INTERMEDIATE (IPC) COURSE

STUDY MATERIAL

PAPER : 3

COST ACCOUNTING AND FINANCIAL MANAGEMENT

Part – 2 : Financial Management

MODULE – 1

BOARD OF STUDIES

THE INSTITUTE OF CHARTERED ACCOUNTANTS OF INDIA

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A WORD ABOUT STUDY MATERIAL

Financial Management has acquired a critical significance now-a-days, due to liberalization, privatization and globalization. The study of this important subject opens new opportunities for Chartered Accountancy students. Therefore, students need to know the principles and practices of Financial Management and how these maybe applied to any business entity.

This study material provides the basic concepts, theories and techniques relating to Financial Management and deals with conceptual theoretical framework. It has been designed having regard to the distance learning students. The students are expected to cover the entire syllabus. The main features of this study material are as under:

- The entire syllabus has been divided into seven chapters.
- The chapters have been grouped into two modules
    - **Module-1 consisting of four chapters namely:**
        Chapter-1: Scope and Objectives of Financial Management
        Chapter-2: Time Value of Money
        Chapter-3: Financial Analysis and Planning
        Chapter-4: Financing Decisions
    - **Module-2 consisting three chapters namely:**
        Chapter-5: Types of Financing
        Chapter-6: Investment Decisions
        Chapter-7: Management of Working Capital
- Each chapter begins with the learning objectives. The learning objectives would enable you to understand the sequence of various aspects dealt within the chapter before going into the details so that you know the direction of your studies.
- In each chapter, an overview has been given just after the learning objectives. This overview provides a preview of the entire chapter and its relevance in the present context.
- Each chapter has been covered in a step-by-step approach. The text has been explained, where appropriate, through illustrations and practical problems. You should go through the chapter carefully ensuring that you understand the topic.

In this revised edition, certain chapters have been revised to make it more students friendly.

In this Study Material, formats of Financial Statements (i.e. Balance Sheet, Income Statements etc) and financial terms used are for illustrative purpose only. For appropriate format and applicability of various Standards, students are advised to refer the study material of appropriate subject (s).

For any further clarification/ guidance, students are requested to send their queries at bosnoida@icai.in.

STUDY TIPS AND EXAMINATION TECHNIQUE

The aim of this section is to provide general guidance as to how to study for your examinations. The guidance given herein is supplementary to the manner of study followed by you and is intended to improve your existing technique, but aims to give ideas on how to improve your existing study techniques, as it is essential that you adopt methods and techniques with which you feel comfortable.

Passing exams is partly a matter of intellectual ability, but however accomplished you are in that respect you can improve your chances significantly by the use of appropriate study and revision techniques. In this section we briefly outline some tips for effective study during the earlier stages.

Know your Syllabus

- Go through the syllabus carefully.

- Volume I has been divided in seven chapters and units based on syllabus.

- Main topics are as under:

    o Scope and Objectives of Financial Management

    o Time Value Of Money

    o Financial Analysis and Planning

    o Financing Decisions

    o Types of Financing

    o Investment Decisions

    o Management of Working Capital

- Understand the linkages between chapters at macro-level.

Plan your Study

- Make a study plan covering the entire syllabus and then decide how much time you can allocate to the subject on daily/weekly basis.

- Allocation of time must be done keeping in view your office commitments as well as social needs and personal hobbies.

- Maintain the time balance amongst various subjects such as purely descriptive type and numerical-based papers. Allocate time in such a manner that your interest is well sustained and you are able to score well in the final examination as well.

- Always assess your preparation periodically, say, on monthly basis. If necessary, revise your plan and allocate more time for the subject in which you feel deficient.

Preparing Study Strategy

- Read, understand and assimilate each chapter.

- First of all, have an overview of the chapter to understand the broad contents and sequence of various sub-topics.

- Do the introspection while going through the chapter and ask various questions to yourself.

- Read each chapter slowly to ensure that you understand and assimilate the main concept. If need be, read once again with concentration and then try to attempt exercise at the end of the chapter or given in the Practice Manual.

- Recapitulate the main concept after going through each chapter by way of brief notes.

- Prepare notes in the manner you feel comfortable covering all key points. Use mnemonic form e.g. C V P denoting cost, valuation and price.

- One may use highlighter/underlining the significant points or writing down in the margin.

- The fact that how well you have understood the topic is your ability to attempt the questions given in the exercises as well as in the practice manual. Make a serious attempt at producing your own answers but at this stage do not be much concern about attempting the questions in examination based conditions. In particular, at initial stages, it is more important to understand and absorb the material thoroughly rather than to observe the time limits that would apply in the actual examination conditions.

- Always try to attempt the past year examination question paper under examination conditions.

- Revision of material should never be selective in any case. Because broad coverage of the syllabus is more important than preparing 2-3 chapters exhaustively.

- Read through the text along with notes carefully. Try to remember the definition and important formulae.

Examination Technique

- Reach examination hall well in time.

- Plan your time so that equal time is awarded for each mark. Keep sometime for revision as well.

- Always attempt to do all questions. Remember that six average answers fetch more marks than five best answers. Therefore, it is important that you must finish each question within allocated time.

- Read the question carefully more than once before starting the answer to understand very clearly as to what is required by the paper-setter.

- Always be concise and write to the point and do not try to fill pages unnecessarily.

- In case a question is not clear, you may state your assumptions and then answer the question.

- While writing answers in respect of essay-type questions, try to make sub-readings so that it catches the examiner's eye. In case of case-study, be very precise and write your conclusion in a clear manner.

- Reference to standards, guidance notes, section of various legislation, etc be done in a clear-cut manner.

- Revise your answers carefully underline important points before leaving the examination hall.

Happy Reading and Best Wishes!

Syllabus

PAPER – 3 : COST ACCOUNTING AND FINANCIAL MANAGEMENT

(One paper ─ Three hours – 100 Marks)

Level of Knowledge: Working knowledge

PART – II : FINANCIAL MANAGEMENT (50 MARKS)

Objectives:

(a) To develop ability to analyse and interpret various tools of financial analysis and planning,

(b) To gain knowledge of management and financing of working capital,

(c) To understand concepts relating to financing and investment decisions, and

(d) To be able to solve simple cases.

Contents

1. **Scope and Objectives of Financial Management**

    (a) Meaning, Importance and Objectives

    (b) Conflicts in profit versus value maximisation principle

    (c) Role of Chief Financial Officer.

2. **Time Value of Money**

    Compounding and Discounting techniques— Concepts of Annuity and Perpetuity

3. **Financial Analysis and Planning**

    (a) Ratio Analysis for performance evaluation and financial health

    (b) Application of Ratio Analysis in decision making

    (c) Analysis of Cash Flow Statement.

4. **Financing Decisions**

    (a) Cost of Capital — Weighted average cost of capital and Marginal cost of capital

    (b) Capital Structure decisions — Capital structure patterns, Designing optimum capital structure, Constraints, Various capital structure theories

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(c) Business Risk and Financial Risk — Operating and financial leverage, Trading on Equity.

5. **Types of Financing**

   (a) Different sources of finance

   (b) Project financing — Intermediate and long term financing

   (c) Negotiating term loans with banks and financial institutions and appraisal thereof

   (d) Introduction to lease financing

   (e) Venture capital finance.

6. **Investment Decisions**

   (a) Purpose, Objective, Process

   (b) Understanding different types of projects

   (c) Techniques of Decision making: Non-discounted and Discounted Cash flow Approaches — Payback Period method, Accounting Rate of Return, Net Present Value, Internal Rate of Return, Modified Internal Rate of Return, Discounted Payback Period and Profitability Index

   (d) Ranking of competing projects, Ranking of projects with unequal lives.

7. **Management of Working Capital**

   (a) Working capital policies

   (b) Funds flow analysis

   (c) Inventory management

   (d) Receivables management

   (e) Payables management

   (f) Management of cash and marketable securities

   (g) Financing of working capital.

CONTENTS

DETAILED CONTENTS: MODULE – 1

1

Scope and Objectives of Financial Management

Learning Objectives
After studying this chapter you will be able to: • Define Financial Management. • Know the objectives, scope and how it has evolved over a period of time. • Focus on Profit Maximization vis-à-vis Wealth Maximization. • Outline the role of Chief Financial Officer in light of growing needs of a modern organization. • Emphasis on relationship between Financial Management with accounting and other related fields.

Overview
This chapter introduces you to the area of Financial Management. It discusses the evolution, importance, scope and objectives of Financial Management and how this area is inter-related with other subject areas. This chapter is of utmost importance as it deals with the fundamentals of Financial Management. Without a clear understanding of the fundamentals the remainder of the chapters will not be easy to grasp. Therefore, knowledge of the background, the environment to which this paper relates, is important as it helps to put everything learnt later into appropriate perspective.

1.1   Introduction

We will like to explain Financial Management by giving a very simple scenario. For the purpose of starting any new business/venture, an entrepreneur goes through the following stages of decision making:-

Stage 1	Stage 2	Stage 3	Stage 4
Decide which assets	Determining what is total investment	Apart from buying assets the entrepreneur	The next stage is to decide what all sources, does the

(premises, machinery, equipment etc) to buy.	(since assets cost money) required for buying assets.	would also need to determine how much cash he would need to run the daily operations (payment for raw material, salaries, wages etc.). In other words this is also defined as Working Capital requirement.	entrepreneur need to tap to finance the total investment (assets and working capital). The sources could be Share Capital (Including Entrepreneur's own funds) or Borrowing from Banks or Investment from Financial Institutions etc.

While deciding how much to take from each source, the entrepreneur would keep in mind the cost of capital for each source (Interest/Dividend etc.). As an entrepreneur he would like to keep the cost of capital low.

Thus, financial management is concerned with efficient acquisition (financing) and allocation (investment in assets, working capital etc) of funds with an objective to make profit (dividend) for owners.

In other words, focus of financial management is to address three major financial decision areas namely, investment, financing and dividend decisions.

1.2   Meaning of Financial Management

Financial management is that managerial activity which is concerned with planning and controlling of the firm's financial resources. In other words it is concerned with acquiring, financing and managing assets to accomplish the overall goal of a business enterprise (mainly to maximise the shareholder's wealth).

In today's world where positive cash flow is more important than book profit, Financial Management can also be defined as planning for the future of a business enterprise to ensure a positive cash flow. Some experts also refer to financial management as the science of money management.

"Financial Management comprises the forecasting, planning, organizing, directing, co-ordinating and controlling of all activities relating to acquisition and application of the financial resources of an undertaking in keeping with its financial objective." Raymond Chambers

Another very elaborate definition given by Phillippatus is

"Financial Management is concerned with the managerial decisions that result in the acquisition and financing of short term and long term credits for the firm."

As such it deals with the situations that require selection of specific assets (or combination of assets), the selection of specific problem of size and growth of an enterprise. The analysis of these decisions is based on the expected inflows and outflows of funds and their effect on managerial objectives.

There are two basic aspects of financial management viz., procurement of funds and an effective use of these funds to achieve business objectives.

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                                                    ┌─────────────────────┐
                                                    │ Procurement of funds │
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│ Aspects of Financial Managerment  │
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                                                    ┌─────────────────────┐
                                                    │  Utilization of Fund │
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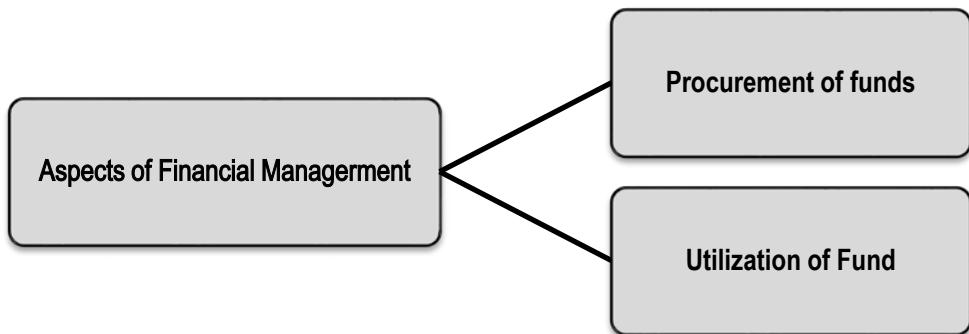
1.2.1   Procurement of Funds: Since funds can be obtained from different sources therefore their procurement is always considered as a complex problem by business concerns. Some of the sources for funds for a business enterprise are:-

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                    ┌──────────────────┐
                    │  Debentures and  │
                    │      Bonds       │
                    └──────────────────┘
      ┌──────────────┐            ┌──────────────────┐
      │ Owners Funds │            │ Hire Purchases & │
      └──────────────┘            │     Leasing      │
                                  └──────────────────┘
  ┌──────────────────┐
  │    Commercial    │            ┌──────────────────┐
  │  Banks (Short,   │            │  Angel Financing │
  │  Medium & Long)  │            └──────────────────┘
  └──────────────────┘
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                    │  Venture Capital │
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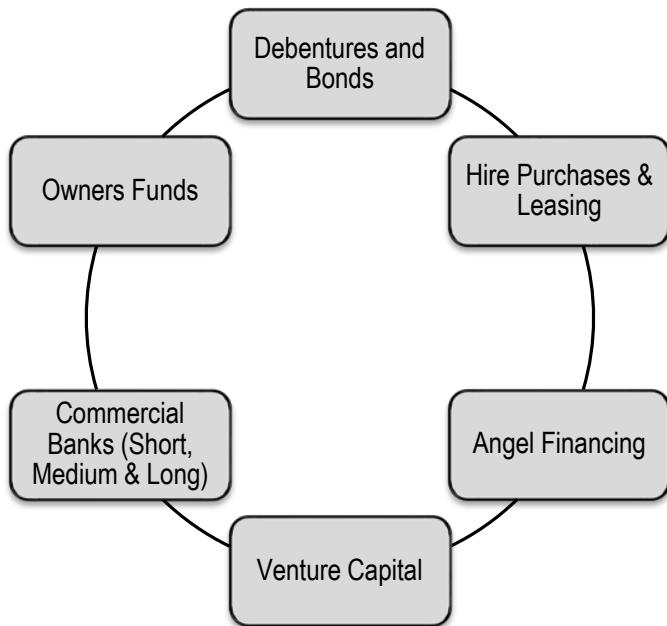
In a global competitive scenario it is not enough to depend on the available ways of raising finance but resource mobilization has to be undertaken through innovative ways or financial products which may meet the needs of investors. We are constantly seeing new and creative sources of funds which are helping the modern businesses to grow faster. For example trading in Carbon Credits is turning out to be another source of funding.

Funds procured from different sources have different characteristics in terms of risk, cost and control. The cost of funds should be at the minimum level for that a proper balancing of risk and control factors must be carried out.

Another key consideration in choosing the source of new business finance is to strike a balance between equity and debt to ensure the funding structure suits the business.

Let us discuss some of the sources of funds:

(a) **Equity:** The funds raised by the issue of equity shares are the best from the risk point of view for the firm, since there is no question of repayment of equity capital except when the firm is under liquidation. From the cost point of view, however, equity capital is usually the most expensive source of funds. This is because the dividend expectations of shareholders are normally higher than prevalent interest rate and also because dividends are an appropriation of profit, not allowed as an expense under the Income Tax Act. Also the issue of new shares to public may dilute the control of the existing shareholders.

(b) **Debentures:** Debentures as a source of funds are comparatively cheaper than the shares because of their tax advantage. The interest the company pays on a debenture is free of tax, unlike a dividend payment which is made from the taxed profits. However, even when times are hard, interest on debenture loans must be paid whereas dividends need not be. However, debentures entail a high degree of risk since they have to be repaid as per the terms of agreement. Also, the interest payment has to be made whether or not the company makes profits.

(c) **Funding from Banks:** Commercial Banks play an important role in funding of the business enterprises. Apart from supporting businesses in their routine activities (deposits, payments etc) they play an important role in meeting the long term and short term needs of a business enterprise. Different lending services provided by Commercial Banks are depicted as follows:-
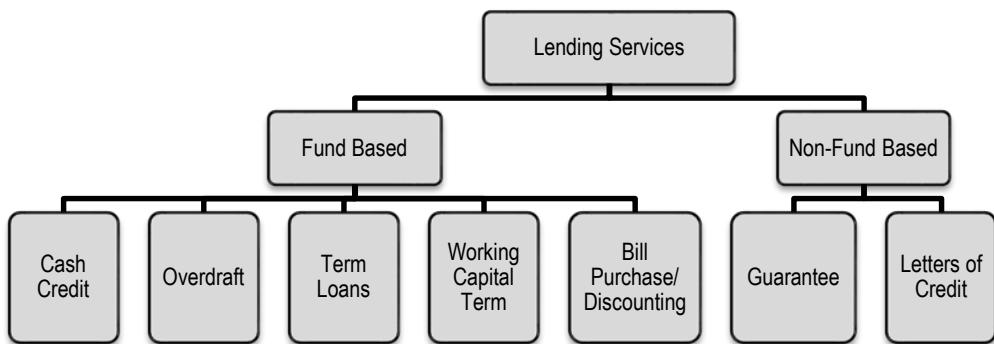
(d) **International Funding:** Funding today is not limited to domestic market. With liberalization and globalization a business enterprise has options to raise capital from International markets also. Foreign Direct Investment (FDI) and Foreign Institutional Investors (FII) are two major routes

for raising funds from foreign sources besides ADR's (American depository receipts) and GDR's (Global depository receipts). Obviously, the mechanism of procurement of funds has to be modified in the light of the requirements of foreign investors.

1.2.2 Effective Utilisation of Funds: The finance manager is also responsible for effective utilisation of funds. He has to point out situations where the funds are being kept idle or where proper use of funds is not being made. All the funds are procured at a certain cost and after entailing a certain amount of risk. If these funds are not utilised in the manner so that they generate an income higher than the cost of procuring them, there is no point in running the business. Hence, it is crucial to employ the funds properly and profitably. Some of the aspects of funds utilization are:-

(a) **Utilization for Fixed Assets:** The funds are to be invested in the manner so that the company can produce at its optimum level without endangering its financial solvency. For this, the finance manager would be required to possess sound knowledge of techniques of capital budgeting.

Capital budgeting (or investment appraisal) is the planning process used to determine whether a firm's long term investments such as new machinery, replacement machinery, new plants, new products, and research development projects would provide the desired return (profit).

(b) **Utilization for Working Capital:** The finance manager must also keep in view the need for adequate working capital and ensure that while the firms enjoy an optimum level of working capital they do not keep too much funds blocked in inventories, book debts, cash etc.

1.3   Evolution of Financial Management

Financial management evolved gradually over the past 50 years. The evolution of financial management is divided into three phases. Financial Management evolved as a separate field of study at the beginning of the century. The three stages of its evolution are:

The Traditional Phase: During this phase, financial management was considered necessary only during occasional events such as takeovers, mergers, expansion, liquidation, etc. Also, when taking financial decisions in the organisation, the needs of outsiders (investment bankers, people who lend money to the business and other such people) to the business was kept in mind.

The Transitional Phase: During this phase, the day-to-day problems that financial managers faced were given importance. The general problems related to funds analysis, planning and control were given more attention in this phase.

The Modern Phase: Modern phase is still going on. The scope of financial management has greatly increased now. It is important to carry out financial analysis for a company. This analysis helps in decision making. During this phase, many theories have been developed regarding

efficient markets, capital budgeting, option pricing, valuation models and also in several other important fields in financial management.

1.4   Importance of Financial Management

Importance of Financial Management cannot be over-emphasized. It is, indeed, the key to successful business operations. Without proper administration of finance, no business enterprise can reach its full potentials for growth and success. Money is to an enterprise, what oil is to an engine.

Financial management is all about planning investment, funding the investment, monitoring expenses against budget and managing gains from the investments. Financial management means management of all matters related to an organization's finances.

The best way to demonstrate the importance of good financial management is to describe some of the tasks that it involves:-

➢   Taking care not to over-invest in fixed assets

➢   Balancing cash-outflow with cash-inflows

➢   Ensuring that there is a sufficient level of short-term working capital

➢   Setting sales revenue targets that will deliver growth

➢   Increasing gross profit by setting the correct pricing for products or services

➢   Controlling the level of general and administrative expenses by finding more cost-efficient ways of running the day-to-day business operations, and

➢   Tax planning that will minimize the taxes a business has to pay.

Let us understand this better by taking an example of a company, Cotton Textiles Limited. The company earns money by selling textiles. Let us assume that it earns ₹ 10 lakhs every month. This is known as revenue. A company has many expenses. Some of the major expenses of the company can be listed as wages to workers, raw materials for making the textile, electricity and water bills and purchase and repair of machines that are used to manufacture the textile.

All these expenses are paid out of the revenues. If the revenues are more than the expenses, then the company will make profit. But, if the expenses are more than revenues, then it will face losses. If it continues like that, eventually, it will lose all its assets. In other words it will lose its property and all that it owns. In that case, even the workers may be asked to leave the company. To avoid this situation, the company has to manage the cash inflows (cash coming into the company) and outflows (various expenses that the company has to meet). This is one of the tasks within the ambit of Financial Management.

1.5   Scope of Financial Management

As an integral part of the overall management, financial management is mainly concerned with acquisition and use of funds by an organization. Based on financial management guru Ezra Solomon's concept of financial management, following aspects are taken up in detail under the

study of financial management:

(a)   Determination of size of the enterprise and determination of rate of growth.

(b)   Determining the composition of assets of the enterprise.

(c)   Determining the mix of enterprise's financing i.e. consideration of level of debt to equity, etc.

(d)   Analysis, planning and control of financial affairs of the enterprise.

The scope of financial management has undergone changes over the years. Until the middle of this century, its scope was limited to procurement of funds under major events in the life of the enterprise such as promotion, expansion, merger, etc. In the modern times, the financial management includes besides procurement of funds, the three different kinds of decisions as well namely investment, financing and dividend. All the three types of decisions would be dealt in detail during the course of this chapter.

The given figure depicts the overview of the scope and functions of financial management. It also gives the interrelation between the market value, financial decisions and risk return trade off. The finance manager, in a bid to maximize shareholders' wealth, should strive to maximize returns in relation to the given risk; he should seek courses of actions that avoid unnecessary risks. To ensure maximum return, funds flowing in and out of the firm should be constantly monitored to assure that they are safeguarded and properly utilized.

An Overview of Financial Management
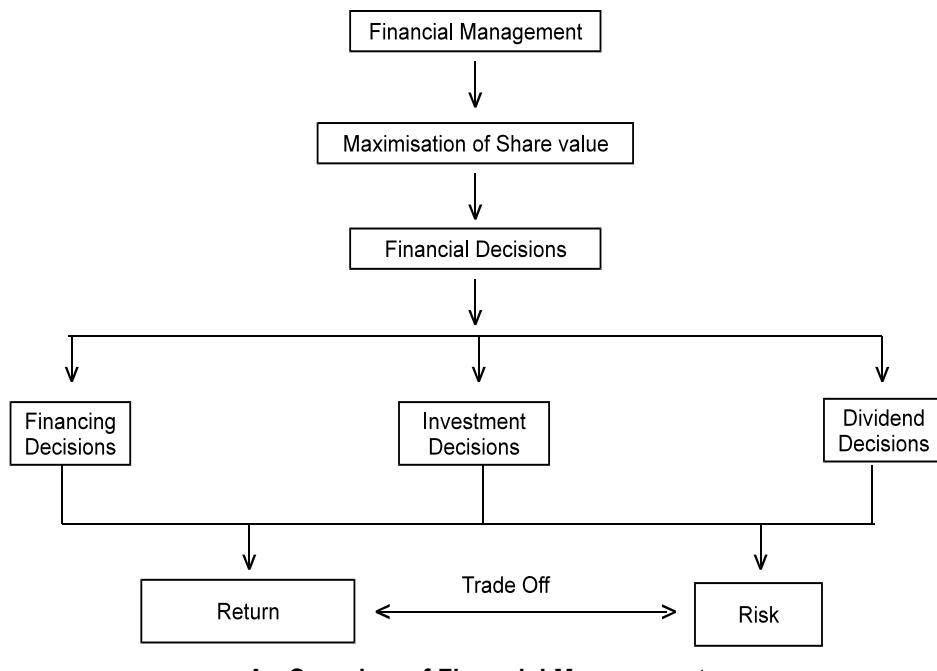
1.6   Objectives of Financial Management

Efficient financial management requires the existence of some objectives or goals because judgment as to whether or not a financial decision is efficient must be made in the light of some objective. Although various objectives are possible but we assume two objectives of financial management for elaborate discussion. These are:

1.6.1 Profit Maximisation : It has traditionally been argued that the primary objective of a company is to earn profit; hence the objective of financial management is also profit maximisation. This implies that the finance manager has to make his decisions in a manner so that the profits of the concern are maximised. Each alternative, therefore, is to be seen as to whether or not it gives maximum profit.

However, profit maximisation cannot be the sole objective of a company. It is at best a limited objective. If profit is given undue importance, a number of problems can arise. Some of these have been discussed below:

(i)   **The term profit is vague.** It does not clarify what exactly it means. It conveys a different meaning to different people. For example, profit may be in short term or long term period; it may be total profit or rate of profit etc.

(ii)   **Profit maximisation has to be attempted with a realisation of risks involved.** There is a direct relationship between risk and profit. Many risky propositions yield high profit. Higher the risk, higher is the possibility of profits. If profit maximisation is the only goal, then risk factor is altogether ignored. This implies that finance manager will accept highly risky proposals also, if they give high profits. In practice, however, risk is very important consideration and has to be balanced with the profit objective.

(iii) **Profit maximisation as an objective does not take into account the time pattern of returns.** Proposal A may give a higher amount of profits as compared to proposal B, yet if the returns of proposal A begin to flow say 10 years later, proposal B may be preferred which may have lower overall profit but the returns flow is more early and quick.

(iv)   **Profit maximisation as an objective is too narrow.** It fails to take into account the social considerations as also the obligations to various interests of workers, consumers, society, as well as ethical trade practices. If these factors are ignored, a company cannot survive for long. Profit maximisation at the cost of social and moral obligations is a short sighted policy.

1.6.2 Wealth / Value Maximisation: We will first like to define what is Wealth / Value Maximization Model. The shareholder value maximization model holds that the primary goal of the firm is to maximize its market value and implies that business decisions should seek to increase the net present value of the economic profits of the firm.

Using Ezra Solomon's symbols and methods, the net present worth can be calculated as shown

below:

(i)   W = V – C

   Where,

      W = Net present worth;

      V = Gross present worth;

      C = Investment (equity capital) required to acquire the asset or to purchase the course of action.

(ii)   V = E/K

   Where,

      E = Size of future benefits available to the suppliers of the input capital;

      K = The capitalization (discount) rate reflecting the quality (certainty/uncertainty) and timing of benefit attached to E.

(iii)   E = G-(M+T+I)

   Where,

      G = Average future flow of gross annual earnings expected from the course of action, before maintenance charges, taxes and interest and other prior charges like preference dividend;

      M = Average annual reinvestment required to maintain G at the projected level;

      T= Expected annual outflow on account of taxes;

      I = Expected flow of annual payments on account of interest, preference dividend and other prior charges.

(iv)   The operational objective of financial management is the maximization of W in Point (i) above.

   The W (Wealth) can also be expressed symbolically by a short-cut method as follows:-

$$W = A_1/(1+K) + A_2/(I+K)\ + ...+ A_n/(1+K)\ - C$$

   Where,

      $A_1,\ A_2,.....A_n$ represents the stream of cash flows expected to occur from a course of action over a period of time;

      K is the appropriate discount rate to measure risk and timing; and

      C is the initial outlay to acquire that asset or purse the course of action.

Thus, it can be observed that the value/wealth maximization decision takes into consideration time value of money and uncertainty of risk.

People buy the shares of a company as an investment with an expectation to gain from increase in wealth of the company. It means that they expect these shares to give them some returns. It is the duty of the finance manager to see that the shareholders get good returns on the shares.

Hence, the value of the share should increase in the share market.

The share value is affected by many things. If a company is able to make good sales and build a good name for itself, in the industry, the company's share value goes up. If the company makes a risky investment, people may lose confidence in the company and the share value will come down. So, this means that the finance manager has the power to influence decisions regarding finances of the company. The decisions should be such that the share value does not decrease. Thus, wealth or value maximization is the most important goal of financial management.

How do we measure the value/wealth of a firm?

> *According to Van Horne, "Value of a firm is represented by the market price of the company's common stock. The market price of a firm's stock represents the focal judgment of all market participants as to what the value of the particular firm is. It takes into account present and prospective future earnings per share, the timing and risk of these earnings, the dividend policy of the firm and many other factors that bear upon the market price of the stock. The market price serves as a performance index or report card of the firm's progress. It indicates how well management is doing on behalf of stockholders."*

<div style="border:1px solid #000; padding:8px">Stockholders hire managers to run their firms for them......</div>

↓ Because stockholders have absolute power to hire and fire managers...

<div style="border:1px solid #000; padding:8px">Managers set aside their interest and maximise stock prices...</div>

↓ Because markets are efficient...

<div style="border:1px solid #000; padding:8px">Stockholders wealth is maximised...</div>

↓ Because lenders are fully protected from shareholders actions...

<div style="border:1px solid #000; padding:8px">Firm value is maximised....</div>

↓ Because there are no costs created for society ...

<div style="border:1px solid #000; padding:8px">Societal wealth is maximised...</div>

Why Wealth Maximization Works? Before we answer this question it is important to first understand and know what other goals a business enterprise may have. Some of the other goals a business enterprise may follow are:-

➢ Achieving a higher growth rate

➢ Attaining a larger market share

➢ Gaining leadership in the market in terms of products and technology

➢ Promoting employee welfare

➢ Increasing customer satisfaction

➢ Improving community life, supporting education and research, solving societal problems, etc.

Though, the above goals are important but the primary goal remains to be wealth maximization, as it is critical for the very existence of the business enterprise. If this goal is not met, public/institutions would lose confidence in the enterprise and will not invest further in the growth of the organization. If the growth of the organization is restricted than the other goals like community welfare will not get fulfilled.

To achieve wealth maximization, the finance manager has to take careful decision in respect of:

(a) **Investment decisions**: These decisions relate to the selection of assets in which funds will be invested by a firm. Funds procured from different sources have to be invested in various kinds of assets. Long term funds are used in a project for various fixed assets and also for current assets. The investment of funds in a project has to be made after careful assessment of the various projects through capital budgeting. A part of long term funds is also to be kept for financing the working capital requirements. Asset management policies are to be laid down regarding various items of current assets. The inventory policy would be determined by the production manager and the finance manager keeping in view the requirement of production and the future price estimates of raw materials and the availability of funds.

(b) **Financing decisions:** These decisions relate to acquiring the optimum finance to meet financial objectives and seeing that fixed and working capital are effectively managed. The financial manager needs to possess a good knowledge of the sources of available funds and their respective costs and needs to ensure that the company has a sound capital structure, i.e. a proper balance between equity capital and debt. Such managers also need to have a very clear understanding as to the difference between profit and cash flow, bearing in mind that profit is of little avail unless the organisation is adequately supported by cash to pay for assets and sustain the working capital cycle. Financing decisions also call for a good knowledge of evaluation of risk, e.g. excessive debt carried high risk for an organization's equity because of the priority rights of the lenders. A major area for risk-related decisions is in overseas trading, where an organisation is vulnerable to currency fluctuations, and the manager must be well aware of the various protective procedures such as hedging (it is a strategy designed to minimize, reduce or cancel out the risk in another investment) available to him. For example, someone who has a shop, takes care of the risk of the goods being destroyed by fire by hedging it via a fire insurance contract.

(c) **Dividend decisions:** These decisions relate to the determination as to how much and how frequently cash can be paid out of the profits of an organisation as income for its owners/shareholders. The owner of any profit-making organization looks for reward for his investment in two ways, the growth of the capital invested and the cash paid out as income; for a sole trader this income would be termed as drawings and for a limited liability company the term is *dividends*.

The dividend decision thus has two elements – the amount to be paid out and the amount to be retained to support the growth of the organisation, the latter being also a financing decision; the level and regular growth of dividends represent a significant factor in determining a profit-making company's market value, i.e. the value placed on its shares by the stock market.

All three types of decisions are interrelated, the first two pertaining to any kind of organisation while the third relates only to profit-making organisations, thus it can be seen that financial management is of vital importance at every level of business activity, from a sole trader to the largest multinational corporation.

1.7   Conflicts in Profit versus Value Maximisation Principle

In any company, the management is the decision taking authority. As a normal tendency the management may pursue its own personal goals (profit maximization). But in an organization where there is a significant outside participation (shareholding, lenders etc.), the management may not be able to exclusively pursue its personal goals due to the constant supervision of the various stakeholders of the company-employees, creditors, customers, government, etc.

Every entity associated with the company will evaluate the performance of the management from the fulfillment of its own objective. The survival of the management will be threatened if the objective of any of the entities remains unfulfilled.

The wealth maximization objective is generally in accord with the interests of the various groups such as owners, employees, creditors and society, and thus, it may be consistent with the management objective of survival.

Owing to limitation (timing, social consideration etc.) in profit maximization, in today's real world situations which is uncertain and multi-period in nature, wealth maximization is a better objective. Where the time period is short and degree of uncertainty is not great, wealth maximization and profit maximization amount to essentially the same.

The table below highlights some of the advantages and disadvantages of both profit maximization and wealth maximization goals:-

Goal	Objective	Advantages		Disadvantages	
Profit Maximization	Large amount of profits	(i)	Easy to calculate profits	(i)	Emphasizes the short term gains
		(ii)	Easy to determine the link between financial	(ii)	Ignores risk or uncertainty
				(iii)	Ignores the timing of

		decisions and profits.	returns (iv) Requires immediate resources.
Shareholders Wealth Maximisation	Highest market value of shares.	(i) Emphasizes the long term gains (ii) Recognises risk or uncertainty (iii) Recognises the timing of returns (iv) Considers shareholders' return.	(i) Offers no clear relationship between financial decisions and share price. (ii) Can lead to management anxiety and frustration.

Example*: Profit maximization can be achieved in the short term at the expense of the long term goal, that is, wealth maximization. For example, a costly investment may experience losses in the short term but yield substantial profits in the long term. Also, a firm that wants to show a short term profit may, for example, postpone major repairs or replacement, although such postponement is likely to hurt its long term profitability.*

Another example can be taken to understand why wealth maximization is a preferred objective than profit maximization.

Illustration 1*: Profit maximization does not consider risk or uncertainty, whereas wealth maximization considers both risk and uncertainty. Suppose there are two products, X and Y, and their projected earnings over the next 5 years are as shown below:*

Year	Product X	Product Y (₹)
1.	10,000	11,000
2.	10,000	11,000
3.	10,000	11,000
4.	10,000	11,000
5.	10,000	11,000
	50,000	55,000

A profit maximization approach would favour product Y over product X. However, if product Y is more risky than product X, then the decision is not as straightforward as the figures seem to indicate. It is important to realize that a trade-off exists between risk and return. Stockholders expect greater returns from investments of higher risk and vice-versa. To choose product Y, stockholders would demand a sufficiently large return to compensate for the comparatively greater level of risk.

1.8   Role of Chief Financial Officer (CFO)

Modern financial management has come a long way from the traditional corporate finance. As the economy is opening up and global resources are being tapped, the opportunities available

to finance managers virtually have no limits.

A new era has ushered during the recent years for chief financial officers. His role assumes significance in the present day context of liberalization, deregulation and globalisation.

Changing Role of the CFO
"Today's CFO team is expected to add value well beyond the traditional roles of cost management, controls and acting as the conscience of the organisation. These roles are challenging enough, but today's CFO is expected to work in collaboration, by serving as the integration hub for key business processes, as a catalyst for change including business transformation, and as a consultant or trusted business advisor in helping to create sustainable growth." Jeff Thomson, IMA President and CEO

To sum it up, the chief financial officer of an organisation plays an important role in the company's goals, policies, and financial success. His responsibilities include:

(a) *Financial analysis and planning:* Determining the proper amount of funds to employ in the firm, i.e. designating the size of the firm and its rate of growth.

(b) *Investment decisions:* The efficient allocation of funds to specific assets.

(c) *Financing and capital structure decisions:* Raising funds on favourable terms as possible i.e. determining the composition of liabilities.

(d) **Management of financial resources (such as working capital).**

(e) *Risk management*: Protecting assets.

The figure below shows how the finance function in a large organization may be organized.
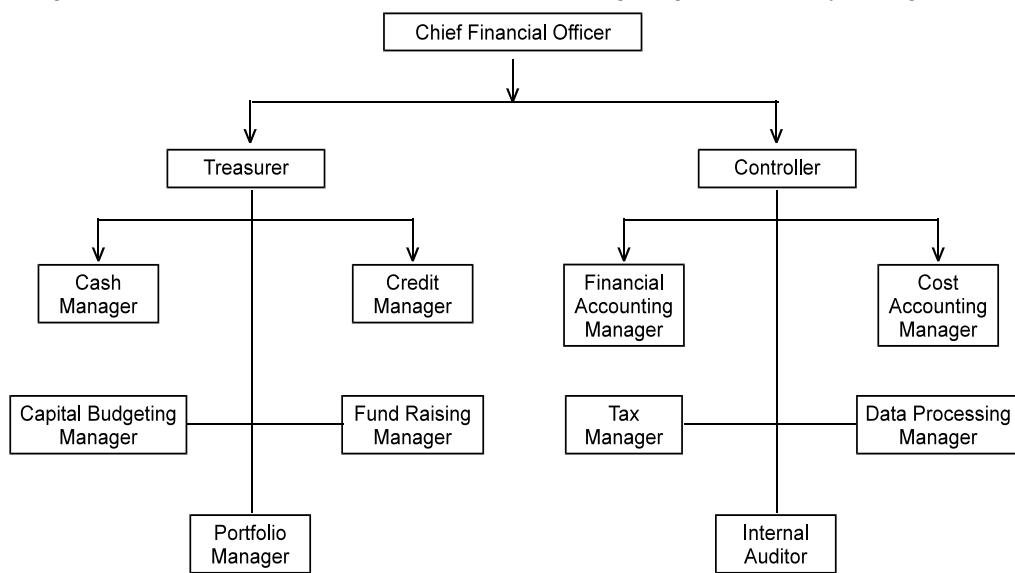
Organisation of Finance Function

1.8.1 Role of CFO in today's World vis-a-vis in the past: Today, the role of chief financial officer, or CFO, is no longer confined to accounting, financial reporting and risk management. It's about being a strategic business partner of the chief executive officer, or CEO. Some of the key differences that highlight the changing role of a CFO are as follows:-

What a CFO used to do?	What a CFO now does?
Budgeting	Budgeting
Forecasting	Forecasting
Accounting	Managing M&As
Treasury (cash management)	Profitability analysis (for example, by customer or product)
Preparing internal financial reports for management	Pricing analysis
Preparing quarterly, annual filings for investors	Decisions about outsourcing
Tax filing	Overseeing the IT function
Tracking accounts payable and accounts receivable	Overseeing the HR function
Travel and entertainment expense management	Strategic planning (sometimes overseeing this function)
	Regulatory compliance
	Risk management

Emerging Issues/Priorities Affecting the Future Role of CFO
➢ **Regulation**: Regulation requirements are increasing and CFOs have an increasingly personal stake in regulatory adherence.
➢ **Globalisation**: The challenges of globalisation are creating a need for finance leaders to develop a finance function that works effectively on the global stage and that embraces diversity.
➢ **Technology**: Technology is evolving very quickly, providing the potential for CFOs to reconfigure finance processes and drive business insight through 'big data' and analytics.
➢ **Risk**: The nature of the risks that organisations face is changing, requiring more effective risk management approaches and increasingly CFOs have a role to play in ensuring an appropriate corporate ethos.
➢ **Transformation**: There will be more pressure on CFOs to transform their finance functions to drive a better service to the business at zero cost impact.
➢ **Stakeholder Management**: Stakeholder management and relationships will become important as increasingly CFOs become the face of the corporate brand.

> ➢ **Strategy**: There will be a greater role to play in strategy validation and execution, because the environment is more complex and quick changing, calling on the analytical skills CFOs can bring.
>
> ➢ **Reporting**: Reporting requirements will broaden and continue to be burdensome for CFOs.
>
> ➢ **Talent and Capability**: A brighter spotlight will shine on talent, capability and behaviours in the top finance role.

Source: Report on ACCA-IMA Roundtable of Top CFOs on "The Changing Role of the CFO"

1.9   Relationship of Financial Management with Related Disciplines

As an integral part of the overall management, financial management is not a totally independent area. It draws heavily on related disciplines and areas of study namely economics, accounting, production, marketing and quantitative methods. Even though these disciplines are inter-related, there are key differences among them. Some of the relationships are being discussed below:

1.9.1   Financial Management and Accounting: The relationship between financial management and accounting are closely related to the extent that accounting is an important input in financial decision making. In other words, accounting is a necessary input into the financial management function.

Financial accounting generates information relating to operations of the organisation. The outcome of accounting is the financial statements such as balance sheet, income statement, and the statement of changes in financial position. The information contained in these statements and reports helps the financial managers in gauging the past performance and future directions of the organisation.

Though financial management and accounting are closely related, still they differ in the treatment of funds and also with regards to decision making. Some of the differences are:-

Treatment of Funds

In accounting, the measurement of funds is based on the accrual principle i.e. revenue is recognised at the point of sale and not when collected and expenses are recognised when they are incurred rather than when actually paid. The accrual based accounting data do not reflect fully the financial conditions of the organisation. An organisation which has earned profit (sales less expenses) may said to be profitable in the accounting sense but it may not be able to meet its current obligations due to shortage of liquidity as a result of say, uncollectible receivables. Such an organisation will not survive regardless of its levels of profits. Whereas, the treatment of funds, in financial management is based on cash flows. The revenues are recognised only when cash is actually received (i.e. cash inflow) and expenses are recognised on actual payment (i.e. cash outflow). This is so because the finance manager is concerned with maintaining solvency of the organisation by providing the cash flows necessary to satisfy its obligations and acquiring and financing the assets needed to achieve the goals of the

organisation. Thus, cash flow based returns help financial managers to avoid insolvency and achieve desired financial goals.

Decision – making

The purpose of accounting is to collect and present financial data on the past, present and future operations of the organization. The financial manager uses these data for financial decision making. It is not that the financial managers cannot collect data or accountants cannot make decisions. But the chief focus of an accountant is to collect data and present the data while the financial manager's primary responsibility relates to financial planning, controlling and decision making. Thus, in a way it can be stated that financial management begins where accounting ends.

1.9.2 Financial Management and Other Related Disciplines: For its day to day decision making process, financial management also draws on other related disciplines such as marketing, production and quantitative methods apart from accounting. For instance, financial managers should consider the impact of new product development and promotion plans made in marketing area since their plans will require capital outlays and have an impact on the projected cash flows. Likewise, changes in the production process may require capital expenditures which the financial managers must evaluate and finance. Finally, the tools and techniques of analysis developed in the quantitative methods discipline are helpful in analyzing complex financial management problems.

