividend rate yet half of them were unable to stick to the policy. A negative correlation between profit ratio and pay-out ratio is also found by some researches. All these findings prove that companies try to maintain the dividend rate, and are ready to step it up only if they are sure of being able to maintain it later on. In case of a lean profit period, companies do not hesitate to go for a higher pay-out, if they can maintain the dividend rate; and when they are forced to reduce the rate, the reduction is kept to the minimum. Once again, it proves the theory that dividend is a 'primary and active' decision variable.

Check Your Progress

1. Why is a dividend policy problem and opportunity for firms with positive earnings?
2. How is shareholder's confidence build?

14.3 SHARE VALUATION PRACTICES

Dividends must be paid in cash only. However, companies do distribute the benefits to shareholders through issue of bonus shares, which is also called as stock-dividends. This is the indirect benefit given to the shareholders. Bonus shares mean the distribution of additional shares free of charge to the existing shareholders. Bonus shares do not immediately result into the dilution of liquidity, but imposes a commitment on future cash-flow, since companies would normally like to maintain the rate of dividend even after the issue of bonus shares.

Issue of bonus shares is just an accounting entry in which accumulated reserves are transferred to the share capital and against that the new shares are issued to the shareholders. This increases the number of outstanding shares of the company and reduces reserves and surplus. The net worth is, however, unaffected. Earnings per share and market price of share should fall after the bonus issue. But, if the company is likely to maintain 'dividend per share' the bonus issue might increase the total value of the firm. Most successful companies can use the bonus issue as an important instrument to keep the dividend rate within a reasonable limit on one side, and giving very good returns to the shareholders on the other side, without getting into the visible signs of undercapitalization.

The normative goal of bonus issue should be to improve the market price of equity shares. But Dr. L.C. Gupta found in his study that the effect of bonus announcement on share prices was haphazard. Ojha's study also did not show much impact of bonus shares on valuation of firm. Dr. Gupta's observation is that the objective of issuing bonus was not mainly to increase total dividend distribution, but the practices had extreme diversity. This observation could be a true reason for haphazard response of equity price to bonus announcement. One third of the companies did not increase the total volume of dividend on the enlarged capital, and a significant number of them even reduced the quantum of dividend. Ojha also commented that maintaining dividend on enhanced capital base lacked proper weightage. Roughly half of the sample companies had reduced the dividend as a percentage of paid up capital. Dhameja also observed the same trend. It seems that companies paying high dividend rate usually had higher bonus ratios, and these companies could maintain the dividend as a percentage to paid-up capital. Obviously, the valuations of these companies have gone up.

Bonus issues, therefore, should not be in lieu of dividend, but it should be additional one, if value of the firm and shareholders' wealth has to be maximized. This happens because, percentage appreciation in share price are higher than percentage increase in dividend. It is not so in all cases of bonus issue.

Table 14.1 *Bonus Shares History: Tata Steel*

Announcement Date	Bonus Ratio
07/06/2004	1 : 2
11/09/1987	2 : 5
11/09/1981	2 : 5
11/09/1967	2 : 5
11/09/1959	1 : 5
11/09/1954	1 : 1

Tata Steel's history of bonus share issue is given in Table 14.1. The bonus ratio 1:2 means the holder of two shares was given one bonus share in the year 2004. In the year 1987 holder of five shares was given two bonus shares. Microsoft has not issued any bonus shares in its history.

14.3.1 Regulations on Bonus Shares

The Companies Act, 2013 does not give any rules governing the issue of bonus shares. However, Securities and Exchange Board of India issues SEBI (Disclosures and Investor Protection) Guidelines. The important provisions of these guidelines are:

1. Pre-requisites
    a. Company must have been authorised to pay bonus shares in its articles of association.
    b. Bonus shares can be issued out of free reserves created out of genuine profits and security premiums collected in cash only.