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        ┌─────────────────────────────┐
        │   Financial Decision Areas  │
        └─────────────────────────────┘

┌──────────────────────────────────┐                    ┌──────────────────────┐
│ 1. Investment analysis           │      Support       │ Primary Discipline   │
│ 2. Working capital management    │ ◄───────────────── │ 1. Accounting        │
│ 3. Sources and cost of funds     │                    └──────────────────────┘
│ 4. Determination of capital      │
│    structure                     │                    ┌──────────────────────┐
│ 5. Dividend policy               │      Support       │ Other Related        │
│ 6. Analysis of risks and returns │ ◄───────────────── │ Disciplines          │
└──────────────────────────────────┘                    │ 1. Marketing         │
              │                                          │ 2. Production        │
              │  Resulting in                            │ 3. Quantitative      │
              ▼                                          │    methods           │
┌────────────────────────────────────┐                  └──────────────────────┘
│ Shareholder's wealth maximisation  │
└────────────────────────────────────┘
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Impact of Other Disciplines on Financial Management

The above figure depicts the relationship between financial management and supportive disciplines. The marketing, production and quantitative methods are, thus, only indirectly related to day to day decision making by financial managers and are supportive in nature while accounting is the primary discipline on which the financial manager draws considerably. Even economics can also be considered as one of the major disciplines which help the financial manager to gain knowledge of what goes on in the world outside the business.

SUMMARY

➢ Financial Management is concerned with efficient acquisition (financing) and allocation (investment in assets, working capital etc) of funds.

➢ In the modern times, the financial management includes besides procurement of funds, the three different kinds of decisions as well namely investment, financing and dividend.

➢ Out of the two objectives, profit maximization and wealth maximization, in today's real world situations which is uncertain and multi-period in nature, wealth maximization is a better objective.

➢ Today the role of chief financial officer, or CFO, is no longer confined to accounting, financial reporting and risk management. It's about being a strategic business partner of the chief executive officer.

➢ The relationship between financial management and accounting are closely related to the extent that accounting is an important input in financial decision making.

2

Time Value of Money

<table>
<tr><td colspan="2">Learning Objectives</td></tr>
<tr><td colspan="2">After studying this chapter you will be able to:</td></tr>
<tr><td>♦</td><td>Understand the Concept of time value of money.</td></tr>
<tr><td>♦</td><td>Understand the relationship between present and future value of money and how interest rate is used to adjust the value of cash flows in-order to arrive at present (discounting) or future (compounding) values.</td></tr>
<tr><td>♦</td><td>Understand how to calculate the present or future value of an annuity?</td></tr>
<tr><td>♦</td><td>Know how to use interest factor table's in order to calculate the present or future values?</td></tr>
</table>

<table>
<tr><td>Overview</td></tr>
<tr><td>This chapter basically tries to impart you the concept and importance of monies worth today as compared to in the future. It talks about present value and future value of your money or investment. It discusses the concept of opportunity cost and the importance to know how to compute the time value of money so that you can distinguish between the worth of investments that offer you returns at different times. This chapter is of utmost importance as other chapters will expand on the concepts learnt in this chapter. For instance, time value concept forms the basis of all the modern tools and techniques of capital budgeting decisions like net present value (NPV) method, internal rate of return method (IRR) to name a few dealt in Chapter Six under Investment Decisions.</td></tr>
</table>

2.1 Concept of Time Value of Money

Let's start a discussion on Time Value of Money by taking a very simple scenario. If you are offered the choice between having ₹ 10,000 today and having ₹ 10,000 at a future date, you will usually prefer to have ₹ 10,000 now. Similarly, if the choice is between paying ₹ 10,000 now or paying the same ₹ 10,000 at a future date, you will usually prefer to pay ₹ 10,000 later. It is simple common sense. In the first case by accepting ₹ 10,000 early, you can simply put the money in the bank and earn some interest. Similarly in the second case by deferring the payment, you can earn interest by keeping the money in the bank.

Therefore the time gap allowed helps us to make some money. This incremental gain is time value of money.

Now let me ask a question, if the bank interest was zero (which is generally not the case), what would be the time value of money? As you rightly guessed it would also be zero.

As we understood above, the interest plays an important role in determining the time value of money. Interest rate is the cost of borrowing money as a yearly percentage. For investors, interest rate is the rate earned on an investment as a yearly percentage.

2.2   Reasons Why Money in the Future is Worth Less Than Similar Money Today

There are three reasons why money can be more valuable today than in the future. Let's discuss them:

(i)   Preference for Present Consumption: Individuals have a preference for current consumption in comparison to future consumption. In order to forego the present consumption for a future one, they need a strong incentive. Say for example, if the individual's present preference is very strong then he has to be offered a very high incentive to forego it like a higher rate of interest and vice versa.

(ii)   Inflation: Inflation means when prices of things rise faster than they actually should. When there is inflation, the value of currency decreases over time. If the inflation is more, then the gap between the value of money today to the value of money in future is more. So, greater the inflation, greater is the gap and vice versa.

(iii)   Risk: Risk of uncertainty in the future lowers the value of money. Say for example, non-receipt of payment, uncertainty of investor's life or any other contingency which may result in non-payment or reduction in payment.

Time value of money results from the concept of interest. So it is now time to discuss Interest.

2.3   Compounding and Discounting

Compounding is the process of calculating future values of cash flows where discounting means finding present value of cash flows.

Compounding

Present Value   Future Value

Discounting
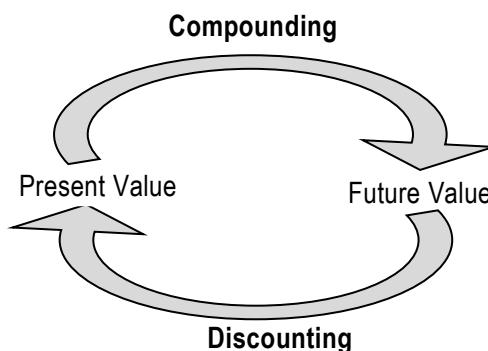
2.4   Simple Interest & Compound Interest

2.4.1   Simple Interest: It may be defined as Interest that is calculated as a simple percentage of the original principal amount. Please note the word "Original". The formula for calculating simple interest is:

SI = P_0 (i)(n)

Where,

SI = simple interest in rupees

P_0 = original principal

i = interest rate per time period (in decimals)

n = number of time periods

If we add principal to the interest i.e. $P_0 + P_0$ (i)(n), we will get the total future value (FV).

2.4.2 Compound Interest: If interest is calculated on original principal amount it is simple interest. When interest is calculated on total of previously earned interest and the original principal it compound interest. Naturally, the amount calculated on the basis of compound interest rate is higher than when calculated with the simple rate.

The Magic of Compound Interest – Rule of 72
(It depicts the effect of compounding ₹ 1,000 lump sum at various ages and interest rates).

	Age of an Individual	Interest Rate	Age of an Individual	Interest Rate	Age of an Individual	Interest Rate	Age of an Individual	Interest Rate
Divide 72 by the interest rate or inflation rate to estimate the number of years it takes for your money to double for or against you.		**4%**		**6%**		**8%**		**12%**
	25	1,000	25	1,000	25	1,000	25	1,000
	43	2,000	37	2,000	34	2,000	31	2,000
	61	4,000	49	4,000	43	4,000	37	4,000
	79	8,000	61	8,000	52	8,000	43	8,000
			73	16,000	61	16,000	49	16,000
			85	32,000	70	32,000	55	32,000
					79	64,000	61	64,000
							67	1,28,000
							73	2,56,000
							79	5,12,000

2.4.3 Compound Interest versus Simple Interest: The given figure shows graphically the differentiation between compound interest and simple interest. The top two ascending lines show the growth of ₹ 100 invested at simple and compound interest. The longer the

funds are invested, the greater the advantage with compound interest. The bottom line shows that ₹ 38.55 must be invested now to obtain ₹ 100 after 10 periods. Conversely, the present value of ₹ 100 to be received after 10 years is ₹ 38.55.
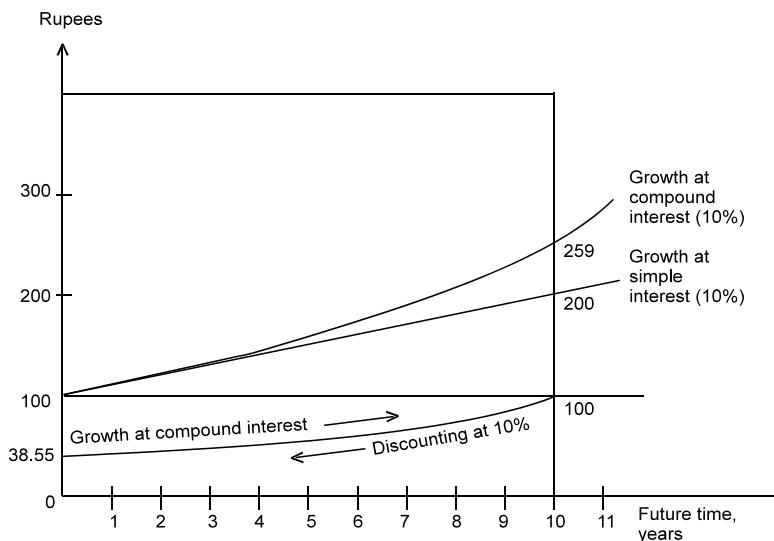
Compound Interest versus Simple Interest

2.4.4   Future Value: This is also known as terminal value. The accrued amount FV_n on a principal P after n payment periods at i (in decimal) rate of interest per payment period is given by:

$$FV_n = P_0 (1 + i)^n,$$

Where,

$$i = \frac{\text{Annual rate of interest}}{\text{Number of payment periods per year}} = \frac{r}{k}.$$

$(1 + i)^n$ is known as future value factor or compound value factor.

So $FV_n = P_0 \left(1 + \dfrac{r}{k} \right)^n$, when compounding is done k times a year at an annual interest rate r.

Or

$$FV_n = P_0 (FVIF_{i,n}),$$

Where,

$FVIF_{i,n}$ is the future value interest factor at i% for n periods equal $(1 + i)^n$.

Computation of FV_n shall be quite simple with a calculator. However, compound interest tables as well as tables for $(1+i)^n$ at various rates per annum with (a) annual compounding; (b) monthly compounded and (c) daily compounding are available.

Illustration 1: *Determine the compound interest for an investment of ₹ 7,500 at 6 % compounded half-yearly. Given that $(1+i)^n$ for i = 0.03 and n = 12 is 1.42576.*

Solution

$$i = \frac{6}{2 \times 100} = 0.03, \qquad n = 6 \times 2 = 12, \qquad P = 1,000$$

Compound Amount = $7,500(1+0.03)^{12}$ = 7,500 × 1.42576 = 10,693.20

Compound Interest = 10,693.20 – 7,500 = 3,193.20

Illustration 2: *₹ 2,000 is invested at annual rate of interest of 10%. What is the amount after 2 years if the compounding is done?*

(a) Annually?   (b) Semi annually?   (c) Monthly?   (d) Daily?

Solution

(a) The annual compounding is given by:

$$FV_2 = P(1 + i)^n, \text{ n being } 2, \text{ i being } \frac{10}{100} = 0.1 \text{ and P being } 2,000$$

$$= 2,000 (1.1)^2 = 2,000 \times 1.21 = ₹\ 2,420$$

(b) For Semiannual compounding, n = 2 × 2 = 4, i = 0.1/2 = 0.05

$$FV_4 = 2,000 (1 + 0.05)^4 = 2,000 \times 1.2155 = ₹\ 2,431$$

(c) For monthly compounding, n = 12 × 2 = 24, i = 0.1/12 = 0.00833

$$FV_{24} = 2,000 (1.00833)^{24} = 2,000 \times 1.22029 = ₹\ 2440.58$$

(d) For daily compounding, n = 365 × 2 = 730, i = 0.1/(365) = 0.00027

$$FV_{730} = 2,000 (1.00027)^{730} = 2,000 \times 1.22135 = ₹\ 2,442.70$$

Illustration 3: *Determine the compound amount and compound interest on ₹ 1,000 at 6% compounded semiannually for 6 years. Given that $(1+i)^n$ = 1.42576 for i = 3% and n = 12.*

Solution

i = (6/2) = 3%, n = 6 × 2 = 12, P = 1,000

Compound amount = $P (1 + i)^n$ = $1,000 (1 + 3\%)^{12}$

$$= 1,000 \times 1.42576 = ₹\ 1,425.76$$

Compound interest = 1,425.76 – 1,000 = ₹ 425.76

Illustration 4: *What annual rate of interest compounded annually doubles an investment in 7 years? Given that $2^{1/7}$ = 1.104090.*

Solution

If the principal be P, FV_n = 2P

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

$\quad\quad 2P = P(1 + i)^7$,

Or, $\quad 2 = (1 + i)^7$

Or, $\quad 2^{1/7} = 1 + i$

Or, $\quad 1.104090 = 1 + i$ $\quad\quad$ i.e., $i = 0.10409$

Required rate of interest = 10.41%

Illustration 5: *A person opened an account on April, 2012 with a deposit of ₹ 800. The account paid 6% interest compounded quarterly. On October 1, 2012, he closed the account and added enough additional money to invest in a 6-month Time Deposit for ₹ 1,000 earning 6% compounded monthly.*

(a) How much additional amount did the person invest on October 1?

(b) What was the maturity value of his Time Deposit on April 1, 2013?

(c) How much total interest was earned?

Given that $(1 + i)^n$ is 1.03022500 for $i = 1\frac{1}{2}\%$, n = 2 and is 1.03037751 for $i = \frac{1}{2}\%$ and n = 6.

Solution

(a) The initial investment earned interests for April – June and July – September quarter, i.e. for 2 quarters.

In this case, $i = \dfrac{6}{4} = 1\dfrac{1}{2}\%, n = 2$ and the compounded amount $= 800\left(1 + 1\dfrac{1}{2}\%\right)^2$

$= 800 \times 1.03022500 = ₹\ 824.18$

The additional amount $= ₹\ (1,000 - 824.18) = ₹\ 175.82$

(b) In this case, the Time Deposit earned interest compounded monthly for 2 quarters.

Here, $i = \dfrac{6}{12} = \dfrac{1}{2}\%, n = 6, P = 1,000$

Required maturity value $1,000\left(1 + \dfrac{1}{2}\%\right)^6 = 1,000 \times 1.03037751 = ₹\ 1,030.38$

(c) Total interest earned $= (24.18 + 30.38) = ₹\ 54.56$

Illustration 6: *Ramanuj has taken a 20 month car loan of ₹ 6,00,000. The rate of interest is 12 per cent per annum. What will be the amount of monthly loan amortization?*

Solution

$$A \ = \ \frac{₹\ 6,00,000}{PVIFA_{1,\ 20}} \ = \ \frac{₹\ 6,00,000}{18.0456} \ = \ ₹\ 33,249.1$$

Monthly interest = 12 per cent/12 = 1 per cent.

2.5   Effective Rate of Interest (EIR)

It is the actual equivalent annual rate of interest at which an investment grows in value when interest is credited more often than once a year. If interest is paid *m* times in a year it can be found by calculating:

$$E_i = \left(1 + \frac{i}{m}\right)^m - 1$$

Illustration 7*: If the interest is 10% payable quarterly, find the effective rate of interest.*

Solution

$$E = \left(1 + \frac{0.1}{4}\right)^4 - 1 = 0.1038 \text{ or } 10.38\%$$

2.5.1   Multi-period Compounding: In case of multi period compounding it can be compounded as below:

Conversion Period	Description
1 day	Compounded daily
1 month	Compounded monthly
3 months	Compounded quarterly
6 months	Compounded semiannually
12 months	Compounded annually

The general formula of effective interest rate shall be

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

Daily compounding is also known as continuous compounding.

Effective interest rate can be calculated as

$$EIR = \left(1 + \frac{i}{365}\right)^{1 \times 365} - 1$$

Or, $FV_n = P \times e^{(i \times n)} = P \times e^x$

$x = (i \times n)$

$e = 2.7183$

2.6   Present Value

Let's first define Present Value. Simple definition is "Present Value" is the current value of a "Future Amount". It can also be defined as the amount to be invested today (Present Value) at a given rate over specified period to equal the "Future Amount".

If we reverse the flow by saying that we expect a fixed amount after n number of years, and we also know the current prevailing interest rate, then by discounting the future amount, at the given interest rate, we will get the present value of investment to be made.

Discounting future amount converts it into present value amount. Similarly, compounding converts present value amount into future value amount.

Therefore, we can say that the present value of a sum of money to be received at a future date is determined by discounting the future value at the interest rate that the money could earn over the period. This process is known as Discounting.

The present value interest rate or the future value interest rate is known as the discount rate. This discount rate is the rate with which the present value or the future value is traded off. A higher discount rate will result in a lower value for the amount in the future. This rate also represents the opportunity cost as it captures the returns that an individual would have made on the next best opportunity.

Since finding present value is simply the reverse of finding Future Value (FV), the formula for Future Value (FV) can be readily transformed into a Present Value formula. Therefore the P_0, the Present Value becomes:-

$$P_0 = \frac{FV_n}{(1 + i)^n} \quad OR \quad P_0 = FV_n (1 + i)^{-n}$$

> Where, FV_n =   Future value n years hence
> i =   Rate of interest per annum
> n =   Number of years for which discounting is done.

As mentioned earlier, computation of P may be simple if we make use of either the calculator or the Present Value table showing values of $(1+i)^{-n}$ for various time periods/per annum interest rates. For positive i, the factor $(1 + i)^{-n}$ is always less than 1, indicating thereby, future amount has smaller present value.

Illustration 8: *What is the present value of ₹ 1 to be received after 2 years compounded annually at 10%?*

Solution

Here $FV_n = 1$, $i = 0.1$

Required Present Value = $FV_n (1+i)^{-n}$

$$= \frac{FV_n}{(1+i)^n} = \frac{1}{(1.1)^2} = \frac{1}{1.21} = 0.8264 = ₹\ 0.83$$

Thus, ₹ 0.83 shall grow to ₹ 1 after 2 years at 10% compounded annually.

Illustration 9: *Find the present value of ₹ 10,000 to be required after 5 years if the interest rate be 9 per cent. Given that $(1.09)^5 = 1.5386$*

Solution

Here, $i = 0.09$, $n = 5$, $FV_n = 10,000$

Required Present value   = $FV_n (1 + i)^{-n}$

$= 10,000 (1.09)^{-5} = 10,000 \times 0.65 = ₹\ 6,500.$

$$\left[(1.09)^{-5} = \frac{1}{(1.09)^5} = 0.65 \right]$$

Illustration 10: *Find out the present value of ₹ 2,000 received after 10 years if discount rate is 8%.*

Solution

Present value of an amount = $FV_n \left(\dfrac{1}{1+i} \right)^n$

Now, I = 8%

n   = 10 years

Present value of an amount $= ₹\ 2,000 \left(\dfrac{1}{1+0.08} \right)^{10}$

$= ₹\ 2,000 (0.463) = ₹\ 926$

Illustration 11*: What is the present value of ₹ 50,000 to be received after 10 years at 10 per cent compounded annually?*

Solution

Here $n = 10$, $i = 0.1$

$P = FV_n (1 + i)^{-n}$

$= 50,000 (1.1)^{-10} = 50,000 \times 0.385543 = ₹\ 19,277.15$

2.7   Annuity

An annuity is a stream of regular periodic payment made or received for a specified period of time. In an ordinary annuity, payments or receipts occur at the end of each period.

2.7.1 Future Value of an Annuity: Expressed algebraically, FVA_n is defined as future (compound) value of an annuity, R the periodic receipt (or payment), and n the length of the annuity, the formula for FVA_n is:-

$$FVA_n = R(I + i)^{n-1} + R (1+i)^{n-2} + \ldots + R(I + i)^1 + R (1+i)^0$$

As we can see, FVA_n is simply equal to the periodic receipt (R) times the "sum of the future value interest factors at i percent for time periods 0 to n-1.

As a shortcut, If R be the periodic payments, the amount FVA_n of the annuity is given by:

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

OR $FVA_n = R \, (FVIFA_{i,n})$

Where $FVIFA_{i,n}$ stands for the future interest factor of an annuity at i% for n periods.

Table for FVA_n at different rates of interest may be used conveniently, if available, to workout problems. The value of expression $\dfrac{(1+i)^n - 1}{i}$ or $FVIFA_{i,n}$ can easily be found through financial tables.

Illustration 12: *Find the amount of an annuity if payment of ₹ 500 is made annually for 7 years at interest rate of 14% compounded annually.*

Solution

　　　Here   R = 500,   n = 7,   i = 0.14

　　　FVA = ₹ 500 × FVIFA (7, 0.14) = 500 × 10.7304915 = ₹ 5,365.25

Illustration 13 : *A person is required to pay four equal annual payments of ₹ 5,000 each in his deposit account that pays 8% interest per year. Find out the future value of annuity at the end of 4 years.*

Solution

$$FVA = R\left(\frac{(1+i)^n - 1}{i} \right)$$

$$= ₹ 5,000 \, (4.507) = ₹ 22,535$$

Illustration 14: *₹ 200 is invested at the end of each month in an account paying interest 6% per year compounded monthly. What is the amount of this annuity after 10th payment? Given*

that $(1.005)^{10} = 1.0511$

Solution

We have $A(n,i) = \dfrac{(1+i)^{n-1}}{i}$, i being the interest rate (in decimal) per payment period over n payment period.

Here, $i = 0.06/12 = 0.005$, $n = 10$.

Required amount is given by $A = P.A(10, 0.005)$

$= 200 \times 10.22 = ₹\ 2,044$.

2.7.2 Present Value of an Annuity: Sometimes instead of a single cash flow the cash flows of the same amount is received for a number of years. The present value of an annuity may be expressed as follows:

$$PVA_n \quad = \quad \frac{R}{(1+i)^1} + \frac{R}{(1+i)^2} + \dots \frac{R}{(1+i)^{n-1}} + \frac{R}{(1+i)^n}$$

$$= R\left(\frac{1}{(1+i)^1} + \frac{1}{(1+i)^2} + \dots \frac{1}{(1+i)^{n-1}} + \frac{1}{(1+i)^n}\right)$$

$= R\,(PVIF_{i,1} + PVIF_{i,2} + PVIF_{i,3} + \dots + PVIF_{i,n})$

$= R\,(PVIF_{i,n})$

Where,

PVA_n	=	Present value of annuity which has duration of n years
R	=	Constant periodic flow
i	=	Discount rate and,
$(PVIF_{i,n})$ =		Present value interest factor of an (ordinary) annuity at i percent for n periods.

Illustration 15: *Find out the present value of a 4 year annuity of ₹ 20,000 discounted at 10 per cent.*

Solution

P VA	=	Amount of annuity × Present value (r, n)
Now, i	=	10%
N	=	4 years

$$PVA \quad = ₹\ 20,000\left[\frac{(1+0.1)^4 - 1}{0.1(1+0.1)^4}\right] = ₹\ 20,000 \times 3.17 = ₹\ 63,400$$

Illustration 16: *Y bought a TV costing ₹ 13,000 by making a down payment of ₹ 3,000 and agreeing to make equal annual payment for 4 years. How much would be each payment if the interest on unpaid amount be 14% compounded annually?*

Solution

In the present case, present value of the unpaid amount was (13,000 − 3,000) = ₹ 10,000. The periodic payment, R may be found from

$$R = \frac{PVA}{PVIF(i, n)} = \frac{10,000}{PVIF(0.14, 4)} = \frac{10,000}{2.914} = ₹\ 3,431.71$$

Illustration 17: *Z plans to receive an annuity of ₹ 5,000 semi-annually for 10 years after he retires in 18 years. Money is worth 9% compounded semi-annually.*

(a)   How much amount is required to finance the annuity?

(b)   What amount of single deposit made now would provide the funds for the annuity?

(c)   How much will Mr. Z receive from the annuity?

Solution

(a)   Let us first find the required present value for the 10 years annuity by using

PVA = R[PVIF(i,n)]

 = 5,000 [PVIF(4.5%, 20)]

 = 5,000 × 13.00793654 = ₹ 65,039.68

$$\text{Since, PVIF}\ (4.5\%, 20) = \frac{(1 + 4.5\%)^{20} - 1}{.045(1 + 4.5\%)^{20}}$$

$$= \frac{2.41171402 - 1}{0.10852713} = 13.00793654$$

(b)   We require the amount of single deposit that matures to ₹ 65,039.68 in 18 years at 9% compounded semi-annually. We use the following formula:-

$$P_0 = FV_n (1 + i)^{-n}$$

Where FV_n = 65,039.68, $n = 18 \times 2 = 36$, $i = \dfrac{9}{2} = 4\dfrac{1}{2}\%, P_0 = ?$

Thus, $P_0 = 65,039.68 \left(1 + 4\dfrac{1}{2}\%\right)^{-36}$ = 65,039.68 × 0.20502817 = ₹ 13,334.97

(c)   Required Amount = ₹ 5,000 x 20 = ₹ 1,00,000

Illustration 18: *Determine the present value of ₹ 700 each paid at the end of each of the next six years. Assume an 8 per cent of interest.*

Solution

As the present value of an annuity of ₹ 700 has to be computed. The present value factor of an annuity of ₹ 1 at 8 per cent for 6 years is 4.623. Therefore, the present value of an annuity of ₹ 700 will be: 4.623× ₹ 700 = ₹ 3,236.10

2.8   Loan Amortisation & Capital Recovery

If we receive some amount from the lender at a given rate of interest for a given period then we can calculate the amount of instalment (constant periodic flow) to pay to the lender as an instalment:

$$R = \frac{PVA_n}{PVIFA_{in}}$$

Reciprocal of $PVIF_{in}$ is also known as capital recovery factor (CRF).

Example: Suppose you have borrowed a 3 year loan of ₹1,00,000 at 9 per cent from your employer to buy a motorcycle. If your employer requires three equal end-of-year repayments, then the annual installment will be:

$$R = \frac{PVA_n}{PVIFA_{in}} \text{ or, } R = \frac{₹1,00,000}{PVIFA_{in}}$$

₹ 1,00,000 = R × $PVIFA_{(0.09,\ 3\ years)}$

₹ 1,00,000 = R × 2.531 (from the PVIFA(i,n) table)

$$R = \frac{₹1,00,000}{2.531} = ₹\ 39,510$$

By paying ₹ 39,510 each year for three years, you shall completely pay-off your loan with 9 per cent interest.

This can be observed from the loan-amortisation schedule given in Table

End of year	Payment	Interest	Principle Repayment	Outstanding Balance
0	--	--	--	1,00,000
1	39,510	9,000	30,510	69,490
2	39,510	6,254	33,256	3,6234
3	39,510	3,261	36,249	0

2.9   Perpetuity

Perpetuity is an annuity in which the periodic payments or receipts begin on a fixed date and continue indefinitely or perpetually. Fixed coupon payments on permanently invested (irredeemable) sums of money are prime examples of perpetuities.

The formula for evaluating perpetuity is relatively straight forward. Two points which are important to understand in this regard are:.

(a)   The value of the perpetuity is finite because receipts that are anticipated far in the future have extremely low present value (today's value of the future cash flows).

(b)   Additionally, because the principal is never repaid, there is no present value for the principal.

Therefore the price of perpetuity is simply the coupon amount over the appropriate discount rate or yield.

2.9.1 Calculation of Multi Period Perpetuity: The formula for determining the present value of multi-period perpetuity is as follows:

$$PVA\infty = \frac{R}{(1+i)^1} + \frac{R}{(1+i)^2} + \frac{R}{(1+i)^3} + ... + \frac{R}{(1+i)^\infty} = \sum_{n=1}^{\infty} \frac{R}{(1+i)^n} = \frac{R}{i}$$

Where:

R = the payment or receipt each period

i = the interest rate per payment or receipt period

Illustration 19: *Ramesh wants to retire and receive ₹ 3,000 a month. He wants to pass this monthly payment to future generations after his death. He can earn an interest of 8% compounded annually. How much will he need to set aside to achieve his perpetuity goal?*

Solution   R = ₹ 3,000

i = 0.08/12 or 0.00667

Substituting these values in the above formula, we get

$$PVA = \frac{₹\ 3,000}{0.00667}$$

$$= ₹\ 4,49,775$$

If he wanted the payments to start today, he must increase the size of the funds to handle the first payment. This is achieved by depositing ₹ 4,52,775 (PV of normal perpetuity + perpetuity received in the beginning = 4,49,775 + 3,000) which provides the immediate payment of ₹ 3,000 and leaves ₹ 4,49,775 in the fund to provide the future ₹ 3,000 payments.

2.9.2 Calculation of Growing Perpetuity: A stream of cash flows that grows at a constant rate forever is known as growing perpetuity.

The formula for determining the present value of growing perpetuity is as follows:

$$PVA = \frac{R}{(1+i)^1} + \frac{R(1+g)}{(1+i)^2} + \frac{R(1+g)^2}{(1+i)^3} + ... + \frac{R(1+g)^\infty}{(1+i)^\infty}$$

$$\sum_{n=1}^{\infty}\frac{R(1+g)^{n-1}}{(1+i)^n}=\frac{R}{i-g}$$

Illustration 20: *Assuming that the discount rate is 7% per annum, how much would you pay to receive ₹ 50, growing at 5%, annually, forever?*

Solution

$$PVA=\frac{R}{i-g}=\frac{50}{0.07-0.05}=2,500$$

2.10 Sinking Fund

It is the fund created for a specified purpose by way of sequence of periodic payments over a time period at a specified interest rate.

Size of the sinking fund deposit is computed from FVA=R[FVIFA(i,n)], where FVA is the amount to be saved, R, the periodic payment, n, the payment period.

Illustration 21: *How much amount is required to be invested every year so as to accumulate ₹ 3,00,000 at the end of 10 years if the interest is compounded annually at 10%?*

Solution

Here,   FVA = 3,00,000   n = 10   i = 0.1

Since, FVA   = R[FVIFA(i,n)]

3,00,000   = R[FVIFA(0.10,10)]

             = R* 6.1146

Therefore, R $=\dfrac{3,00,000}{15.9374248}=18,823.62=$ R = ₹ 18,823.62

Illustration 22: *ABCL Company has issued debentures of ₹ 50 lakhs to be repaid after 7 years. How much should the company invest in a sinking fund earning 12 percent in order to be able to repay debentures?*

Solution

        A (CVFA$_{r,\,t}$)   =   50,00,000

        A (CVFA$_{0.12,\,7}$)   =   50,00,000

        A = $\dfrac{50,00,000}{(\text{CVFA}_{0.12,7})}$

        A = $\dfrac{50,00,000}{10.089}$ = ₹ 4.96 lakhs.

Illustration 23: *Bank of Delhi pays 8 per cent interest, compounded quarterly, on its money market account. The managers of Bank of Gurgaon want its money market account to equal Bank of Delhi's effective annual rate, but interest is to be compounded on monthly basis. What nominal, or quoted, or APR rate must Bank of Gurgaon set?*

Solution

Bank of Delhi's effective annual rate is 8.24 per cent:

$$\text{Effective annual rate} = \left(1 + \frac{0.08}{4}\right)^4 - 1.0 = (1.02)^4 - 1 = 1.0824 - 1 = 0.0824 = 8.24\%.$$

Now, Bank of Gurgaon must have the same effective annual rate:

$$\left(1 + \frac{i}{12}\right)^{12} - 1.0 = 0.0824$$

$$\left(1 + \frac{i}{12}\right)^{12} = 1.0824$$

$$1 + \frac{i}{12} = (1.0824)^{1/12}$$

$$1 + \frac{i}{12} = 1.00662$$

$$\frac{i}{12} = 0.00662$$

$$i = 0.07944 = 7.94\%.$$

Thus, the two banks have different quoted rates – Bank of Delhi's quoted rate is 8%, while Bank of Gurgaon's quoted rate is 7.94%; however, both banks have the same effective annual rate of 8.24%. The difference in their quoted rates is due to the difference in compounding frequency.

SUMMARY

➢   Money has time value.

➢   A rupee today is more valuable than a rupee a year hence.

➢   We use rate of interest to express the time value of money.

➢   Simple Interest may be defined as Interest that is calculated as a simple percentage of the original principal amount.

  Formula : $SI = P_0\ (i)(n)$

➢   Compound interest is calculated on total of previously earned interest and the Original Principal.

➤ The Present Value of a sum of money to be received at a future date is determined by discounting the future value at the interest rate that the money could earn over the period

Formula: $P_0 = \dfrac{FV_n}{(1 + i)^n}$ OR $P_0 = FV_n (1 + i)^{-n}$

➤ Future Value is the value at some future time of a present amount of money, or a series of payments, evaluated at a given interest rate.

Formula: $FV_n = P_0 + SI = P_0 + P_0(i)(n)$ or

$$FV_n = P_0 \left(1 + \frac{r}{k} \right)^n$$

➤ An annuity is a series of equal payments or receipts occurring over a specified number of periods.

a. Present value of an ordinary annuity – cash flows occur at the end of each period, and present value is calculated as of one period before the first cash flow.

b. Present value of an annuity due – cash flows occur at the beginning of each period, and present value is calculated as of the first cash flow.

Formula: $PVA_n = = R (PVIF_{i,n})$

c. Future value of an ordinary annuity – cash flows occur at the end of each period, and future value is calculated as of the last cash flow.

d. Future value of an annuity due – cash flows occur at the beginning of each period, and future value is calculated as of one period after the last cash flow.

Formula: $FVA_n = R (FVIFA_{i,n})$

3

Financial Analysis and Planning

Learning Objectives

After studying this chapter you will be able to:

- Understand the financial analysis of financial statements.

- How Financial Analysis helps in decision making?

- Learn about the important Tools and Techniques of Financial Analysis like ratio analysis. These tools and techniques would help us in analysing the financial health of a company better.

Overview

This chapter requires loads of reading to understand the concepts and thorough practice of the problems. The first unit deals with ratio analysis. Here you need to understand the different types of ratios and their significance alongwith their application in decision-making scenarios. The second unit deals with cash flow and funds flow statement analysis. This chapter draws a lot from the paper of Accounting present in the same group. You should be conceptually clear with respect to the topics covered here as they create a stepping stone for you for understanding and implementation in further chapters.

3.1 Introduction

The basis for financial analysis, planning and decision making is financial statements which mainly consist of Balance Sheet and Profit and Loss Account. The profit & loss account shows the operating activities of the concern and the balance sheet depicts the balance value of the acquired assets and of liabilities at a particular point of time.

However, the above statements do not disclose all of the necessary and relevant information. For the purpose of obtaining the material and relevant information necessary for ascertaining the financial strengths and weaknesses of an enterprise, it is necessary to analyse the data

depicted in the financial statement.

The financial manager has certain analytical tools which help in financial analysis and planning. The main tools are Ratio Analysis and Cash Flow Analysis. We will first discuss the Ratio Analysis.

3.2 Ratio and Ratio Analysis

Let us first understand the definition of ratio and meaning of ratio analysis

3.2.1 Definition of Ratio: A ratio is defined as "the indicated quotient of two mathematical expressions and as the relationship between two or more things." Here ratio means financial ratio or accounting ratio which is a mathematical expression of the relationship between accounting figures.

3.2.2 Ratio Analysis: The term financial ratio can be explained by defining how it is calculated and what the objective of this calculation is?

a.   Calculation Basis

- ➢   A relationship expressed in mathematical terms;
- ➢   Between two individual figures or group of figures;
- ➢   Connected with each other in some logical manner; and
- ➢   Selected from financial statements of the concern

b.   Objective for financial ratios is that all stakeholders (owners, investors, lenders, employees etc.) can draw conclusions about the

- ➢   Performance (past, present and future);
- ➢   Strengths & weaknesses of a firm; and
- ➢   Can take decisions in relation to the firm.

Ratio analysis is based on the fact that a single accounting figure by itself may not communicate any meaningful information but when expressed as a relative to some other figure, it may definitely provide some significant information.

Ratio analysis is not just comparing different numbers from the balance sheet, income statement, and cash flow statement. It is comparing the number against previous years, other companies, the industry, or even the economy in general for the purpose of financial analysis.

3.3 Types of Ratios
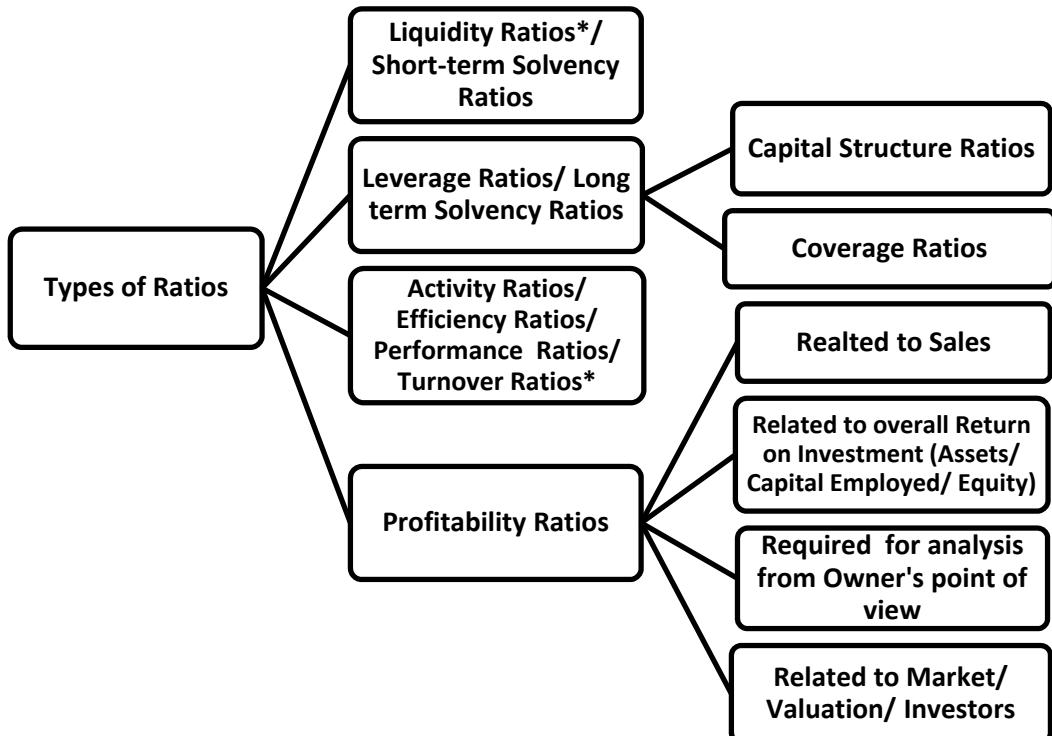
Classification of Ratios

Liquidity ratios should be examined taking relevant turnover ratios into consideration.

3.3.1 Liquidity Ratios: The terms 'liquidity' and 'short-term solvency' are used synonymously.

Liquidity or short-term solvency means ability of the business to pay its short-term liabilities. Inability to pay-off short-term liabilities affects its credibility as well as its credit rating. Continuous default on the part of the business leads to commercial bankruptcy. Eventually such commercial bankruptcy may lead to its sickness and dissolution. Short-term lenders and creditors of a business are very much interested to know its state of liquidity because of their financial stake. Both lack of sufficient liquidity and excess liquidity is bad for the organization.

Various Liquidity Ratios are:

(a)   Current Ratio

(b)   Quick Ratio or Acid test Ratio

(c)	Cash Ratio or Absolute Liquidity Ratio
(d)	Basic Defense Interval or Interval Measure Ratios
(e)	Net Working Capital Ratio

(a) Current Ratio: The Current Ratio is one of the best known measures of short term solvency. It is the most common measure of short-term liquidity.

$$\textbf{Current Ratio =} \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Where,

Current Assets	=	Inventories + Sundry Debtors + Cash and Bank Balances + Receivables/ Accruals + Loans and Advances + Disposable Investments + Any other current assets.
Current Liabilities	=	Creditors for goods and services + Short-term Loans + Bank Overdraft + Cash Credit + Outstanding Expenses + Provision for Taxation + Proposed Dividend + Unclaimed Dividend + Any other current liabilities.

The main question this ratio addresses is: "Does your business have enough current assets to meet the payment schedule of its current debts with a margin of safety for possible losses in current assets?"

A generally acceptable current ratio is 2 to 1. But whether or not a specific ratio is satisfactory depends on the nature of the business and the characteristics of its current assets and liabilities.

(b) Quick Ratios: The Quick Ratio is sometimes called the "acid-test" ratio and is one of the best measures of liquidity.

$$\text{Quick Ratio or Acid Test Ratio =} \frac{\text{Quick Assets}}{\text{Current Liabilities}}$$

Where,

Quick Assets	=	Current Assets $-$Inventories
Current Liabilities	=	As mentioned under Current Ratio.

The Quick Ratio is a much more conservative measure of short-term liquidity than the Current Ratio. It helps answer the question: "If all sales revenues should disappear, could my business meet its current obligations with the readily convertible quick funds on hand?"

Quick Assets consist of only cash and near cash assets. Inventories are deducted from current assets on the belief that these are not 'near cash assets' and also because in times of financial difficulty inventory may be saleable only at liquidation value. But in a seller's market inventories are also near cash assets.

An acid-test of 1:1 is considered satisfactory unless the majority of "quick assets" are in accounts receivable, and the pattern of accounts receivable collection lags behind the schedule for paying current liabilities.

(c) Cash Ratio/ Absolute Liquidity Ratio: The cash ratio measures the absolute liquidity of the business. This ratio considers only the absolute liquidity available with the firm. This ratio is calculated as:

$$\text{Cash Ratio} = \frac{\text{Cash and Bank balances + Marketable Securities}}{\text{Current Liabilities}}$$

$$\text{Or, } \frac{\text{Cash and Bank balances + Current Investments}}{\text{Current Liabilities}}$$

The Absolute Liquidity Ratio only tests short-term liquidity in terms of cash and marketable securities/ current investments.

(d) Basic Defense Interval/ Interval Measure:

$$\text{Basic Defense Interval} = \frac{\text{Cash and Bank balances + Marketable Securities}}{\text{Opearing Expenses} \div \text{No. of days (say 360)}}$$

$$\text{Or, Interval Measure} = \frac{\text{Current Assets - Inventories}}{\text{Daily Operating Expenses}}$$

$$\text{Daily Operating Expenses} = \frac{\substack{\text{Cost of Goods Sold + Selling, Administartion and other} \\ \text{General expenses - Depreciation and other non cash expenditure}}}{\text{No. of days in a year}}$$

If for some reason all the company's revenues were to suddenly cease, the Basic Defense Interval would help determine the number of days the company can cover its cash expenses without the aid of additional financing.

(e) Net Working Capital Ratio: Net working capital is more a measure of cash flow than a ratio. The result of this calculation must be a positive number. It is calculated as shown below:

Net Working Capital Ratio = Current Assets – Current Liabilities (excluding short-term bank borrowing)

Bankers look at Net Working Capital over time to determine a company's ability to weather financial crises. Loans are often tied to minimum working capital requirements.

3.3.2 Long-term Solvency Ratio /Leverage Ratio: The leverage ratios may be defined as those financial ratios which measure the long term stability and structure of the firm. These ratios indicate the mix of funds provided by owners and lenders and assure the lenders of the long term funds with regard to:

(i)   Periodic payment of interest during the period of the loan and

(ii) Repayment of principal amount on maturity.

Leverage ratios are of two types:

1. **Capital Structure Ratios**

    (a) Equity Ratio

    (b) Debt Ratio

    (c) Debt to Equity Ratio

    (d) Debt to Total Assets Ratio

    (e) Capital Gearing Ratio

    (f) Proprietary Ratio

2. **Coverage Ratios**

    (a) Debt-Service Coverage Ratio (DSCR)

    (b) Interest Coverage Ratio

    (c) Preference Dividend Coverage Ratio

    (d) Fixed Charges Coverage Ratio

3.3.2.1 Capital Structure Ratios: These ratios provide an insight into the financing techniques used by a business and focus, as a consequence, on the long-term solvency position.

From the balance sheet one can get only the absolute fund employed and its sources, but only capital structure ratios show the relative weight of different sources.

Various capital structure ratios are:

(a) Equity Ratio:

$$\text{Equity Ratio} = \frac{\text{Shareholders' Equity}}{\text{Capital Employed}}$$

This ratio indicates proportion of owners' fund to total fund invested in the business. Traditionally, it is believed that higher the proportion of owners' fund lower is the degree of risk.

(b) Debt Ratio:

$$\text{Debt Ratio} = \frac{\text{Total outside liabilities}}{\text{Total Debt} + \text{Net worth}}$$

$$\text{Or, Debt Ratio} = \frac{\text{Total Debt}}{\text{Net Assets}}$$

Total debt or total outside liabilities includes short and long term borrowings from financial institutions, debentures/bonds, deferred payment arrangements for buying capital equipments, bank borrowings,

public deposits and any other interest bearing loan.

This ratio is used to analyse the long-term solvency of a firm.

(c)   Debt to Equity Ratio:

$$\text{Debt to Equity Ratio} = \frac{\text{Total Outside Liabilities}}{\text{Shareholders' Equity}}$$

$$= \frac{\text{Total Debt *}}{\text{Shareholders' Equity}}$$

Or,

$$= \frac{\text{Long-term Debt **}}{\text{Shareholders' equity}}$$

*Not merely long-term debt.

** Sometimes only interest-bearing, long term debt is used instead of total liabilities (exclusive of current liabilities)

The shareholders' equity is equity and preference share capital + post accumulated profits (excluding fictitious assets etc).

A high debt to equities ratio here means less protection for creditors, a low ratio, on the other hand, indicates a wider safety cushion (i.e., creditors feel the owner's funds can help absorb possible losses of income and capital). This ratio indicates the proportion of debt fund in relation to equity. This ratio is very often referred in capital structure decision as well as in the legislation dealing with the capital structure decisions (i.e. issue of shares and debentures). Lenders are also very keen to know this ratio since it shows relative weights of debt and equity. Debt equity ratio is the indicator of firm's financial leverage.

(d)   Debt to Total Assets Ratio: This ratio measures the proportion of total assets financed with debt and, therefore, the extent of financial leverage.

$$\text{Debt to Total Assets Ratio} = \frac{\text{Total Outside Liabilities}}{\text{Total Assets}}$$

$$\text{Or,} = \frac{\text{Total Debt}}{\text{Total Assets}}$$

(e)   Capital Gearing Ratio: In addition to debt-equity ratio, sometimes capital gearing ratio is also calculated to show the proportion of fixed interest (dividend) bearing capital to funds belonging to equity shareholders i.e. equity funds or net worth.

$$\text{Capital Gearing Ratio} = \frac{(\text{Preference Share Capital} + \text{Debentures} + \text{Other Borrowed funds})}{(\text{Equity Share Capital} + \text{Reserves \& Surplus} - \text{Losses})}$$

(f) Proprietary Ratio:

Proprietary Ratio = $\dfrac{\text{Proprietary Fund}}{\text{Total Assets}}$

Proprietary fund includes Equity Share Capital + Preference Share Capital + Reserve & Surplus. Total assets exclude fictitious assets and losses.

It indicates the proportion of total assets financed by shareholders.

3.3.2.2 Coverage Ratios: The coverage ratios measure the firm's ability to service the fixed liabilities. These ratios establish the relationship between fixed claims and what is normally available out of which these claims are to be paid. The fixed claims consist of:

(i)   Interest on loans

(ii)   Preference dividend

(iii) Amortisation of principal or repayment of the instalment of loans or redemption of preference capital on maturity.

The following are important coverage ratios:

(a) Debt Service Coverage Ratio (DSCR): Lenders are interested in debt service coverage to judge the firm's ability to pay off current interest and instalments.

Debt Service Coverage Ratio = $\dfrac{\text{Earnings available for debt services}}{\text{Interest} + \text{Instalments}}$

Earning for debt service* =   Net profit (Earning after taxes) + Non-cash operating expenses like depreciation and other amortizations + Interest +other adjustments like loss on sale of Fixed Asset e.t.c

*Fund from operation (or cash from operation) before interest and taxes also can be considered as per the requirement.

Normally DSCR of 1.5 to 2 is satisfactory. You may note that sometimes in both numerator and denominator lease rentals may be added.

(b) Interest Coverage Ratio: This ratio also known as "times interest earned ratio" indicates the firm's ability to meet interest (and other fixed-charges) obligations. This ratio is computed as:

Interest Coverage Ratio = $\dfrac{\text{Earnings before interest and taxes (EBIT)}}{\text{Interest}}$

Earnings before interest and taxes are used in the numerator of this ratio because the ability to pay interest is not affected by tax burden as interest on debt funds is deductible expense. This ratio indicates the extent to which earnings may fall without causing any embarrassment to the firm regarding the payment of interest charges. A high interest coverage ratio means that an

enterprise can easily meet its interest obligations even if earnings before interest and taxes suffer a considerable decline. A lower ratio indicates excessive use of debt or inefficient operations.

(c) Preference Dividend Coverage Ratio: This ratio measures the ability of a firm to pay dividend on preference shares which carry a stated rate of return. This ratio is computed as:

$$\text{Preference Dividend Coverage Ratio} = \frac{\text{Net Profit / Earning after taxes (EAT)}}{\text{Pr eference dividend liability}}$$

Earnings after tax is considered because unlike debt on which interest is charged on the profit of the firm, the preference dividend is treated as appropriation of profit.

This ratio indicates margin of safety available to the preference shareholders. A higher ratio is desirable from preference shareholders point of view.

Similarly **Equity Dividend coverage ratio** can also be calculated taking (EAT – Pref. Dividend) and equity fund figures into consideration.

(d) Fixed Charges Coverage Ratio: This ratio shows how many times the cash flow before interest and taxes covers all fixed financing charges. This ratio is more than 1 is considered as safe.

$$\text{Fixed Charges Coverage Ratio} = \frac{\text{EBIT} + \text{Depreciation}}{\text{Interest} + \dfrac{\text{Re payment of loan}}{1 - \text{tax rate}}}$$

Notes for calculating Ratios:

1. EBIT (Earnings before interest and taxes) = PBIT (Profit before interest and taxes),

   EAT (Earnings after taxes) = PAT (Profit after taxes),

   EBT (Earnings before taxes) = PBT (Profit before taxes)

2. Ratios shall be calculated based on requirement and availability and may deviate from original formulae.

3. Numerator should be taken in correspondence with the denominator and vice-versa.

3.3.3 Activity Ratio/ Efficiency Ratio/ Performance Ratio/ Turnover Ratio: These ratios are employed to evaluate the efficiency with which the firm manages and utilises its assets. For this reason, they are often called 'Asset management ratios'. These ratios usually indicate the frequency of sales with respect to its assets. These assets may be capital assets or working capital or average inventory.

Activity Ratio/ Efficiency Ratio/ Performance Ratio/ Turnover Ratio:

(a) Total Assets Turnover Ratio

(b) Fixed Assets Turnover Ratio

(c)   Capital Turnover Ratio

(d)   Current Assets Turnover Ratio

(e)   Working Capital Turnover Ratio

    (i)   Inventory/ Stock Turnover Ratio

    (ii)   Receivables (Debtors) Turnover Ratio

    (iii) Payables (Creditors) Turnover Ratio.

These ratios are usually calculated with reference to sales/cost of goods sold and are expressed in terms of rate or times.

Asset Turnover Ratios: Based on different concepts of assets employed, it can be expressed as follows:

(a)   Total Asset Turnover Ratio: This ratio measures the efficiency with which the firm uses its total assets. This ratio is computed as:

$$\text{Total Asset Turnover Ratio} = \frac{\text{Sales / Cost of Goods Sold}}{\text{Total Assets}}$$

(b)   Fixed Assets Turnover Ratio: It measures the efficiency with which the firm uses its fixed assets.

$$\text{Fixed Assets Turnover Ratio} = \frac{\text{Sales / Cost of Goods Sold}}{\text{Fixed Assets}}$$

A high fixed assets turnover ratio indicates efficient utilisation of fixed assets in generating sales. A firm whose plant and machinery are old may show a higher fixed assets turnover ratio than the firm which has purchased them recently.

(c)   Capital Turnover Ratio/ Net Asset Turnover Ratio:

$$\text{Capital Turnover Ratio} = \frac{\text{Sales / Cost of Goods Sold}}{\text{Net Assets}}$$

This ratio indicates the firm's ability of generating sales/ Cost of Goods Sold per rupee of long term investment. The higher the ratio, the more efficient is the utilisation of owner's and long-term creditors' funds. Net Assets includes Net Fixed Assets and Net Current Assets (Current Assets – Current Liabilities). Since Net Assets equals to capital employed it is also known as Capital Turnover Ratio.

(d)   Current Assets Turnover Ratio: It measures the efficiency using the current assts by the firm.

$$\text{Current Assets Turnover Ratio} = \frac{\text{Sales / Cost of Goods Sold}}{\text{Current Assets}}$$

(e)   Working Capital Turnover Ratio:

$$\text{Working Capital Turnover Ratio} = \frac{\text{Sales / Cost of Goods Sold}}{\text{Working Capital}}$$

Working Capital Turnover is further segregated into Inventory Turnover, Debtors Turnover, and Creditors Turnover.

Note: Average of Total Assets/ Fixed Assets/ Current Assets/ Net Assets/ Working Capita/ also can be taken.

(i)   Inventory/ Stock Turnover Ratio: This ratio also known as stock turnover ratio establishes the relationship between the cost of goods sold during the year and average inventory held during the year. It measures the efficiency with which a firm utilizes or manages its inventory*.* It is calculated as follows:

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of Goods Sold / Sales}}{\text{Average Inventory *}}$$

$$\text{*Average Inventory} = \frac{\text{Opening Stock} + \text{Closing Stock}}{2}$$

In the case of inventory of raw material the inventory turnover ratio is calculated using the following formula :

$$\frac{\text{Raw Material Consumed}}{\text{Average Raw Material Stock}}$$

This ratio indicates that how fast inventory is used or sold. A high ratio is good from the view point of liquidity and vice versa. A low ratio would indicate that inventory is not used/ sold/ lost and stays in a shelf or in the warehouse for a long time.

(ii)   Receivables (Debtors) Turnover Ratio: In case firm sells goods on credit, the realization of sales revenue is delayed and the receivables are created. The cash is realised from these receivables later on.

The speed with which these receivables are collected affects the liquidity position of the firm. The debtor's turnover ratio throws light on the collection and credit policies of the firm. It measures the efficiency with which management is managing its accounts receivables*.* It is calculated as follows:

$$\text{Receivable (Debtor) Turnover Ratio} = \frac{\text{Credit Sales}}{\text{Average Accounts Receivable}}$$

Receivables (Debtors') Velocity: Debtors' turnover ratio indicates the average collection period. However, the average collection period can be directly calculated as follows: Receivable

Velocity/ Average Collection Period

$$= \frac{\text{Average Accounts Receivables}}{\text{Average Daily Credit Sales}}$$

Or,

$$= \frac{12 \text{ months} / 52 \text{ weeks} / 360 \text{ days}}{\text{Receivable Turnover Ratio}}$$

Average Daily Credit Sales = Average Daily Credit Sales

$$= \frac{\text{Credit Sales}}{\text{No. of days in year (say 360)}}$$

The average collection period measures the average number of days it takes to collect an account receivable. This ratio is also referred to as the number of days of receivable and the number of day's sales in receivables.

(iii) Payables Turnover Ratio: This ratio is calculated on the same lines as receivable turnover ratio is calculated. This ratio shows the velocity of payables payment by the firm. It is calculated as follows:

Payables Turnover Ratio = $\dfrac{\text{Annual Net Credit Purchases}}{\text{Average Accounts Payables}}$

A low creditor's turnover ratio reflects liberal credit terms granted by supplies. While a high ratio shows that accounts are settled rapidly.

$$\frac{\text{Credit Purchases}}{\text{Average Accounts Payable}}$$

Payable Velocity/ Average payment period can be calculated using:

$$\frac{\text{Average Accounts Payable}}{\text{Average Daily Credit Purchases}}$$

Or,

$$= \frac{12 \text{ months} / 52 \text{ weeks} / 360 \text{ days}}{\text{Payables Turnover Ratio}}$$

In determining the credit policy, debtor's turnover and average collection period provide a unique guideline.

The firm can compare what credit period it receives from the suppliers and what it offers to the customers. Also it can compare the average credit period offered to the customers in the industry to which it belongs.

The above three ratios i.e. Inventory Turnover Ratio/ Receivables Turnover Ratio is also relevant to examine liquidity of an organization.

> **Notes for calculating Ratios:**
> 1.   Only selling & distribution expenses differential Cost of Goods Sold (COGS) and Cost of Sales (COS) in absence of it COGS will be equal to sales.
> 2.   We can consider Cost of Goods Sold/ Cost of Sales to calculate turnover ratios eliminating profit part.
> 3.   Average of Total Assets/ Fixed Assets/ Current Assets/ Net Assets/ Working Capita/ also can be taken in calculating the above ratios. Infact when average figures of total assets, net assets, capital employed, shareholders' fund etc. are available it may be preferred to calculate ratios by using this information.
> 4.   Ratios shall be calculated based on requirement and availability and may deviate from original formulae.

3.3.4 Profitability Ratios: The profitability ratios measure the profitability or the operational efficiency of the firm. These ratios reflect the final results of business operations. They are some of the most closely watched and widely quoted ratios. Management attempts to maximize these ratios to maximize firm value.

The results of the firm can be evaluated in terms of its earnings with reference to a given level of assets or sales or owner's interest etc. Therefore, the profitability ratios are broadly classified in four categories:

(i)   Profitability Ratios related to Sales

(ii)   Profitability Ratios related to overall Return on Investment

(iii) Profitability Ratios required for Analysis from Owner's Point of View

(iv) Profitability Ratios related to Market/ Valuation/ Investors.

> **Profitability Ratios are as follows:**
> 1.   **Profitability Ratios based on Sales**
>   (a)   Gross Profit Ratio
>   (b)   Net Profit Ratio
>   (c)   Operating Profit Ratio
>   (d)   Expenses Ratio
> 2.   **Profitability Ratios related to Overall Return on Assets/ Investments**
>   (a)   Return on Investments (ROI)
>   (i)   Return on Assets (ROA)
>   (ii)   Return of Capital Employed (ROCE)

> (iii)   Return on Equity (ROE)
>
> **3.   Profitability Ratios required for Analysis from Owner's Point of View**
>
> (a)   Earnings per Share (EPS)
>
> (b)   Dividend per Share (DPS)
>
> (c)   Dividend Payout Ratio (DP)
>
> **4.   Profitability Ratios related to Market/ Valuation/ Investors**
>
> (a)   Price Earnings (P/E) Ratio
>
> (b)   Dividend and Earning Yield
>
> (c)   Market Value/ Book Value per Share (MVBV)
>
> (d)   Q Ratio

3.3.4.1 Profitability Ratios based on Sales

(a)   Gross Profit (G.P) Ratio/ Gross Profit Margin: It measures the percentage of each sale in rupees remaining after payment for the goods sold.

Gross Profit Ratio = $\dfrac{\text{Gross Pr ofit}}{\text{Sales}} \times 100$

Gross profit margin depends on the relationship between price/ sales, volume and costs. A high Gross Profit Margin is a favourable sign of good management.

(b)   Net Profit Ratio/ Net Profit Margin: It measures the relationship between net profit and sales of the business. Depending on the concept of net profit it can be calculated as:

(i)   Net Profit Ratio = $\dfrac{\text{Net Pr ofit}}{\text{Sales}} \times 100$ or $\dfrac{\text{Earnings after taxes (EAT)}}{\text{Sales}} \times 100$

(ii)   Pre-tax Profit Ratio = $\dfrac{\text{Earnings before taxes (EBT)}}{\text{Sales}} \times 100$

Net Profit ratio finds the proportion of revenue that finds its way into profits. A high net profit ratio will ensure positive returns of the business.

(c)   Operating Profit Ratio:

Operating profit ratio is also calculated to evaluate operating performance of business.

Operating Profit Ratio = $\dfrac{\text{Operating Pr ofit}}{\text{Sales}} \times 100$ or, $\dfrac{\text{Earnings before int erest and taxes (EBIT)}}{\text{Sales}} \times 100$

Where,

Operating Profit = Sales – Cost of Goods sold(COGS) – Expenses

Operating profit ratio measures the percentage of each sale in rupees that remains after the payment of all costs and expenses except for interest and taxes. This ratio is followed closely by analysts because it focuses on operating results. Operating profit is often referred to as earnings before interest and taxes or EBIT.

(d) Expenses Ratio: Based on different concepts of expenses it can be expresses in different variants as below:

(i)   Cost of Goods Sold (COGS) Ratio $= \dfrac{COGS}{Sales} \times 100$

(ii)   Operating Expenses Ratio $= \dfrac{Administrative\, exp. + Selling\, \&\, Distribution\, OH}{Sales} \times 100$

(iii) Operating Ratio $= \dfrac{COGS + Operating\, expenses}{Sales} \times 100$

(iv) Financial Expenses Ratio $= \dfrac{Financial\, expenses\,*}{Sales} \times 100$

*It excludes taxes, loss due to theft, goods destroyed by fire etc.

Administration Expenses Ratio, Selling & Distribution Expenses Ratio also can be calculated in similar ways.

3.3.4.2 Profitability Ratios related to Overall Return on Assets/ Investments:

(a)   Return on Investment (ROI): ROI is the most important ratio of all. It is the percentage of return on funds invested in the business by its owners. In short, this ratio tells the owner whether or not all the effort put into the business has been worthwhile. It compares earnings/ returns/ profit with the investment in the company. The ROI is calculated as follows:

Return on Investment $= \dfrac{Return\,/\,Profit\,/\,Earnings}{Investment} \times 100$

Or, $= \dfrac{Return\,/\,Profit\,/\,Earnings}{Sales} \times \dfrac{Sales}{Investment}$

(i) $\dfrac{Return\,/\,Profit\,/\,Earnings}{Sales}$ = Profitability Ratio

(ii)   Investment Turnover Ratio $= \dfrac{Sales}{Investments}$

So, ROI = Profitability Ratio $\times$ Investment Turnover Ratio. ROI can be improved either by improving   Profitability Ratio or Investment Turnover Ratio or by both.

The concept of investment varies and accordingly there are three broad categories of ROI i.e.

(i)   Return on Assets (ROA),

(ii)   Return on Capital Employed (ROCE) and

(iii)   Return on Equity (ROE).

We should keep in mind that investment may be Total Assets or Net Assets. Further funds employed in net assets are also known as capital employed which is nothing but Net worth plus Debt. Where Net worth is equity shareholders' fund. Similarly the concept of returns/ earnings/ profits may vary as per the requirement and availability of information.

(i)   Return on Assets (ROA): The profitability ratio is measured in terms of relationship between net profits and assets employed to earn that profit. This ratio measures the profitability of the firm in terms of assets employed in the firm. Based on various concepts of net profit (return) and assets the ROA may be measured as follows:

$$\text{ROA} = \frac{\text{Net Profit after taxes}}{\text{Average Total Assets}} \text{ or } \frac{\text{Net Profit after taxes}}{\text{Average Tangible Assets}} \text{ or } \frac{\text{Net Profit after taxes}}{\text{Average Fixed Assets}}$$

Here net profit is exclusive of interest. As Assets are also financed by lenders, hence ROA can be calculated as:

$$= \frac{\text{Net Profit after taxes} + \text{Interest}}{\text{Average Total Assets / Average Tangible Assets / Average Fixed Assets}}$$

$$\text{Or, } \frac{\text{EBIT}(1-t)}{\text{Average Total Assets}} \text{ \{also known as } \textbf{Return on Total Assets} \text{ (ROTA)\}}$$

$$\text{Or, } \frac{\text{EBIT}(1-t)}{\text{Average Net Assets}} \text{ \{also known as } \textbf{Return on Net Assets} \text{ (RONA)\}}$$

(ii)   Return on Capital Employed (ROCE): It is another variation of ROI.

The ROCE is calculated as follows:

$$\text{ROCE (Pre-tax)} = \frac{\text{Earnings before interest and taxes (EBIT)}}{\text{Capital Employed}} \times 100$$

$$\text{ROCE (Post-tax)} = \frac{\text{EBIT}(1-t)}{\text{Capital Employed}} \times 100$$

Sometime it is calculated as

$$= \frac{\text{Net Profit after taxes (PAT/EAT)} + \text{Interest}}{\text{Capital Employed}} \times 100$$

Where,

Capital Employed   = Total Assets – Current Liabilities

OR

= Fixed Assets + Working Capital

ROCE should always be higher than the rate at which the company borrows.

Intangible assets (assets which have no physical existence like goodwill, patents and trade marks) should be included in the capital employed. But no fictitious asset should be included within capital employed. If information is available then average capital employed shall be taken.

(iii) Return on Equity (ROE): Return on Equity measures the profitability of equity funds invested in the firm. This ratio reveals how profitably of the owners' funds have been utilised by the firm. It also measures the percentage return generated to equity shareholders. This ratio is computed as:

$$ROE = \frac{Net\,Profit\,after\,taxes - Preference\,dividend\,(if\,any)}{Net\,worth\,/\,equity\,shareholders'\,fund} \times 100$$

Return on equity is one of the most important indicators of a firm's profitability and potential growth. Companies that boast a high return on equity with little or no debt are able to grow without large capital expenditures, allowing the owners of the business to withdraw cash and reinvest it elsewhere. Many investors fail to realize, however, that two companies can have the same return on equity, yet one can be a much better business. If return on total shareholders is calculated then Net Profit after taxes (before preference dividend) shall be divided by total shareholders' fund includes preference share capital. ROE can also be considered under profitability ratio required for analysis from owner's point of view.

Composition of Return on Equity using the DuPont Model:

A finance executive at E.I. Du Pont de Nemours and Co., of Wilmington, Delaware, created the DuPont system of financial analysis in 1919. That system is used around the world today and serves as the basis of components that make up return on equity.

There are three components in the calculation of return on equity using the traditional DuPont model- the net profit margin, asset turnover, and the equity multiplier. By examining each input individually, the sources of a company's return on equity can be discovered and compared to its competitors.

(i)   Net Profit Margin: The net profit margin is simply the after-tax profit a company generates for each rupee of revenue. Net profit margins vary across industries, making it important to compare a potential investment against its competitors. Although the general rule-of-thumb is that a higher net profit margin is preferable, it is not uncommon for management to purposely lower the net profit margin in a bid to attract higher sales.

Net profit margin = Net Income ÷ Revenue

Net profit margin is a safety cushion; the lower the margin, the less room for error. A business with 1% margins has no room for flawed execution. Small miscalculations on management's part could lead to tremendous losses with little or no warning.

(ii)   ***Asset Turnover****:* The asset turnover ratio is a measure of how effectively a company converts its assets into sales. It is calculated as follows:

Asset Turnover = Revenue ÷ Assets

The asset turnover ratio tends to be inversely related to the net profit margin; i.e., the higher the net profit margin, the lower the asset turnover. The result is that the investor can compare companies using different models (low-profit, high-volume vs. high-profit, low-volume) and determine which one is the more attractive business.

(iii)   ***Equity Multiplier****:* It is possible for a company with terrible sales and margins to take on excessive debt and artificially increase its return on equity. The equity multiplier, a measure of financial leverage, allows the investor to see what portion of the return on equity is the result of debt. The equity multiplier is calculated as follows:

Equity Multiplier = Assets ÷ Shareholders' Equity.

Calculation of Return on Equity

To calculate the return on equity using the DuPont model, simply multiply the three components (net profit margin, asset turnover, and equity multiplier.)

Return on Equity = (Net Profit Margin) (Asset Turnover) (Equity Multiplier)

Example: *XYZ Company's details are as under:*

Revenue: ₹ 29,261; Net Income: ₹ 4,212; Assets: ₹ 27,987; Shareholders' Equity: ₹ 13,572. Calculate return on equity.

Solution

(i)   Net Profit Margin = Net Income (₹ 4,212) ÷ Revenue (₹ 29,261) = 0.1439, or 14.39%

(ii)   Asset Turnover = Revenue (₹ 29,261) ÷ Assets (₹ 27,987) = 1.0455

(iii)   Equity Multiplier = Assets (₹ 27,987) ÷ Shareholders' Equity (₹ 13,572) = 2.0621

Finally, we multiply the three components together to calculate the return on equity:

Return on Equity = Net Profit Margin × Asset Turnover × Equity Multiplier

= (0.1439) × (1.0455) × (2.0621) = 0.3102, or 31.02%

Analysis: A 31.02% return on equity is good in any industry. Yet, if you were to leave out the equity multiplier to see how much company would earn if it were completely debt-free, you will see that the ROE drops to 15.04%. 15.04% of the return on equity was due to profit margins and sales, while 15.96% was due to returns earned on the debt at work in the business. If you found a company at a comparable valuation with the same return on equity yet a higher percentage arose from internally-generated sales, it would be more attractive.

3.3.4.3 Profitability Ratios Required for Analysis from Owner's Point of View

(a)   Earnings per Share (EPS): The profitability of a firm from the point of view of ordinary shareholders can be measured in terms of number of equity shares. This is known as Earnings per share. It is calculated as follows:

Earnings per Share (EPS) = $\dfrac{\text{Net profit available to equity share holders}}{\text{Number of equity shares outs tanding}}$

(b) Dividend per Share (DPS): Earnings per share as stated above reflects the profitability of a firm per share; it does not reflect how much profit is paid as dividend and how much is retained by the business. Dividend per share ratio indicates the amount of profit distributed to equity shareholders per share. It is calculated as:

Dividend per Share (DPS) = $\dfrac{\text{Total Dividend paid to equity share holders}}{\text{Number of equity shares outs tanding}}$

(c) Dividend Payout Ratio (DP): This ratio measures the dividend paid in relation to net earnings. It is determined to see to how much extent earnings per share have been retained by the management for the business. It is computed as:

Dividend payout Ratio = $\dfrac{\text{Dividend per equity share (DPS)}}{\text{Earning per Share (EPS)}}$

3.3.4.4 Profitability Ratios related to market/ valuation/ Investors: These ratios involve measures that consider the market value of the company's shares. Frequently share prices data are punched with the accounting data to generate new set of information. These are (a) Price- Earnings Ratio, (b) Dividend Yield, (c) Market Value/ Book Value per share, (d) Q Ratio.

(a) Price- Earnings Ratio (P/E Ratio): The price earnings ratio indicates the expectation of equity investors about the earnings of the firm. It relates earnings to market price and is generally taken as a summary measure of growth potential of an investment, risk characteristics, shareholders orientation, corporate image and degree of liquidity. It is calculated as

Price-Earnings per Share (P/E Ratio) = $\dfrac{\text{Market Pr ice per Share (MPS)}}{\text{Earning per Share (EPS)}}$

It indicates the payback period to the investors or prospective investors.

(b) Dividend and Earning Yield:

Dividend Yield = $\dfrac{\text{Dividend} \pm \text{Change in share peice}}{\text{Initial share price}} \times 100$

Sometime it is calculated as

$\dfrac{\text{Dividend per Share (DPS)}}{\text{Market Pr ice per Share (MPS)}} \times 100$

This ratio indicates return on investment; this may be on average investment or closing investment. Dividend (%) indicates return on paid up value of shares. But yield (%) is the indicator of true return in which share capital is taken at its market value. Earning Yield also can be calculated as

$$\text{Earnings Yield} = \frac{\text{Earnings per Share (EPS)}}{\text{Market Price per Share (MPS)}} \times 100$$

Also known as Earnings Price (EP) Ratio.

(c) Market Value /Book Value per Share (MVBV): It provides evaluation of how investors view the company's past and future performance.

$$\frac{\text{Market value per share}}{\text{Book value per share}} = \frac{\text{Average share price}}{\text{Net worth} \div \text{No. of equity shares}}$$

$$\text{Or, } \frac{\text{Closing share price}}{\text{Net worth} \div \text{No. of equity shares}}$$

This ratio indicates market response of the shareholders' investment. Undoubtedly, higher the ratios better is the shareholders' position in terms of return and capital gains.

(d) Q Ratio: This ratio is proposed by James Tobin, a ratio is defined as

$$\frac{\text{Market Value of equity and liabilities}}{\text{Estimated replacement cost of assets}}$$

Notes for calculating Ratios:

1. EBIT (Earnings before interest and taxes) = PBIT (Profit before interest and taxes),

    EAT (Earnings after taxes) = PAT (Profit after taxes),

    EBT (Earnings before taxes) = PBT (Profit before taxes)

2. In absence of preference dividend PAT can be taken as earnings available to equity shareholders.

3. If information is available then average capital employed shall be taken while calculating ROCE.

3. Ratios shall be calculated based on requirement and availability and may deviate from original formulae.

4. Numerator should be taken in correspondence with the denominator and vice-versa.

3.4   Application of Ratio Analysis in Financial Decision Making

A popular technique of analysing the performance of a business concern is that of financial ratio analysis. As a tool of financial management, they are of crucial significance.

The importance of ratio analysis lies in the fact that it presents facts on a comparative basis and enables drawing of inferences regarding the performance of a firm.

Ratio analysis is relevant in assessing the performance of a firm in respect of following aspects:

3.4.1 Financial Ratios for Evaluating Performance

(a) Liquidity Position: With the help of ratio analysis one can draw conclusions regarding liquidity position of a firm. The liquidity position of a firm would be satisfactory if it is able to meet its obligations when they become due. This ability is reflected in the liquidity ratios of a firm. The liquidity ratios are particularly useful in credit analysis by banks and other suppliers of short-term loans.

(b) Long-term Solvency: Ratio analysis is equally useful for assessing the long-term financial viability of a firm. This aspect of the financial position of a borrower is of concern to the long term creditors, security analysts and the present and potential owners of a business.

The long term solvency is measured by the leverage/capital structure and profitability ratios which focus on earning power and operating efficiency.

The leverage ratios, for instance, will indicate whether a firm has a reasonable proportion of various sources of finance or whether heavily loaded with debt in which case its solvency is exposed to serious strain.

Similarly, the various profitability ratios would reveal whether or not the firm is able to offer adequate return to its owners consistent with the risk involved.

(c) Operating Efficiency: Ratio analysis throws light on the degree of efficiency in the management and utilisation of its assets.

The various activity ratios measure this kind of operational efficiency. In fact, the solvency of a firm is, in the ultimate analysis, dependent upon the sales revenues generated by the use of its assets – total as well as its components.

(d) Overall Profitability: Unlike the outside parties which are interested in one aspect of the financial position of a firm, the management is constantly concerned about the overall profitability of the enterprise. That is, they are concerned about the ability of the firm to meet its short-term as well as long-term obligations to its creditors, to ensure a reasonable return to its owners and secure optimum utilisation of the assets of the firm. This is possible if an integrated view is taken and all the ratios are considered together.

(e) Inter-firm Comparison: Ratio analysis not only throws light on the financial position of a firm but also serves as a stepping stone to remedial measures. This is made possible due to inter-firm comparison/comparison with industry averages.

A single figure of particular ratio is meaningless unless it is related to some standard or norm. One of the popular techniques is to compare the ratios of a firm with the industry average. It should be reasonably expected that the performance of a firm should be in broad conformity with that of the industry to which it belongs.

An inter-firm comparison would demonstrate the relative position vis-a-vis its competitors. If the results are at variance either with the industry average or with those of the competitors, the firm can seek to identify the probable reasons and, in the light, take remedial measures.

Ratios not only perform post mortem of operations, but also serve as barometer for future. Ratios have predictory value and they are very helpful in forecasting and planning the business activities for a future. It helps in budgeting.

Conclusions are drawn on the basis of the analysis obtained by using ratio analysis. The decisions affected may be whether to supply goods on credit to a concern, whether bank loans will be made available, etc.

(f)   Financial Ratios for Budgeting: In this field ratios are able to provide a great deal of assistance, budget is only an estimate of future activity based on past experience, in the making of which the relationship between different spheres of activities are invaluable.

It is usually possible to estimate budgeted figures using financial ratios.

Ratios also can be made use of for measuring actual performance with budgeted estimates. They indicate directions in which adjustments should be made either in the budget or in performance to bring them closer to each other.

3.5   Limitations of Financial Ratios

The limitations of financial ratios are listed below:

(i)   *Diversified product lines:* Many businesses operate a large number of divisions in quite different industries. In such cases ratios calculated on the basis of aggregate data cannot be used for inter-firm comparisons.

(ii)   *Financial data are badly distorted by inflation:* Historical cost values may be substantially different from true values. Such distortions of financial data are also carried in the financial ratios.

(iii)   Seasonal factors may also influence financial data.

Example: *A company deals in summer garments. It keeps a high inventory during October - January every year. For the rest of the year its inventory level becomes just 1/4th of the seasonal inventory level.*

So liquidity ratios and inventory ratios will produce biased picture. Year end picture may not be the average picture of the business. Sometimes it is suggested to take monthly average inventory data instead of year end data to eliminate seasonal factors. But for external users it is difficult to get monthly inventory figures. (Even in some cases monthly inventory figures may not be available).

(iv)   *To give a good shape to the popularly used financial ratios* (*like current ratio, debt- equity ratios, etc.*): The business may make some year-end adjustments. Such window dressing can change the character of financial ratios which would be different had there been no such change.

(v)   *Differences in accounting policies and accounting period*: It can make the accounting data of two firms non-comparable as also the accounting ratios.

(vi) *There is no standard set of ratios against which a firm's ratios can be compared*: Sometimes a firm's ratios are compared with the industry average. But if a firm desires to be above the average, then industry average becomes a low standard. On the other hand, for a below average firm, industry averages become too high a standard to achieve.

(vii) *It is very difficult to generalise whether a particular ratio is good or bad*: For example, a low current ratio may be said 'bad' from the point of view of low liquidity, but a high current ratio may not be 'good' as this may result from inefficient working capital management.

(viii) *Financial ratios are inter-related, not independent*: Viewed in isolation one ratio may highlight efficiency. But when considered as a set of ratios they may speak differently. Such interdependence among the ratios can be taken care of through multivariate analysis.

Financial ratios provide clues but not conclusions. These are tools only in the hands of experts because there is no standard ready-made interpretation of financial ratios.

3.6   Summary of Ratios

Another way of categorizing the ratios is being shown to you in a tabular form. A summary of the ratios has been tabulated as under:

Ratio	Formulae	Comments
Liquidity Ratio		
Current Ratio	$\dfrac{\text{Current Assets}}{\text{Current Liabilities}}$	A simple measure that estimates whether the business can pay short term debts. Ideal ratio is 2 : 1.
Quick Ratio	$\dfrac{\text{Quick Assets}}{\text{Current Liabilities}}$	It measures the ability to meet current debt immediately. Ideal ratio is 1 : 1.
Cash Ratio	$\dfrac{\left(\begin{array}{c}\text{Cash and Bank balances +}\\ \text{Marketable Securities}\end{array}\right)}{\text{Current Liabilities}}$	It measures absolute liquidity of the business.
Basic Defense Interval Ratio	$\dfrac{\left(\begin{array}{c}\text{Cash and Bank balances +}\\ \text{Marketable Securities}\end{array}\right)}{\text{Opearing Expenses} \div \text{No. of days}}$	It measures the ability of the business to meet regular cash expenditures.
Net Working Capital Ratio	Current Assets – Current Liabilities	It is a measure of cash flow to determine the ability of business to survive financial crisis.

Capital Structure Ratio		
Equity Ratio	$\dfrac{\text{Shareholders' Equity}}{\text{Capital Employed}}$	It indicates owner's fund in companies to total fund invested.
Debt Ratio	$\dfrac{\text{Total outside liabilities}}{\text{Total Debt} + \text{Net worth}}$	It is an indicator of use of outside funds.
Debt to equity Ratio	$\dfrac{\text{Total Outside Liabilities}}{\text{Shareholders' Equity}}$	It indicates the composition of capital structure in terms of debt and equity.
Debt to Total assets Ratio	$\dfrac{\text{Total Outside Liabilities}}{\text{Total Assets}}$	It measures how much of total assets is financed by the debt.
Capital Gearing Ratio	$\dfrac{\left(\begin{array}{c}\text{Preference Share Capital} + \text{Debentures} \\ + \text{ Other Borrowed funds}\end{array}\right)}{\left(\begin{array}{c}\text{Equity Share Capital} + \\ \text{Reserves \& Surplus} - \text{Losses}\end{array}\right)}$	It shows the proportion of fixed interest bearing capital to equity shareholders' fund. It also signifies the advantage of financial leverage to the equity shareholder.
Proprietary Ratio	$\dfrac{\text{Proprietary Fund}}{\text{Total Assets}}$	It measures the proportion of total assets financed by shareholders.
Coverage Ratios		
Debt Service Coverage Ratio (DSCR)	$\dfrac{\text{Earnings available for debt services}}{\text{Interest} + \text{Instalments}}$	It measures the ability to meet the commitment of various debt services like interest, instalment etc. Ideal ratio is 2.
Interest Coverage Ratio	$\dfrac{\text{EBIT}}{\text{Interest}}$	It measures the ability of the business to meet interest. Ideal ratio is > 1.
Preference Dividend Coverage Ratio	$\dfrac{\text{Net Profit / Earning after taxes (EAT)}}{\text{Preference dividend liability}}$	It measures the ability to pay the preference shareholders' dividend. Ideal ratio is > 1.
Fixed Charges Coverage Ratio	$\dfrac{\text{EBIT} + \text{Depreciation}}{\text{Interest} + \dfrac{\text{Re} - \text{payment of loan}}{1 - \text{tax rate}}}$	This ratio shows how many times the cash flow before interest and taxes covers all fixed financing charges. The

		ideal ratio is > 1.
Activity Ratio/ Efficiency Ratio/ Performance Ratio/ Turnover Ratio		
Total Asset Turnover Ratio	$\dfrac{\text{Sales / Cost of Goods Sold}}{\text{Average Total Assets}}$	A measure of total asset utilisation. It helps to answer the question - What sales are being generated by each rupee's worth of assets invested in the business?
Fixed Assets Turnover Ratio	$\dfrac{\text{Sales / Cost of Goods Sold}}{\text{Fixed Assets}}$	This ratio is about fixed asset capacity. A reducing sales or profit being generated from each rupee invested in fixed assets may indicate overcapacity or poorer-performing equipment.
Capital Turnover Ratio	$\dfrac{\text{Sales / Cost of Goods Sold}}{\text{Net Assets}}$	This indicates the firm's ability to generate sales per rupee of long term investment.
Working Capital Turnover Ratio	$\dfrac{\text{Sales / COGS}}{\text{Working Capital}}$	It measures the efficiency of the firm to use working capital.
Inventory Turnover Ratio	$\dfrac{\text{COGS / Sales}}{\text{Average Inventory}}$	It measures the efficiency of the firm to manage its inventory.
Debtors Turnover Ratio	$\dfrac{\text{Credit Sales}}{\text{Average Accounts Receivable}}$	It measures the efficiency at which firm is managing its receivables.
Receivables (Debtors') Velocity	$\dfrac{\text{Average Accounts Receivables}}{\text{Average Daily Credit Sales}}$	It measures the velocity of collection of receivables.
Payables Turnover Ratio	$\dfrac{\text{Annual Net Credit Purchases}}{\text{Average Accounts Payables}}$	It measures the velocity of payables payment.
Profitability Ratios based on Sales		
Gross Profit Ratio	$\dfrac{\text{Gross Profit}}{\text{Sales}} \times 100$	This ratio tells us something about the business's ability

		consistently to control its production costs or to manage the margins it makes on products it buys and sells.
Net Profit Ratio	$\dfrac{\text{Net Profit}}{\text{Sales}} \times 100$	It measures the relationship between net profit and sales of the business.
Operating Profit Ratio	$\dfrac{\text{Operating Profit}}{\text{Sales}} \times 100$	It measures operating performance of business.
Expenses Ratio		
Cost of Goods Sold (COGS) Ratio	$\dfrac{\text{COGS}}{\text{Sales}} \times 100$	It measures portion of a particular expenses in comparison to sales.
Operating Expenses Ratio	$\dfrac{\left(\begin{array}{l}\text{Administrative exp.} + \\ \text{Selling \& Distribution OH}\end{array}\right)}{\text{Sales}} \times 100$	
Operating Ratio	$\dfrac{\text{COGS} + \text{Operating expenses}}{\text{Sales}} \times 100$	
Financial Expenses Ratio	$\dfrac{\text{Financial expenses}}{\text{Sales}} \times 100$	
Profitability Ratios related to Overall Return on Assets/ Investments		
Return on Investment (ROI)	$\dfrac{\text{Return / Profit / Earnings}}{\text{Investments}} \times 100$	It measures overall return of the business on investment/ equity funds/ capital employed/ assets.
Return on Assets (ROA)	$\dfrac{\text{Net Profit after taxes}}{\text{Average total assets}}$	It measures net profit per rupee of average total assets/ average tangible assets/ average fixed assets.
Return on Capital Employed ROCE (Pre-tax)	$\dfrac{\text{EBIT}}{\text{Capital Employed}} \times 100$	It measures overall earnings (either pre-tax or post tax) on total capital employed.
Return on Capital Employed ROCE (Post-tax)	$\dfrac{\text{EBIT}(1-t)}{\text{Capital Employed}} \times 100$	It indicates earnings available to equity shareholders in comparison

Return on Equity (ROE)	$\dfrac{\left(\begin{array}{l}\text{Net Pr ofit after taxes} - \\ \text{Pr eference dividend (if any)}\end{array}\right)}{\text{Net worth / equity shareholders' fund}} \times$	to equity shareholders' net worth.
Profitability Ratios Required for Analysis from Owner's Point of View		
Earnings per Share (EPS)	$\dfrac{\text{Net profit available to equity share hold}}{\text{Number of equity shares outs tandin}}$	EPS measures the overall profit generated for each share in existence over a particular period.
Dividend per Share (DPS)	$\dfrac{\text{Dividend paid to equity share holders}}{\text{Number of equity shares outs tanding}}$	Proportion of profit distributed per equity share.
Dividend payout Ratio (DP)	$\dfrac{\text{Dividend per equity share}}{\text{Earning per Share (EPS)}}$	It shows % of EPS paid as dividend and retained earnings.
Profitability Ratios related to market/ valuation/ Investors		
Price-Earnings per Share (P/E Ratio)	$\dfrac{\text{Market Pr ice per Share (MPS)}}{\text{Earning per Share (EPS)}}$	At any time, the P/E ratio is an indication of how highly the market "rates" or "values" a business. A P/E ratio is best viewed in the context of a sector or market average to get a feel for relative value and stock market pricing.
Dividend Yield	$\dfrac{\text{Dividend} \pm \text{Change in share peice}}{\text{Initial share price}} \times 100$ OR $\dfrac{\text{Dividend per Share (DPS)}}{\text{Market Pr ice per Share (MPS)}} \times 100$	It measures dividend paid based on market price of shares.
Earnings Yield	$\dfrac{\text{Earnings per Share (EPS)}}{\text{Market Price per Share (MPS)}} \times 100$	It is the relationship of earning per share and market value of shares.
Market Value /Book Value per Share	$\dfrac{\text{Market value per share}}{\text{Book value per share}}$	It indicates market response of the shareholders' investment.

Q Ratio	$\dfrac{\text{Market Value of equity and liabilities}}{\text{Estimated replacement cost of assets}}$	It measures market value of equity as well as debt in comparison to all assets at their replacement cost.