NOTES

c. Company should not have defaulted in interest payment or repayment of loans or in making any statutory payments.

d. Bonus shares are not paid in lieu of dividends.

e. After the issue of bonus share the share capital should not exceed the authorised share capital.

f. Bonus shares cannot be issued if outstanding shares are partly paid up.

g. Approval of banks and other lenders, if required, must be obtained.

2. Process

a. Notify the Stock Exchange about the date of Board meeting in which bonus share issue proposal is listed on agenda.

b. Decide and communicate 30 days in advance the book closure dates for this purpose.

c. Board of Directors need to (i) decide/recommend the issue of bonus shares as per the articles of association, (ii) authorise some officer to decide the dates for fixing a record date.

d. Intimate the Stock Exchange about the Board decision.

e. Where shareholder approval is not needed, implement bonus issue within 15 days of the Board decision.

f. General meeting must decide in favour of issue of bonus shares, where articles of association warrant so.

g. Where general meeting has approved the issue of bonus shares, the issue of bonus share must be completed within 2 months of the general meeting decision.

h. File return with the Registrar of Companies within 30 days of issue of bonus shares.

i. Apply for listing of new share certificates.

14.3.2 Stock Split

One more way the companies can distribute benefits to shareholders is by splitting the shares. One share is split into two or more in the stock-split action. For example, Tata Steel split its ₹100 face value share into 10 shares of ₹10 each in the year 1996. Microsoft has split shares many times in its history. Table 14.2 gives the stock split history of Microsoft and Table 14.3 gives the same for Tata Steel.

NOTES

Table 14.2 *Stock Split History of Microsoft*

Payable date	Split Ratio	Closing Price	
		Before	After
Sept. 18, 1987	2 for 1	$114.50	$53.50
April 12, 1990	2 for 1	$120.75	$60.75
June 26, 1991	3 for 2	$100.75	$68.00
June 12, 1992	3 for 2	$112.50	$75.75
May 20, 1994	2 for 1	$097.75	$50.63
December 6, 1996	2 for 1	$152.875	$81.75
February 20, 1998	2 for 1	$155.13	$81.63
March 26, 1999	2 for 1	$178.13	$92.38
February 18, 2003	2 for 1	$048.30	$24.96

Table 14.3 *Stock Split: Tata Steel*

Payable Date	Split Ratio
03/01/1996	10 for 1

Technically the stock split should not make any difference as it is neither a cash transaction nor even an accounting entry. Just face value of share is reduced and more shares are distributed. Still, stock split is a popular method of distribution among the shareholders, especially in USA.

Performance of companies reflects in the share price. If the share price is very high the small investors cannot afford to buy them and demand may decline. Therefore, when share prices are high a company may split the share so that the price per share will decline and come within the affordable range for the small investors. This will increase demand and liquidity of share. It has remained the interest of researchers to study the effect of stock-split on the valuation of firm. The findings are mix. A glance at Table 9.2 on the stock-split history of Microsoft and share prices before and after the announcement also gives a mix picture.

Appropriate procedure must be followed for the stock-split also. The procedure involves almost the similar steps as for bonus issues with some change in timeline. Board must decide, the book closure must be affected, stock exchange must be informed, effect be given in certain time frame and also get the new shares listed.

Reverse stock split

As the terms indicate the shares are merged or combined in the reverse split. Defined number of share is merged into one. The number of outstanding shares reduces but the market capitalisation would remain the same after the reverse split. For example, City Bank went for reverse split in the ratio of 1 to 10 and merged ten shares into one in 2011. Reverse split is helpful in reporting higher earnings per share, which would act as a confidence boosting act sometimes. If the company wants to change its clientele from small investors to large ones, the reverse split becomes a useful tool.

NOTES

14.3.3 Stock Repurchase

Stock repurchase, also known as buyback of shares, involves the company making offer to all its shareholders to buy back its own shares at the specific price. The company will need cash to pay for the buyback and will have the reduced number of outstanding shares. In India companies were not allowed to buy back shares for long time. Since only 1999 in India companies are allowed to buy back their own shares, subject to some rules.

When buyback is useful

The stock repurchase is advisable in certain situations:

- When shares are undervalued in the market
- If the company has cash surplus for a long period of time
- If the management wants to increase the controlling interest in the company
- If the management intends to take the company private
- To block the takeover attempt
- To achieve the targeted debt-equity structure

Undervalued shares

Often shares of companies are not traded at the fair prices. If the management is of the view that shares are undervalued, they may like to buy back the shares and send positive signals in the market about the fair price.

Surplus cash

The undervaluation may also occur when a company is sitting on huge amount of cash surplus and has no profitable investments on horizons. Cash on hand, no investment opportunity and low share price is a perfect situation for the management to start buyback.

Increase in controlling interest

Buyback of shares reduce the number of outstanding shares without reducing the shares held by the management group. Thus, management group's holding percentage will increase without investing more money in the company.

Taking company private

Through the buyback the management can take a publicly traded company private. There are many reasons taking a public company private can be beneficial. This process is subject to law of the land.

Block takeover bid

When a management senses a hostile takeover bid the company may try to foil the attempt by pushing up the market price, which can be done by making a counter offer of buyback at a higher price making it expensive for the hostile takeover.

NOTES

Achieving targeted capital structure

Buyback of shares reduce the equity and increase the debt-equity ratio without taking more debt. If the current financial leverage is inadequate, and the company has some more risk appetite the buyback would serve good purpose of achieving targeted debt-equity structure.

Important rules governing buyback

Buy back is subject to some rules, important of which are given below:

1. It should have been authorised by the articles of association of the company.
2. Shares must be fully paid up.
3. If the buyback is 10% or less of the paid up capital a simple resolution in Board is enough, otherwise a special resolution in general meeting is needed.
4. Buyback can be done only after six months of the previous buyback.
5. Buyback must be completed within 365 days.
6. Buyback should be 25% or less of the paid up capital and free reserves.
7. The debt-equity ratio should not fall below 2:1 after the buyback.
8. Companies also need to adhere to the stipulations of SEBI, if shares are listed on the stock exchange.
9. The shares can be bought back from the free reserve only and the sum equal to the nominal value of shares must be deposited in the capital redemption reserve account.
10. Buyback of shares can be done in any of the following ways:
    - From existing shareholders on proportionate basis.
    - Through either open market or through book-building process.
    - From buying odd lots on recognised market.
    - By purchasing shares issued to employees under the stock option plan.
    - By buying the sweat equity.

14.3.4 Capital Structure Substitution Theory and Dividends

Whether to pay dividends or use the cash for stock repurchase is always a dilemma for managers. The Capital Structure Substitution Theory attempts to suggest a conceptual solution to this dilemma. This theory is describes the relationship between earnings, stock price and capital structure of a publicly traded company. This theory is based on the assumption that the company management attempts to attain a capital structure that maximises the earnings per share. The attempt to attain a capital structure, which maximises the earnings per share makes the debt-equity decision dynamic and therefore explains why some companies pay dividends and others do not.

NOTES

The capital structure substitution theory recognises the fact that there is difference between the capital gain tax and tax on dividends and therefore, investors are expected to prefer capital gain. Despite this preference, in some cases stock repurchase leads to reduction in the earnings per share.

The capital structure substitution theory is useful in drawing the inference that the companies with debt-equity ratio will decide whether paying dividend is advisable or stock repurchase based on the following equation:

$$\frac{D}{E} > \frac{1-T_C}{1-T_D} - 1 \qquad (14.1)$$

where, D = debt

E = equity

T_C = capital gain tax rate

T_D = Tax rate on dividends

If the debt-equity ratio is greater than the right side of the equation, the company should opt for dividend payment to maximise the earnings per share and thereby to increase the firm value. If the current debt-equity is less then buyback or the stock repurchase is advisable. With the same logic we can say that only-equity company should prefer stock repurchase as a value maximising exercise.