Illustration 1 : *In a meeting held at Solan towards the end of 2014, the Directors of M/s HPCL Ltd. have taken a decision to diversify. At present HPCL Ltd. sells all finished goods from its own warehouse. The company issued debentures on 01.01.2015 and purchased fixed assets on the same day. The purchase prices have remained stable during the concerned period. Following information is provided to you:*

INCOME STATEMENTS

	2014 (₹)		2015 (₹)	
Cash Sales	30,000		32,000	
Credit Sales	2,70,000	3,00,000	3,42,000	3,74,000
Less: Cost of goods sold		2,36,000		2,98,000
Gross profit		64,000		76,000
Less: Operating Expenses				
Warehousing	13,000		14,000	
Transport	6,000		10,000	
Administrative	19,000		19,000	
Selling	11,000		14,000	
		49,000	2,000	59,000
Net Profit		15,000		17,000

BALANCE SHEET

	2014 (₹)		2015 (₹)	
Fixed Assets (Net Block)	-	30,000	-	40,000
Receivables	50,000		82,000	
Cash at Bank	10,000		7,000	
Stock	60,000		94,000	
Total Current Assets (CA)	1,20,000		1,83,000	
Payables	50,000		76,000	
Total Current Liabilities (CL)	50,000		76,000	
Working Capital (CA - CL)		70,000		1,07,000
Total Assets		1,00,000		1,47,000

Represented by:				
Share Capital		*75,000*		*75,000*
Reserve and Surplus		*25,000*		*42,000*
Debentures		*–*		*30,000*
		1,00,000		*1,47,000*

You are required to calculate the following ratios for the years 2014 and 2015.

(i)   *Gross Profit Ratio*

(ii)   *Operating Expenses to Sales Ratio.*

(iii)   *Operating Profit Ratio*

(iv)   *Capital Turnover Ratio*

(v)   *Stock Turnover Ratio*

(vi)   *Net Profit to Net Worth Ratio, and*

(vii) *Receivables Collection Period.*

Ratio relating to capital employed should be based on the capital at the end of the year. Give the reasons for change in the ratios for 2 years. Assume opening stock of ₹ 40,000 for the year 2014. Ignore Taxation.

Solution

Computation of Ratios		
1. Gross profit ratio	**2014**	**2015**
Gross profit/sales	$\dfrac{64,000\times100}{3,00,000}$	$\dfrac{76,000\times100}{3,74,000}$
	21.3%	20.3
2. Operating expense to sales ratio		
Operating exp / Total sales	$\dfrac{49,000\times100}{3,00,000}$	$\dfrac{57,000\times100}{3,74,000}$
	16.3%	15.2%
3. Operating profit ratio		
Operating profit / Total sales	$\dfrac{15,000\times100}{3,00,000}$	$\dfrac{19,000\times100}{3,74,000}$
	5%	5.08%
4. Capital turnover ratio		
Sales / capital employed	$\dfrac{3,00,000}{1,00,000}=3$	$\dfrac{3,74,000}{1,47,000}=2.54$

5.	Stock turnover ratio		
	COGS / Average stock	$\dfrac{2,36,000}{50,000} = 4.7$	$\dfrac{2,98,000}{77,000} = 3.9$
6.	Net Profit to Networth		
	Net profit / Networth	$\dfrac{15,000 \times 100}{1,00,000} = 15\%$	$\dfrac{17,000 \times 100}{1,17,000}$ $= 14.5\%$
7.	*Receivables collection period*		
	Average receivables / Average daily sales	$\dfrac{50,000}{739.73}$	$\dfrac{82,000}{936.99}$
	(Refer to working note)	67.6 days	87.5 days

Working note:

Average daily sales = Credit sales / 365	$\dfrac{2,70,000}{365}$	$\dfrac{3,42,000}{365}$
	₹ 739.73	₹ 936.99

Analysis: The decline in the Gross profit ratio could be either due to a reduction in the selling price or increase in the direct expenses (since the purchase price has remained the same). Similarly there is a decline in the ratio of Operating expenses to sales. However since operating expenses have little bearing with sales, a decline in this ratio cannot be necessarily be interpreted as an increase in operational efficiency. An in-depth analysis reveals that the decline in the warehousing and the administrative expenses has been partly set off by an increase in the transport and the selling expenses. The operating profit ratio has remained the same in spite of a decline in the Gross profit margin ratio. In fact the company has not benefited at all in terms of operational performance because of the increased sales.

The company has not been able to deploy its capital efficiently. This is indicated by a decline in the Capital turnover from 3 to 2.5 times. In case the capital turnover would have remained at 3 the company would have increased sales and profits by ₹ 67,000 and ₹ 3,350 respectively.

The decline in the stock turnover ratio implies that the company has increased its investment in stock. Return on Networth has declined indicating that the additional capital employed has failed to increase the volume of sales proportionately. The increase in the Average collection period indicates that the company has become liberal in extending credit on sales. However, there is a corresponding increase in the current assets due to such a policy.

It appears as if the decision to expand the business has not shown the desired results.

Illustration 2 : *Following is the abridged Balance Sheet of Alpha Ltd. :-*

Liabilities	₹	Assets	₹	₹
Share Capital	1,00,000	Land and Buildings		80,000
Profit and Loss Account	17,000	Plant and Machineries	50,000	
Current Liabilities	40,000	Less: Depreciation	15,000	35,000
				1,15,000
		Stock	21,000	
		Receivables	20,000	
		Bank	1,000	42,000
Total	1,57,000	Total		1,57,000

With the help of the additional information furnished below, you are required to prepare Trading and Profit & Loss Account and a Balance Sheet as at 31st March, 2013:

(i)   *The company went in for reorganisation of capital structure, with share capital remaining the same as follows:*

Share capital	50%
Other Shareholders' funds	15%
5% Debentures	10%
Payables	25%

Debentures were issued on 1st April, interest being paid annually on 31st March.

(ii)   *Land and Buildings remained unchanged. Additional plant and machinery has been bought and a further ₹ 5,000 depreciation written off.*

(The total fixed assets then constituted 60% of total gross fixed and current assets.)

(iii)   *Working capital ratio was 8 : 5.*

(iv)   *Quick assets ratio was 1 : 1.*

(v)   *The receivables (four-fifth of the quick assets) to sales ratio revealed a credit period of 2 months. There were no cash sales.*

(vi)   *Return on net worth was 10%.*

(vii)   *Gross profit was at the rate of 15% of selling price.*

(viii)   *Stock turnover was eight times for the year.*

Ignore Taxation.

Solution

Particulars	%	(₹)
Share capital	50%	1,00,000
Other shareholders funds	15%	30,000

5% Debentures	10%	20,000
Payables	25%	50,000
Total	100%	2,00,000

Land and Buildings

Total liabilities	=	Total Assets
₹ 2,00,000	=	Total Assets
Fixed Assets	=	60% of total gross fixed assets and current assets
	=	₹ 2,00,000×60/100 = ₹ 1,20,000

Calculation of additions to Plant & Machinery

	₹
Total fixed assets	1,20,000
Less: Land & Buildings	80,000
Plant and Machinery (after providing depreciation)	40,000
Depreciation on Machinery up to 31-3-2012	15,000
Add: Further depreciation	5,000
Total	20,000

Current assets	=	Total assets – Fixed assets
	=	₹ 2,00,000 – ₹ 1,20,000 = ₹ 80,000

Calculation of stock

Quick ratio: $= \dfrac{\text{Current assets} - \text{stock}}{\text{Current liabilities}} = 1$

$= \dfrac{₹\,80,000\, -\, \text{stock}}{₹\,50,000} = 1$

₹ 50,000	=	₹ 80,000 – Stock
Stock	=	₹ 80,000 - ₹ 50,000
	=	₹ 30,000
Receivables	=	4/5th of quick assets
	=	(₹ 80,000 – 30,000)× 4/5
	=	₹ 40,000

Receivables turnover ratio

$= \dfrac{\text{Receivables}}{\text{Credit Sales}} \times 365\,\text{days} = \quad 60\ \text{days}$

$= \dfrac{40,000 \times 12}{\text{Credit Sales}} \times 365 = \quad 2\ \text{months}$

2 credit sales =   4,80,000

Credit sales   =   4,80,000/2

=   2,40,000

Gross profit (15% of sales)

₹ 2,40,000×15/100 = ₹ 36,000

Return on networth (net profit)

Net worth   =   ₹ 1,00,000 + ₹ 30,000

=   ₹ 1,30,000

Net profit   =   ₹ 1,30,000×10/100   =   ₹ 13,000

Debenture interest = ₹ 20,000×5/100   =   ₹ 1,000

Projected profit and loss account for the year ended 31-3-2013

To cost of goods sold	2,04,000	By sales	2,40,000
To gross profit	36,000		
	2,40,000		2,40,000
To debenture interest	1,000	By gross profit	36,000
To administration and other expenses	22,000		
To net profit	13,000		
	36,000		36,000

Projected Balance Sheet as at 31st March, 2013

Liabilities	₹	Assets		₹
Share capital	1,00,000	Fixed assets		
Profit and loss A/c	30,000	Land & buildings		80,000
(17,000+13,000)		Plant & machinery	60,000	
5% Debentures	20,000	*Less*: Depreciation	20,000	40,000
Current liabilities		Current assets		
		Stock	30,000	
Trade creditors	50,000	Debtors	40,000	
		Bank	10,000	80,000
	2,00,000			2,00,000

Illustration 3 : *X Co. has made plans for the next year. It is estimated that the company will employ total assets of ₹ 8,00,000; 50 per cent of the assets being financed by borrowed capital at an interest cost of 8 per cent per year. The direct costs for the year are estimated at ₹ 4,80,000 and all other operating expenses are estimated at ₹ 80,000. the goods will be sold to customers at 150 per cent of the direct costs. Tax rate is assumed to be 50 per cent.*

You are required to calculate: (i) net profit margin; (ii) return on assets; (iii) asset turnover and (iv) return on owners' equity.

Solution   **The net profit is calculated as follows:**

	₹	₹
Sales (150% of ₹ 4,80,000)		7,20,000
Direct costs		4,80,000
Gross profit		2,40,000
Operating expenses	80,000	
Interest changes (8% of ₹ 4,00,000)	32,000	1,12,000
Profit before taxes		1,28,000
Taxes (@ 50%)		64,000
Net profit after taxes		64,000

(i)   Net profit margin $= \dfrac{\text{Profit after taxes}}{\text{Sales}}$ $= \dfrac{₹\,64,000}{₹\,7,20,000} = 0.89$ or 8.9%

Net profit margin $= \dfrac{\text{EBIT (1 - T)}}{\text{Sales}}$ $= \dfrac{₹\,1,60,000(1-.5)}{7,20,000} = 0.111$ or 11.1%

(ii)   Return on assets $= \dfrac{\text{EBIT (1 - T)}}{\text{Assets}}$ $= \dfrac{₹\,1,60,000(1-.5)}{8,00,000} = 0.10$ or 10%

(iii) Asset turnover $= \dfrac{\text{Sales}}{\text{Assets}}$ $= \dfrac{₹\,7,20,000}{₹\,8,00,000} = 0.9$ times

(iv)   Return on equity $= \dfrac{\text{Net Profit after taxes}}{\text{Owners' equity}}$ $= \dfrac{₹\,64,000}{50\% \text{ of } ₹\,8,00,000}$

$= \dfrac{₹\,64,000}{₹\,4,00,000} = 0.16$ or 16%

Illustration 4 : *The total sales (all credit) of a firm are ₹ 6,40,000. It has a gross profit margin of 15 per cent and a current ratio of 2.5. The firm's current liabilities are ₹ 96,000; inventories ₹ 48,000 and cash ₹ 16,000. (a) Determine the average inventory to be carried by the firm, if an inventory turnover of 5 times is expected? (Assume a 360 day year). (b) Determine the average collection period if the opening balance of debtors is intended to be of ₹ 80,000? (Assume a 360 day year).*

Solution

(a)   Inventory turnover $= \dfrac{\text{Cost of goods sold}}{\text{Average inventory}}$

Since gross profit margin is 15 per cent, the cost of goods sold should be 85 per cent of the sales.

Cost of goods sold = 0.85 × ₹ 6,40,000 = ₹ 5,44,000.

Thus, $= \dfrac{₹\,5,44,000}{\text{Average inventory}} = 5$

Average inventory $= \dfrac{₹\,5,44,000}{5} = ₹\,1,08,800$

(b) Average collection period $= \dfrac{\text{Average Receivables}}{\text{Credit Sales}} \times 360\,\text{days}$

Average Receivables $= \dfrac{(\text{Opening Receivables} + \text{Closing Receivables})}{2}$

Closing balance of receivables is found as follows:

	₹	₹
Current assets (2.5 of current liabilities)		2,40,000
Less: Inventories	48,000	
Cash	16,000	64,000
∴ Receivables		1,76,000

Average Receivables $= \dfrac{(₹\,1,76,000 + ₹\,80,000)}{2}$

₹ 2,56,000 ÷ 2 = ₹ 1,28,000

Average collection period $= \dfrac{₹\,1,28,000}{₹\,6,40,000} \times 360 = 72\,\text{days}$

Illustration 5: *The capital structure of Beta Limited is as follows:*

Equity share capital of Rs. 10 each	*8,00,000*
9% preference share capital of Rs. 10 each	*3,00,000*
	11,00,000

Additional information: Profit (after tax at 35 per cent), ₹ 2,70,000; Depreciation, ₹ 60,000; Equity dividend paid, 20 per cent; Market price of equity shares, ₹ 40.

You are required to compute the following, showing the necessary workings:

(a) Dividend yield on the equity shares

(b) Cover for the preference and equity dividends

(c) Earnings per shares

(d) Price-earnings ratio.

Solution

(a) *Dividend yield on the equity shares*

$$= \frac{\text{Dividend per share}}{\text{Market price per share}} \times 100 = \frac{₹\,2\,(=0.20 \times ₹\,10)}{₹\,40} \times 100 = 5 \text{ per cent}$$

(b) *Dividend coverage ratio*

(i) Preference $= \dfrac{\text{Profit after taxes}}{\text{Dividend payable to preference shareholders}}$

$$= \frac{₹\,2,70,000}{₹\,27,000\,(=0.09 \times ₹\,3,00,000)} = 10 \text{ times}$$

(ii) Equity $= \dfrac{\text{Profit after taxes} - \text{Preference share dividend}}{\text{Dividend payable to equity shareholders at current rate of Rs. 2 per share}}$

$$= \frac{₹\,2,70,000 - ₹\,27,000}{₹\,1,60,000\,(80,000 \text{ shares} \times ₹\,2)} = 1.52 \text{ times}$$

(c) *Earnings per equity share*

$$= \frac{\text{Earnings available to equity shareholders}}{\text{Number of equity shares outstanding}} = \frac{₹\,2,43,000}{80,000} = ₹\,3.04 \text{ per share}$$

(d) *Price-earning (P/E) ratio* $\quad = \dfrac{\text{Market price per share}}{\text{Equity per share}} = \dfrac{₹\,40}{₹\,3.04} = 13.2 \text{ times}$

Illustration 6 : *The following accounting information and financial ratios of PQR Ltd. relate to the year ended 31st December, 2013:*

		2013
I	*Accounting Information:*	
	Gross Profit	*15% of Sales*
	Net profit	*8% of sales*
	Raw materials consumed	*20% of works cost*
	Direct wages	*10% of works cost*
	Stock of raw materials	*3 months' usage*
	Stock of finished goods	*6% of works cost*
	Debt collection period	*60 days*
	All sales are on credit	
II	*Financial Ratios:*	
	Fixed assets to sales	*1 : 3*
	Fixed assets to Current assets	*13 : 11*

Current ratio	*2 : 1*
Long-term loans to Current liabilities	*2 : 1*
Capital to Reserves and Surplus	*1 : 4*

If value of fixed assets as on 31st December, 2012 amounted to ₹ 26 lakhs, prepare a summarised Profit and Loss Account of the company for the year ended 31st December, 2013 and also the Balance Sheet as on 31st December, 2013.

Solution

(a)   Working Notes:

(i)   Calculation of Sales

$$\frac{\text{Fixed Assets}}{\text{Sales}} = \frac{1}{3}$$

$\therefore \quad \frac{26,00,000}{\text{Sales}} = \frac{1}{3} \Rightarrow \text{Sales} = ₹\ 78,00,000$

(ii)   Calculation of Current Assets

$$\frac{\text{Fixed Assets}}{\text{Current Assets}} = \frac{13}{11}$$

$\therefore \quad \frac{26,00,000}{\text{Current Assets}} = \frac{13}{11} \Rightarrow \text{Current Assets} = ₹\ 22,00,000$

(iii)   Calculation of Raw Material Consumption and Direct Wages

	₹
Sales	78,00,000
Less: Gross Profit	11,70,000
Works Cost	66,30,000

Raw Material Consumption (20% of Works Cost)   ₹ 13,26,000

Direct Wages (10% of Works Cost)   ₹   6,63,000

(iv)   Calculation of Stock of Raw Materials (= 3 months usage)

$$= 13,26,000 \times \frac{3}{12} = ₹\ 3,31,500$$

(v)   Calculation of Stock of Finished Goods (= 6% of Works Cost)

$$= 66,30,000 \times \frac{6}{100} = ₹\ 3,97,800$$

(vi) Calculation of Current Liabilities

$$\frac{\text{Current Assets}}{\text{Current Liabilities}} = 2$$

$$\frac{22,00,000}{\text{Current Liabilities}} = 2 \Rightarrow \text{Current Liabilities} = ₹\,11,00,000$$

(vii) Calculation of Receivables

$$\text{Average collection period} = \frac{\text{Receivables}}{\text{Credit Sales}} \times 365$$

$$\frac{\text{Receivables}}{78,00,000} \times 365 = 60 \Rightarrow \text{Receivables} = `\,12,82,191.78 \text{ or } `\,12,82,192$$

(viii) Calculation of Long term Loan

$$\frac{\text{Long term Loan}}{\text{Current Liabilities}} = \frac{2}{1}$$

$$\frac{\text{Long term loan}}{11,00,000} = \frac{2}{1} \Rightarrow \text{Long term loan} = ₹\,22,00,000.$$

(ix) Calculation of Cash Balance

		₹
Current assets		22,00,000
Less: Receivables	12,82,192	
Raw materials stock	3,31,500	
Finished goods stock	3,97,800	20,11,492
Cash balance		1,88,508

(x) Calculation of Net worth

Fixed Assets		26,00,000
Current Assets		22,00,000
Total Assets		48,00,000
Less: Long term Loan	22,00,000	
Current Liabilities	11,00,000	33,00,000
Net worth		15,00,000

Net worth = Share capital + Reserves = 15,00,000

$$\frac{\text{Capital}}{\text{Reserves and Surplus}} = \frac{1}{4} \Rightarrow \text{Share Capital} = 15,00,000 \times \frac{1}{5} = ₹\ 3,00,000$$

$$\text{Reserves and Surplus} = 15,00,000 \times \frac{4}{5} = ₹ 12,00,000$$

Profit and Loss Account of PQR Ltd.
for the year ended 31st December, 2013

	Particulars	₹	Particulars	₹
To	Direct Materials	13,26,000	By Sales	78,00,000
To	Direct Wages	6,63,000		
To	Works (Overhead) Balancing figure	46,41,000		
To	Gross Profit c/d (15% of Sales)	11,70,000		
		78,00,000		78,00,000
To	Selling and Distribution Expenses (Balancing figure)	5,46,000	By Gross Profit b/d	11,70,000
To	Net Profit (8% of Sales)	6,24,000		
		11,70,000		11,70,000

Balance Sheet of PQR Ltd.
as at 31st December, 2013

Liabilities	₹	Assets	₹
Share Capital	3,00,000	Fixed Assets	26,00,000
Reserves and Surplus	12,00,000	Current Assets:	
Long term loans	22,00,000	Stock of Raw Material	3,31,500
Current liabilities	11,00,000	Stock of Finished Goods	3,97,800
		Receivables	12,82,192
		Cash	1,88,508
	48,00,000		48,00,000

Illustration 7 : *Ganpati Limited has furnished the following ratios and information relating to the year ended 31st March, 2013.*

Sales	*₹ 60,00,000*
Return on net worth	*25%*
Rate of income tax	*50%*
Share capital to reserves	*7:3*
Current ratio	*2*

Net profit to sales	*6.25%*
Inventory turnover (based on cost of goods sold)	*12*
Cost of goods sold	*₹ 18,00,000*
Interest on debentures	*₹ 60,000*
Receivables	*₹ 2,00,000*
Payables	*₹ 2,00,000*

You are required to:

(a) Calculate the operating expenses for the year ended 31st March, 2013.

(b) Prepare a balance sheet as on 31st March in the following format:

Balance Sheet as on 31st March, 2013

Liabilities	₹	Assets	₹
Share Capital		*Fixed Assets*	
Reserve and Surplus		*Current Assets*	
15% Debentures		*Stock*	
Payables		*Receivables*	
		Cash	

Solution

(a) Calculation of Operating Expenses for the year ended 31st March, 2013.

		(₹)
Net Profit [@ 6.25% of Sales]		3,75,000
Add: Income Tax (@ 50%)		3,75,000
Profit Before Tax (PBT)		7,50,000
Add: Debenture Interest		60,000
Profit before interest and tax (PBIT)		8,10,000
Sales		60,00,000
Less: Cost of goods sold	18,00,000	
PBIT	8,10,000	26,10,000
Operating Expenses		33,90,000

(b)   Balance Sheet as on 31st March, 2013

Liabilities	₹	Assets	₹
Share Capital	10,50,000	Fixed Assets	17,00,000
Reserve and Surplus	4,50,000	Current Assets:	

15% Debentures	4,00,000	Stock	1,50,000
Payables	2,00,000	Receivables	2,00,000
		Cash	50,000
	21,00,000		21,00,000

Working Notes:

(i) **Share Capital and Reserves**

The return on net worth is 25%. Therefore, the profit after tax of ₹ 3,75,000 should be equivalent to 25% of the net worth.

Net worth $\times \dfrac{25}{100} = ₹\ 3,75,000$

∴   Net worth = $\dfrac{₹\ 3,75,000 \times 100}{25} = ₹\ 15,00,000$

The ratio of share capital to reserves is 7:3

Share Capital = $15,00,000 \times \dfrac{7}{10} = ₹\ 10,50,000$

Reserves = $15,00,000 \times \dfrac{3}{10} = ₹\ 4,50,000$

(ii) **Debentures**

Interest on Debentures @ 15% = ₹ 60,000

∴   Debentures = $\dfrac{60,000 \times 100}{15} = ₹\ 4,00,000$

(iii) **Current Assets**

Current Ratio = 2

Payables = ₹ 2,00,000

∴   Current Assets = 2 Current Liabilities = 2× 2,00,000 = ₹ 4,00,000

(iv) **Fixed Assets**

Liabilities:	₹
Share capital	10,50,000
Reserves	4,50,000
Debentures	4,00,000
Payables	2,00,000
	21,00,000

Less: Current Assets	4,00,000
Fixed Assets	17,00,000

(v) **Composition of Current Assets**

Inventory Turnover = 12

$$\frac{\text{Cost of goods sold}}{\text{Closing stock}} = 12$$

Closing stock = $\dfrac{₹18,00,000}{12}$ = Closing stock = ₹ 1,50,000

Composition:	**(₹)**
Stock	1,50,000
Receivables	2,00,000
Cash (balancing figure)	50,000
Total Current Assets	4,00,000

Illustration 8 *: ABC Company sells plumbing fixtures on terms of 2/10, net 30. Its financial statements over the last 3 years are as follows:*

	2011	2012	2013
	₹	₹	₹
Cash	30,000	20,000	5,000
Accounts receivable	2,00,000	2,60,000	2,90,000
Inventory	4,00,000	4,80,000	6,00,000
Net fixed assets	8,00,000	8,00,000	8,00,000
	14,30,000	15,60,000	16,95,000
	₹	₹	₹
Accounts payable	2,30,000	3,00,000	3,80,000
Accruals	2,00,000	2,10,000	2,25,000
Bank loan, short-term	1,00,000	1,00,000	1,40,000
Long-term debt	3,00,000	3,00,000	3,00,000
Common stock	1,00,000	1,00,000	1,00,000
Retained earnings	5,00,000	5,50,000	5,50,000
	14,30,000	15,60,000	16,95,000
	₹	₹	₹
Sales	40,00,000	43,00,000	38,00,000

Cost of goods sold	*32,00,000*	*36,00,000*	*33,00,000*
Net profit	*3,00,000*	*2,00,000*	*1,00,000*

Analyse the company's financial condition and performance over the last 3 years. Are there any problems?

Solution

	2011	2012	2013
Current ratio	1.19	1.25	1.20
Acid-test ratio	0.43	0.46	0.40
Average collection period	18	22	27
Inventory turnover	NA*	8.2	6.1
Total debt to net worth	1.38	1.40	1.61
Long-term debt to total capitalization	0.33	0.32	0.32
Gross profit margin	0.200	0.163	0.132
Net profit margin	0.075	0.047	0.026
Asset turnover	2.80	2.76	2.24
Return on assets	0.21	0.13	0.06

*Analysis :*The company's profitability has declined steadily over the period. As only ₹ 50,000 is added to retained earnings, the company must be paying substantial dividends. Receivables are growing slower, although the average collection period is still very reasonable relative to the terms given. Inventory turnover is slowing as well, indicating a relative buildup in inventories. The increase in receivables and inventories, coupled with the fact that net worth has increased very little, has resulted in the total debt-to-worth ratio increasing to what would have to be regarded on an absolute basis as a high level.

The current and acid-test ratios have fluctuated, but the current ratio is not particularly inspiring. The lack of deterioration in these ratios is clouded by the relative build up in both receivables and inventories, evidencing deterioration in the liquidity of these two assets. Both the gross profit and net profit margins have declined substantially. The relationship between the two suggests that the company has reduced relative expenses in 2012 in particular. The build up in inventories and receivables has resulted in a decline in the asset turnover ratio, and this, coupled with the decline in profitability, has resulted in a sharp decrease in the return on assets ratio.

Illustration 9 : *Using the following information, complete this balance sheet:*

Long-term debt to net worth	*0.5 to 1*
Total asset turnover	*2.5 ×*
*Average collection period**	*18 days*
Inventory turnover	*9 ×*

	₹		₹
Gross profit margin			10%
Acid-test ratio			1 to 1

*Assume a 360-day year and all sales on credit.

	₹		₹
Cash	_____	Notes and payables	1,00,000
Accounts receivable	_____	Long-term debt	_____
Inventory	_____	Common stock	1,00,000
Plant and equipment	_____	Retained earnings	1,00,000
Total assets	_____	Total liabilities and equity	_____

Solution

$$\frac{\text{Long-term debt}}{\text{Net worth}} = 0.5 = \frac{\text{Long-term debt}}{2,00,000}$$

Long-term debt = ₹ 1,00,000

Total liabilities and net worth = ₹ 4,00,000

Total assets = ₹ 4,00,000

$$\frac{\text{Sales}}{\text{Total assets}} = 2.5 = \frac{\text{Sales}}{4,00,000} = \text{Sales} = ₹\ 10,00,000$$

Cost of goods sold = (0.9) (₹ 10,00,000) = ₹ 9,00,000.

$$\frac{\text{Cost of goods sold}}{\text{Inventory}} = \frac{9,00,000}{\text{Inventory}} = 9 = \text{Inventory} = ₹1,00,000$$

$$\frac{\text{Receivables} \times 360}{10,00,000} = 18 \text{ days}$$

Receivables = ₹ 50,000

$$\frac{\text{Cash} + 50,000}{1,00,000} = 1$$

Cash = ₹ 50,000

Plant and equipment = ₹ 2,00,000.

<div align="center">**Balance Sheet**</div>

	₹		₹
Cash	50,000	Notes and payables	1,00,000
Accounts receivable	50,000	Long-term debt	1,00,000

Inventory	1,00,000	Common stock	1,00,000
Plant and equipment	2,00,000	Retained earnings	1,00,000
Total assets	4,00,000	Total liabilities and equity	4,00,000

UNIT–II: CASH FLOW AND FUNDS FLOW ANALYSIS

Learning Objectives

After studying this chapter you will be able to:

- Know the meaning of cash flow statement and define the sources and application of cash.
- Explain the salient features of AS 3 which is important in context of preparation of cash flow statements.
- Explain the features and preparation of fund flow statements.
- Understand the difference between cash flow statement and funds flow statement and their utility and limitations.

3.7   Introduction

A simple definition of a cash flow statement is a statement which discloses the changes in cash position between the two periods. Along with changes in the cash position the cash flow statement also outlines the reasons for such inflows or outflows of cash which in turn helps to analyze the functioning of a business.

3.8   Utility of Cash Flow Analysis

The cash flow statement is an important planning tool in the hands of management. A cash flow statement is useful for short-term planning.

A business enterprise needs sufficient cash to meet its various obligations in the near future such as payment for purchase of fixed assets, payment of debts maturing in the near future, expenses of the business, etc. A historical analysis of the different sources and applications of cash will enable the management to make reliable cash flow projections for the immediate future. It may then plan out for investment of surplus or meeting the deficit, if any.

Its chief advantages and utility are as follows:

1. **Helps in Efficient Cash Management**:- It helps to determine how much cash will be available at a particular point of time to meet obligations like payment to trade creditors, repayment of cash loans, dividends, etc. This helps to provide information about the liquidity and solvency information of an enterprise.

2. **Helps in Internal Financial Management:-** A proper planning of the cash resources will enable the management to make available sufficient cash whenever needed and invest surplus cash, if any in productive and profitable opportunities.

3. **Discloses the Movements of Cash**:- It helps in understanding and analysis of what are the sources and application of the cash for a company. Also it discloses the volume as well as the speed at which the cash flows in the different segments of the business, there by helping to analyze the different segments of the business.

4. **Historical versus Future Estimates:-** Historical cash flow information is often used as an indicator of the amount, timing and certainty of future cash flows.

5. **Discloses the Success or Failure of Cash Planning:-** It helps in determining how efficiently the cash is being managed by the management of the business.

6. **Comparison Between Two Enterprises:-** Cash flow information is useful in assessing the ability of the enterprise to generate cash and cash equivalents and enables users to develop models to assess and compare the present value of the future cash flows of different enterprises. It enhances the comparability of the reporting of operating performance by different enterprises because it eliminates the effects of using different accounting treatments for the same transactions and events.

7. **Analysis of Profitability vis-à-vis Net Cash Flow:-** It is also useful in examining the relationship between profitability and net cash flow.

3.9   Limitations of Cash Flow Analysis

Cash flow analysis is a useful tool of financial analysis. However, it has its own limitations. These limitations are as under:

1. **Cash flow statement cannot be equated with the Income Statement.** An Income Statement takes into account both cash as well as non-cash items and, therefore, net cash flow does not necessarily mean net income of the business.

2. **The cash balance as disclosed by the cash flow statement may not represent the real liquid position of the business** since it can be easily influenced by postponing purchases and other payments.

3. **Cash flow statement cannot replace the Funds Flow Statement.** Each of them has a separate function to perform.

In spite of these limitations it can be said that cash flow statement is a useful supplementary instrument.

The technique of cash flow analysis, when used in conjunction with ratio analysis, serves as a barometer in measuring the profitability and financial position of the business.

3.10 AS 3 (Revised) and Cash Flow Statement

The cash flow statement is prepared in accordance with the provisions contended in AS 3 (Revised) issued by the Council of the Institute of Chartered Accountants of India. Students are advised to read the standard thoroughly to learn various intricacies relating to preparation of cash flow statement.

The AS 3 (Revised) while laying down its objectives says that information about the cash flows of an enterprise is useful in providing users of financial statements with a basis to assess the ability of the enterprise to generate cash and cash equivalents and the needs of the enterprise to utilize those cash flows. The economic decisions that are taken by users require an evaluation of the ability of an enterprise to generate cash and cash equivalents and the timing and certainty

of their generation.

The Statement deals with the provision of information about the historical changes in cash and cash equivalents of an enterprise by means of a cash flow statement which classifies cash flows during the period from operating, investing and financing activities.

3.11 Definitions

AS 3 (Revised) has defined the following terms as follows:

(a) *Cash* comprises cash on hand and demand deposits with banks.

(b) *Cash equivalents* are short term highly liquid investments that are readily convertible into known amounts of cash and which are subject to an insignificant risk of changes in value.

(c) *Cash flows* are inflows and outflows of cash and cash equivalents.

(d) *Operating activities* are the principal revenue-producing activities of the enterprise and other activities that are not investing or financing activities.

(e) *Investing activities* are the acquisition and disposal of long-term assets and other investments not included in cash equivalents.

(f) *Financing activities* are activities that result in changes in the size and composition of the owners' capital (including preference share capital in the case of a company) and borrowings of the enterprise.

3.12 Cash and Cash Equivalents

Cash equivalents are held for the purpose of meeting short-term cash commitments rather than for investment or other purposes. For an investment to qualify as a cash equivalent, it must be readily convertible to a known amount of cash and be subject to an insignificant risk of changes in value. Therefore, an investment normally qualifies as a cash equivalent only when it has a short maturity of say, three months or less from the date of acquisition.

Investments in shares are excluded from cash equivalents unless they are, in substance, cash equivalents; for example, preference shares of a company acquired shortly before their specified redemption date (provided there is only an insignificant risk of failure of the company to repay the amount at maturity).

3.13 Presentation of Cash Flow Statement

The cash flow statement should report cash flows during the period classified into following categories:-

a.   Operating activities

b.   Investing activities

c.   Financing activities

Classification by activity provides information that allows users to assess the impact of those activities on the financial position of the enterprise and the amount of its cash and cash equivalents. This information may also be used to evaluate the relationships among those activities.

A single transaction may include mix of cash flows that are classified differently. For example, the instalment paid in respect of a fixed asset acquired on deferred payment basis includes both interest and loan, the interest element is classified under financing activities and the loan element is classified under investing activities.

3.13.1 Operating Activities:
3.13.1 Operating Activities: Cash flows from operating activities are primarily derived from the principal revenue-producing activities of the enterprise. Therefore, they generally result from the transactions and other events that enter into the determination of net profit or loss. Examples of cash flows from operating activities are:

(a) Cash receipts from the sale of goods and the rendering of services;

(b) Cash receipts from royalties, fees, commissions and other revenue;

(c) Cash payments to suppliers for goods and services;

(d) Cash payments to and on behalf of employees;

(e) Cash receipts and cash payments of an insurance enterprise for premiums and claims, annuities and other policy benefits;

(f) Cash payments or refunds of income taxes unless they can be specifically identified with financing and investing activities; and

(g) Cash receipts and payments relating to futures contracts, forward contracts, option contracts and swap contracts when the contracts are held for dealing or trading purposes.

Some Additional Points

Some transactions, such as the sale of an item of plant, may give rise to a gain or loss which is included in the determination of net profit or loss. However, the cash flows relating to such transactions are cash flows from investing activities.

An enterprise may hold securities and loans for dealing or trading purposes, in which case they are similar to inventory acquired specifically for resale. Therefore, cash flows arising from the purchase and sale of dealing or trading securities are classified as operating activities.

Similarly cash advances and loans made by financial enterprises are usually classified as operating activities since they relate to the main revenue-producing activity of that enterprise.

3.13.2 Investing Activities:
3.13.2 Investing Activities: The activities of acquisition and disposal of long-term assets and other investments not included in cash equivalents are investing activities. Separate disclosure of cash flows arising from investing activities is important because the cash flows represent the extent to which expenditures have been made for resources intended to generate future income and cash flows.

Examples of cash flows arising from investing activities are:

(a) Cash payments to acquire fixed assets (including intangibles). These payments include those relating to capitalized research and development costs and self-constructed fixed assets;

(b) Cash receipts from disposal of fixed assets (including intangibles);

(c) Cash payments to acquire shares, warrants or debt instruments of other enterprises and interests in joint ventures (other than payments for those instruments considered to be cash equivalents and those held for dealing or trading purposes);

(d) Cash receipts from disposal of shares, warrants or debt instruments of other enterprises and interests in joint ventures (other than receipts from those instruments considered to be cash equivalents and those held for dealing or trading purposes);

(e) Cash advances and loans made to third parties (other than advances and loans made by a financial enterprise);

(f) Cash receipts from the repayment of advances and loans made to third parties (other than advances and loans of a financial enterprise);

(g) Cash payments for futures contracts, forward contracts, option contracts and swap contracts except when the contracts are held for dealing or trading purposes, or the payments are classified as financing activities; and

(h) Cash receipts from futures contracts, forward contracts, option contacts and swap contracts except when the contracts are held for dealing or trading purposes, or the receipts are classified as financing activities.

When a contract is accounted for as a hedge of an identifiable position, the cash flows of the contract are classified in the same manner as the cash flows of the position being hedged.

3.13.3 Financing Activities: Financing activities are those activities which result in change in size and composition of owner's capital and borrowing of the organization. The separate disclosure of cash flows arising from financing activities is important because it is useful in predicting claims on future cash flows by providers of funds (both capital and borrowings) to the enterprise.

Examples of cash flows arising from financing activities are:

(a) Cash proceeds from issuing shares or other similar instruments;

(b) Cash proceeds from issuing debentures, loans, notes, bonds and other short or long-term borrowings; and

(c) Cash repayments of amounts borrowed.

3.13.4 Special Items Treatment: In addition to the general classification of three types of cash flows, the applicable Accounting Standards provides for the treatment of the cash flows of certain special items as under:

3.13.4.1 Foreign Currency Cash Flows*:* Cash flows arising from transactions in a foreign currency should be recorded in an enterprises reporting currency.

The reporting should be done by applying the exchange rate at the date of cash flow statement.

A rate which approximates the actual rate may also be used. If the result is substantially the same as would arise if the rates at the dates of the cash flow were used.

The effect of changes in exchange rates on cash and cash equivalents held in foreign currency should be reported as a separate part in the form of reconciliation in order to reconcile cash and cash equivalents at the beginning and end of the period.

Evidently, unrealised gains and losses arising from changes in foreign exchange rates are not cash flows.

3.13.4.2 Extraordinary Items*:* Any cash flows relating to extraordinary items should as far as possible classify them into operating, investing or financing activities and those items should be separately disclosed in the cash flow statement. Some of the examples for extraordinary items is bad debts recovered, claims from insurance companies, winning of a law suit or lottery etc.

The above disclosure is in addition to disclosure mentioned in AS-5, 'Net Profit or Loss for the period, prior period items and changes in accounting policies.'

3.13.4.3 Interest and Dividends*:* Cash flows from interest and dividends received and paid should each be disclosed separately.

The treatment of interest and dividends, received and paid, depends upon the nature of the enterprise i.e., financial enterprises and other enterprises.

➢   In case of financial enterprises, cash flows arising from interest paid and interest & Dividends received, should be classified as cash flows from operating activities.

➢   In case of other enterprises, Cash outflows arising from interest paid on terms loans and debentures should be classified as cash outflows from financing activities.

➢   Cash outflows arising from interest paid on working capital loans should be classified as cash outflow from operating activities.

➢   Interest and dividends received should be classified as cash inflow from investing activities.

➢   Dividend paid on equity and preference share capital should be classified as cash outflow from financing activities.

3.13.4.4 Taxes on Income*:* Cash flows arising from taxes on income should be separately disclosed.

It should be classified as cash flows from operating activities unless they can be specifically identified with financing and investing activities.

3.13.4.5 Investments in Subsidiaries, Associates and Joint Ventures*:* When accounting for an investment in an associate or a subsidiary or a joint venture, an investor restricts its reporting in the cash flow statement to the cash flows between itself and the investee/joint venture, for

example, cash flows relating to dividends and advances.

3.13.4.6 Acquisitions and Disposals of Subsidiaries and Other Business Units*:* The aggregate cash flows arising from acquisitions and from disposals of subsidiaries or other business units should be presented separately and classified as investing activities.

An enterprise should disclose, in aggregate, in respect of both acquisition and disposal of subsidiaries or other business units during the period each of the following:

(a) the total purchase or disposal consideration; and

(b) the portion of the purchase or disposal consideration discharged by means of cash and cash equivalents.

3.13.4.6 Non-Cash Transactions*:* Investing and financing transactions that do not require the use of cash or cash equivalents should be excluded from a cash flow statement. Such transactions should be disclosed elsewhere in the financial statements in a way that provides all the relevant information about these investing and financing activities. The exclusion of non-cash transactions from the cash flow statement is consistent with the objective of a cash flow statement as these do not involve cash flows in the current period. Examples of non-cash transactions:

(a) The acquisition of assets by assuming directly related liabilities.
(b) The acquisition of an enterprise by means of issue of shares.
(c) Conversion of debt into equity.

3.14 Procedure in Preparation of Cash Flow Statement

The procedure used for the preparation of cash flow statement is as follows:

Calculation of net increase or decrease in cash and cash equivalents accounts: The difference between cash and cash equivalents for the period may be computed by comparing these accounts given in the comparative balance sheets. The results will be cash receipts and payments during the period responsible for the increase or decrease in cash and cash equivalent items.

Calculation of the net cash provided or used by operating activities: It is accomplished by the analysis of Profit and Loss Account, Comparative Balance Sheet and selected additional information.

Calculation of the net cash provided or used by investing and financing activities: All other changes in the Balance sheet items must be analysed taking into account the additional information and effect on cash may be grouped under the investing and financing activities.

Final Preparation of a Cash Flow Statement: It may be prepared by classifying all cash inflows and outflows in terms of operating, investing and financing activities. The net cash flow provided or used in each of these three activities may be highlighted.

Ensure that the aggregate of net cash flows from operating, investing and financing activities is equal to net increase or decrease in cash and cash equivalents.

Report any significant investing financing transactions that did not involve cash or cash equivalents in a separate schedule to the Cash Flow Statement.

3.14.1 Reporting of Cash Flow from Operating Activities: The financial statements are generally prepared on accrual basis of accounting under which the net income will not indicate the net cash provided by or net loss will not indicate the net cash used in operating activities.

In order to calculate the net cash flows in operating activities, it is necessary to replace revenues and expenses with actual receipts and payments in cash. This is done by eliminating the non-cash revenues and/non-cash expenses from the given earned revenues and incurred expenses.

There are two methods of converting net profit into net cash flows from operating activities-

(i)   Direct method, and

(ii)   Indirect method.

(i)   **Direct Method:** Under direct method, actual cash receipts (for a period) from operating revenues and actual cash payments (for a period) for operating expenses are arranged and presented in the cash flow statement. The difference between cash receipts and cash payments is the net cash flow from operating activities.

       It is in effect a cash basis Profit and Loss account.

(ii)   **Indirect Method:** In this method, the net profit (loss) is used as the base then adjusted for items that affected net profit but did not affect cash.

       Non-cash and non-operating charges in the Profit and Loss account are added back to the net profit while non-cash and non-operating credits are deducted to calculate operating profit before working capital changes. It is a partial conversion of accrual basis profit to cash basis profit. Further necessary adjustments are made for increase or decrease in current assets and current liabilities to obtain net cash from operating activities.

3.14.2 Other Disclosure Requirements: An enterprise should disclose, together with a commentary by management, the amount of significant cash and cash equivalent balances held by the enterprise that are *not available for use by it*.

There are various circumstances in which cash and cash equivalent balances held by an enterprise are not available for use by it. Examples include cash and cash equivalent balances held by a branch of the enterprise that operates in a country where exchange controls or other legal restrictions apply as a result of which the balances are not available for use by the enterprise.