14.3.5 Factors Affecting Dividend Decision

In absence of any sound theoretical solution to the problem regarding a dividend policy, the idea of important managerial considerations assumes a lot of significance. In practice the following factors are taken into account while designing the dividend policy:

- **Amount of earnings:** The level of earnings is the prime factor affecting the dividend policy of a company. The level of earnings is measured in terms of 'earnings per share' because dividends are paid in 'dividend per share'. Accumulated profits also have some implications on the dividend policy of a company.
- **Cash flows:** Dividends are paid in cash. Therefore, cash profits and total cash flow become meaningful factors in determining the dividend policy. It is not prudent to borrow for the purpose of the dividend payment.
- **Tax incidence:** Tax implications on dividend payment have some bearings on the pragmatic dividend policy. In India currently the shareholders do not pay income tax on dividend income received from the domestic companies, but the companies distributing dividends pay 15 per cent dividend distribution tax and also surcharges on it. This may be beneficial for high income shareholders but detrimental to the interest of low income shareholders. The dividend behaviour of the companies would change with such tax provisions.

- **Need for funds:** Generally, it is assumed that companies in need of funds would keep the low pay-out and vice versa. But some researchers have observed that future investment intention and loss of funds in research and accumulated burden of tax-liability were of very little importance in dividend policy, even when external funds were found costlier. This once again proves that companies treat the dividend decision as primary decision. The author found that growth-oriented companies, new breed of management and the new companies followed the retention oriented policy. Even large companies did not emphasize on use of internal financing in their financial policy-making as compared to small and medium companies. This could be due to a variety of reasons, like, large companies might have got built-in debt capacity and shareholders are always watchful of financial signals of large companies.
- **Liquidity of the firm:** Firms with a cash crunch position would not like to aggravate it by the way of lenient dividend policy. However, firms in distress are also found to even borrow and pay dividends, if they have some profits but face cash crisis. However, a prudent practice would support the conservation of liquidity through dividend policy. Cash rich companies would like to pay more dividends.
- **Ability to borrow:** When the dividend decision is considered to be primary, a company would not like to retain too much unless it is unable to borrow from the market. However, it is also true that the retained earnings increase the equity, which enhances the borrowing power of the firm.
- **Controlling interest:** Persons with controlling interest in the company matter a lot in dividend decisions. It is clearly noticed that most of the group companies and multinational companies indicated the intention to draw out funds as early as possible.
- **Restrictions:** The dividend payment is governed by the Companies Act, 1956 (and now by the new Companies Act 2013). Institutional investors also often impose restrictive clauses on the dividend payment. The flexibility of companies in making dividend decision is within the boundary of these legal and contractual restrictions.
- **Risk of takeover bid:** A dividend policy that pulls down the share prices exposes the company to a chance of takeover. If a company is viewed distributing dividends despite having growth opportunities may start losing its share prices. Likewise a company, which is distributing less dividends despite having not much growth opportunities is also likely to face fall in share prices. In both the situations chance of takeover bid increases.
- **Criticism of high dividends:** A firm paying very high dividends may be perceived to be wooing investors and send wrong signals that not everything is well in the company. This happens when there are reasons for not distributing very high dividends and still a company does so.

NOTES

14.3.6 Tax Considerations in Dividend Decision when Tax is Levied at the Hands of Companies and Receipients

MM's assumption that taxes do not exist is far from reality. Investors have to pay taxes on dividends and capital gains. But different tax rates are applicable to dividends and capital gains. Dividend income is generally treated as the ordinary income, while capital gains are specially treated for tax purposes. In most countries, the capital gains tax rate is lower than the marginal tax rate for ordinary income. From the tax point of view, a shareholder in high tax bracket should prefer capital gains over current dividends for two reasons: (i) the capital gains tax is less than the tax on dividends, and (ii) the capital gains tax is payable only when the shares are actually sold. The effect of the favourable tax differential in case of capital gains will result in tax savings. As a consequence, the value of the share should be higher in the internal financing case than in the external financing one. Thus, the tax advantage of capital gains over dividends strongly favours a low-dividend payout policy. This implies that investors will pay more for low-dividend yield shares. Tax differential should attract tax clienteles. Investors in high-tax brackets should own low-payout shares, and those in low-tax bracket should own high-payout shares. In reality, most investors may have marginal income tax rate higher than the capital gains tax rate. Thus, dividends, on an average, are considered bad since they will result in higher taxes and reduction in the wealth of shareholders. Tax differential generally favours low-payout clientele.