Additional information may be relevant to users in understanding the financial position and liquidity of an enterprise. Disclosure of this information, together with a commentary by management, is encouraged and may include:

(a)   the amount of undrawn borrowing facilities that may be available for future operating activities and to settle capital commitments, indicating any restrictions on the use of these facilities; and

(b)   the aggregate amount of cash flows that represent increases in operating capacity separately from those cash flows that are required to maintain operating capacity.

The separate disclosure of cash flows that represent increases in operating capacity and cash flows that are required to maintain operating capacity is useful in enabling the user to determine whether the enterprise is investing adequately in the maintenance of its operating capacity. An enterprise that does not invest adequately in the maintenance of its operating capacity may be prejudicing future profitability for the sake of current liquidity and distributions to owners.

3.14.3 Format of Cash Flow Statement: AS 3 (Revised) has not provided any specific format for the preparation of cash flow statements, but a general idea can be had from the illustration given in the appendix to the Accounting Standard. There seems to be flexibility in the presentation of cash flow statements. However, a widely accepted format under direct method and indirect method is given below:

Option 1:- Cash Flow Statement (Direct Method)			₹
Cash Flow from Operating Activities			
Cash receipts from customers		xxx	
Cash paid to suppliers and employees		(xxx)	
Cash generated from operations		xxx	
Income tax paid		(xxx)	
Cash flow before extraordinary items		xxx	
Proceeds from earthquake disaster settlement etc		xxx	
Net cash from Operating Activities	(a)		xxx
Cash Flows from Investing Activities			
Net Proceeds / (purchase) of fixed assets		(xxx)	
Purchase of investments		(xxx)	
Interest received		xxx	
Dividend received		xxx	
Net cash from investing Activities	(b)		xxx
Cash Flows from Financing Activities			
Proceeds from issue of share capital		xxx	
Net Proceeds/ (Repayments) from long term borrowings		xxx	
Interest paid		(xxx)	
Dividend paid		(xxx)	
Net cash from Financing Activities	(c)		xxx
Net increase / (decrease) in Cash and Cash Equivalent	(a+b+c)		xxx

Cash and Cash Equivalents at beginning of period		xxx
Cash and Cash Equivalent at end of period		xxx
Option 2:- Cash Flow Statement (Indirect Method)		*(₹)*
Cash Flow from Operating Activities		
Net profit before tax and extraordinary items	xxx	
Adjustments for:		
- Depreciation	xxx	
- Exchange Fluctuation loss/ (gain) – net	xxx	
- Loss on sale of fixed assets	xxx	
- Interest Income	(xxx)	
- Dividend Income	(xxx)	
- Interest Expense	xxx	
- Dividend Paid	xxx	
Operating profit before working capital changes	xxx	
Adjustments for:		
- Trade and other receivables (increase) / decrease	(xxx)	
- Inventories (increase) / decrease	(xxx)	
- Trade payable (decrease) / increase	xxx	
Cash generation from operations	xxx	
- Income Tax	(xxx)	
Cash flow before extraordinary items	xxx	
Proceeds from earthquake disaster settlement etc.	xxx	
Net cash from Operating Activities (a)		xxx
Cash Flow from Investing Activities		
Net Proceeds / (purchase) of fixed assets	(xxx)	
Purchase of investments	(xxx)	
Interest received	xxx	
Dividend received	xxx	
Net cash from Investing Activities (b)		Xxx
Cash Flow from Financing Activities		
Proceeds from issue of share capital	xxx	
Net Proceeds/ (Repayments) from long term borrowings	xxx	

Dividend Paid		(xxx)	
Interest Paid		(xxx)	
Net cash from Financing Activities	(c)		xxx
Net increase / (decrease) in Cash and Cash Equivalent	(a+b+c)		xxx
Cash and Cash Equivalents at the beginning of the year			xxx
Cash and Cash Equivalents at the end of the year			xxx

Cash from Operations (₹)

Funds from Operations				xxx
Add:	Increase in Current Liabilities	(excluding Bank Overdraft)	xxx	
	Decrease in Current Assets	(excluding cash & bank balance)	xxx	xxx
Less:	Increase in Current Assets	(excluding cash & bank balance)	xxx	
	Decrease in Current Liabilities	(excluding bank overdraft)	xxx	xxx
Cash from Operations				xxx

The concept and technique of preparing a Cash Flow Statement will be clear with the help of illustrations given in the following pages.

Illustration 10_: From the following information prepare a Cash Flow Statement according to (a) Direct Method (b) Indirect Method as per AS 3 (Revised). Working notes would form part of your answer_

_(1)_   _BALANCE SHEET_
                  _as on 31.12. 2013_

		2013		2012 (₹ in '000)
Assets				
Cash on hand and balances with banks		200		25
Short-term investments		670		135
Sundry debtors		1,700		1,200
Interest receivable		100		--
Inventories		900		1,950
Long-term investments		2,500		2,500
Fixed assets at cost	2,180		1,910	

Less: Accumulated depreciation	(1,450)		(1,060)	
Fixed assets (net)		730		850
Total Assets		**6,800**		**6,660**
		2013		**2012**
Liabilities				
Sundry creditors		150		1,890
Interest payable		230		100
Income taxes payable		400		1,000
Long-term debt		1,110		1,040
Total liabilities		**1,890**		**4,030**
Shareholders' funds				
Share capital		1,500		1,250
Reserves		3,410		1,380
Total shareholders' funds		**4,910**		**2,630**
Total Liabilities and Shareholders' funds		**6,800**		**6,660**

(2)   **STATEMENT OF PROFIT AND LOSS**
                     for the period ended 31.12. 2013

	(₹ in '000)
Sales	30,650
Cost of sales	(26,000)
Gross profit	4,650
Depreciation	(450)
Administrative and selling expenses	(910)
Interest expense	(400)
Interest income	300
Dividend income	200
Foreign exchange loss	(40)
Net profit before taxation and extraordinary item	3,350
Extraordinary item-	
Insurance proceeds from earthquake disaster settlement	180
Net profit after extraordinary item	3,530
Income tax	(300)
Net Profit	3,230

Additional Information: (Figures in ₹ '000).

(a)   An amount of 250 was raised from the issue of share capital and a further 250 was raised from long-term borrowings.

(b) *Interest expense was 400 of which 170 was paid during the period. 100 relating to interest expense of the prior period was also paid during the period.*

(c) *Dividends paid were 1,200.*

(d) *Tax deducted at source on dividends received (included in the tax expense of 300 for the year) amounted to 40.*

(e) *During the period, the enterprise acquired fixed assets for 350. The payment was made in cash.*

(f) *Plant with original cost of 80 and accumulated depreciation of 60 was sold for 20.*

(g) *Foreign exchange loss of 40 represents the reduction in the carrying amount of a short-term investment in foreign currency designated bonds arising out of a change in exchange rate between the date of acquisition of the investment and the balance sheet date.*

(h) *Sundry debtors and sundry creditors include amounts relating to credit sales and credit purchases only.*

Solution

<div align="center">

CASH FLOW STATEMENT
(Direct Method)

</div>

(₹ in '000)

		2013
Cash flows from operating activities		
Cash receipts from customers	30,150	
Cash paid to suppliers and employees	(27,600)	
Cash generated from operations	2,550	
Income taxes paid	(860)	
Cash flow before extraordinary item	1,690	
Proceeds from earthquake disaster settlement	180	
Net cash from operating activities		1,870
Cash flows from investing activities		
Purchase of fixed assets	(350)	
Proceeds from sale of equipment	20	
Interest received	200	
Dividend received	160	
Net cash from investing activities		30
Cash Flows from financing activities		
Proceeds from issuance of share capital	250	
Proceeds from long-term borrowings	250	

Repayments of long-term borrowings	(180)	
Interest paid	(270)	
Dividend paid	(1,200)	
Net cash used in financing activities		(1,150)
Net increase in cash and cash equivalents		750
Cash and cash equivalents at beginning of period (See Note 1)		160
Cash and cash equivalents at end of period (See Note 1)		910

Notes to the Cash Flow Statement (Direct & Indirect Method)

1   **Cash and cash equivalents:** Cash and cash equivalents consist of cash on hand and balances with banks, and investments in money-market instruments. Cash and cash equivalents included in the cash flow statement comprise the following balance sheet amounts.

	2013	2012
Cash on hand and balances with banks	200	25
Short-term investments	670	135
Cash and cash equivalents	870	160
Effects of exchange rate changes	40	--
Cash and cash equivalents as restated	910	160

Cash and cash equivalents at the end of the period include deposits with banks of 100 held by a branch which are not freely permissible to the company because of currency exchange restrictions.

The company has undrawn borrowing facilities of 2,000 of which 700 may be used only for future expansion.

2.   Total tax paid during the year (including tax deducted at source on dividends received) amounted to 900.

CASH FLOW STATEMENT
(Indirect Method)

(₹ in '000)

		2013
Cash flows from operating activities		
Net profit before taxation, and extraordinary item	3,350	
Adjustments for:		
Depreciation	450	

Foreign exchange loss	40	
Interest income	(300)	
Dividend income	(200)	
Interest expense	400	
Operating profit before working capital changes	3,740	
Increase in sundry debtors	(500)	
Decrease in inventories	1,050	
Decrease in sundry creditors	(1,740)	
Cash generated from operations	2,550	
Income taxes paid	(860)	
Cash flows before extraordinary item	1,690	
Proceeds from earthquake disaster settlement	180	
Net cash from operating activities		1,870
Cash flows from investing activities		
Purchase of fixed assets	(350)	
Proceeds from sale of equipment	20	
Interest received	200	
Dividends received	160	
Net cash from investing activities		30
Cash flows from financing activities		
Proceeds from issuance of share capital	250	
Proceeds from long-term borrowings	250	
Repayment of long-term borrowings	(180)	
Interest paid	(270)	
Dividends paid	(1,200)	
Net cash used in financing activities		(1,150)
Net increase in cash and cash equivalents		750
Cash and cash equivalents at beginning of period (See Note 1)		160
Cash and cash equivalents at end of period (See Note 1)		910

Alternative Presentation (Indirect Method)

As an alternative, in an indirect method cash flow statement, operating profit before working capital changes is sometimes presented as follows:

Revenues excluding investment income	30,650
Operating expenses excluding depreciation	(26,910)
Operating profit before working capital changes	3,740

Working Notes:

The working notes given below do not form part of the cash flow statement. The purpose of these working notes is merely to assist in understanding the manner in which various figures in the cash flow statement have been derived. (Figures are in ₹ '000).

1.	*Cash receipts from customers*		
	Sales		30,650
	Add: Sundry debtors at the beginning of the year		1,200
			31,850
	Less: Sundry debtors at the end of the year		1,700
			30,150
2.	*Cash paid to suppliers and employees*		
	Cost of sales		26,000
	Administrative & selling expenses		910
			26,910
	Add: Sundry creditors at the beginning of the year	1,890	
	Inventories at the end of the year	900	2,790
			29,700
	Less: Sundry creditors at the end of the year	150	
	Inventories at the beginning of the year	1,950	2,100
			27,600
3.	*Income taxes paid (including tax deducted at source from dividends received)*		
	Income tax expense for the year (including tax deducted at source from dividends received		300
	Add: Income tax liability at the beginning of the year		1,000
			1,300
	Less: Income tax liability at the end of the year		400
			900
	Out of 900, tax deducted at source on dividends received (amounting to 40), is included in cash flows from investing activities and the balance of 860 is included in cash flows from operating activities.		
4.	*Repayment of long-term borrowings*		
	Long-term debt at the beginning of the year		1,040

	Add: Long-term borrowings made during the year		250
			1,290
	Less: Long-term borrowings at the end of the year		1,110
			180
5.	*Interest paid*		
	Interest expense for the year		400
	Add: Interest payable at the beginning of the year		100
			500
	Less: Interest payable at the end of the year		230
			270

Illustration 11: *Swastik Oils Ltd. has furnished the following information for the year ended 31st March, 2014:*

	(₹ in lakhs)
Net profit	37,500.00
Dividend (including interim dividend paid)	12,000.00
Provision for income-tax	7,500.00
Income-tax paid during the year	6,372.00
Loss on sale of assets (net)	60.00
Book value of assets sold	277.50
Depreciation charged to P&L Account	30,000.00
Profit on sale of investments	150.00
Interest income on investments	3,759.00
Value of investments sold	41,647.50
Interest expenses (due during the year)	15,000.00
Interest paid during the year	15,780.00
Increase in working capital (excluding cash and bank balance)	84,112.50
Purchase of fixed assets	21,840.00
Investments on joint venture	5,775.00
Expenditure on construction work-in-progress	69,480.00
Proceeds from long-term borrowings	38,970.00
Proceeds from short-term borrowings	30,862.50
Opening cash and bank balances	11,032.50
Closing cash and bank balances	2,569.50

You are required to prepare the cash flow statement in accordance with AS 3 for the year ended

31st March, 2014. (Make assumptions wherever necessary).

Solution

SWASTIK OILS LIMITED
Cash Flow Statement for the Year Ended 31st March, 2014

(a)	**Cash Flows from Operating Activities**	**(₹ in lakhs)**
	Net profit before taxation (37,500 + 7,500)	45,000.00
	Adjustment for:	
	Depreciation charged to P&L A/c	30,000.00
	Loss on sale of assets (net)	60.00
	Profit on sale of investments	(150.00)
	Interest income on investments	(3,759.00)
	Interest expenses	15,000.00
	Operating profit before working capital changes	86,151.00
	Increase (change) in working capital (excluding cash and bank balance)	(84,112.50)
	Cash generated from operations	2,038.50
	Income tax paid	(6,372.00)
	Net cash used in operating activities (A)	(4,333.50)
(b)	**Cash Flow from investing Activities**	
	Sale of Assets (277.50-60.00)	217.50
	Sale of Investments (41,647.50+150)	41,797.50
	Interest Income on investments (assumed)	3,759.00
	Purchase of fixed assets	(21,840.00)
	Investments in Joint Venture	(5,775.00)
	Expenditure on construction work-in-progress	(69,480.00)
	Net Cash used in investing activities (B)	(51,321.00)
(c)	**Cash Flow from Financing Activities**	
	Proceeds from long-term borrowings	38,970.00
	Proceeds from short-term borrowings	30,862.50
	Interest paid	(15,780.00)
	Dividends (including interim dividend paid)	(12,000.00)
	Net cash from financing activities (C)	42,052.50
	Net increase in cash and cash equivalents (A) + (B) + (C)	(13,602.00)

Cash and cash equivalents at the beginning of the year	11,032.50
Cash and cash equivalents at the end of the year	2,569.50

3.15 Funds Flow Analysis

Another important tool in the hands of finance managers for ascertaining the changes in financial position of a firm between two accounting periods is known as funds flow statement. Funds flow statement analyses the reasons for change in financial position between two balance sheets. It shows the inflow and outflow of funds i.e., sources and application of funds during a particular period.

Fund Flow Statement summarizes for a particular period the resources made available to finance the activities of an enterprise and the uses to which such resources have been put. A fund flow statement may serve as supplementary financial information to the users.

3.15.1 Meaning of Fund: 'Fund' means working capital. Working capital is viewed as the difference between current assets and current liabilities. If we see balance sheets of a company for two consecutive years, we can note that working capital in such Balance Sheets are different.

Example: *Let us see the Balance Sheets of a company for the year ended 31st March, 2013 and 2014.*

(Rupees in Lacs)

Current Assets, Loans and Advances:	*31.3.2013*	*31.3.2014*
Inventories	*15,24*	*14,91*
Sundry Debtors	*1,26*	*1,83*
Cash and Bank	*1,34*	*1,66*
Other current Assets	*8*	*9*
Loans and Advances	*11,76*	*14,74*
	29,68	*33,23*
Less: ***Current Liabilities and Provisions:***		
Liabilities	*17,76*	*14,83*
Provision for Taxation	*6,22*	*7,45*
Proposed Dividend	*65*	*2,07*
	24,63	*24,35*
Working Capital	*5,05*	*8,88*

From the given figures, we find that working capital has increased by ₹ 383 Lacs. What are the reasons of such increase?

Fund Flow Statement explains the reasons for such change.

Funds may be compared with water tank. It contains a particular water level to which there is inflow of water as well as outflow. If inflow is more than outflow water level will go up and if

outflow is more than inflow then water level will come down.

Similarly, there is a particular fund level at the Balance Sheet date. Throughout the year there are fund inflows and outflows. So fund experiences a continuous change through the year. At the end of the year, i.e., at the next balance sheet date fund stands at a particular level. If we want to measure the difference between the two dates i.e. Working capital in the first Balance sheet date and Working capital at the next Balance sheet date. This will be given by the differences of the Total Fund Inflows and Total Fund Outflows.

3.15.2 Change in Working Capital: Even when a firm is earning adequate profit it may be short of fund for day to day working. Such a situation may be the result of:

(a)   Purchase of fixed assets or long-term investments during the phase of extension without raising long-term funds by issue of shares or debentures;

(b)   Payment of dividends in excess of profits earned;

(c)   Extension of credit to the customers;

(d)   Holding larger stock to the current levels; and

(e)   Repaying a long-term liability or redemption of preference shares without raising long-term resources.

Conversely, even in a year of loss, working capital may not diminish as much as the amount of loss less depreciation due to many reasons. Change in Working Capital Statement is usually prepared to show any change in working capital between two consecutive Balance Sheet dates.

Example: *Given below is the Change in Working Capital Statement of the same company as an example:*

Change in Working Capital Position

			(Rupees in Lacs)
Current Assets, Loans & Advances	*31.3.2013*	*31.3.2014*	*Change*
Inventories	*15,24*	*14,91*	*– 33*
Sundry Debtors	*1,26*	*1,83*	*+ 57*
Cash and Bank	*1,34*	*1,66*	*+ 32*
Other Current Assets	*8*	*9*	*+ 1*
Loans and Advances	*11,76*	*14,74*	*+ 298*
	29,68	*33,23*	*355*
Less : ***Current Liabilities and Provisions***			
Liabilities	*17,76*	*14,83*	*– 293*
Provision for Taxation	*6,22*	*7,45*	*+ 123*
Proposed Dividend	*65*	*2,07*	*+ 142*
	24,63	*24,35*	*– 28*
Working Capital	*505*	*888*	*383*
			= [355 – (–28)]

[Students may note that in Fund Flow Analysis, sometimes provisions for taxation and proposed dividend are excluded from current liabilities. This is just to show the true payments as outflows.]

3.15.3 Elements of Funds Flow Statement: We have already seen that there are numerous movements in funds in an accounting year. It is important to understand these movements since they affect the financial position of a company. This is done by preparing a statement known as Funds Flow Statement, also known as Sources and Application of Funds Statement or the Statement of Changes in Financial Position. There is no prescribed form in which the statement should be prepared. However, it is customary to draw it in a manner as would disclose the main sources of funds and their uses. It shows the various sources and uses of funds during a year. Some of those sources and application are listed below:

There is no prescribed form in which the statement should be prepared. However, it is customary to draw it in a manner as would disclose the main sources of funds and their uses.

3.15.3.1 Sources of Funds

(i) **Issue of shares and debentures for cash***:* If shares or debentures are issued at par, the paid-up value constitutes the source of fund. If shares/debentures are issued at a premium, such premium is to be added and if shares/debentures are issued at a discount, such discount is to be subtracted to determine the source of fund.

But issue of bonus shares, conversion of debentures into equity shares or shares issued to the vendors in case of business purchases do not constitute sources of fund.

(ii) **Long-term Loans:** Amount of long-term loan raised constitutes source of fund. But if a long-term loan is just renewed for an old loan, then the money received by such renewal becomes the source.

(iii) **Sale of investments and other fixed assets:** Sale proceeds constitute a source of fund.

Illustration 5: An old machine costing ₹ 8 Lacs, W.D.V. ₹ 2 Lacs was sold for ₹ 1.75 Lacs. Here source of fund was only ₹ 1.75 lakhs.

(iv) **Fund from Operations:** Fund generated from operations is calculated as below:

Net Income

Additions

1. Depreciation of fixed assets
2. Amortization of intangible and deferred charges (i.e. amortization of goodwill, trademarks, patent rights, copyright, discount on issue of shares and debentures, on redemption of preference shares and debentures, preliminary expenses, etc.)
3. Amortization of loss on sale of investments
4. Amortization of loss on sale of fixed assets
5. Losses from other non-operating items
6. Tax provision (created out of current profit)

7.   Proposed dividend

8.   Transfer to reserve

Subtraction

1.   Deferred credit (other than the portion already charged to Profit and Loss A/c)

2.   Profit on sale of investment

3.   Profit on sale of fixed assets

4.   Any subsidy credited to P & L A/c.

5.   Any written back reserve and provision.

Here, Fund from Operations, is calculated after adding back tax provision and proposed dividend. Students should note that if provision for taxation and proposed dividend are excluded from current liabilities, then only these items are to be added back to find out the 'Fund from Operations'. By fund from operations if we want to mean gross fund generated before tax and dividend, then this concept is found useful. At the same time, fund from operations may also mean net fund generated after tax and dividend. For explaining the reasons for change in fund it would be better to follow the gross concept.

(v)   **Decrease in Working Capital:** It is just for balancing the Fund Flow Statement. This figure will come from change in working capital statement.

3.15.3.2 Applications of Funds

(i)   **Purchase of fixed assets and investments:** Cash payment for purchase is application of fund. But if purchase is made by issue of shares or debentures, such will not constitute application of fund. Similarly, if purchases are on credit, these will not constitute fund applications.

(ii)   **Redemption of debentures, preference shares and repayment of loan:** Payment made including premium (less: discount) is to be taken as fund applications.

(iii)   **Payment of dividend and tax:** These two items are to be taken as applications of fund if provisions are excluded from current liabilities and current provisions are added back to profit to determine the 'Fund from Operations'.

(v)   **Increase in working capital:** It is the balancing figure. This figure will come from change in working capital statement.

3.15.3.3 Calculation of Funds from Operations

Example

Profit and Loss Account

	₹		₹
To Stock	*2,90,000*	*By Sales*	*50,20,000*
To Purchases	*27,30,000*	*By Stock*	*3,40,000*
To Wages	*10,10,000*	*By Interest Received*	*10,000*

To Salaries & Admn. Exp.	6,35,000	By Transfer from Div.	
To Depreciation	2,70,000	Equalisation Reserve	2,00,000
To Investment Reserve	1,20,000	By Profit on sale of	
To Patents	15,000	Machinery	20,000
To Provision for Income-Tax	2,70,000		
To Net Profit	2,50,000		
	55,90,000		55,90,000

Funds generated by trading activities before tax was ₹ 7,05,000 as shown below:

	₹	₹
Net Profit (after tax)		2,50,000
Add: Non-cash charges		
Depreciation	2,70,000	
Patents written off	15,000	
Investment Reserve	1,20,000	4,05,000
Less: Transfer from Dividend		6,55,000
Equalisation Reserve	2,00,000	
Profit on sale of machinery	20,000	2,20,000
		4,35,000
Add: Provision for income tax		2,70,000
		7,05,000

3.15.3.4 Funds Flow from Opening Balance Sheet: The balance sheet at the end of the very first year of operations of a business is more or less the fund flow statement for that year. Suppose the balance sheet at the end of the year of a business is as follows:

Liabilities	₹	Assets	₹
Share Capital	8,00,000	Fixed Assets	12,00,000
Profit & Loss A/c	20,000	*Less*: Depreciation	1,00,000
8% Debentures	3,00,000		11,00,000
Sundry Creditors	2,00,000		
Bills Payable	1,00,000	Sundry Debtors	2,00,000
Provision for Taxation	1,00,000	Stock-in-trade	2,00,000
Proposed Dividend	80,000	Cash at Bank	1,00,000
		Preliminary Exp.	20,000
		Less : Written off	20,000
	16,00,000		16,00,000

The Fund Flow Statement of the above mentioned business will be as follows:

Sources of Fund	₹	₹
Share Capital		8,00,000
8% Debentures		3,00,000
Fund from Operations:		
P & L A/c	20,000	
Add: Depreciation	1,00,000	
Preliminary Exp. w/o	20,000	
Provision for Taxation	1,00,000	
Proposed Dividend	80,000	3,20,000
		14,20,000
Applications of Fund		
Purchase of Fixed Assets	12,00,000	
Payment of Preliminary Expenses	20,000	
Working Capital	2,00,000	
		14,20,000

3.15.4 Analysis of Funds Flow Statement: Fund Flow Statement is prepared to explain the change in the working capital position of a business.

Particularly there are two flows of funds (inflow):-

a) Long term fund raised by issue of shares, debentures or sale of fixed assets and

b) Fund generated from operations which may be taken as a gross before payment of dividend and taxes or net after payment of dividend and taxes.

Applications of fund are for investment in fixed assets or repayment of capital.

If long-term fund requirement is met just out of long-term sources, then the whole fund generated from operations will be represented by increase in working capital. On the other hand, if fund generated from operations is not sufficient to bridge a gap of long-term fund requirement, then there will be a decline in working capital.

3.15.5 Benefits of Funds Flow Statement: Funds flow statement is useful for long term analysis. It is a very useful tool in the hands of management for judging the financial and operating performance of the company. The balance sheet and profit and loss account failed to provide the information which is provided by funds flow statement i.e., changes in financial position of an enterprise. Such an analysis is of great help to management, shareholders, creditors, brokers etc.

1.   The funds flow statement helps in answering the following questions:

     (a)   Where have the profits gone?

(b)   Why there is an imbalance existing between liquidity position and profitability position of the enterprise?

(c)   Why is the concern financially solid in spite of losses?

2.   A projected funds flow statement can be prepared and resources can be properly allocated after an analysis of the present state of affairs. The optimal utilisation of available funds is necessary for the overall growth of the enterprise. The funds flow statement prepared in advance gives a clear-cut direction to the management in this regard. The projected funds flow statement can be prepared and budgetary /capital expenditure control can be exercised in the organisation.

3.   The funds flow statement analysis helps the management to test whether the working capital has been effectively used or not and whether the working capital level is adequate or inadequate for the requirement of business. The working capital position helps the management in taking policy decisions regarding dividend etc.

4.   The funds flow statement analysis helps the investors to decide whether the company has managed funds properly. It also indicates the credit worthiness of a company which helps the lenders to decide whether to lend money to the company or not. It helps management to take policy decisions and to decide about the financing policies and capital expenditure programme for future.

3.15.6 Funds Flow Statement versus Cash Flow Statement: Both funds flow and cash flow statements are used in analysis of past transactions of a business firm. The differences between these two statements are given below:

(a)   Funds flow statement is based on the accrual accounting system. In case of preparation of cash flow statements all transactions effecting the cash or cash equivalents only is taken into consideration.

(b)   Funds flow statement analyses the sources and application of funds of long-term nature and the net increase or decrease in long-term funds will be reflected on the working capital of the firm. The cash flow statement will only consider the increase or decrease in current assets and current liabilities in calculating the cash flow of funds from operations.

(c)   Funds Flow analysis is more useful for long range financial planning. Cash flow analysis is more useful for identifying and correcting the current liquidity problems of the firm.

(d)   Funds flow statement tallies the funds generated from various sources with various uses to which they are put. Cash flow statement starts with the opening balance of cash and reach to the closing balance of cash by proceeding through sources and uses.

Illustration 12: *Given below is the Balance Sheet of X Ltd. as on 31st March, 2012, 2013 and 2014.*

	31st March				*31st March*		
Liabilities	*2012*	*2013*	*2014*	*Assets*	*2012*	*2013*	*2014*
	(₹ in Lacs)				*(₹ in Lacs)*		
Share Capital	70,00	75,00	75,00	*Plant & Machinery*	80,00	110,00	130,00

Reserve	12,00	16,00	25,00	Investments	35,00	30,00	45,00
Profit & Loss A/c	6,00	7,00	9,00	Stock	15,00	15,00	20,00
12% Debentures	10,00	5,00	10,00	Debtors	5,00	5,50	5,00
Cash Credit	5,00	7,00	12,00	Cash at Bank	5,00	3,00	3,25
Creditors	12,00	14,00	18,00				
Tax Provision	11,00	17,00	28,00				
Proposed Div.	14,00	22,50	26,25				
	140,00	163,50	203,25		140,00	163,50	203,25
Other Information:							

(i)   Depreciation:2011-2012 ₹ 500 lacs; 2012-13 ₹ 700 lacs; and 2013-14 ₹ 775 lacs.

(ii)   In 2012-13 a part of the 12% debentures was converted into equity at par.

(iii)   In the last three years there was no sale of fixed assets.

(iv)   In 2012-13 investment costing ₹ 500 lacs was sold for ₹ 510 lacs. The management is confused on the deteriorating liquidity position despite good profit earned by the enterprise. Identify the reasons. Fund Flow Analysis may be adopted for this purpose.

Solution

(1)   Working Capital of X Ltd. during 2011-12, 2012-13 and 2013-14
       Current Assets :

	2011-12	2012-13	2013-14
			(₹ in Lacs)
Stock	15,00	15,00	20,00
Debtors	5,00	5,50	5,00
Cash at Bank	5,00	3,00	3,25
	25,00	23,50	28,25
Less : **Current Liabilities :**			
Cash Credit	5,00	7,00	12,00
Creditors	12,00	14,00	18,00
	17,00	21,00	30,00
Working Capital	8,00	2,50	(1,75)
Decrease in Working Capital	—	5,50	4,25

So working capital decreased by ₹ 550 lacs in 2008-09 and ₹ 425 lacs in 2013-14.

(2)   Profit earned and funds from operations

| | 2012-13 | 2013-14 |
| | | *(₹ in Lacs)* |

Profit during the year :

| | **2012-13** | **2013-14** |
		(₹ in Lacs)
Increase in Profit & Loss A/c	1,00	2,00
Increase in Reserve	4,00	9,00
Tax provision	17,00	28,00
Proposed Dividend	22,50	26,25
	44,50	65,25
Less : Profit on sale of Investment	(10)	—
Add : Depreciation	7,00	7,75
Fund from operations	51,40	73,00

X Ltd. earned ₹ 44,50 lacs profit and ₹ 51,40 Lacs fund in 2012-13. It earned ₹ 62,25 lacs profit and ₹ 73,00 lacs fund in 2013-14.

(3)   Fund Flow Statements

| | **2012-13** | **2013-14** |
		(₹ in Lacs)
Sources:		
Fund from operations	51,40	73,00
Issue of 12% debentures	—	5,00
Sale of investments	5,10	
	56,50	78,00
Applications:		
Purchase of Plant and Machinery	37,00	27,75
Purchase of Investments	—	15,00
Tax payment	11,00	17,00
Dividend payment	14,00	22,50
	62,00	82,25
Decrease in Working Capital	5,50	4,25

Comments:

(1)   It appears (₹ 25,00 lacs) that 48.64% (₹ 51,40 lacs) × 100 of the fund generated during 2012-13 were used to pay tax and dividend. The percentage became still higher (54.11%)

$$\frac{₹\,39,50}{₹\,73,00} \times 100 \text{ in 2013-14}$$

(2) In 2012-13 the balance of the fund generated was 51.36% (100 – 48.64%) which is used to finance purchase of plant and machinery. Sources of finance for long-term investment were:

Fund from Operations	71.35% (₹ 26,40 lacs/₹ 37,00 lacs) ×100
Sale of Investments	13.78% (₹ 5,10 lacs / ₹ 37,00 lacs) ×100
Working Capital	14.87% (₹ 5,50 lacs / ₹ 37,00 lacs) ×100

Thus inadequate long-term fund to finance purchase of plant and machinery deteriorated working capital position. Also the management proposed 30% dividend in 2012-13.

So, liquidity deterioration in 2012-13 was due to (a) deployment of working capital in long term investment and (b) high rate of dividend.

(3) In 2013-14, fund generation was 42.02% more. But dividend was increased from 20% to 30% which absorbed about 30.83% of funds generated. Tax paid to fund generated was also increased from 21.40% to 23.29%, Investment in Plant & Machinery (net of collection by issue of debentures) was 31.16% of the fund generated. Thus, margin of 14.73 would remain had there been no investment outside business. This amounts to ₹ 10.75 lacs. So outside investment caused liquidity deterioration in 2013-14.

Illustration 13: *Given below are the balance sheets of Spark Company for the years ending 31st July, 2013 and 31st July, 2014.*

Balance Sheet for the year ending on 31st July

	(₹) 2013	(₹) 2014
Capital and Liabilities		
Share capital	3,00,000	3,50,000
General reserve	1,00,000	1,25,000
Capital reserve (profit on sale of investment)	-	5,000
Profit and loss account	50,000	1,00,000
15% Debentures	1,50,000	1,00,000
Accrued expenses	5,000	6,000
Creditors	80,000	1,25,000
Provision for dividend	15,000	17,000
Provision for taxation	35,000	38,000
Total	7,35,000	8,66,000

Assets		
Fixed Assets	5,00,000	6,00,000
Less: Accumulated depreciation	1,00,000	1,25,000
Net fixed assets	4,00,000	4,75,000
Long-term investments (at cost)	90,000	90,000
Stock (at cost)	1,00,000	1,35,000
Debtors (net of provisions for doubtful debts of ₹ 20,000 and ₹ 25,000 respectively for 2013 and 2014)	1,12,500	1,22,500
Bills receivables	20,000	32,500
Prepaid expenses	5,000	6,000
Miscellaneous expenditure	7,500	5,000
Total	7,35,000	8,66,000

Additional Information:

(i)   During the year 2014, fixed asset with a net book value of ₹ 5,000 (accumulated depreciation ₹ 15,000) was sold for ₹ 4,000.

(ii)   During the year 2014, investments costing ₹ 40,000 were sold, and also investments costing ₹ 40,000 were purchased.

(iii) Debentures were retired at a premium of 10 percent.

(iv) Tax of ₹ 27,500 was paid for 2013.

(v)   During 2014, bad debts of ₹ 7,000 were written off against the provision for doubtful debt account.

(vi) The proposed dividend for 2013 was paid in 2014.

You are required to prepare a funds flow statement (i.e. statement of changes in financial position on working capital basis) for the year ended 31st July, 2014.

Solution

Funds Flow Statement for the year ended 31st July, 2014

		(₹)
Sources		
Working capital from operations	1,71,000	
Sale of fixed asset	4,000	
Sale of investments	45,000	
Share capital issued	50,000	
Total Funds Provided		2,70,000

Uses		
Purchase of fixed assets	1,20,000	
Purchase of investments	40,000	
Payment of debentures (at a premium of 10%)	55,000	
Payment of dividend	15,000	
Payment of taxes	27,500	
Total Funds Applied		2,57,500
Increase in Working Capital		12,500

Working Notes:

(a) **Funds from Operations:**

	₹
Profit and loss balance on 31st July, 2014	1,00,000
Add: Depreciation	40,000
Loss on sale of asset	1,000
Misc. expenditure written off	2,500
Transfer to reserve	25,000
Premium on redemption of debentures	5,000
Provision for dividend	17,000
Provision for taxation	30,500
	2,21,000
Less: Profit and loss balance on 31st July, 2013	50,000
Funds from Operations	1,71,000

(b) Depreciation for the year 2014 was ₹ 40,000. The accumulated depreciation on 31st July, 2013 was ₹ 1,00,000 of which ₹ 15,000 was written off during the year on account of sale of asset. Thus, the balance on 31st July, 2014 should have been ₹ 85,000. Since the balance is ₹ 1,25,000, the company would have provided a depreciation of ₹ 40,000 (i.e. ₹ 1,25,000 – ₹ 85,000) during the year 2014.

(c) Fixed assets were of ₹ 5,00,000 in 2013. With the sale of a fixed asset costing ₹ 20,000 (i.e. ₹ 5,000 + ₹ 15,000) this balance should have been ₹ 4,80,000. But the balance on 31st July, 2014 is ₹ 6,00,000. This means fixed assets of ₹ 1,20,000 were acquired during the year.

(d) Profit on the sale of investment, ₹ 5,000 has been credited to capital reserve account. It implies that investments were sold for ₹ 45,000 (i.e. ₹ 40,000 + ₹ 5,000).

The provision for taxation during the year 2014 is ₹ 30,500 [i.e. ₹ 38,000 – (₹ 35,000 – ₹ 27,500)].

Bad debts written off against the provision account have no significance for funds flow statement, as they do not affect working capital.

Illustration 14: *The summarized Balance Sheet of Xansa Ltd. as on 31-12-2012 and 31-12-2013 are as follows:*

	31-12-2012	*31-12-2013*
Assets		
Fixed assets at cost	*8,00,000*	*9,50,000*
Less: Depreciation	*2,30,000*	*2,90,000*
Net	*5,70,000*	*6,60,000*
Investments	*1,00,000*	*80,000*
Current Assets	*2,80,000*	*3,30,000*
Preliminary expenses	*20,000*	*10,000*
	9,70,000	*10,80,000*
Liabilities		
Share Capital	*3,00,000*	*4,00,000*
Capital reserve	*–*	*10,000*
General reserve	*1,70,000*	*2,00,000*
Profit & Loss account	*60,000*	*75,000*
Debentures	*2,00,000*	*1,40,000*
Sundry Creditors	*1,20,000*	*1,30,000*
Tax Provision	*90,000*	*85,000*
Proposed dividend	*30,000*	*36,000*
Unpaid dividend	*–*	*4,000*
	9,70,000	*10,80,000*

During 2013, the company –

(a) *Sold one machine for ₹ 25,000 the cost of the machine was ₹ 64,000 and depreciation provided for it amounted to ₹ 35,000.*

(b) *Provided ₹ 95,000 as depreciation.*

(c) *Redeemed 30% of debentures at ₹ 103.*

(d) *Sold investments at profit and credited to capital reserve; and*

(e) *Decided to value the stock at cost, whereas earlier the practice was to value stock at cost less 10%. The stock according to books on 31-12-2012 was ₹ 54,000 and stock on 31-12-2013 was ₹ 75,000, which was correctly valued at cost.*

You are required to prepare the following statements:

(i) *Funds from Operations*

(ii)   Sources and application of funds and statement of changes in working capital.

(iii)   Fixed assets account and loss on sale of machinery account.

Solution

Working Notes:

Fixed Assets A/c

	₹		₹
To Balance b/d	8,00,000	By Sale of Machinery A/c	64,000
To Cash Purchases (Bal. figure)	2,14,000	By Balance c/d	9,50,000
	10,14,000		10,14,000

Sale on Machinery A/c

	₹		₹
To Fixed Assets (original cost)	64,000	By Provision for Depreciation (provided till date)	35,000
		By Cash (sales)	25,000
		By Loss (P & L A/c)	4,000
	64,000		64,000

Provision for Depreciation of Fixed Assets A/c

	₹		₹
To Sale of Machinery a/c	35,000	By Balance b/d	2,30,000
To Balance c/d	2,90,000	By Profit & Loss A/c	95,000
	3,25,000		3,25,000

Statement of Funds generated from Operations

		(₹)
Profit & Loss A/c (Carried forward to B/S)		75,000
Add: Fixed Assets (loss on sales)	4,000	
Depreciation	95,000	
Premium on redemption of Debentures (60,000×3/100)	1,800	
Preliminary expenses written off	10,000	
Provision for Income-tax	85,000	
Proposed Dividend	36,000	
Transfer to General Reserve	30,000	2,61,800

		3,36,800
Less:		
Profit and Loss A/c Opening Balance	60,000	
Increase in Opening Stock value (54,000×10/90)	6,000	66,000
Funds generated from operation		**2,70,800**

Funds flow Statement of Xansa Ltd. for the year ended 31-12-2013

	(₹)
Sources of Funds:	
Issue of Shares	1,00,000
Sale of Investments	30,000
Sale of Machinery	25,000
Funds generated from operations	2,70,800
Total	4,25,800
Application of Funds:	
Purchase of Fixed Assets	2,14,000
Redemption of Debentures with 3% Premium i.e., (60,000×103/100)	61,800
Dividend paid for the last year (₹ 30,000 – ₹ 4,000 unpaid dividend)	26,000
Taxes paid belonging to last year	90,000
Increase in Working Capital (balancing figure)	34,000
Total	4,25,800

Statement of Changes in Working Capital

Particulars	2012	2013	+	-
Current Assets	2,86,000	3,30,000	44,000	-
(including 6,000 on account of revaluation of stock)				
Current Liabilities	1,20,000	1,30,000	-	10,000
Net Working capital	1,66,000	2,00,000		
Increase in Working Capital	34,000	-	-	34,000
	2,00,000	2,00,000	44,000	44,000

SUMMARY

1. **Financial Analysis and its Tools:** - For the purpose of obtaining the material and relevant information necessary for ascertaining the financial strengths and weaknesses of an enterprise, it is necessary to analyze the data depicted in the financial statement. The financial manager has certain analytical tools which help in financial analysis and planning. The main tools are Ratio Analysis and Cash Flow Analysis

2. **Ratio Analysis:-** The ratio analysis is based on the fact that a single accounting figure by itself may not communicate any meaningful information but when expressed as a relative to some other figure, it may definitely provide some significant information. Ratio analysis is not just comparing different numbers from the balance sheet, income statement, and cash flow statement. It is comparing the number against previous years, other companies, the industry, or even the economy in general for the purpose of financial analysis.

3. **Type of Ratios and Importance of Ratios Analysis:-** The ratios can be classified into following four broad categories:

    (i)   Liquidity Ratios

    (ii)   Capital Structure/Leverage Ratios

    (iii) Activity Ratios

    (iv)   Profitability Ratios

    A popular technique of analyzing the performance of a business concern is that of financial ratio analysis. As a tool of financial management, they are of crucial significance. The importance of ratio analysis lies in the fact that it presents facts on a comparative basis and enables drawing of inferences regarding the performance of a firm.

    Ratio analysis is relevant in assessing the performance of a firm in respect of following aspects:

    I   Liquidity Position

    II   Long-term Solvency

    III   Operating Efficiency

    IV   Overall Profitability

    V   Inter-firm Comparison

    VI   Financial Ratios for Supporting Budgeting

4. **Cash Flow Statement:** Simple definition of a cash flow statement is a statement which discloses the changes in cash position between the two periods. Along with changes in the cash position the cash flow statement also outlines the reasons for such inflows or outflows of cash which in turn helps to analyze the functioning of a business. The cash flow statement is an important planning tool in the hands of management. A cash flow statement is useful for short-term planning.

5. **Classification of Cash Flow Activities:-** The cash flow statement should report cash flows during the period classified into following categories:-

    a.   Operating activities

b   Investing activities

c   Financing activities

Classification by activity provides information that allows users to assess the impact of those activities on the financial position of the enterprise and the amount of its cash and cash equivalents. This information may also be used to evaluate the relationships **among those activities.**

6.   **Funds Flow Statement:-** Another important tool in the hands of finance managers for ascertaining the changes in financial position of a firm between two accounting periods is known as funds flow statement. Funds flow statement analyses the reasons for change in financial position between two balance sheets. It shows the inflow and outflow of funds i.e., sources and application of funds during a particular period.

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Financing Decisions

UNIT – I : COST OF CAPITAL

Learning Objectives

After studying this chapter you will be able to:

- Understand the concept of "Cost of Capital" that impacts the capital investments decisions for a business.

- Understand what are the different sources of capital (Debt, Equity Shares, and Preference Shares etc.)?

- Understand what is the cost of employing each of these sources of capital?

- Know what is weighted average cost of capital (WACC) (overall cost of capital) for a business and also what is marginal cost of capital?

- Summarize how cost of capital is important in Financial Management?

Overview

This chapter covers the concept and significance of cost of capital, capital structure decisions and leverages. Cost of capital has relevance in almost every type of financial decision making. Leverages help in understanding what change in a firm's policy in terms of say increase or reduction in the number of units it is producing or whether the firm should rely more or less heavily on borrowed money, etc affect the risk and return scenario of the firm. The concept of financing mix has utility while deciding upon the hurdle rate for capital budgeting decisions under Chapter Six on Investment Decisions. Needless to say, this chapter too has applications in real life situations and requires thorough understanding of the concepts underlying each topic. Being a practically-oriented chapter, you need to practice a lot.

4.1 Introduction

In the previous chapter 'Time Value of Money', we learned the concept of discounting of the future cash flows to arrive at the present value of the future cash flows. Similarly, to know the future value of any given cash flows we used the technique of compounding. While applying

both discounting and compounding techniques we needed a rate (e.g. interest rate) to arrive at present value of future cashflows or future value of present cashflows. While doing so the discounting rate was generally given in the question. But to calculate the present value/ future value of cashflows when discount rate is not given, an appropriate discount rate needs to be calculated. In this chapter we will learn to find out appropriate rate for discounting/ compounding of cashflows. This rate of discount is popularly known as cost of capital.

The cost of capital i.e. cost of having capital for long period from different sources of finance. Generally the sources of finance for non corporate entity could be either internal (savings, investments in current and non-current assets etc.) or external borrowings (loan from financial institutions, local borrowings etc.).

The sources of finance for the corporate entities could be categorised into two part as below:
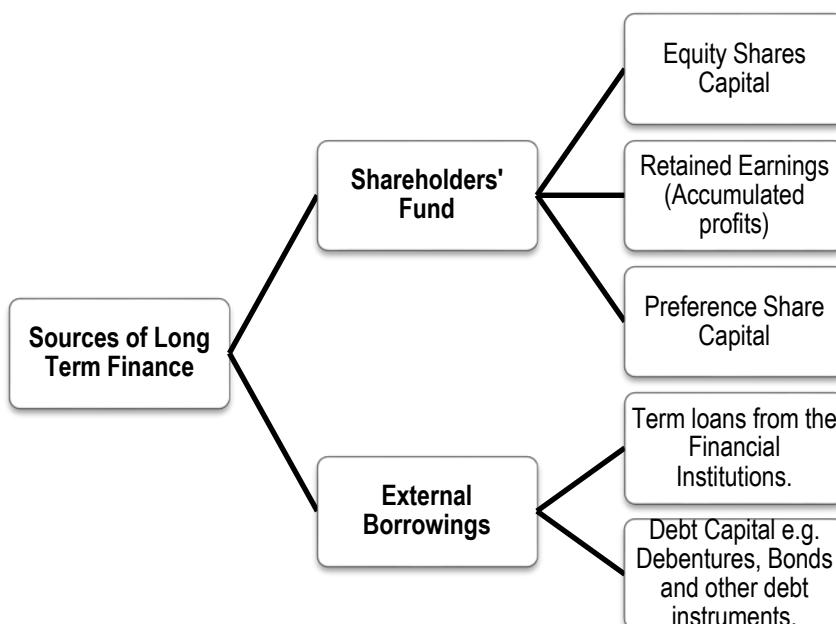
Shareholders' Fund: Shareholder' fund includes Equity Share Capital, Preference Share Capital, Retained earnings (accumulated profits).

External Borrowings: External borrowings includes long term loan from financial institutions, funds from issuance of debt instruments like Debentures, Bonds, any other debt instruments.

4.2 The Cost of Capital

Cost of capital is the return expected by the providers of capital (i.e. shareholders, lenders and the debt-holders) to the business as a compensation for their contribution to the total capital. When an entity (corporate or others) procured finances from either sources as listed above, it has to pay some additional amount of money besides the principal amount. The additional

money paid to these financiers may be either one off payment or regular payment at specified intervals. This additional money paid is said to be the cost of using the capital and it is called the cost of capital. This cost of capital expressed in rate is used to discount/ compound the cashflow or stream of cashflows. Cost of capital is also known as 'cut-off' rate, 'hurdle rate', 'minimum rate of return' etc.

4.3 Significance of the Cost of Capital

The cost of capital is important to arrive at correct amount and helps the management or an investor to take an appropriate decision. The correct cost of capital helps in the following decision making:

(i) Evaluation of investment options: The estimated benefits (future cashflows) from available investment opportunities (business or project) are converted into the present value of benefits by discounting them with the relevant cost of capital. Here it is pertinent to mention that every investment option may have different cost of capital hence it is very important to use the cost of capital which is relevant to the options available. Here Internal Rate of Return (IRR) is treated as cost of capital for evaluation of two options (projects).

(ii) Performance Appraisal: Cost of capital is used to appraise the performance of a particulars project or business. The performance of a project or business in compared against the cost of capital which is known here as cut-off rate or hurdle rate.

(iii) Designing of optimum credit policy: While appraising the credit period to be allowed to the customers, the cost of allowing credit period is compared against the benefit/ profit earned by providing credit to customer of segment of customers. Here cost of capital is used to arrive at the present value of cost and benefits received.

4.4 Determination of the Cost of Capital

The cost of capital can either be explicit or implicit. The cash outflow of an entity towards the utilization of capital which is clear and obvious is termed as explicit cost of capital. These outflows may be interest payment to debenture holders, repayment of principal amount to financial institution or payment of dividend to shareholders etc. On the other hand Implicit cost is the cost which is actually not a cash outflow but it is an opportunity loss of foregoing a better investment opportunity by choosing an alternative option. An entrepreneur for example, uses its bank deposits which earns interest @ of 9% p.a. for the business purpose. Using its bank deposits for business purpose means forgoing interest earnings from the bank on this deposit. The cost of capital in this case will be 9% interest that could have been earned by not investing the deposit for the business purpose. This opportunity loss of 9% is called implicit cost capital or opportunity cost.

The two factors which are considered to determine the cost of capital are:

(i)   Source of Finance

(ii) Reciprocal payment of the using finance.

We will discuss the cost of capital of each source of finance separately.
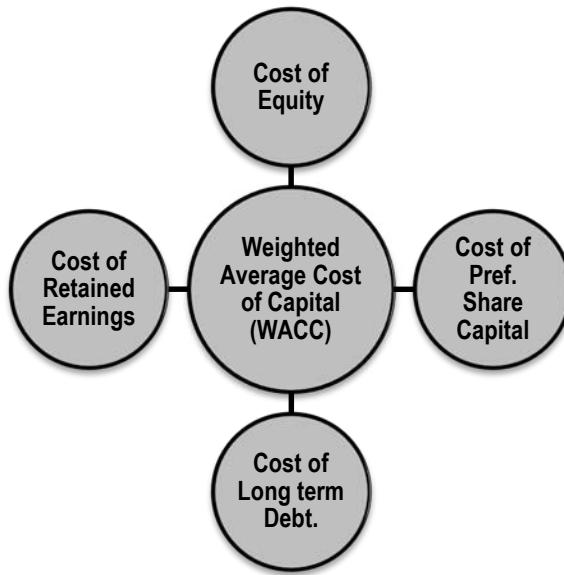
4.5 Cost of Long term Debt

External borrowings or debt instruments do not confers ownership to the providers of finance. The providers of the debt fund do not participate in the affairs of the company but enjoys the charge on the profit before taxes. Long term debt includes long term loans from the financial institutions, capital from issuing debentures or bonds etc. (In the next chapter we will discuss in detail about the sources of long term debt.).

As discussed above the external borrowing or debt includes long term loan from financial institutions, issuance of debt instruments like debentures or bonds etc. The calculation of cost of loan from a financial institution is similar to that of redeemable debentures. Here we confine our discussion of cost debt to Debentures or Bonds only.

Features of debentures or bonds:

Face Value: Debentures or Bonds are denominated with some value; this denominated value is called face value of the debenture. Interest is calculated on the face value of the debentures. E.g. If a company issue 9% Non- convertible debentures of ₹ 100 each, this means the face value is ₹ 100 and the interest @9% will be calculated on this face value.

Interest (Coupon) Rate: Each debenture bears a fixed interest (coupon) rate (except Zero coupon bond and Deep discount bond). Interest (coupon) rate is applied to face value of debenture to calculate interest, which is payable to the holders of debentures periodically.

Maturity period: Debentures or Bonds has a fixed maturity period for redemption. However, in case of irredeemable debentures maturity period is not defined and it is taken as infinite.

Redemption Value: Redeemable debentures or bonds are redeemed on its specified maturity date. Based on the debt covenants the redemption value is determined. Redemption value may vary from the face value of the debenture.

Benefit of tax shield: The payment of interest to the debenture holders are allowed as expenses for the purpose of corporate tax determination. Hence, interest paid to the debenture holders save the tax liability of the company. Saving in the tax liability is also known as tax shield. The example given below will show you how interest paid by a company reduces the tax liability:

Example: There are two companies namely X Ltd. and Y Ltd. The capital of the X Ltd is fully financed by the shareholders whereas Y Ltd uses debt fund as well. The below is the profitability statement of both the companies:

	X Ltd. (₹ in lakh)	Y Ltd. (₹ in lakh)
Earnings before interest and taxes (EBIT)	100	100
Interest paid to debenture holders	-	(40)
Profit before tax (PBT)	100	60
Tax @ 35%	**(35)**	**(21)**
Profit after tax (PAT)	65	39

A comparison of the two companies shows that an interest payment of 40 by the Y Ltd. results in a tax shield (tax saving) of ₹14 lakh (₹ 40 lakh paid as interest × 35% tax rate). Therefore the effective interest is ₹ 26 lakh only.

Based on redemption (repayment of principal) on maturity the debts can be categorised into two types (i) Irredeemable debts and (ii) Redeemable debts.
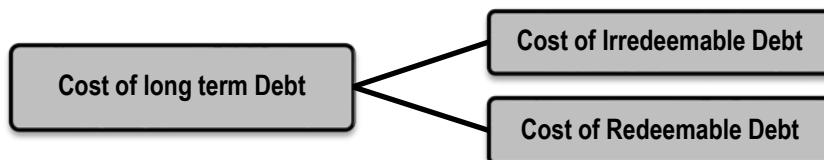
4.5.1 Cost of Irredeemable Debentures

The cost of debentures which are not redeemed by the issuer of the debenture is known as irredeemable debentures. Cost of debentures not redeemable during the life time of the company is calculated as below:

$$K_d = \frac{I}{NP}(1-t)$$

Where,			
	K_d	=	Cost of debt after tax
	I	=	Annual interest payment
	NP	=	Net proceeds of debentures or current market price
	t	=	Tax rate

Suppose a company issues 1,000, 15% debentures of the face value of ₹100 each at a discount of ₹5. Suppose further, that the under-writing and other costs are ₹ 5,000/- for the total issue. Thus ₹ 90,000 is actually realised, i.e., ₹ 1,00,000 minus ₹ 5,000 as discount and ₹ 5,000 as under-writing expenses. The interest per annum of ₹15,000 is therefore the cost of ₹ 90,000, actually received by the company. This is because interest is a charge on profit and every year the company will save ₹ 7,500 as tax, assuming that the income tax rate is 50%. Hence the after tax cost of ₹ 90,000 is ₹ 7,500 which comes to 8.33%.

Illustration 1: *Five years ago, Sona Limited issued 12 per cent irredeemable debentures at ₹ 103, a ₹ 3 premium to their par value of ₹ 100. The current market price of these debentures is ₹ 94. If the company pays corporate tax at a rate of 35 per cent what is its current cost of debenture capital?*

Solution: Cost of irredeemable debenture:

$$K_d = \frac{I}{NP}(1-t)$$

$$K_d = \frac{₹12}{₹94}(1-0.35) = 0.08297 \text{ or } 8.30\%$$

4.5.2   Cost of Redeemable Debentures (using approximation method):

The cost of redeemable debentures will be calculated as below:

(i) $K_d = \dfrac{I(1-t)+\dfrac{(RV-NP)}{n}}{\dfrac{(RV+NP)}{2}}$			
Where,			
	I	=	Interest payment
	NP	=	Net proceeds from debentures in case of new issue of debt or Current market price in case of existing debt.
	RV	=	Redemption value of debentures
	t	=	Tax rate applicable to the company
	n	=	Life of debentures.

The above formula to calculate cost of debt is used where only interest on debt is tax deductable. Sometime, debts are issued at discount and/ or redeemed at a premium. If discount on issue and/ or premium on redemption are tax deductible, the following formula can be used to calculate the cost of debt.

(ii) $K_d = \dfrac{I + \dfrac{(RV - NP)}{n}}{\dfrac{(RV + NP)}{2}}(1-t)$

In absence of any specific information, students may use any of the above formulae to calculate the Cost of Debt (K_d) with logical assumption.

Illustration 2*: A company issued 10,000, 10% debentures of ₹ 100 each at a premium of 10% on 1.4.2013 to be matured on 1.4.2018. The debentures will be redeemed on maturity. Compute the cost of debentures assuming 35% as tax rate.*

Solution

The cost of debenture (K_d) will be calculated as below:

Cost of debenture (K_d) $= \dfrac{I(1-t) + \dfrac{(RV - NP)}{n}}{\dfrac{(RV + NP)}{2}}$

I	= Interest on debenture = 10% of ₹100	= ₹10
NP	= Net Proceeds = 110% of ₹100	= ₹110
RV	= Redemption value	= ₹100
n	= Period of debenture	= 5 years
t	= Tax rate	= 35% or 0.35

$K_d = \dfrac{₹10(1-0.35) + \dfrac{(₹100 - ₹110)}{5\,years}}{\dfrac{(₹100 + ₹110)}{2}}$

Or, $K_d = \dfrac{₹10 \times 0.65 - ₹2}{₹105} = \dfrac{₹4.5}{₹105} = 0.0428$ or 4.28%

Illustration 3*: A company issued 10,000, 10% debentures of ₹ 100 each on 1.4.2013 to be matured on 1.4.2018. The company wants to know the current cost of its existing debt and the market price of the debentures is ₹ 80. Compute the cost of existing debentures assuming 35% tax rate.*

Solution

Cost of debenture (K_d) $= \dfrac{I(1-t)+\dfrac{(RV-NP)}{n}}{\dfrac{(RV+NP)}{2}}$

I   = Interest on debenture = 10% of ₹100   = ₹10

NP   = Current market price   = ₹80

RV   = Redemption value   = ₹100

n   = Period of debenture   = 5 years

t   = Tax rate   = 35% or 0.35

K_d $= \dfrac{₹10(1-0.35)+\dfrac{(₹100-₹80)}{5\,years}}{\dfrac{(₹100+₹80)}{2}}$

Or, $= \dfrac{₹10\times0.65+₹4}{₹90} = \dfrac{₹10.5}{₹90}$ = 0.1166 or 11.67%

4.5.2.1 Cost of Debt using Present value method: The cost of redeemable debt (K_d) is also calculated by discounting the relevant cash flows using Internal rate of return (IRR). (The concept of IRR is discussed in later Chapter- Investment Decisions).

The relevant cash flows are as follows:

Year	Cash flows
0	Net proceeds in case of new issue/ Current market price in case of existing debt (NP or P_0)
1 to n	Interest net of tax [I(1-t)]
n	Redemption value (RV)

Steps to calculate relevant cash flows:

Step-1: Identify the cash flows

Step-2: Calculate NPVs of cash flows as identified above using two discount rates (guessing).

Step-3: Calculate IRR

Example: A company issued 10,000, 10% debentures of ₹ 100 each on 1.4.2013 to be matured on 1.4.2018. The company wants to know the current cost of its existing debt and the market price of the debentures is ₹ 80. Compute the cost of existing debentures assuming 35% tax rate.

Step-1: Identification of relevant cash flows

Year	Cash flows
0	Current market price (P_0) = ₹80
1 to 5	Interest net of tax [I(1-t)] = 10% of ₹100 (1-0.35) = ₹6.5
5	Redemption value (RV) = Face value i.e. ₹100

Step- 2: Calculation of NPVs at two discount rates

Year	Cash flows	Discount factor @ 10%	Present Value	Discount factor @ 15%	Present Value
0	80	1.000	(80.00)	1.000	(80.00)
1 to 5	6.5	3.791	24.64	3.352	21.79
5	100	0.621	62.10	0.497	49.70
NPV			+6.74		-8.51

Step- 3: Calculation of IRR

$$\text{IRR} = L + \frac{NPV_L}{NPV_L - NPV_H}(H - L) = 10\% + \frac{6.74}{6.74 - (-8.51)}(15\% - 10\%) = 12.21\%$$

4.5.2.2 Amortisation of Bond: A bond may be amortised every year i.e. principal is repaid every year rather than at maturity. In such a situation, the principal will go down with annual payments and interest will be computed on the outstanding amount. The cash flows of the bonds will be uneven.

The formula for determining the value of a bond or debenture that is amortised every year is as follows:

$$V_B = \frac{C_1}{(1+K_d)^1} + \frac{C_2}{(1+K_d)^2} + \dots + \frac{C_n}{(1+K_d)^n}$$

$$V_B = \sum_{t=1}^{n} \frac{C_t}{(1+K_d)^t}$$

Illustration 4: *RBML is proposing to sell a 5-year bond of ₹ 5,000 at 8 per cent rate of interest per annum. The bond amount will be amortised equally over its life. What is the bond's present value for an investor if he expects a minimum rate of return of 6 per cent?*

Solution:

The amount of interest will go on declining as the outstanding amount of bond will be reducing due to amortisation. The amount of interest for five years will be:

First year: ₹5,000 × 0.08 = ₹ 400;

Second year: (₹5,000 – ₹1,000) × 0.08 = ₹ 320;

Third year: (₹4,000 – ₹1,000) × 0.08 = ₹ 240;

Fourth year: (₹3,000 – ₹1,000) × 0.08 = ₹ 160; and

Fifth year: (₹2,000 – ₹1,000) × 0.08 = ₹ 80.

The outstanding amount of bond will be zero at the end of fifth year.

Since RBML will have to return ₹1,000 every year, the outflows every year will consist of interest payment and repayment of principal:

First year: ₹1,000 + ₹ 400 = ₹1,400;

Second year: ₹1,000 + ₹ 320 = ₹1,320;

Third year: ₹1,000 + ₹ 240 = ₹1,240;

Fourth year: ₹1,000 + ₹ 160 = ₹1,160; and

Fifth year: ₹1,000 + ₹80 = ₹ 1,080.

The above cash flows of all five years will be discounted with the cost of capital. Here the expected rate i.e. 6% will be used.

Value of the bond is calculated as follows:

$$V_B = \frac{₹1,400}{(1.06)^1} + \frac{₹1,320}{(1.06)^2} + \frac{₹1,240}{(1.06)^3} + \frac{₹1,160}{(1.06)^4} + \frac{₹1,080}{(1.06)^5}$$

$$= \frac{₹1,400}{1.06} + \frac{₹1,320}{1.1236} + \frac{₹1,240}{1.1910} + \frac{₹1,160}{1.2624} + \frac{₹1,080}{1.3382}$$

$$= ₹1,320.75 + ₹1,174.80 + ₹1,041.14 + ₹918.88 + ₹807.05 = ₹ 5,262.62$$

4.5.3   Cost of Convertible Debenture:

Holders of the convertibel debentures has the option to either get the debentures redeemed into the cash or get specified numbers of companies shares in leiu of cash. The calculation of cost of convertible debentures are very much similar to the redeemable debentures. While determining the redeemable value of the debentures, it is assumed that all the debenture holders will choose the option which has the higher value and accordingly it is considered to calculate cost of debt.

Example: A company issued 10,000, 15% Convertible debentures of ₹100 each with a maturity period of 5 years. At maturity the debenture holders will have the option to convert the debentures into equity shares of the company in the ratio of 1:10 (10 shares for each debenture). The current market price of the equity shares is ₹12 each and historically the

growth rate of the shares are 5% per annum. Compute the cost of debentures assuming 35% tax rate.

Determination of Redemption value:

Higher of

(i)   The cash value of debentures   = ₹100

(ii)   Value of equity shares   = 10 shares × ₹12$(1+0.05)^5$

                                = 10 shares × 15.312 = ₹153.12

₹153.12 will be taken as redemption value as it is higher than the cash option and attractive to the investors.

Calculation of Cost of Convertible debenture (using approximation method):

$$K_d = \dfrac{I(1-t)+\dfrac{(RV-NP)}{n}}{\dfrac{(RV+NP)}{2}} = \dfrac{15(1-0.35)+\dfrac{(153.12-100)}{5}}{\dfrac{(153.12+100)}{2}} = \dfrac{9.75+10.62}{126.53} = 16.09\%$$

Alternatively:

Using present value method

Year	Cash flows	Discount factor @ 15%	Present Value	Discount factor @ 20%	Present Value
0	100	1.000	(100.00)	1.000	(100.00)
1 to 5	9.75	3.352	32.68	2.991	29.16
5	153.12	0.497	76.10	0.402	61.55
NPV			+8.78		-9.29

$$\text{IRR} = L + \dfrac{NPV_L}{NPV_L - NPV_H}(H-L) = 15\% + \dfrac{8.78}{8.78-(-9.29)}(20\% - 15\%) = 0.17429 \text{ or } 17.43\%$$

4.6   Cost of Preference Share Capital

The preference share capital is paid dividend at a specified rate on face value of preference shares. Payment of dividend to the preference shareholders are not mandatory but are given priority over the equity shareholder. The payment of dividend to the preference share holders are not charged as expenses but treated as appropriation of after tax profit. Hence, dividend paid to preference share holders does not reduce the tax liability to the company. Like the debentures, Preference share capital can be categorised as redeemable and irredeemable. Accordingly cost of capital for each type will be discussed here.
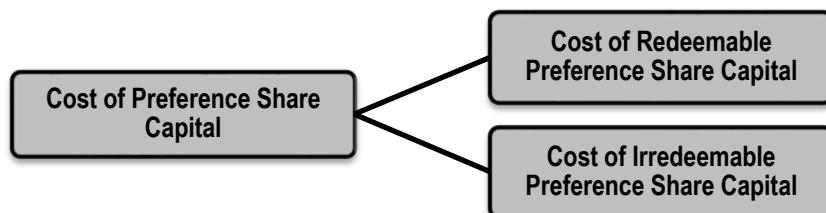
4.6.1   Cost of Redeemable Preference Shares

Preference shares issued by a company which are redeemed on its maturity is called redeemable preference shares. Cost of redeemable preference share is similar to the cost of redeemable debentures with the exception that the dividends paid to the preference shareholders are not tax deductible. Cost of preference capital is calculated as follows:

$$K_p = \frac{PD + \dfrac{(RV - NP)}{n}}{\dfrac{(RV + NP)}{2}}$$

Where,

PD	=	Annual preference dividend
RV	=	Redemption value of preference shares
NP	=	Net proceeds on issue of preference shares
n	=	Life of preference shares.

The cost of redeemable preference share could also be calculated as the discount rate that equates the net proceeds of the sale of preference shares with the present value of the future dividends and principal payments.

Illustration 5*: XYZ Ltd. issues 2,000 10% preference shares of ₹ 100 each at ₹ 95 each. The company proposes to redeem the preference shares at the end of 10th year from the date of issue. Calculate the cost of preference share?*

Solution

$$K_p = \frac{PD + \dfrac{(RV - NP)}{n}}{\dfrac{(RV + NP)}{2}}$$

$$K_p = \frac{10 + \left(\dfrac{100 - 95}{10}\right)}{\left(\dfrac{100 + 95}{2}\right)} \qquad = 0.1077 \text{ (approx.)} = 10.77\%$$

4.6.2   Cost of Irredeemable Preference Shares

The cost of irredeemable preference shares is similar to calculation of perpetuity. The cost is calculated by dividing the preference dividend with the current market price or net proceeds from the issue. The cost of irredeemable preference share is as below:

$$K_P = \frac{PD}{P_0}$$

Where,

PD = Annual preference dividend

P_0 = Net proceeds in issue of preference shares.

Note: As per the Companies Act 2013, issuances of irredeemable preference shares are not allowed but for the academic knowledge it is studied here.

Illustration 6: *XYZ & Co. issues 2,000 10% preference shares of ₹ 100 each at ₹ 95 each. Calculate the cost of preference shares.*

Solution:

$$K_P = \frac{PD}{P_0}$$

$$K_p = \frac{(10 \times 2,000)}{(95 \times 2,000)} = \frac{10}{95} = 0.1053 = 10.53\%$$

Illustration 7: *If R Energy is issuing preferred stock at ₹100 per share, with a stated dividend of ₹12, and a floatation cost of 3% then, what is the cost of preference share?*

Solution:

$$K_p = \frac{Preferred\ stock\ dividend}{Market\ price\ of\ preferred\ stock\ (1 - floatation\ cost)}$$

$$= \frac{₹12}{₹100(1 - 0.03)} = \frac{₹12}{₹97} = 0.1237 \text{ or } 12.37\%$$

4.7   Cost of Equity Share Capital

It may prima facie appear that equity capital does not carry any cost. But this is not true. The market share price is a function of return that equity shareholders expect and get. If the company does not meet their requirements, it will have an adverse effect on the market share price. Also, it is relatively the highest cost of capital. Due to relative higher risk, equity shareholders expect higher return hence, the cost of capital is also high.

In simple words, cost of equity capital is the rate of return which equates the present value of expected dividends with the market share price. In theory, the management strives to maximize the position of equity holders and the effort involves many decisions.

Different methods are employed to compute the cost of equity share capital.
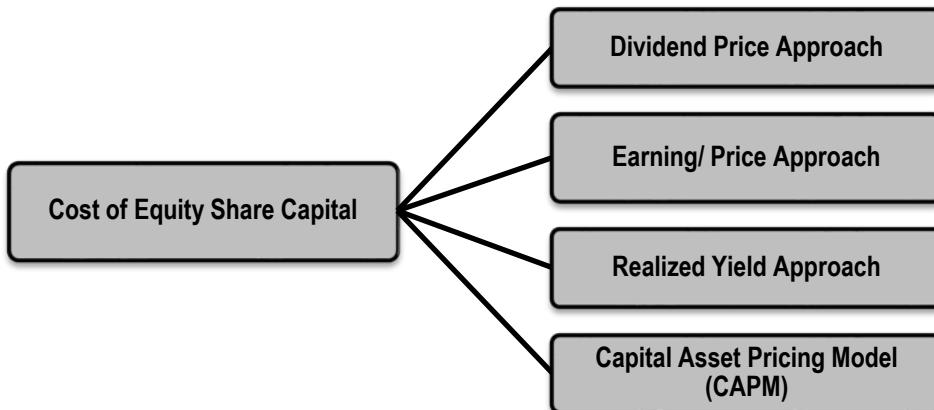
4.7.1 Dividend Price Approach

This is also known as Dividend Valuation Model. This model makes an assumption that the market price of a share is the present value of its future dividends stream. As per this approach the cost of equity is the rate which equates the future dividends to the current market price. Here, cost of equity capital is computed by dividing the expected dividend by market price per share.

Dividend Price Approach with Constant Dividend: In this approach dividend is constant, which means there is no-growth or zero growth in dividend. The cost of equity can be calculated as follows:

$$K_e = \frac{D}{P_0}$$

Where,

      K_e = Cost of equity

      D = Expected dividend

      P_0 = Market price of equity (ex- dividend)

This model assumes that dividends are paid at a constant rate to perpetuity. It ignores taxation.

Dividend Price Approach with Constant Growth: As per this approach the rate of dividend growth remains constant. Where earnings, dividends and equity share price all grow at the same rate, the cost of equity capital may be computed as follows:

$$K_e = \frac{D_1}{P_0} + g$$

Where,

　　　$D_1 = [D_0 (1+ g)]$ i.e. next expected dividend

　　　P_0 = Current Market price per share

　　　g = Constant Growth Rate of Dividend.

In case of newly issued equity shares where floatation cost is incurred, the cost of equity share with an estimation of constant dividend growth is calculated as below:

Ke = $\dfrac{D_1}{P_0 - F}$ +　　Where, F = Flotation cost per share.

Illustration 8: *A company has paid dividend of ₹ 1 per share (of face value of ₹ 10 each) last year and it is expected to grow @ 10% next year. Calculate the cost of equity if the market price of share is ₹ 55.*

Solution

$K_e = \dfrac{D_1}{P_0} + g$ = $\dfrac{₹1(1+0.1)}{₹55} + 0.1$ = 0.12 = 12%

4.7.2   Earning/ Price Approach

The advocates of this approach co-relate the earnings of the company with the market price of its share. Accordingly, the cost of equity share capital would be based upon the expected rate of earnings of a company. The argument is that each investor expects a certain amount of earnings, whether distributed or not from the company in whose shares he invests. Thus, if an investor expects that the company in which he is going to subscribe for shares should have at least a 20% rate of earning, the cost of equity share capital can be construed on this basis. Suppose the company is expected to earn 30% the investor will be prepared to pay ₹ 150 $\left(₹ \dfrac{30}{20} \times 100 \right)$ for each share of ₹ 100.

Earnings/ Price Approach with Constant Earnings:

$K_e = \dfrac{E}{P}$

Where,

　　　E = Current earnings per share

　　　P = Market share price

Since practically earnings do not remain constant and the price of equity shares is also directly influenced by the growth rate in earnings. The above formula need to be modified to reflect the growth element.

Earnings/ Price Approach with Growth in Earnings:

$$K_e = \frac{E}{P} + g$$

Where,

E = Current earnings per share

P = Market price per share

g = Annual growth rate of earnings.

The Earning Price Approach is similar to the dividend price approach; only it seeks to nullify the effect of changes in the dividend policy.

Estimation of Growth Rate

The calculation of 'g' (the growth rate) is an important factor in calculating cost of equity share capital. Generally two methods are used to determine the growth rate, which are discussed below:

(i)   Average Method

It calculated as below:

$$D_0 = D_n(1+g)^n \qquad \text{or} \qquad g = \sqrt[n]{\frac{D_0}{D_n}} - 1$$

Where, D_0 = Current dividend, D_n = Dividend in n years ago

Trick: Growth rate can also be found as follows:

Step-I: Divide D_0 by D_n, find out the result, then refer the FVIF table,

Step-II: Find out the result found at Step-I in corresponding year's row

Step-III: See the interest rate for the corresponding column. This is the growth rate.

Example: The current dividend (D_0) is ₹16.10 and the dividend 5 year ago was ₹10. The growth rate in the dividend can found out as follows:

Step-I: Divide D_0 by D_n i.e. ₹16.10 ÷ ₹10 = 1.61

Step-II: Find out the result found at Step-I i.e. 1.61 in corresponding year's row i.e. 5th year

Step-III: See the interest rate for the corresponding column which is 10%. Therefore, growth rate (g) is 10%.

(ii) Gordon's Growth Model

Unlike the Average method, Gordon's growth model attempts to derive a future growth rate. As per this model increase in the level of investment will give rise to an increase in

future dividends. This model takes Earnings retention rate (b) and rate of return on investments (r) into account to estimate the future growth rate.

It can be calculated as below:

Growth (g) = b × r

Where,   r = rate of return on fund invested

                   b = earnings retention ratio/ rate*

(*Proportion of earnings available to equity shareholders which is not distributed as dividend)

4.7.3   Realized Yield Approach

According to this approach, the average rate of return realized in the past few years is historically regarded as 'expected return' in the future. It computes cost of equity based on the past records of dividends actually realised by the equity shareholders. Though, this approach provides a single mechanism of calculating cost of equity, it has unrealistic assumptions like risks faced by the company remain same; the shareholders continue to expect the same rate of return; and the reinvestment opportunity cost (rate) of the shareholders is same as the realised yield. If the earnings do not remain stable, this method is not practical.

Illustration 9

Mr. Mehra had purchased a share of Alpha Limited for ₹ 1,000. He received dividend for a period of five years at the rate of 10 percent. At the end of the fifth year, he sold the share of Alpha Limited for ₹ 1,128. You are required to compute the cost of equity as per realised yield approach.

Solution

We know that as per the realised yield approach, cost of equity is equal to the realised rate of return. Therefore, it is important to compute the internal rate of return by trial and error method. This realised rate of return is the discount rate which equates the present value of the dividends received in the past five years plus the present value of sale price of ₹ 1,128 to the purchase price of ₹1,000. The discount rate which equalises these two is 12 percent approximately. Let us look at the table given for a better understanding:

Year	Dividend (₹)	Sale Proceeds (₹)	Discount Factor @ 12%	Present Value (₹)
1	100	-	0.893	89.3
2	100	-	0.797	79.7
3	100	-	0.712	71.2
4	100	-	0.636	63.6
5	100	-	0.567	56.7
6	Beginning	1,128	0.567	639.576
				1,000.076

We find that the purchase price of Alpha limited's share was ₹ 1,000 and the present value of the past five years of dividends plus the present value of the sale price at the discount rate of 12 percent is ₹1,000.076. Therefore, the realised rate of return may be taken as 12 percent. This 12 percent is the cost of equity.

4.7.4   Capital Asset Pricing Model (CAPM) Approach

CAPM model describes the risk-return trade-off for securities. It describes the linear relationship between risk and return for securities.

The risks, to which a security is exposed, can be classified into two groups:

(i)   Unsystematic Risk: This is also called company specific risk as the risk is related with the company's performance. This type of risk can be reduced or eliminated by diversification of the securities portfolio. This is also known as diversifiable risk.

(ii)   Systematic Risk: It is the macro- economic or market specific risk under which a company operates. This type of risk cannot be eliminated by the diversification hence, it is non-diversifiable. The examples are inflation, Government policy, interest rate etc.

As diversifiable risk can be eliminated by an investor through diversification, the non-diversifiable risk is the risk which cannot be eliminated; therefore a business should be concerned as per CAPM method, solely with non-diversifiable risk.

The non-diversifiable risks are assessed in terms of beta coefficient (b or β) through fitting regression equation between return of a security and the return on a market portfolio.

$$K_e = R_f + (R_m - R_f)\,\beta$$

Risk premium $(R_m - R_f)\,\beta$
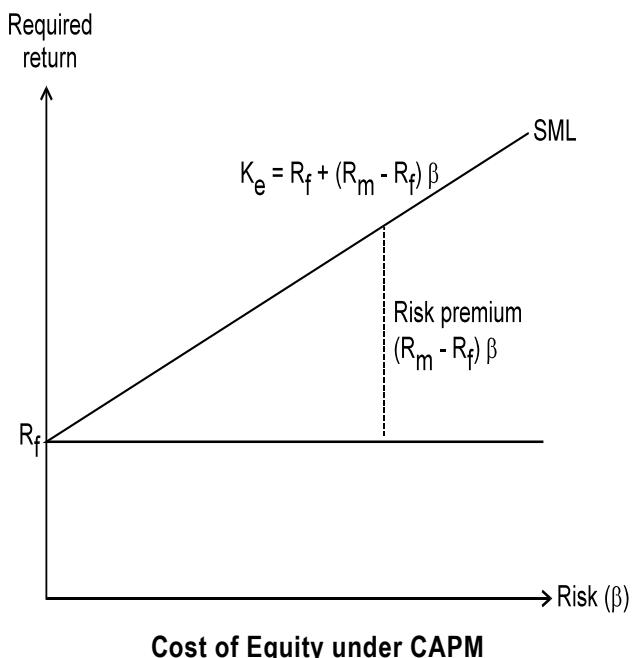
Cost of Equity under CAPM

Thus, the cost of equity capital can be calculated under this approach as:

$$K_e = R_f + ß (R_m − R_f)$$
Where,

K_e	=	Cost of equity capital
R_f	=	Risk free rate of return
ß	=	Beta coefficient
R_m	=	Rate of return on market portfolio
$(R_m − R_f)$	=	Market premium
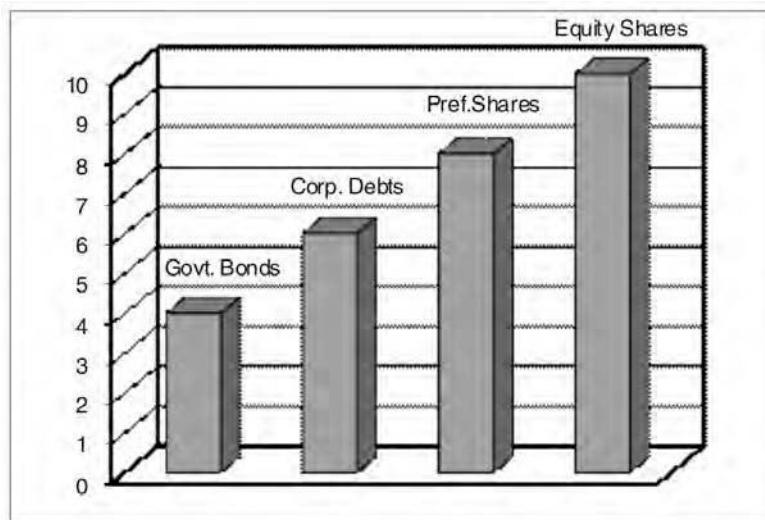
Risk Return relationship of various securities

Therefore, Required rate of return = Risk free rate + Risk premium

The idea behind CAPM is that investors need to be compensated in two ways- time value of money and risk.

➢ The time value of money is represented by the risk-free rate in the formula and compensates the investors for placing money in any investment over a period of time.

➢ The other half of the formula represents risk and calculates the amount of compensation the investor needs for taking on additional risk. This is calculated by taking a risk measure (beta) which compares the returns of the asset to the market over a period of time and compares it to the market premium.

The CAPM says that the expected return of a security or a portfolio equals the rate on a risk-free security plus a risk premium. If this expected return does not meet or beat the required return, then the investment should not be undertaken.

The shortcomings of this approach are:

(a) Estimation of betas with historical data is unrealistic; and

(b) Market imperfections may lead investors to unsystematic risk.

Despite these shortcomings, the CAPM is useful in calculating cost of equity, even when the firm is suffering losses.

The basic factor behind determining the cost of equity share capital is to measure the expectation of investors from the equity shares of that particular company. Therefore, the whole question of determining the cost of equity shares hinges upon the factors which go into the expectations of particular group of investors in a company of a particular risk class.

Illustration 10: Calculate the cost of equity capital of H Ltd., whose risk free rate of return equals 10%. The firm's beta equals 1.75 and the return on the market portfolio equals to 15%.

Solution

$$K_e = R_f + ß (R_m − R_f)$$
$$K_e = 0.10 + 1.75 (0.15 − 0.10)$$
$$= 0.10 + 1.75 (0.05)$$
$$= 0.1875 \text{ or } 18.75\%$$

4.8   Cost of Retained Earnings

Like another source of fund, retained earnings involve cost. It is the opportunity cost of dividends foregone by shareholders.

The given figure depicts how a company can either keep or reinvest cash or return it to the shareholders as dividends. (Arrows represent possible cash flows or transfers.) If the cash is reinvested, the opportunity cost is the expected rate of return that shareholders could have obtained by investing in financial assets.
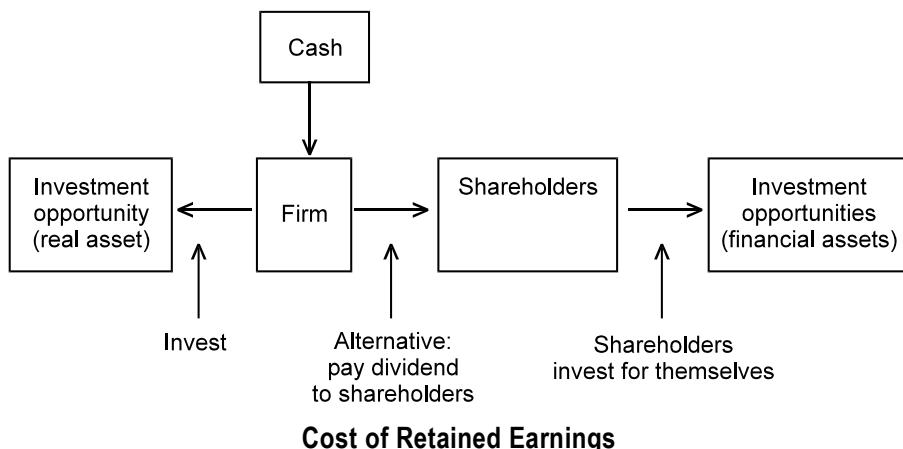
Cost of Retained Earnings

The cost of retained earnings is often used interchangeably with the cost of equity, as cost of retained earnings is nothing but the expected return of the shareholders from the investment in shares of the company. However, sometime cost of retained earnings remains below the cost of equity due to saving in floatation cost and existence of personal tax.

The Cost of Retained Earnings (K_s) is calculated as below:

> In absence of any information on personal tax (t_p):
>
> Cost of Retained Earnings (K_s) = Cost of Equity Shares (K_e)
>
> If there is any information on personal tax (t_p): $K_s = K_e - t_p$

Floatation Cost: The new issue of a security (debt or equity) involves some expenditure in the form of underwriting or brokerage fees, legal and administrative charges, registration fees, printing expenses etc. The sum of all these cost is known as floatation cost. This expenditure is incurred to make the securities available to the investors. Floatation cost is adjusted to arrive at net proceeds for the calculation of cost of capital.

Illustration 11: *ABC Company provides the following details:*

D_0 =   ₹ 4.19 P_0 = ₹ 50 $g = 5\%$

Calculate the cost of retained earnings.

Solution

$$K_s \quad = \frac{D_1}{P_0} + g \ = \ \frac{D_0(1+g)}{P_0} + g$$

$$= \quad \frac{₹4.19(1+0.05)}{₹50} + 0.05$$

$$= \quad 0.088 + 0.05$$

$$= \quad 13.8\%$$

Illustration 12: *ABC Company provides the following details:*

   $R_f = 7\%$ $ß = 1.20$ $R_m - R_f = 6\%$

Calculate the cost of retained earnings based on CAPM method.

Solution

K_s = $R_f + ß (R_m – R_f)$

      =   7% + 1.20 (6%)

      =   7% + 7.20

K_s =   14.2%

4.9   Weighted Average Cost of Capital (WACC)

WACC is also known as the overall cost of capital of having capitals from the different sources as explained above. WACC of a company depends on the capital structure of a company. It weighs the cost of capital of a particular source of capital with its proportion to the total capital. The weighted average cost of capital for a firm is of use in two major areas:-

1.   In consideration of the firm's position;

2.   Evaluation of proposed changes necessitating a change in the firm's capital. Thus, a weighted average technique may be used in a quasi-marginal way to evaluate a proposed investment project, such as the construction of a new building.

Thus, weighted average cost of capital is the weighted average after tax costs of the individual components of firm's capital structure. That is, the after tax cost of each debt and equity is calculated separately and added together to a single overall cost of capital.

The steps to calculate WACC is as follows:

Step 1: Calculated the total capital from all the sources.

(i.e. Long term debt capital + Pref. Share Capital + Equity Share Capital + Retained Earnings)

Step 2: Calculated the proportion (or %) of each source of capital to the total capital.

(i.e. $\dfrac{\text{Equity Share Capital (for example)}}{\text{Total Capital (as calculated in Step 1 above)}}$)

Step 3: Multiply the proportion as calculated in Step 2 above with the respective cost of capital.

(i.e. K_e × Proportion (%) of equity share capital (for example) calculated in Step 2 above)

Step 4: Aggregate the cost of capital as calculated in Step 3 above. This is the WACC.

(i.e. $K_e + K_d + K_p + K_s$ as calculated in Step 3 above)

Example:

Calculation of WACC

Capital Component	Cost of capital	% of total capital structure	Total
Retained Earnings	10%	25%	2.50%
Equity Share Capital	11%	10%	1.10%
Preference Share Capital	9%	15%	1.35%
Long term debts	6%	50%	3.00%
Total (WACC)			7.95%

The cost of weighted average method is preferred because the proportions of various sources

of funds in the capital structure are different. To be representative, therefore, cost of capital should take into account the relative proportions of different sources of finance.