Consider an example. Two identical firms X and Y have different dividend policy. Both have after tax profit, of ₹100. X pays 100 per cent dividend. Y does not pay any dividend and shareholders get capital gains. Assume further that capital gains from shares held at least for one year are taxed at 20 per cent and marginal income tax rate is 40 per cent. Suppose Y's shareholders are in highest tax bracket and pay tax on dividend income at 40 per cent. X's shareholders will receive dividends of '100 and their after-tax dividend income will be: ₹100 (1 – 0.40) = ₹60. Y's shareholders will realize capital gains of '100 and their after-tax capital gains will be: ₹100 (1 – 0.20) = ₹80. Y's shareholders are better off as they have tax advantage. Since the after tax equity income of Y's shareholders is higher than X's shareholders and since both firms are identical in all other respects, Y's equity price will be higher. To match capital gain of ₹1 of Y's shareholders, X's shareholders should receive dividend of ₹1.33:

After-tax dividend = After-tax capital gain

$$(1 - 0.40)\,DIV = (1 - 0.20)$$

$$DIV = 0.80/0.60 = 1.33$$

If X's shareholders get dividend of ₹1.33 and Y's shareholders get capital gain of '1, both will have after-tax income of ₹0.80.

If a tax system favours capital gains to dividend income, there may still be several investors who are in lower tax brackets. These investors investing in shares will prefer dividend income rather than capital gains. Thus, there may exist high-

payout clientele. In a tax system that treats dividends more favourably than capital gains, shareholders in high tax brackets will also prefer receiving dividends rather than capital gains. Under this tax system, dividends will be considered good and it will generally attract high-payout clientele. This situation prevails currently in India. There is no tax on dividend income in the hands of shareholders (both individuals and companies), but companies are required to pay dividend distribution tax on dividends paid to shareholders. Short-term capital gains are taxed is the hands of shareholders. As a result of this system, shareholders in India will prefer to receive current dividends rather than capital gains. Since companies paying dividends are required to pay additional tax, this taxation system may create a conflict between shareholders and companies. Companies would like to pay no or low dividends to save dividend distribution tax while shareholders would like to have more dividends as they have no tax liability on the dividend income. If the objective of the companies is to maximize the wealth of shareholders, the Indian tax system augurs for paying higher dividends.

India is an exception where dividends are not taxed but capital gains are. In most countries, tax systems favour capital gains with no or low tax rates as compared to dividends. Thus, the preference for low-payout or high-payout shares will depend on the tax status of the individual investors.

Check Your Progress

3. What are bonus shares?
4. What is the stock-split action?
5. Why should a shareholder in high tax bracket prefer capital gains over current dividends from the tax point of view?

14.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. A dividend policy is both a problem and an opportunity for firms with positive earnings. It is an opportunity because by the way of distributing dividends they can satisfy the shareholders. It is a problem as well, since no solid theory has yet been developed with which optimal dividend policy can be defined.
2. A shareholder's confidence is built through a consistency in dividend payment.
3. Bonus shares mean the distribution of additional shares free of charge to the existing shareholders. Bonus shares do not immediately result into the dilution of liquidity, but imposes a commitment on future cash-flow, since companies would normally like to maintain the rate of dividend even after the issue of bonus shares.