Securities analysts employ WACC all the time when valuing and selecting investments. In discounted cash flow analysis, WACC is used as the discount rate applied to future cash flows for deriving a business's net present value. WACC can be used as a hurdle rate against which to assess return on investment capital performance. Investors use WACC as a tool to decide whether or not to invest. The WACC represents the minimum rate of return at which a company produces value for its investors. Let's say a company produces a return of 20% and has a WACC of 11%. By contrast, if the company's return is less than WACC, the company is shedding value, which indicates that investors should put their money elsewhere.

Therefore, WACC serves as a useful reality check for investors.

But there are problems in determination of weighted average cost of capital. These mainly relate to:-

1.   Computation of equity capital and;

2.   Assignment of weights to the cost of specific source of financing. Assignment of weights can be possible either on the basis of historical weighting or marginal weighting.

Historical Weighting:- The basis here is the funds already employed by the firm. This basis is based on the assumption that the business's existing capital structure is optimal and therefore should be maintained in the future. In historical weighting, there is a choice between the book value weights and market value weights. While the book value weights may be operationally convenient, the market value basis is theoretically more consistent, sound and a better indicator of firm's capital structure. The desirable practice is to employ market weights to compute the firm's cost of capital. This rationale rests on the fact that the cost of capital measures the cost of issuing securities – stocks as well as bonds – to finance projects, and that these securities are issued at market value, not at book value.

Illustration 13: *Calculate the WACC using the following data by using:*

(a)   Book value weights

(b)   Market value weights

The capital structure of the company is as under:

	(₹)
Debentures (₹ 100 per debenture)	*5,00,000*
Preference shares (₹ 100 per share)	*5,00,000*
Equity shares (₹ 10 per share)	*10,00,000*
	20,00,000

The market prices of these securities are:

Debentures   ₹ *105 per debenture*

Preference shares   ₹ *110 per preference share*

Equity shares   ₹ *24 each.*

Additional information:

(1) ₹ *100 per debenture redeemable at par, 10% coupon rate, 4% floatation costs, 10 year maturity.*

(2) ₹ *100 per preference share redeemable at par, 5% coupon rate, 2% floatation cost and 10 year maturity.*

(3) *Equity shares has* ₹ *4 floatation cost and market price* ₹ *24 per share.*

The next year expected dividend is ₹ *1 with annual growth of 5%. The firm has practice of paying all earnings in the form of dividend.*

Corporate tax rate is 50%.

Solution

Cost of Equity (K_e) = $\dfrac{D_1}{P_0 - F} + g$ = $\dfrac{₹1}{₹24 - ₹4} + 0.05$ = 0.1 or 10%

Cost of Debt (K_d) = $\dfrac{I(1-t) + \left(\dfrac{RV - NP}{n}\right)}{\left(\dfrac{RV + NP}{2}\right)}$ = $\dfrac{10(1-0.5) + \left(\dfrac{100 - NP}{n}\right)}{\left(\dfrac{RV + NP}{2}\right)}$

Cost of debt = K_d = $\dfrac{10(1 - 0.5) + \dfrac{(100 - 96)}{10}}{\dfrac{(100 + 96)}{2}}$ = $\left(\dfrac{5 + 0.4}{98}\right)$ = 0.055 (approx.)

Cost of preference shares = K_p = $\left(\dfrac{5 + \dfrac{2}{10}}{\dfrac{198}{2}}\right)$ = $\left(\dfrac{5.2}{99}\right)$ = 0.053 (approx.)

(a) Calculation of WACC using book value weights

Source of capital	Book Value	Weights	After tax cost of capital	WACC (K_o)
		(a)	(b)	(c) = (a)×(b)
10% Debentures	5,00,000	0.25	0.055	0.0137
5% Preference shares	5,00,000	0.25	0.053	0.0132

Equity shares	10,00,000	0.50	0.10	0.0500
	20,00,000	1.00		0.0769

WACC (K_o) = 0.0769 or 7.69%

(b)   Calculation of WACC using market value weights

Source of capital	Market Value	Weights	After tax cost of capital	WACC (K_o)
		(a)	(b)	(c) = (a)×(b)
10% Debentures (₹105× 5,000)	5,25,000	0.151	0.055	0.008
5% Preference shares (₹110× 5,000)	5,50,000	0.158	0.053	0.008
Equity shares (₹24× 1,00,000)	24,00,000	0.691	0.10	0.069
	34,75,000	1.000		0.085

WACC (K_o) = 0.085 or 8.5%

Illustration 14: *Determine the cost of capital of Best Luck Limited using the book value (BV) and market value (MV) weights from the following information:*

Sources	*Book Value*	*Market Value*
	(₹)	*(₹)*
Equity shares	*1,20,00,000*	*2,00,00,000*
Retained earnings	*30,00,000*	*—*
Preference shares	*9,00,000*	*10,40,000*
Debentures	*36,00,000*	*33,75,000*

Additional information :

I.   *Equity : Equity shares are quoted at ₹ 130 per share and a new issue priced at ₹ 125 per share will be fully subscribed; flotation costs will be ₹ 5 per share.*

II.   *Dividend : During the previous 5 years, dividends have steadily increased from ₹ 10.60 to ₹ 14.19 per share. Dividend at the end of the current year is expected to be ₹ 15 per share.*

III.   *Preference shares : 15% Preference shares with face value of ₹ 100 would realise ₹ 105 per share.*

IV.   *Debentures : The company proposes to issue 11-year 15% debentures but the yield on debentures of similar maturity and risk class is 16% ; flotation cost is 2%.*

V.   *Tax : Corporate tax rate is 35%. Ignore dividend tax.*

Solution

(i)   Cost of Equity (K$_e$) $= \dfrac{D_1}{P_0 - F} + g = \dfrac{₹15}{₹125 - ₹5} + 0.06$ (refer to working note)

K_e $= 0.125 + 0.06 = 0.185$

Working Note: Calculation of 'g'

₹ $10.6(1+g)^5$ = ₹ 14.19 Or, $(1+g)^5 = \dfrac{14.19}{10.6} = 1.338$

Table (FVIF) suggests that ₹1 compounds to ₹1.338 in 5 years at the compound rate of 6 percent. Therefore, g is 6 per cent.

(ii) Cost of Retained Earnings (K$_s$) $= \dfrac{D_1}{P_0} + g = \dfrac{₹15}{₹125} + 0.06 = 0.18$

(iii) Cost of Preference Shares (K$_p$) $= \dfrac{PD}{P_0} = \dfrac{₹15}{₹105} = 0.1429$

(iv) Cost of Debentures (K$_d$) $= \dfrac{I(1-t) + \left(\dfrac{RV - NP}{n}\right)}{\dfrac{RV + NP}{2}} = \dfrac{₹15(1-0.35) + \left(\dfrac{₹100 - ₹91.75^*}{11 \text{years}}\right)}{\dfrac{₹100 + ₹91.75^*}{2}}$

$= \dfrac{₹15 \times 0.65 + ₹0.75}{₹95.875} = \dfrac{₹10.5}{₹95.875} = 0.1095$

*Since yield on similar type of debentures is 16 per cent, the company would be required to offer debentures at discount.

Market price of debentures (approximation method) = Coupon rate ÷ Market rate of interest

= ₹ 15 ÷ 0.16 = ₹ 93.75

Sale proceeds from debentures = ₹93.75 – ₹ 2 (i.e., floatation cost) = ₹91.75

Market value (P$_0$) of debentures can also be found out using the present value method:

P$_0$ = Annual Interest × PVIFA (16%, 11 years) + Redemption value × PVIF (16%, 11 years)

P$_0$ = ₹15 × 5.029 + ₹100 × 0.195

P$_0$ = ₹75.435 + ₹19.5 = ₹94.935

Net Proceeds = ₹94.935 – 2% of ₹100 = ₹92.935

Accordingly, the cost of debt can be calculated

Cost of capital [BV weights and MV weights]   (amount in lakh of rupees)

Source of capital	Weights		Specific Cost (K)	Total cost	
	BV	MV		(BV × K)	(MV × K)
Equity Shares	120	160*	0.1850	22.2	29.6
Retained Earnings	30	40*	0.1800	5.4	7.2
Preference Shares	9	10.4	0.1429	1.29	1.49
Debentures	36	33.75	0.1095	3.94	3.70
Total	195	244.15		32.83	41.99

*Market Value of equity has been apportioned in the ratio of Book Value of equity and retained earnings

Weighted Average Cost of Capital (WACC):

Using Book Value $= \dfrac{₹32.83}{₹195}$ =0.1684 or 16.84%

Using Market Value $= \dfrac{₹41.99}{₹244.15}$ = 0.172 or 17.2%

4.10 Marginal Cost of Capital

The marginal cost of capital may be defined as the cost of raising an additional rupee of capital. Since the capital is raised in substantial amount in practice, marginal cost is referred to as the cost incurred in raising new funds. Marginal cost of capital is derived, when the average cost of capital is calculated using the marginal weights.

The marginal weights represent the proportion of funds the firm intends to employ. Thus, the problem of choosing between the book value weights and the market value weights does not arise in the case of marginal cost of capital computation.

To calculate the marginal cost of capital, the intended financing proportion should be applied as weights to marginal component costs. The marginal cost of capital should, therefore, be calculated in the composite sense. When a firm raises funds in proportional manner and the component's cost remains unchanged, there will be no difference between average cost of capital (of the total funds) and the marginal cost of capital. The component costs may remain constant upto certain level of funds raised and then start increasing with amount of funds raised.

For example, the cost of debt may remain 7% (after tax) till ₹10 lakhs of debt is raised, between ₹10 lakhs and ₹15 lakhs, the cost may be 8% and so on. Similarly, if the firm has to use the external equity when the retained profits are not sufficient, the cost of equity will be higher because of the floatation costs. When the components cost start rising, the average cost of capital will rise and the marginal cost of capital will however, rise at a faster rate.

Illustration 15: *ABC Ltd. has the following capital structure which is considered to be optimum as on 31st March, 2013.*

	(₹)
14% Debentures	*30,000*
11% Preference shares	*10,000*
Equity Shares (10,000 shares)	*1,60,000*
	2,00,000

The company share has a market price of ₹ 23.60. Next year dividend per share is 50% of year 2013 EPS. The following is the trend of EPS for the preceding 10 years which is expected to continue in future.

Year	*EPS (₹)*	*Year*	*EPS ₹)*
2004	*1.00*	*2009*	*1.61*
2005	*1.10*	*2010*	*1.77*
2006	*1.21*	*2011*	*1.95*
2007	*1.33*	*2012*	*2.15*
2008	*1.46*	*2013*	*2.36*

The company issued new debentures carrying 16% rate of interest and the current market price of debenture is ₹ 96.

Preference share ₹ 9.20 (with annual dividend of ₹ 1.1 per share) were also issued. The company is in 50% tax bracket.

(A) Calculate after tax:

　　(i)   Cost of new debt

　　(ii)   Cost of new preference shares

　　(iii) New equity share (consuming new equity from retained earnings)

(B) Calculate marginal cost of capital when no new shares are issued.

(C) How much can be spent for capital investment before new ordinary shares must be sold. Assuming that retained earnings for next year's investment are 50 percent of 2013.

(D) What will the marginal cost of capital when the funds exceeds the amount calculated in (C), assuming new equity is issued at ₹ 20 per share?

Solution

(A) (i) **Cost of new debt**

$$K_d = \frac{I(1-t)}{P_0}$$

$$= \frac{16\,(1-0.5)}{96} = 0.0833$$

(ii) **Cost of new preference shares**

$$K_p = \frac{PD}{P_0} = \frac{1.1}{9.2} = 0.12$$

(iii) **Cost of new equity shares**

$$K_e = \frac{D_1}{P_0} + g$$

$$= \frac{1.18}{23.60} + 0.10 = 0.05 + 0.10 = 0.15$$

Calculation of D_1

D_1 = 50% of 2013 EPS = 50% of 2.36 = ₹ 1.18

(B) Calculation of marginal cost of capital

Type of Capital	Proportion	Specific Cost	Product
(1)	(2)	(3)	(2) × (3) = (4)
Debenture	0.15	0.0833	0.0125
Preference Share	0.05	0.12	0.0060
Equity Share	0.80	0.15	0.1200
	Marginal cost of capital		0.1385

(C) The company can spend the following amount without increasing marginal cost of capital and without selling the new shares:

Retained earnings = (0.50) (2.36 × 10,000) = ₹ 11,800

The ordinary equity (Retained earnings in this case) is 80% of total capital

11,800 = 80% of Total Capital

∴ Capital investment before issuing equity $= \dfrac{₹\,11,800}{0.80} = ₹\,14,750$

(D) If the company spends in excess of ₹ 14,750 it will have to issue new shares.

The cost of new issue will be $= \dfrac{₹\ 1.18}{20} + 0.10 = 0.159$

The marginal cost of capital will be:

Type of Capital	Proportion	Specific Cost	Product
(1)	(2)	(3)	(2) × (3) = (4)
Debentures	0.15	0.0833	0.0125
Preference Shares	0.05	0.1200	0.0060
Equity Shares (New)	0.80	0.1590	0.1272
			0.1457

Illustration 16 : *Gamma Limited has in issue 5,00,000 ₹ 1 ordinary shares whose current ex-dividend market price is ₹ 1.50 per share. The company has just paid a dividend of 27 paise per share, and dividends are expected to continue at this level for some time. If the company has no debt capital, what is the weighted average cost of capital?*

Solution

Market value of equity, E = 5,00,000 shares × ₹1.50 = ₹7,50,000

Market value of debt, D = Nil

Cost of equity capital, $K_e = \dfrac{D_1}{P_0} = \dfrac{₹0.27}{₹1.50} = 0.18$

Since there is no debt capital, WACC = K_e = 18 per cent.

Illustration 17: *Masco Limited wishes to raise additional finance of ₹ 10 lakhs for meeting its investment plans. It has ₹ 2,10,000 in the form of retained earnings available for investment purposes. Further details are as following:*

(1)	Debt / equity mix	30%/70%
(2)	Cost of debt	
	Upto ₹ 1,80,000	10% (before tax)
	Beyond ₹ 1,80,000	16% (before tax)
(3)	Earnings per share	₹ 4
(4)	Dividend pay out	50% of earnings
(5)	Expected growth rate in dividend	10%
(6)	Current market price per share	₹ 44
(7)	Tax rate	50%

You are required:

(a)   To determine the pattern for raising the additional finance.

(b)   To determine the post-tax average cost of additional debt.

(c)   To determine the cost of retained earnings and cost of equity, and

(d)   Compute the overall weighted average after tax cost of additional finance.

Solution

(a)   Pattern of raising additional finance

Equity	70% of ₹ 10,00,000	= ₹ 7,00,000
Debt	30% of ₹ 10,00,000	= ₹ 3,00,000

The capital structure after raising additional finance:

		(₹)
Shareholders' funds		
Equity Capital	(7,00,000–2,10,000)	4,90,000
Retained earnings		2,10,000
Debt (Interest at 10% p.a.)		1,80,000
(Interest at 16% p.a.)	(3,00,000–1,80,000)	1,20,000
Total Funds		10,00,000

(b)   Determination of post-tax average cost of additional debt

$K_d = I (1 – t)$

Where,

   I = Interest Rate

   t = Corporate tax-rate

On ₹ 1,80,000	=	10% (1 – 0.5)	=	5% or 0.05
On ₹ 1,20,000	=	16% (1 – 0.5)	=	8% or 0.08

Average Cost of Debt

$$= \frac{(₹\ 1,80,000 \times 0.05) + (₹\ 1,20,000 \times 0.08)}{₹\ 3,00,000} \times 100 = 6.2\%$$

(c)   Determination of cost of retained earnings and cost of equity applying Dividend growth model:

$$K_e = \frac{D_1}{P_0} + g$$

Where,

K_e = Cost of equity

$D_1 = D_0(1+ g)$

D_0 = Dividend paid (i.e., 50% of EPS = 50% × ₹ 4 = ₹ 2)

g = Growth rate

P_0 = Current market price per share

Then, $K_e = \dfrac{₹\ 2(1.1)}{₹\ 44} + 0.10 = \dfrac{₹\ 2.2}{₹\ 44} + 0.10 = 0.05 + 0.10 = 0.15 = 15\%$

(d)   Computation of overall weighted average after tax cost of additional finance

Particular	(₹)	Weights	Cost of funds	Weighted Cost (%)
Equity (including retained earnings)	7,00,000	0.70	15%	10.5
Debt	3,00,000	0.30	6.2%	1.86
WACC	10,00,000			12.36

Illustration 18

The following details are provided by the GPS Limited :

	(₹)
Equity Share Capital	*65,00,000*
12% Preference Share Capital	*12,00,000*
15% Redeemable Debentures	*20,00,000*
10% Convertible Debentures	*8,00,000*

The cost of equity capital for the company is 16.30% and Income Tax rate for the company is 30%.

You are required to calculate the Weighted Average Cost of Capital (WACC) of the company.

Solution

Calculation of Weighted Average Cost of Capital (WACC)

Source	Amount (₹)	Weight	Cost of Capital after tax	WACC
Equity Capital	65,00,000	0.619	0.163	0.1009
12% Preference Capital	12,00,000	0.114	0.120	0.0137
15% Redeemable Debentures	20,00,000	0.190	0.105*	0.020
10% Convertible Debentures	8,00,000	0.076	0.07**	0.0053
Total	1,05,00,000	1.0000		0.1399

* Cost of Debentures (after tax)   = 15 (1 – 0.30) = 10.5% = 0.105

** Cost of Debentures (after tax)   = 10 (1 – 0.30) = 7% = 0.07

Weighted Average Cost of Capital   = 0.1399 = 13.99%

(Note: In the above solution, the Cost of Debentures has been computed in the above manner without considering the impact of special features i.e. redeemability and convertibility in absence of requisite information.)

4.11 Conclusion

The determination of cost of capital is, thus, beset with a number of problems in dynamic world of today. Conditions which are present now may not remain static in future. Therefore, howsoever cost of capital is determined now, it is dependent on certain conditions or situations which are subject to change.

Firstly, the firm's internal structure and character change. For instance, as the firm grows and matures, its business risk may decline resulting in new structure and cost of capital.

Secondly, capital market conditions may change, making either debt or equity more favourable than the other.

Thirdly, supply and demand for funds may vary from time to time leading to change in cost of different components of capital.

Fourthly, the company may experience subtle change in capital structure because of retained earnings unless its growth rate is sufficient to call for employment of debt on a continuous basis.

Because of these reasons the firm should periodically re-examine its cost of capital before determining annual capital budget.

UNIT – II : CAPITAL STRUCTURE DECISIONS

Learning Objectives

After studying this chapter you will be able to:

- Define and explain in detail the term capital structure.
- Discuss what is an optimal capital structure for a business?
- Understand different theories relating to the valuation of a firm.
- Understand EBIT-EPS break even or indifference analysis and how to construct and interpret an EBIT-EPS chart.
- Understand the concept of capitalization, over-capitalization and under-capitalisation.

4.12 Meaning of Capital Structure

Capital structure is the combination of capitals from different sources of finance. The capital of a company consists of equity share holders' fund, preference share capital and long term external debts. The source and quantum of capital is decided on the basis of need of the company and the cost of the capital. However, the objective of a company is to maximise the value of the company and it is prime objective while deciding the optimal capital structure.

Capital Structure decision refers to deciding the forms of financing (which sources to be tapped); their actual requirements (amount to be funded) and their relative proportions (mix) in total capitalisation.

Whenever funds are to be raised to finance investments, capital structure decision is involved. A demand for raising funds generates a new capital structure since a decision has to be made as to the quantity and forms of financing. The process of financing or capital structure decision is depicted in the figure below.
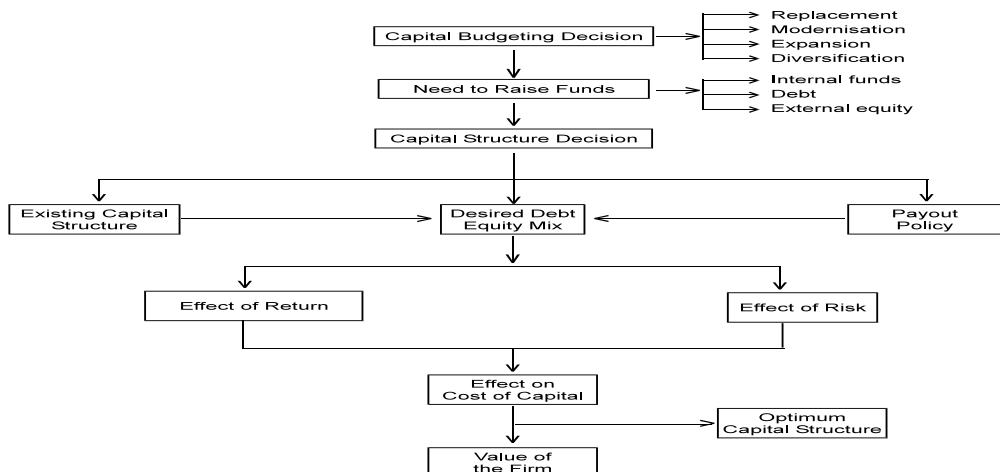
Financing Decision Process

4.13 Designing Capital Structure

A firm has the choice to raise funds for financing its investment proposals from different sources in different proportions. It can:

(a)   Exclusively use debt (in case of existing company), or

(b)   Exclusively use equity capital, or

(c)   Exclusively use preference share capital (in case of existing company), or

(d)   Use a combination of debt and equity in different proportions, or

(e)   Use a combination of debt, equity and preference capital in different proportions, or

(f)   Use a combination of debt and preference capital in different proportion (in case of existing company).

The choice of the combination of these sources is called capital structure mix. But the question is which of the pattern should the firm choose?

Factors Governing Capital Structure

While choosing a suitable financing pattern, certain fundamental principles should be kept in mind, which are discussed below:

(a) *Cost Principle:* According to this principle, an ideal pattern or capital structure is one that minimises cost of capital structure and maximises earnings per share (EPS). For e.g. Debt capital is cheaper than equity capital from the point of its cost and interest being deductible for income tax purpose, whereas no such deduction is allowed for dividends.

(b) *Risk Principle:* According to this principle, reliance is placed more on common equity for financing capital requirements than excessive use of debt. Use of more and more debt means higher commitment in form of interest payout. This would lead to erosion of shareholders value in unfavourable business situation. There are two risks associated with this principle:

(i)   *Business risk:* It is an unavoidable risk because of the environment in which the firm has to operate and it is represented by the variability of earnings before interest and tax (EBIT). The variability in turn is influenced by revenues and expenses. Revenues and expenses are affected by demand of firm products, variations in prices and proportion of fixed cost in total cost.

(ii)   *Financial risk:* It is a risk associated with the availability of earnings per share caused by use of financial leverage. It is the additional risk borne by the shareholders when a firm uses debt in addition to equity financing.

Generally, a firm should neither be exposed to high degree of business risk and low degree of financial risk or vice-versa, so that shareholders do not bear a higher risk.

(c) Control Principle: While designing a capital structure, the finance manager may also keep in mind that existing management control and ownership remains undisturbed. Issue of new equity will dilute existing control pattern and also it involves higher cost. Issue of more debt causes no dilution in control, but causes a higher degree of financial risk.

(d) Flexibility Principle: By flexibility it means that the management chooses such a combination of sources of financing which it finds easier to adjust according to changes in need of funds in future too. While debt could be interchanged (If the company is loaded with a debt of 18% and funds are available at 15%, it can return old debt with new debt, at a lesser interest rate), but the same option may not be available in case of equity investment.

(e) Other Considerations: Besides above principles, other factors such as nature of industry, timing of issue and competition in the industry should also be considered. Industries facing severe competition also resort to more equity than debt.

Thus a finance manager in designing a suitable pattern of capital structure must bring about satisfactory compromise between the above principles. The compromise can be reached by assigning weights to these principles in terms of various characteristics of the company.

4.14 Key Concepts for Designing Optimal Structure

The capital structure decisions are so significant in financial management, as they influence debt – equity mix which ultimately affects shareholders return and risk.

Since cost of debt is cheaper, firm prefers to borrow rather than to raise from equity. So long as return on investment is more than the cost of borrowing, extra borrowing increases the earnings per share. However, beyond a limit, it increases the risk and share price may fall because shareholders may assume that their investment is associated with more risk.

For an appropriate debt -equity mix, let us discuss some key concepts:-

4.14.1 Leverages: There are two leverages associated with the study of capital structure, namely operating leverage and financial leverage.

Operating leverage:- Operating leverage exists when a firm has a fixed cost that must be defrayed regardless of volume of business. It can be defined as the firm's ability to use fixed operating costs to magnify the effects of changes in sales on its earnings before interest and taxes. In simple words, the percentage change in profits accompanying a change in volume is greater than the percentage change in volume.

Operating leverage can also be defined in terms of Degree of Operating Leverage (DOL). When proportionate change in EBIT as of result of a given change in sales is more than the proportionate change in sales, operating leverage exists. The greater the DOL, the higher is the operating leverage.

Therefore, DOL exists when Percentage change in EBIT/Percentage change in Sales is > 1

Financial leverage:- Financial leverage involves the use of fixed cost of financing and refers to the mix of debt and equity in the capitalisation of a firm. Financial leverage is a superstructure built on the operating leverage. It results from the presence of fixed financial charges in the firm's income stream. They are to be paid regardless of the amount of EBIT available to pay them. After paying them, the operating profits belong to the ordinary shareholders.

In simple words, financial leverage involves the use of funds obtained at a fixed cost in the hope of increasing the return to the shareholders.

Positive Financial Leverage occurs when the firm earns more on the assets purchased with the funds, than the fixed cost of their use. Financial Leverage is also called as "Trading on Equity".

The degree of financial leverage can be found out as:

$$\frac{\text{Percentage change in Earnings per share (EPS)}}{\text{Percentage change in Earnings before interest and tax (EBIT)}}$$

Positive Financial Leverage occurs when the result of above is greater than 1.

Operating Leverage vis-à-vis Financial Leverage:- A company having higher operating leverage should be accompanied by a low financial leverage and vice versa, otherwise it will face problems of insolvency and inadequate liquidity. Thus, a combination of both the leverages is a challenging task.

However, the determination of optimal level of debt is a formidable task and is a major policy decision. Determination of optimal level of debt involves equalising between return and risk. EBIT-EPS analysis is a widely used tool to determine level of debt in a firm. Through this analysis, a comparison can be drawn for various methods of financing by obtaining indifference point. It is a point to the EBIT level at which EPS remains unchanged irrespective of level of debt-equity mix. The concepts of leverages and EBIT-EPS analysis would be dealt in detail separately for better understanding.

4.14.2 Coverage Ratio: The ability of the firm to use debt in the capital structure can also be judged in terms of coverage ratio namely EBIT/Interest. Higher the ratio, greater is the certainty of meeting interest payments.

4.14.3 Cash flow Analysis: It is a good supporting tool for EBIT-EPS analysis in framing a suitable capital structure. To determine the debt capacity, cash flow under adverse conditions should be examined. A high debt equity ratio is not risky if the company has the ability to generate cash flows. It would, therefore, be possible to increase the debt until cash flows equal the risk set out by debt.

The main drawback of this approach is that it fails to take into account uncertainty due to technological developments or changes in political climate.

These approaches as discussed above do not provide solution to the problem of determining an appropriate level of debt. However, with the information available a range can be determined for an optimum level of debt in the capital structure.

4.15 Optimal Capital Structure

The theory of optimal capital structure deals with the issue of the right mix of debt and equity in the long term capital structure of a firm. This theory states that if a company takes on debt, the value of the firm increases up to a point. Beyond that point if debt continues to increase then the value of the firm will start to decrease. Similarly if the company is unable to repay the debt within the specified period then it will affect the goodwill of the company in the market and may create problems for collecting further debt. Therefore, the company should select its appropriate capital structure with due consideration to the factors mentioned earlier.

4.16 EBIT-EPS Analysis

The basic objective of financial management is to design an appropriate capital structure which can provide the highest earnings per share (EPS) over the company's expected range of earnings before interest and taxes (EBIT).

EPS measures a company's performance for the shareholders. The level of EBIT varies from year to year and represents the success of a company's operations. EBIT-EPS analysis is a vital tool for designing the optimal capital structure of a company.

The objective of this analysis is to find the EBIT level that will equate EPS regardless of the financing plan chosen.

Financial Break-even and Indifference Analysis

Financial break-even point is the minimum level of EBIT needed to satisfy all the fixed financial charges i.e. interest and preference dividends. It denotes the level of EBIT for which the company's EPS equals zero.

If the EBIT is less than the financial breakeven point, then the EPS will be negative but if the expected level of EBIT is more than the breakeven point, then more fixed costs financing instruments can be taken in the capital structure, otherwise, equity would be preferred.

EBIT-EPS breakeven analysis is used for determining the appropriate amount of debt a company might carry.

Another method of considering the impact of various financing alternatives on earnings per share is to prepare the EBIT chart or the range of Earnings Chart. This chart shows the likely EPS at various probable EBIT levels. Thus, under one particular alternative, EPS may be ₹ 2 at a given EBIT level. However, the EPS may go down if another alternative of financing is chosen even though the EBIT remains at the same level. At a given EBIT, earnings per share under various alternatives of financing may be plotted. A straight line representing the EPS at various levels of EBIT under the alternative may be drawn. Wherever this line intersects, it is

known as break-even point. This point is a useful guide in formulating the capital structure. This is known as EPS equivalency point or indifference point since this shows that, between the two given alternatives of financing (i.e., regardless of leverage in the financial plans), EPS would be the same at the given level of EBIT.

The equivalency or indifference point can also be calculated algebraically in the following manner:

$$\frac{(EBIT - I_1)(1-T)}{E_1} = \frac{(EBIT - I_2)(1-T)}{E_2}$$

Where,

EBIT	=	Indifference point
E_1	=	Number of equity shares in Alternative 1
E_2	=	Number of equity shares in Alternative 2
I_1	=	Interest charges in Alternative 1
1_2	=	Interest charges in Alternative 2
T	=	Tax-rate
Alternative 1	=	All equity finance
Alternative 2	=	Debt-equity finance.

The indifference point can also be depicted graphically as:

Debt-Equity Indifference Point
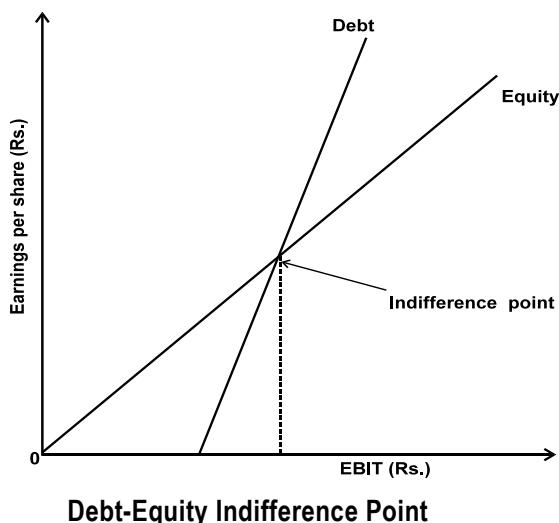
Illustration 19: *Best of Luck Ltd., a profit making company, has a paid-up capital of ₹ 100 lakhs consisting of 10 lakhs ordinary shares of ₹ 10 each. Currently, it is earning an annual pre-tax profit of ₹ 60 lakhs. The company's shares are listed and are quoted in the range of ₹ 50 to ₹ 80. The management wants to diversify production and has approved a project which*

will cost ₹ 50 lakhs and which is expected to yield a pre-tax income of ₹ 40 lakhs per annum. To raise this additional capital, the following options are under consideration of the management:

(a)   To issue equity share capital for the entire additional amount. It is expected that the new shares (face value of ₹ 10) can be sold at a premium of ₹ 15.

(b)   To issue 16% non-convertible debentures of ₹ 100 each for the entire amount.

(c)   To issue equity capital for ₹ 25 lakhs (face value of ₹ 10) and 16% non-convertible debentures for the balance amount. In this case, the company can issue shares at a premium of ₹ 40 each.

You are required to advise the management as to how the additional capital can be raised, keeping in mind that the management wants to maximise the earnings per share to maintain its goodwill. The company is paying income tax at 50%.

Solution

Calculation of Earnings per share under the three options:

Particulars	Options		
	Option I: Issue Equity shares only	**Option II: Issue 16% Debentures only**	**Option III: Issue Equity Shares and 16% Debentures of equal amount**
Number of Equity Shares (nos):			
-Existing	10,00,000	10,00,000	10,00,000
-Newly issued	2,00,000 $\left(\dfrac{₹50,00,000}{₹(10+15)}\right)$	---	50,000 $\left(\dfrac{₹25,00,000}{₹(10+40)}\right)$
Total	12,00,000	10,00,000	10,50,000
16% Debentures (₹)	---	50,00,000	25,00,000
	(₹)	(₹)	(₹)
Profit Before Interest and Tax:			
-Existing pre-tax profit	60,00,000	60,00,000	60,00,000
-From new projects	40,00,000	40,00,000	40,00,000
	1,00,00,000	1,00,00,000	1,00,00,000
Less: Interest on 16% Debentures	---	8,00,000	4,00,000

		(16% ×₹50,00,000)	(16% × ₹25,00,000)
Profit Before Tax	1,00,00,000	92,00,000	96,00,000
Tax at 50%	50,00,000	46,00,000	48,00,000
Profit After Tax	50,00,000	46,00,000	48,00,000
Earnings Per Share (EPS) $\left(\dfrac{PAT}{No.of\,Shares}\right)$	4.17 $\left(\dfrac{₹50,00,000}{12,00,000}\right)$	4.60 $\left(\dfrac{₹46,00,000}{10,00,000}\right)$	4.57 $\left(\dfrac{₹48,00,000}{10,50,000}\right)$

Advise: Option II i.e. issue of 16% Debentures is most suitable to maximize the earnings per share.

Illustration 20 : *Shahji Steels Limited requires ₹ 25,00,000 for a new plant. This plant is expected to yield earnings before interest and taxes of ₹ 5,00,000. While deciding about the financial plan, the company considers the objective of maximizing earnings per share. It has three alternatives to finance the project - by raising debt of ₹ 2,50,000 or ₹ 10,00,000 or ₹ 15,00,000 and the balance, in each case, by issuing equity shares. The company's share is currently selling at ₹ 150, but is expected to decline to ₹ 125 in case the funds are borrowed in excess of ₹ 10,00,000. The funds can be borrowed at the rate of 10 percent upto ₹ 2,50,000, at 15 percent over ₹ 2,50,000 and upto ₹ 10,00,000 and at 20 percent over ₹ 10,00,000. The tax rate applicable to the company is 50 percent. Which form of financing should the company choose?*

Solution

Plan I = Raising Debt of ₹ 2.5 lakh + Equity of ₹ 22.5 lakh.

Plan II = Raising Debt of ₹ 10 lakh + Equity of ₹ 15 lakh.

Plan III = Raising Debt of ₹ 15 lakh + Equity of ₹ 10 lakh.

Calculation of Earnings per share (EPS):

Particulars	Financial Plans		
	Plan I (₹)	Plan II (₹)	Plan III (₹)
Expected EBIT	5,00,000	5,00,000	5,00,000
Less: Interest [a]	(25,000)	(1,37,500)	(2,37,500)
Earnings before taxes	4,75,000	3,62,500	2,62,500
Less: Taxes @50%	(2,37,500)	(1,81,250)	(1,31,250)
Earnings after taxes (EAT)	2,37,500	1,81,250	1,31,250
Number of shares [b]	15,000	10,000	8,000
Earnings per share (EPS)	15.83	18.13	16.41

Financing Plan II (i.e. Raising debt of ₹10 lakh and issue of equity share capital of ₹15 lakh) is the option which maximises the earnings per share.

Working Notes:

(a) Calculation of interest on Debt.

Plan I	(₹2,50,000 × 10%)		₹ 25,000
Plan II	(₹2,50,000 × 10%)	₹ 25,000	
	(₹7,50,000 × 15%)	₹1,12,500	₹1,37,500
Plan III	(₹2,50,000 × 10%)	₹ 25,000	
	(₹7,50,000 × 15%)	₹1,12,500	
	(₹5,00,000 × 20%)	₹1,00,000	₹2,37,500

(b) Number of equity shares to be issued

Plan I: $\dfrac{₹\ 22,50,000}{₹\ 150\ \text{(Market price of share)}} = 15,000$ shares

Plan II: $\dfrac{₹\ 15,00,000}{₹\ 150} = 10,000$ shares

Plan III: $\dfrac{₹\ 10,00,000}{₹\ 125} = 8,000$ shares

Illustration 21 *: Ganesha Limited is setting up a project with a capital outlay of ₹ 60,00,000. It has two alternatives in financing the project cost.*

Alternative-I: 100% equity finance by issuing equity shares of ₹ 10 each

Alternative-II: Debt-equity ratio 2:1(equity shares will be of ₹10 each)

The rate of interest payable on the debts is 18% p.a. The corporate tax rate is 40%. Calculate the indifference point between the two alternative methods of financing.

Solution

Calculation of Indifference point between the two alternatives of financing.

Alternative-I   By issue of 6,00,000 equity shares of ₹ 10 each amounting to ₹ 60 lakhs. No financial charges are involved.

Alternative-II   By raising the funds in the following way:

Debt =   ₹ 40 lakhs

Equity =   ₹ 20 lakhs (2,00,000 equity shares of ₹ 10 each)

Interest payable on debt = $40,00,000 \times \dfrac{18}{100}$ = ₹ 7,20,000

The difference point between the two alternatives is calculated by:

$$\frac{(EBIT - I_1)\,(1 - T)}{E_1} = \frac{(EBIT - I_2)\,(1\text{-}T)}{E_2}$$

Where, EBIT   = Earnings before interest and taxes

I_1 = Interest charges in Alternative-I

I_2 = Interest charges in Alternative-II

T   = Tax rate

E_1 = Equity shares in Alternative-I

E_2 = Equity shares in Alternative-II

Putting the values, the break-even point would be as follows:

$$\frac{(EBIT - 0)\,(1 - 0.40)}{6,00,000} = \frac{(EBIT - 7,20,000)\,(1 - 0.40)}{2,00,000}$$

$$\frac{(EBIT)\,(0.60)}{6,00,000} = \frac{(EBIT - 7,20,000)\,(0.60)}{2,00,000}$$

$$\frac{EBIT(0.60)}{3} = \frac{0.60(EBIT - 7,20,000)}{1}$$

EBIT = 3EBIT − 21,60,000

−2 EBIT = −21,60,000

$$EBIT = \frac{21,60,000}{2}$$

EBIT = ₹10,80,000

Therefore, at EBIT of ₹10,80,000 earnings per share for the two alternatives is equal.

Illustration 22 : Ganapati Limited is considering three financing plans. The key information is as follows:

(a)   *Total investment to be raised ₹ 2,00,000*

(b)   *Plans of Financing Proportion:*

Plans	Equity	Debt	Preference Shares
A	100%	-	-
B	50%	50%	-
C	50%	-	50%

(c)   *Cost of debt*   *8%*

      Cost of preference shares   *8%*

(d)   *Tax rate*   *50%*

(e)   *Equity shares of the face value of ₹ 10 each will be issued at a premium of ₹ 10 per share.*

(f)   *Expected EBIT is ₹ 80,000.*

You are required to determine for each plan: -

(i)   *Earnings per share (EPS)*

(ii) *The financial break-even point.*

(iii) *Indicate if any of the plans dominate and compute the EBIT range among the plans for indifference.*

Solution

(i)   Computation of Earnings per share (EPS)

Plans	*A*	*B*	*C*
Earnings before interest and tax (EBIT)	80,000	80,000	80,000
Less: Interest charges	---	(8,000) (8% × ₹1 lakh)	---
Earnings before tax (EBT)	80,000	72,000	80,000
Less: Tax (@ 50%)	(40,000)	(36,000)	(40,000)
Earnings after tax (EAT)	40,000	36,000	40,000
Less: Preference Dividend	---	---	(8,000) (8% × ₹1 lakh)
Earnings available for Equity shareholders (A)	40,000	36,000	32,000
No. of Equity shares (B)	10,000 (₹2 lakh ÷ ₹20)	5,000 (₹1 lakh ÷ ₹20)	5,000 (₹1 lakh ÷ ₹20)
EPS (₹) [(A) ÷ (B)]	4	7.20	6.40

(ii)   Calculation of Financial Break-even point

Financial break-even point is the earnings which are equal to the fixed finance charges and preference dividend.

Plan A : Under this plan there is no interest or preference dividend payment hence, the Financial Break-even point will be zero.

Plan B : Under this plan there is an interest payment of ₹8,000 and no preference dividend, hence, the Financial Break-even point will be ₹ 8,000 (Interest charges).

Plan C : Under this plan there is no interest payment but an after tax preference dividend of ₹ 8,000 is paid. Hence, the Financial Break-even point will be before tax earnings of ₹ 16,000 (i.e. ₹ 8,000 ÷ 0.5 = ₹16,000.)

(iii) Computation of indifference point between the plans.

The indifference between two alternative methods of financing is calculated by applying the following formula.

$$\frac{(EBIT - I_1)(1 - T)}{E_1} = \frac{(EBIT - I_2)(1 - T)}{E_2}$$

Where,

EBIT	=	Earnings before interest and tax.
I_1	=	Fixed charges (interest or pref. dividend) under Alternative
I_2	=	Fixed charges (interest or pref. dividend) under Alternative T
	=	Tax rate
E_1	=	No. of equity shares in Alternative 1
E_2	=	No. of equity shares in Alternative 2

Now, we can calculate indifference point between different plans of financing.

I.   Indifference point where EBIT of Plan A and Plan B is equal.

$$\frac{(EBIT - 0)(1 - 0.5)}{10,000} = \frac{(EBIT - 8,000)(1 - 0.5)}{5,000}$$

0.5 EBIT (5,000)	=	(0.5 EBIT – 4,000) (10,000)
0.5 EBIT	=	EBIT – 8,000
0.5 EBIT	=	8,000
EBIT	=	₹16,000

II.   Indifference point where EBIT of Plan A and Plan C is equal.

$$\frac{(EBIT - 0)(1 - 0.5)}{10,000} = \frac{(EBIT - 0)(1 - 0.5) - 8,000}{5,000}$$

$$\frac{0.5\,EBIT}{10,000} = \frac{0.5\,EBIT - 8,000}{5,000}$$

0.25 EBIT	=	0.5 EBIT – 8,000
0.25 EBIT	=	8,000
EBIT	=	₹ 32,000

III.   **Indifference point where EBIT of Plan B and Plan C are equal.**

$$\frac{(EBIT - 8,000)(1 - 0.5)}{5,000} = \frac{(EBIT - 0)(1 - 0.5) - 8,000}{5,000}$$

$$0.5\ EBIT - 4,000 = 0.5\ EBIT - 8,000$$

There is no indifference point between the financial plans B and C.

It can be seen that Financial Plan B dominates Plan C. Since, the financial break-even point of the former is only ₹ 8,000 but in case of latter it is ₹ 16,000.