NOTES

4. One more way the companies can distribute benefits to shareholders is by splitting the shares. One share is split into two or more in the stock-split action.
5. From the tax point of view, a shareholder in high tax bracket should prefer capital gains over current dividends for two reasons: (i) the capital gains tax is less than the tax on dividends, and (ii) the capital gains tax is payable only when the shares are actually sold.

14.5 SUMMARY

- Dividend policy is essentially the financing policy because it determines the retained earnings. Dividend means share out of profit, or that part of net earning which is paid to shareholders.
- Profit-making firms face a dilemma because they have to decide whether to give returns in cash to the shareholders, or to use the funds earned by them for further investment.
- Most companies try to balance between the payment and retention of profits and attempt to create shareholder value.
- The dividend is paid in cash as per the legal requirements of the Companies Act, 1956 (now the new Companies Act 2013). Dividend policy is expected to keep 'shareholders' confidence' as its focal point.
- Investors want a guarantee as well as more money if more profit is earned by the company. Also, it is very common for the shareholders to expect last dividend as the minimum for the coming year also.
- Companies which consider dividend decision as a part of the financing policy would like to follow the residual dividend policy. In this policy, the companies first determine the investment needs, and retain the profit accordingly.
- Dividends must be paid in cash only. However, companies do distribute the benefits to shareholders through issue of bonus shares, which is also called as stock-dividends.
- Issue of bonus shares is just an accounting entry in which accumulated reserves are transferred to the share capital and against that the new shares are issued to the shareholders.
- The normative goal of bonus issue should be to improve the market price of equity shares. But Dr L. C. Gupta found in his study1 that the effect of bonus announcement on share prices was haphazard.
- The Companies Act, 2013 does not give any rules governing the issue of bonus shares. However, Securities and Exchange Board of India has issued SEBI (Disclosures and Investor Protection) Guidelines.

- Reverse split is helpful in reporting higher earnings per share, which would act as a confidence boosting act sometimes. If the company wants to change its clientele from small investors to large ones, the reverse split becomes a useful tool.
- Stock repurchase, also known as buyback of shares, involves the company making offer to all its shareholders to buy back its own shares at the specific price. The company will need cash to pay for the buyback and will have the reduced number of outstanding shares.
- The undervaluation may also occur when a company is sitting on huge amount of cash surplus and has no profitable investments on horizons.
- Buyback of shares reduce the equity and increase the debt-equity ratio without taking more debt.
- The capital structure substitution theory recognizes the fact that there is difference between the capital gain tax and tax on dividends and therefore, investors are expected to prefer capital gain.
- MM's assumption that taxes do not exist is far from reality. Investors have to pay taxes on dividends and capital gains. But different tax rates are applicable to dividends and capital gains.

14.6 KEY WORDS

- **Takeover:** A takeover occurs when one company makes a successful bid to assume control of or acquire another. It can be done by purchasing a majority stake in the target firm. Takeovers are also commonly done through the merger and acquisition process.
- **Article of Association:** Articles of association form a document that specifies the regulations for a company's operations and defines the company's purpose. The document lays out how tasks are to be accomplished within the organization, including the process for appointing directors and the handling of financial records.

14.7 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short-Answer Questions

1. What are the reasons for a dividend dilemma?
2. List the important rules governing buyback.
3. Write a short note on the Capital Structure Substitution theory.

NOTES

Long-Answer Questions

1. Describe the different types of dividend policy.
2. Discuss the factors affecting dividend decision.
3. Explain the tax considerations in dividend decision when tax is levied at the hands of companies and recipients.

14.8 FURTHER READINGS

Patel, Bhavesh. 2014. *Fundamentals of Financial Management*. New Delhi: Vikas Publishing House.

Khan, M.Y. and Jain, P.K. 2007. *Financial Management- Text Problems and Cases.* New Delhi: Tata McGraw-Hill.

Chandra, Prasanna. 2004. *Financial Management: Theory and Practice.* New Delhi: Tata McGraw-Hill.

Kulkarni, P.V. and B. G. Satyaprasad. 2002. *Financial Management.* New Delhi: Himalaya Publication House.