Illustration 23: *Yoyo Limited presently has ₹ 36,00,000 in debt outstanding bearing an interest rate of 10 per cent. It wishes to finance a ₹ 40,00,000 expansion programme and is considering three alternatives: additional debt at 12 per cent interest, preference shares with an 11 per cent dividend, and the issue of equity shares at ₹ 16 per share. The company presently has 8,00,000 shares outstanding and is in a 40 per cent tax bracket.*

(a)   *If earnings before interest and taxes are presently ₹ 15,00,000, what would be earnings per share for the three alternatives, assuming no immediate increase in profitability?*

(b)   *Develop an indifference chart for these alternatives. What are the approximate indifference points? To check one of these points, what is the indifference point mathematically between debt and common?*

(c)   *Which alternative do you prefer? How much would EBIT need to increase before the next alternative would be best?*

Solution

(a)

Particulars	Alternatives		
	Alternative–I : Take additional Debt	Alternative-II: Issue 11% Preference Shares	Alternative-III: Issue further Equity Shares
	(₹)	(₹)	(₹)
EBIT	15,00,000	15,00,000	15,00,000
Interest on Debts:			
- on existing debt @10%	(3,60,000)	(3,60,000)	(3,60,000)
- on new debt @ 12%	(4,80,000)	---	---
Profit before taxes	6,60,000	11,40,000	11,40,000
Taxes @ 40%	(2,64,000)	(4,56,000)	(4,56,000)
Profit after taxes	3,96,000	6,84,000	6,84,000

Preference shares dividend	---	(4,40,000)	---
Earnings available to equity Shareholders	3,96,000	2,44,000	6,84,000
Number of shares	8,00,000	8,00,000	10,50,000
Earnings per share	0.495	0.305	0.651
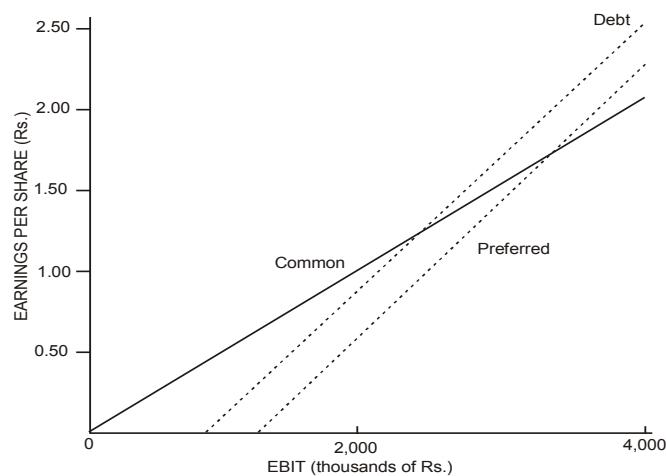
(b) Approximate indifference points: Debt and equity shares, ₹ 24 lakhs, preference and equity shares, ₹ 33 lakhs in EBIT; Debt dominates preferred by the same margin throughout, there is no difference point. Mathematically, the indifference point between debt and equity shares is (in thousands):

$$\frac{EBIT^* - ₹\,840}{800} = \frac{EBIT^* - ₹\,360}{1,050}$$

EBIT* (1,050) – ₹ 840(1,050) = EBIT* (800) – ₹ 360 (800)

250EBIT* = ₹5,94,000

EBIT* = ₹2,376

Note that for the debt alternative, the total before-tax interest is ₹840, and this is the intercept on the horizontal axis. For the preferred stock alternative, we divide ₹440 by (1–0.40) to get ₹733. When this is added to ₹360 in interest on existing debt, the intercept becomes ₹1,093.

(c) For the present EBIT level, equity shares is clearly preferable. EBIT would need to increase by ₹2,376 – ₹1,500 = ₹876 before an indifference point with debt is reached. One would want to be comfortably above this indifference point before a strong case for debt should be made. The lower the probability that actual EBIT will fall below the

indifference point, the stronger the case that can be made for debt, all other things remain the same.

Illustration 24: *Alpha Limited requires funds amounting to ₹ 80 lakh for its new project. To raise the funds, the company has following two alternatives:*

(i)   to issue Equity Shares of ₹ 100 each (at par) amounting to ₹ 60 lakh and borrow the balance amount at the interest of 12% p.a.; or

(ii) to issue Equity Shares of ₹100 each (at par) and 12% Debentures in equal proportion.

The Income-tax rate is 30%.

Find out the point of indifference between the available two modes of financing and state which option will be beneficial in different situations.

Solution

(i)   Amount   = ₹ 80,00,000

Plan I   = Equity of ₹ 60,00,000 + Debt of ₹ 20,00,000

Plan II   = Equity of ₹ 40,00,000 + 12% Debentures of ₹ 40,00,000

Plan I: Interest Payable on Loan

= 12% × ₹ 20,00,000 = ₹ 2,40,000

Plan II: Interest Payable on Debentures

= 12% × ₹ 40,00,000 = ₹ 4,80,000

Computation of Point of Indifference

$$\frac{\left(EBIT - I_1\right)\left(1-t\right)}{E_1} = \frac{\left(EBIT - I_2\right)\left(1-t\right)}{E_2}$$

$$\frac{\left(EBIT - ₹2,40,000\right)\left(1-0.3\right)}{60,000} = \frac{\left(EBIT - ₹4,80,000\right)\left(I-0.3\right)}{40,000}$$

2 (EBIT – ₹ 2,40,000) = 3 (EBIT – ₹ 4,80,000)

2 EBIT – ₹ 4,80,000 =   3 EBIT – ₹ 14,40,000

2 EBIT – 3 EBIT = - ₹ 14,40,000 + ₹ 4,80,000

EBIT = ₹ 9,60,000

(ii)   Earnings per share (EPS) under Two Situations for both the Plans

Situation A (EBIT is assumed to be ₹ 9,50,000)		
Particulars	Plan I	Plan II
EBIT	9,50,000	9,50,000

Less: Interest @ 12%	(2,40,000)	(4,80,000)
EBT	7,10,000	4,70,000
Less: Taxes @ 30%	(2,13,000)	(1,41,000)
EAT	4,97,000	3,29,000
No. of Equity Shares	60,000	40,000
EPS	8.28	8.23

Comment: In Situation A, when expected EBIT is less than the EBIT at indifference point then, Plan I is more viable as it has higher EPS. The advantage of EPS would be available from the use of equity capital and not debt capital.

Situation B (EBIT is assumed to be ₹ 9,70,000)		
Particulars	**Plan I**	**Plan II**
EBIT	9,70,000	9,70,000
Less: Interest @ 12%	(2,40,000)	(4,80,000)
EBT	7,30,000	4,90,000
Less: Taxes @ 30%	(2,19,000)	(1,47,000)
EAT	5,11,000	3,43,000
No. of Equity Shares	60,000	40,000
EPS	8.52	8.58

Comment: In Situation B, when expected EBIT is more than the EBIT at indifference point then, Plan II is more viable as it has higher EPS. The use of fixed-cost source of funds would be beneficial from the EPS viewpoint. In this case, financial leverage would be favourable.

(Note: The problem can also be worked out assuming any other figure of EBIT which is more than 9,60,000 and any other figure less than 9,60,000. Alternatively, the answer may also be based on the factors/governing the capital structure like the cost, risk, control, etc. Principles).

4.17 Cost of Capital, Capital Structure and Market Price of Share

The financial leverage has a magnifying effect on earnings per share, such that for a given level of percentage increase in EBIT, there will be more than proportionate change in the same direction in the earnings per share. The financing decision of the firm is one of the basic conditions oriented to the achievement of maximisation for the shareholders wealth. The capital structure should be examined from the view point of its impact on the value of the firm. If the capital structure affects the total value of the firm, a firm should select such a financing mix (a combination of debt and equity) which will maximise the market value of the firm. Such

an optimum leverage not only maximises the value of the company and wealth of its owners, but also minimises the cost of capital. As a result, the company is able to increase its economic rate of investment and growth.

In theory, capital structure can affect the value of the firm by affecting either its expected earnings or cost of capital or both. While financing mix cannot affect the total earnings, it can affect the share of earnings belonging to the share holders. But financial leverage can largely influence the value of the firm through the cost of capital.

4.18 Capital Structure Theories

The following approaches explain the relationship between cost of capital, capital structure and value of the firm:
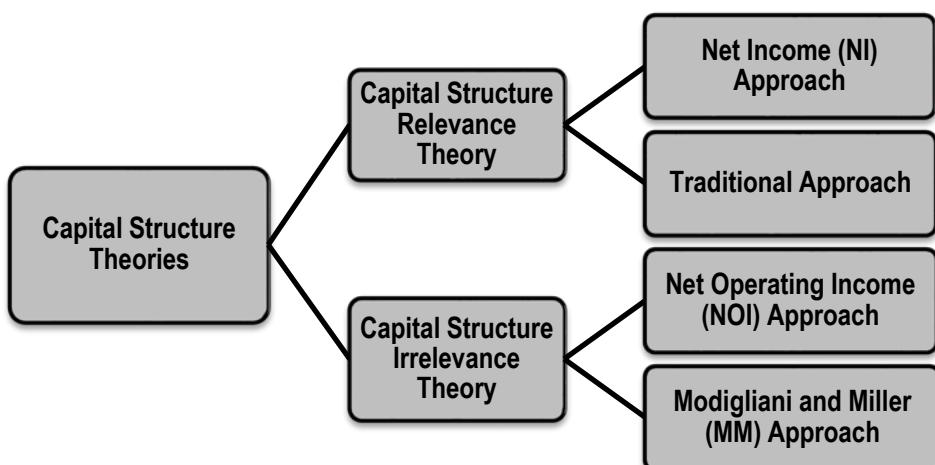
(a)   Net Income (NI) approach

(b)   Traditional approach.

(c)   Net Operating Income (NOI) approach

(d)   Modigliani-Miller (MM) approach

However, the following assumptions are made to understand this relationship.

➢   There are only two kinds of funds used by a firm i.e. debt and equity.

➢   Taxes are not considered.

➢   The payout ratio is 100%.

➢   The firm's total financing remains constant.

➢   Business risk is constant over time.

➢   The firm has perpetual life.

4.18.1 Net Income (NI) Approach: According to this approach, capital structure decision is relevant to the value of the firm. An increase in financial leverage will lead to decline in the weighted average cost of capital (WACC), while the value of the firm as well as market price of ordinary share will increase. Conversely, a decrease in the leverage will cause an increase in the overall cost of capital and a consequent decline in the value as well as market price of equity shares.
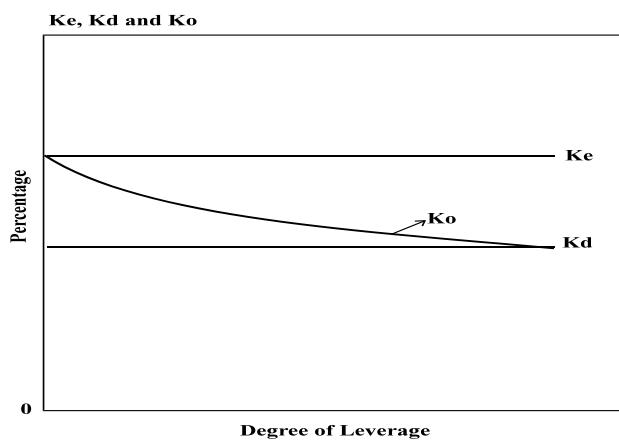
From the above diagram, K_e and K_d are assumed not to change with leverage. As debt increases, it causes weighted average cost of capital (WACC) to decrease.

The value of the firm on the basis of Net Income Approach can be ascertained as follows:

$$V = S + D$$

Where,

V = Value of the firm

S = Market value of equity

D = Market value of debt

Market value of equity (S) = $\dfrac{NI}{K_e}$

Where,

NI   = Earnings available for equity shareholders

K_e = Equity Capitalisation rate

Under, NI approach, the value of the firm will be maximum at a point where weighted average cost of capital (WACC) is minimum. Thus, the theory suggests total or maximum possible debt financing for minimising the cost of capital. The overall cost of capital under this approach is :

$$\text{Overall cost of capital} = \frac{EBIT}{\text{Value of the firm}}$$

Thus according to this approach, the firm can increase its total value by decreasing its overall

cost of capital through increasing the degree of leverage. The significant conclusion of this approach is that it pleads for the firm to employ as much debt as possible to maximise its value.

Illustration 25: *Rupa Ltd.'s EBIT is ₹ 5,00,000. The company has 10%, 20 lakh debentures. The equity capitalization rate i.e. K_e is 16%.*

You are required to calculate:

(i) Market value of equity and value of firm

(ii) Overall cost of capital.

Solution

(i) Statement showing value of firm

	(₹)
EBIT	5,00,000
Less: Interest on debentures (10% of ₹ 20,00,000)	(2,00,000)
Earnings available for equity holders i.e. Net Income (NI)	3,00,000
Equity capitalization rate (K_e)	16%
Market value of equity $(S) = \dfrac{NI}{K_e} = \left(\dfrac{3,00,000}{16.00} \times 100\right)$	18,75,000
Market value of debt (D)	20,00,000
Total value of firm V = S + D	38,75,000

(ii) $\text{Overall cost of capital} = \dfrac{\text{EBIT}}{\text{Value of firm}} = \dfrac{5,00,000}{38,75,000} = 12.90\%$

4.18.2 Traditional Approach: This approach favours that as a result of financial leverage up to some point, cost of capital comes down and value of firm increases. However, beyond that point, reverse trends emerge. The principle implication of this approach is that the cost of capital is dependent on the capital structure and there is an optimal capital structure which minimises cost of capital.

At the optimal capital structure, the real marginal cost of debt and equity is the same. Before the optimal point, the real marginal cost of debt is less than real marginal cost of equity and beyond this optimal point the real marginal cost of debt is more than real marginal cost of equity.
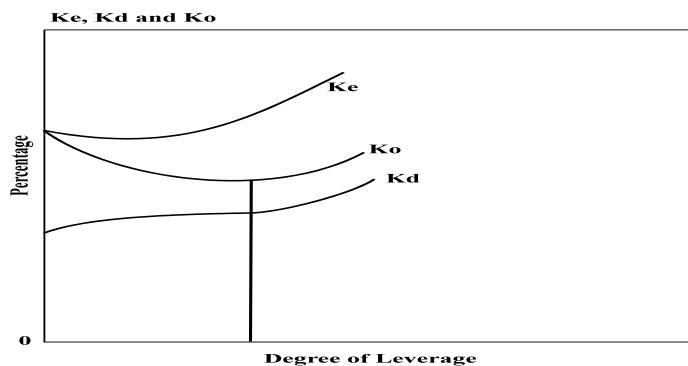
The above diagram suggests that cost of capital is a function of leverage. It declines with K_d (debt) and starts rising. This means that there is a range of capital structure in which cost of capital is minimised.

Optimum capital structure occurs at the point where value of the firm is highest and the cost of capital is the lowest.

According to net operating income approach, capital structure decisions are totally irrelevant. Modigliani-Miller supports the net operating income approach but provides behavioural justification. The traditional approach strikes a balance between these extremes.

Main Highlights of Traditional Approach

(a)   The firm should strive to reach the optimal capital structure and its total valuation through a judicious use of the both debt and equity in capital structure. At the optimal capital structure, the overall cost of capital will be minimum and the value of the firm will be maximum.

(b)   Value of the firm increases with financial leverage upto a certain point. Beyond this point the increase in financial leverage will increase its overall cost of capital and hence the value of firm will decline. This is because the benefits of use of debt may be so large that even after offsetting the effect of increase in cost of equity, the overall cost of capital may still go down. However, if financial leverage increases beyond an acceptable limit, the risk of debt investor may also increase, consequently cost of debt also starts increasing. The increasing cost of equity owing to increased financial risk and increasing cost of debt makes the overall cost of capital to increase.

Illustration 26: *Indra Ltd. has EBIT of ₹ 1,00,000. The company makes use of debt and equity capital. The firm has 10% debentures of ₹ 5,00,000 and the firm's equity capitalization rate is 15%.*

You are required to compute:

(i)   Current value of the firm

(ii)   Overall cost of capital.

Solution

(i)   Calculation of total value of the firm

	(₹)
EBIT	1,00,000
Less: Interest (@10% on ₹ 5,00,000)	50,000
Earnings available for equity holders	50,000
Equity capitalization rate i.e. K_e	15%

$$\text{Value of equity holders} = \frac{\text{Earnings available for equity holders}}{K_e}$$

$$= \frac{50,000}{0.15} = ₹\ 3,33,333$$

Value of Debt (given) D   5,00,000

Total value of the firm V = D + S {5,00,000 + 3,33,333)   8,33,333

(ii)   Overall cost of capital $= K_o = K_e \left(\dfrac{S}{V}\right) + K_d \left(\dfrac{D}{V}\right)$ or $\dfrac{EBIT}{V}$

$$= 0.15 \left(\frac{3,33,333}{8,33,333}\right) + 0.10 \left(\frac{5,00,000}{8,33,333}\right)$$

$$= \frac{1}{8,33,333} \left[50,000 + 50,000\right] = 12.00\%$$

4.18.3 Net Operating Income Approach (NOI): NOI means earnings before interest and tax (EBIT). According to this approach, capital structure decisions of the firm are irrelevant.

Any change in the leverage will not lead to any change in the total value of the firm and the market price of shares, as the overall cost of capital is independent of the degree of leverage. As a result, the division between debt and equity is irrelevant.

As per this approach, an increase in the use of debt which is apparently cheaper is offset by an increase in the equity capitalisation rate. This happens because equity investors seek higher compensation as they are opposed to greater risk due to the existence of fixed return securities in the capital structure.
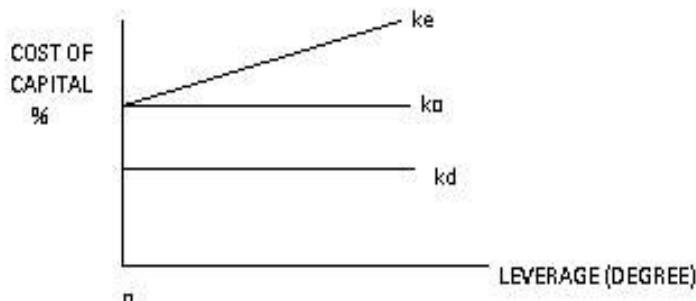
The above diagram shows that K_o (Overall capitalisation rate) and (debt – capitalisation rate) are constant and K_e (Cost of equity) increases with leverage.

Illustration 27: *Amita Ltd's operating income is ₹ 5,00,000. The firm's cost of debt is 10% and currently the firm employs ₹15,00,000 of debt. The overall cost of capital of the firm is 15%.*

You are required to determine:

(i)   Total value of the firm.

(ii)   Cost of equity.

Solution

(i)   Statement showing value of the firm

	(₹)
Net operating income/EBIT	5,00,000
Less: Interest on debentures (10% of ₹ 15,00,000)	(1,50,000)
Earnings available for equity holders	3,50,000
Total cost of capital (K_0) (given)	15%
Value of the firm $V = \dfrac{EBIT}{k_0} = \dfrac{5,00,000}{0.15}$	33,33,333

(ii)   Calculation of cost of equity

	(₹)
Market value of debt (D)	15,00,000
Market value of equity (s) S = V − D = ₹33,33,333 – ₹15,00,000	18,33,333

$$K_e = \frac{Earnings\ available\ for\ equity\ holders}{Value\ of\ equity\,(S)}$$

Or, $= \dfrac{\text{EBIT} - \text{Interest paid on debt}}{\text{Market value of equity}} = \dfrac{₹3,50,000}{₹18,33,333} = 19.09\%$

OR

$$K_o = K_e \left(\frac{S}{V}\right) + K_d \left(\frac{D}{V}\right)$$

$$K_e = K_o \left(\frac{V}{S}\right) - K_d \left(\frac{D}{S}\right)$$

$$= 0.15 \left(\frac{33,33,333}{18,33,333}\right) - 0.10 \left(\frac{15,00,000}{18,33,333}\right)$$

$$= \frac{1}{18,33,333} \left[(0.15 \times 33,33,333) - (0.10 \times 15,00,000)\right]$$

$$= \frac{1}{18,33,333} \left[5,00,000 - 1,50,000\right] = 19.09\%$$

Illustration 28: *Alpha Limited and Beta Limited are identical except for capital structures. Alpha Ltd. has 50 per cent debt and 50 per cent equity, whereas Beta Ltd. has 20 per cent debt and 80 per cent equity. (All percentages are in market-value terms). The borrowing rate for both companies is 8 per cent in a no-tax world, and capital markets are assumed to be perfect.*

(a) *(i) If you own 2 per cent of the shares of Alpha Ltd., what is your return if the company has net operating income of ₹ 3,60,000 and the overall capitalisation rate of the company, K_0 is 18 per cent? (ii) What is the implied required rate of return on equity?*

(b) *Beta Ltd. has the same net operating income as Alpha Ltd. (i) What is the implied required equity return of Beta Ltd.? (ii) Why does it differ from that of Alpha Ltd.?*

Solution

(a) Value of the Alpha Ltd. $= \dfrac{\text{NOI}}{K_0} = \dfrac{₹3,60,000}{18\%} = ₹\ 20,00,000$

(i) Return on Shares on Alpha Ltd.

	(₹)
Value of the company	20,00,000
Market value of debt (50%)	10,00,000
Market value of shares (50%)	10,00,000

	(₹)
Net operating income	3,60,000
Interest on debt (8% × ₹10,00,000)	80,000
Earnings available to shareholders	2,80,000
Return on 2% shares (2% × ₹ 2,80,000)	5,600

(ii) Implied required rate of return on equity = $\dfrac{₹\,2,80,000}{₹\,10,00,000}$ = 28%

(b) (i) Calculation of Implied rate of return

	(₹)
Total value of company	20,00,000
Market value of debt (20% × ₹20,00,000)	4,00,000
Market value of equity (80% × ₹20,00,000)	16,00,000

	(₹)
Net operating income	3,60,000
Interest on debt (8%× ₹4,00,000)	32,000
Earnings available to shareholders	3,28,000

Implied required rate of return on equity = $\dfrac{₹\,3,28,000}{₹\,16,00,000}$ = 20.5%

(ii) It is lower than the Alpha Ltd. because Beta Ltd. uses less debt in its capital structure. As the equity capitalisation is a linear function of the debt-to-equity ratio when we use the net operating income approach, the decline in required equity return offsets exactly the disadvantage of not employing so much in the way of "cheaper" debt funds.

4.18.3 Modigliani-Miller Approach (MM): The NOI approach is definitional or conceptual and lacks behavioural significance. It does not provide operational justification for irrelevance of capital structure. However, Modigliani-Miller approach provides behavioural justification for constant overall cost of capital and, therefore, total value of the firm.

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┌─────────────────────────────────┐         ┌──────────────────────────────────┐
│                                 │         │  MM Approach -1958: without tax  │
│  Modigliani-Miller (MM) Approach│◄────────┤                                  │
│                                 │         └──────────────────────────────────┘
│                                 │◄────────┐
└─────────────────────────────────┘         ┌──────────────────────────────────┐
                                            │  MM Approach- 1963: with tax     │
                                            └──────────────────────────────────┘
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MM Approach- 1958: without tax:
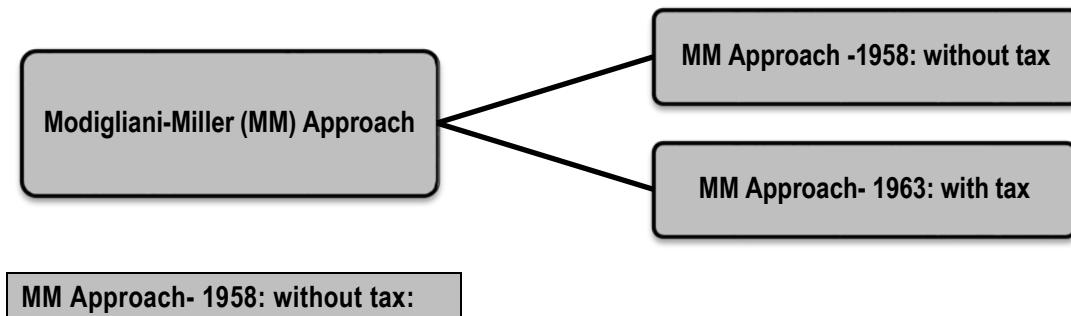
This approach describes, in a perfect capital market where there is no transaction cost and no taxes, the value and cost of capital of a company remain unchanged irrespective of change in the capital structure. The approach is based on further additional assumptions like:

➢   Capital markets are perfect. All information is freely available and there are no transaction costs.

➢   All investors are rational.

➢   Firms can be grouped into 'Equivalent risk classes' on the basis of their business risk.

➢   Non-existence of corporate taxes.

Based on the above assumptions, Modigliani-Miller derived the following three propositions:

(i)   Total market value of a firm is equal to its expected net operating income divided by the discount rate appropriate to its risk class decided by the market.

$$\text{Value of levered firm } (V_g) = \text{Value of unlevered firm } (V_u)$$

$$\text{Value of a firm} = \frac{\text{Net Operating Income (NOI)}}{K_0}$$

(ii)   A firm having debt in capital structure has higher cost of equity than an unlevered firm. The cost of equity will include risk premium for the financial risk. The cost of equity in a levered firm is determined as under:

$$K_e = K_o + (K_o - K_d)\frac{\text{Debt}}{\text{Equity}}$$

(iii)   The structure of the capital (financial leverage) does not effect the overall cost of capital. The cost of capital is only affected by the business risk.

Ke, Kd and Ko
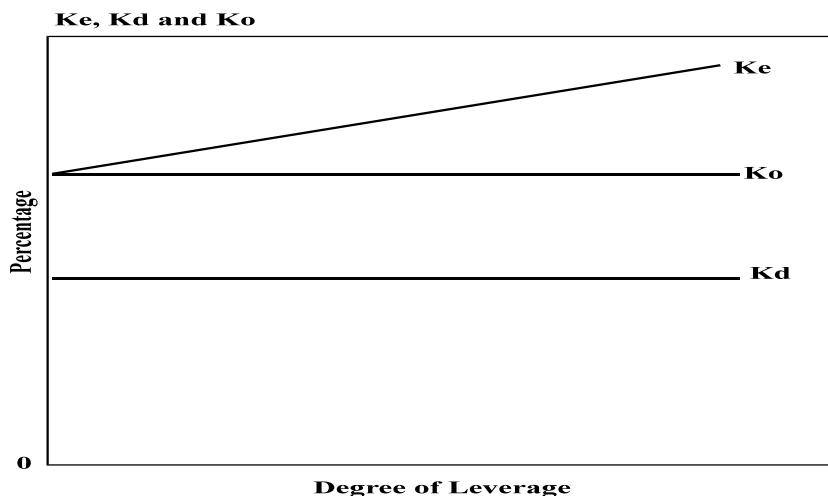
It is evident from the above diagram that the average cost of the capital (K_o) is a constant and not affected by leverage.

The operational justification of Modigliani-Miller hypothesis is explained through the functioning of the arbitrage process and substitution of corporate leverage by personal leverage. Arbitrage refers to buying asset or security at lower price in one market and selling it at a higher price in another market. As a result, equilibrium is attained in different markets. This is illustrated by taking two identical firms of which one has debt in the capital structure while the other does not. Investors of the firm whose value is higher will sell their shares and instead buy the shares of the firm whose value is lower. They will be able to earn the same return at lower outlay with the same perceived risk or lower risk. They would, therefore, be better off.

The value of the levered firm can neither be greater nor lower than that of an unlevered firm according this approach. The two must be equal. There is neither advantage nor disadvantage in using debt in the firm's capital structure.

The approach considers capital structure of a firm as a whole pie divided into equity, debt and other securities. No matter how the capital structure of a firm is divided (among debt, equity etc.), there is a conservation of investment value. Since the total investment value of a corporation depends upon its underlying profitability and risk, it is invariant with respect to relative changes in the firm's financial capitalisation.

According to MM, since the sum of the parts must equal the whole, therefore, regardless of the financing mix, the total value of the firm stays the same.

The shortcoming of this approach is that the arbitrage process as suggested by Modigliani-Miller will fail to work because of imperfections in capital market, existence of transaction cost and presence of corporate income taxes.

In 1963, MM model was amended by incorporating tax, they recognised that the value of the firm will increase or cost of capital will decrease where corporate taxes exist. As a result, there will be some difference in the earnings of equity and debt-holders in levered and unlevered firm and value of levered firm will be greater than the value of unlevered firm by an amount equal to amount of debt multiplied by corporate tax rate.

MM has developed the formulae for computation of cost of capital (K_o), cost of equity (K_e) for the levered firm.

(i)   Value of a levered company = Value of an unlevered company + Tax benefit

Or, $V_g = V_u + TB$

(ii)   Cost of equity in a levered company (K_{eg}) = K_{eu} + (K_{eu} – K_d) $\dfrac{\text{Debt}(1-t)}{\text{Equity}}$

Where, K_{eg} = Cost of equity in a levered company

K_{eu} = Cost of equity in an unlevered company

K_d = Cost of debt

t   = Tax rate

(iii) WACC in a levered company (K_{og})= $K_{eu}(1-tL)$

Where, K_{og} = WACC of a levered company

K_{eu} = Cost of equity in an unlevered company

t   = Tax rate

L   = $\dfrac{\text{Debt}}{\text{Debt}+\text{Equity}}$

Illustration 29*: When value of levered firm is more than the value of unlevered firm*

There are two company N Ltd. and M Ltd., having same earnings before interest and taxes i.e. EBIT of ₹ 20,000. M Ltd. is a levered company having a debt of ₹ 1,00,000 @ 7% rate of interest. The cost of equity of N Ltd. is 10% and of M Ltd. is 11.50%.

Find out how arbitrage process will be carried on?

Solution

	Company	
	M Ltd.	**N Ltd.**
EBIT (NOI)	₹ 20,000	₹ 20,000

Debt (D)	₹ 1,00,000	---
K_e	11.50%	10%
K_d	7%	---

Value of equity (S) $= \dfrac{\text{NOI} - \text{Interest}}{\text{Cost of equity}}$

$S_M = \dfrac{20,000 - 7,000}{11.50\%}$ $= ₹ 1,13,043$

$S_N = \dfrac{20,000}{10\%}$ $= ₹ 2,00,000$

$V_M = 1,13,043 + 1,00,000$ {V = S + D} $= ₹ 2,13,043$

$V_N = ₹ 2,00,000$

Arbitrage Process:

If you have 10% shares of M Ltd., your value of investment in equity shares is 10% of ₹1,13,043 i.e. ₹ 11,304.30 and return will be 10% of (₹20,000 – ₹7,000) = ₹ 1,300.

Alternate Strategy will be:

Sell your 10% share of levered firm for ₹ 11,304.30 and borrow 10% of levered firms debt i.e. 10% of ₹ 1,00,000 and invest the money i.e. 10% in unlevered firms stock:

Total resources /Money we have = ₹11,304.30 + ₹10,000 = ₹21,304.3 and you invest 10% of ₹2,00,000 = ₹ 20,000

Surplus cash available with you is = ₹21,304.3 – ₹20,000 = ₹ 1,304.3

Your return = 10% EBIT of unlevered firm – Interest to be paid on borrowed funds

i.e. = 10% of ₹ 20,000 – 7% of ₹ 10,000 = ₹2,000 – ₹700 = ₹ 1,300

i.e. your return is same i.e. ₹ 1,300 which you are getting from N Ltd. before investing in M Ltd. But still you have ₹ 1,304.3 excess money available with you. Hence, you are better off by doing arbitrage.

Illustration 30*: When value of unlevered firm is more than the value of levered firm*

There are two companies U Ltd. and L Ltd., having same NOI of ₹ 20,000 except that L Ltd. is a levered company having a debt of ₹ 1,00,000 @ 7% and cost of equity of U Ltd. & L Ltd. are 10% and 18% respectively.

Show how arbitrage process will work.

Solution

	Company	
	U Ltd.	**L Ltd.**
NOI	₹ 20,000	₹ 20,000
Debt capital	–	₹ 1,00,000
K_d	–	7%
K_e	10%	18%
Value of equity capital (s) = $\left(\dfrac{EBIT - Interest}{K_e}\right)$	₹ 2,00,000 $\left(\dfrac{20,000}{0.10}\right)$	₹ 72,222 $\left(\dfrac{20,000 - 7,000}{0.18}\right)$
Total value of the firm V = S + D	₹ 2,00,000	₹ 1,72,222 (₹ 72,222 + ₹1,00,000)

Assume you have 10% shares of unlevered firm i.e. investment of 10% of ₹ 2,00,000 = ₹ 20,000 and Return @ 10% on ₹ 20,000. Investment will be 10% of earnings available for equity i.e. 10% × 20,000 = ₹ 2,000.

Alternative strategy:

Sell your shares in unlevered firm for ₹ 20,000 and buy 10% shares of levered firm's equity plus debt

i.e. 10% equity of levered firm	= 7,222
10% debt of levered firm	= 10,000
Total investment	= 17,222

Your resources are ₹ 20,000

Surplus cash available = Surplus – Investment = 20,000 – 17,222 = ₹ 2,778

Your return on investment is:

7% on debt of ₹ 10,000	700
10% on equity i.e. 10% of earnings available for equity holders i.e. (10% × 13,000)	1,300
Total return	2,000

i.e. in both the cases the return received is ₹ 2,000 and still you have excess cash of ₹ 2,778.

Hence, you are better off i.e you will start selling unlevered company shares and buy levered company's shares thereby pushing down the value of shares of unlevered firm and increasing the value of levered firm till equilibrium is reached.

Illustration 31: *One-third of the total market value of Sanghmani Limited consists of loan stock, which has a cost of 10 per cent. Another company, Samsui Limited, is identical in every respect to Sanghmani Limited, except that its capital structure is all-equity, and its cost of equity is 16 per cent. According to Modigliani and Miller, if we ignored taxation and tax relief on debt capital, what would be the cost of equity of Sanghmani Limited?*

Solution

Here we are assuming that MM Approach 1958: Without tax, where capital structure has no relevance with the value of company and accordingly overall cost of capital of both levered as well as unlevered company is same. Therefore, the two companies should have similar WACCs. Because Samsui Limited is all-equity financed, its WACC is the same as its cost of equity finance, i.e. 16 per cent. It follows that Sanghmani Limited should have WACC equal to 16 per cent also.

Therefore, Cost of equity in Sanghmani Ltd. (levered company) will be calculated as follows:

$$K_o = \frac{2}{3} \times K_e + \frac{1}{3} \times K_d = 16\% \text{ (i.e. equal to WACC of Samsui Ltd.)}$$

$$\text{Or, } 16\% = \frac{2}{3} \times K_e + \frac{1}{3} \times 10\% \qquad \text{Or, } K_e = 19$$

4.19 Over- Capitalisation and Under -Capitalisation

4.19.1 Over- Capitalisation: It is a situation where a firm has more capital than it needs or in other words assets are worth less than its issued share capital, and earnings are insufficient to pay dividend and interest. This situation mainly arises when the existing capital is not effectively utilized on account of fall in earning capacity of the company while company has raised funds more than its requirements. The chief sign of over-capitalisation is the fall in payment of dividend and interest leading to fall in value of the shares of the company.

Causes of Over-Capitalisation: Over-capitalisation arises due to following reasons:

(i)   Raising more money through issue of shares or debentures than company can employ profitably.

(ii)   Borrowing huge amount at higher rate than rate at which company can earn.

(iii) Excessive payment for the acquisition of fictitious assets such as goodwill etc.

(iv) Improper provision for depreciation, replacement of assets and distribution of dividends at a higher rate.

(v)   Wrong estimation of earnings and capitalisation.

Consequences of Over-Capitalisation: Over-capitalisation results in the following consequences:

(i)   Considerable reduction in the rate of dividend and interest payments.

(ii)   Reduction in the market price of shares.

(iii) Resorting to "window dressing".

(iv)   Some companies may opt for reorganization. However, sometimes the matter gets worse and the company may go into liquidation.

Remedies for Over-Capitalisation: Following steps may be adopted to avoid the negative consequences of over-capitalisation:

(i)   Company should go for thorough reorganization.

(ii)   Buyback of shares.

(iii) Reduction in claims of debenture-holders and creditors.

(iv)   Value of shares may also be reduced. This will result in sufficient funds for the company to carry out replacement of assets.

4.19.2 Under Capitalisation: It is just reverse of over-capitalisation. It is a state, when its actual capitalisation is lower than its proper capitalisation as warranted by its earning capacity. This situation normally happens with companies which have insufficient capital but large secret reserves in the form of considerable appreciation in the values of the fixed assets not brought into the books.

Consequences of Under-Capitalisation: Under-capitalisation results in the following consequences:

(i)   The dividend rate will be higher in comparison to similarly situated companies.

(ii)   Market value of shares will be higher than value of shares of other similar companies because their earning rate being considerably more than the prevailing rate on such securities.

(iii) Real value of shares will be higher than their book value.

Effects of Under-Capitalisation: Under-capitalisation has the following effects:

(i)   It encourages acute competition. High profitability encourages new entrepreneurs to come into same type of business.

(ii)   High rate of dividend encourages the workers' union to demand high wages.

(iii) Normally common people (consumers) start feeling that they are being exploited.

(iv)   Management may resort to manipulation of share values.

(v)   Invite more government control and regulation on the company and higher taxation also.

Remedies: Following steps may be adopted to avoid the negative consequences of under capitalization:

(i)   The shares of the company should be split up. This will reduce dividend per share, though EPS shall remain unchanged.

(ii)   Issue of Bonus Shares is the most appropriate measure as this will reduce both dividend per share and the average rate of earning.

(iii) By revising upward the par value of shares in exchange of the existing shares held by them.

4.19.3 Over-Capitalisation vis-à-vis Under-Capitalisation: From the above discussion it can be said that both over capitalisation and under capitalisation are not good. However, over capitalisation is more dangerous to the company, shareholders and the society than under capitalisation. The situation of under capitalisation can be handled more easily than the situation of over-capitalisation. Moreover, under capitalisation is not an economic problem but a problem of adjusting capital structure. Thus, under capitalisation should be considered less dangerous but both situations are bad and every company should strive to have a proper capitalisation.

UNIT – III : BUSINESS RISK AND FINANCIAL RISK
Learning Objectives
After studying this chapter you will be able to:
• Define, discuss, and quantify "business risk" and "financial risk".
• Explain in detail operating and financial leverage and identify causes of both.
• Understand how to calculate and interpret a firm's leverage?
• Calculate a firm's operating break-even (quantity) point and break-even (sales) point
• Understand what is involved in determining the appropriate amount of financial leverage for a firm?

4.20 Introduction

A firm can finance its operations through common and preference shares, with retained earnings, or with debt. Usually a firm uses a combination of these financing instruments. Capital structure refers to a firm's debt-to-equity ratio, which provides insight into how risky a company is Capital structure decisions by firms will have an effect on the expected profitability of the firm, the risks faced by debt holders and shareholders, the probability of failure, the cost of capital and the market value of the firm.

4.20.1 Business Risk and Financial Risk

Risk facing the common shareholders is of two types, namely business risk and financial risk. Therefore, the risk faced by common shareholders is a function of these two risks, i.e. {Business Risk, Financial Risk}

Business Risk:- It refers to the risk associated with the firm's operations. It is the uncertainty about the future operating income (EBIT), i.e. how well can the operating incomes be predicted?

Business risk can be measured by the standard deviation of the Basic Earning Power ratio.
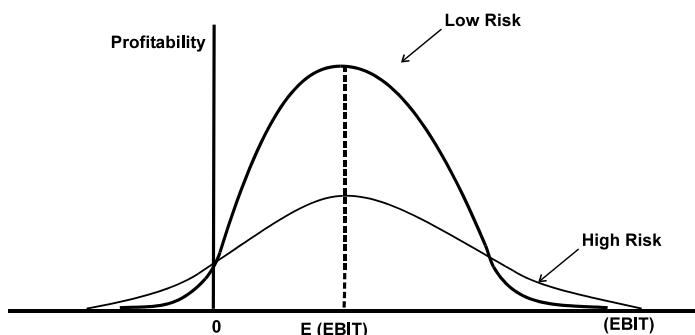
Financial Risk:- It refers to the additional risk placed on the firm's shareholders as a result of

debt use i.e. the additional risk a shareholder bears when a company uses debt in addition to equity financing. Companies that issue more debt instruments would have higher financial risk than companies financed mostly or entirely by equity.

4.21 Debt versus Equity Financing

Financing a business through borrowing is cheaper than using equity. This is because:

➢   Lenders require a lower rate of return than ordinary shareholders. Debt financial securities present a lower risk than shares for the finance providers because they have prior claims on annual income and liquidation.

➢   A profitable business effectively pays less for debt capital than equity for another reason: the debt interest can be offset against pre-tax profits before the calculation of the corporate tax, thus reducing the tax paid.

➢   Issuing and transaction costs associated with raising and servicing debt are generally less than for ordinary shares.

These are some benefits from financing a firm with debt. Still firms tend to avoid very high gearing levels.

One reason is financial distress risk. This could be induced by the requirement to pay interest regardless of the cash flow of the business. If the firm goes through a rough period in its business activities it may have trouble paying its bondholders, bankers and other creditors their entitlement.

The relationship between Expected return (Earnings per share) and the level of gearing can be represented as:
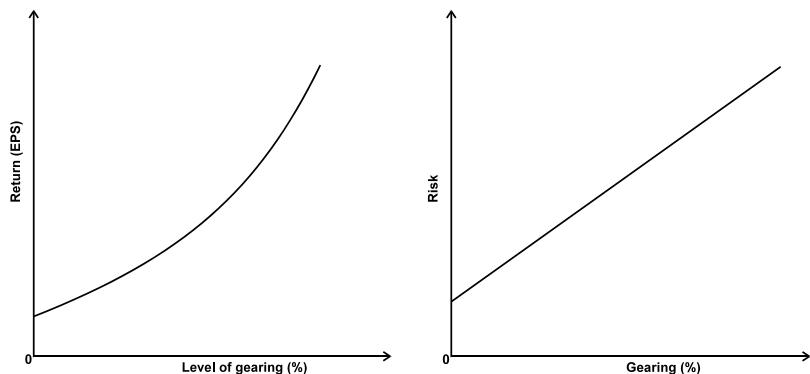
Relationship between leverage and risk

Leverage can occur in either the *operating or financing* portions of the income statement.

The effect of leverage is to *magnify* the effects of changes in sales volume on earnings.

Let's now discuss in detail Operating, Financing and Combined Leverages.

4.22 Meaning and Types of Leverage

4.22.1 Meaning of Leverage: Leverage refers to the ability of a firm in employing long term funds having a fixed cost, to enhance returns to the owners. In other words, leverage is the amount of debt that a firm uses to finance its assets. A firm with a lot of debt in its capital structure is said to be highly levered. A firm with no debt is said to be unlevered.

The term Leverage in general refers to a relationship between two interrelated variables. In financial analysis it represents the influence of one financial variable over some other related financial variable. These financial variables may be costs, output, sales revenue, Earnings Before Interest and Tax (EBIT), Earning per share (EPS) etc.

4.22.2 Types of Leverage: There are three commonly used measures of leverage in financial analysis. These are:

(i)   Operating Leverage

(ii) Financial Leverage

(iii) Combined Leverage

4.22.3 Chart Showing Operating Leverage, Financial Leverage and Combined leverage

Profitability Statement		
Sales	**xxx**	
Less: **Variable Cost**	**(xxx)**	
Contribution	**xxx**	**Operating Leverage**
Less: **Fixed Cost**	**(xxx)**	
Operating Profit/ EBIT	**xxx**	**Financial Leverage** / **Combined Leverage**
Less: **Interest**	**(xxx)**	
Earnings Before Tax (EBT)	**xxx**	
Less: **Tax**	**(xxx)**	
Profit After Tax (PAT)	**xxx**	
Less: **Pref. Dividend (if any)**	**(xxx)**	
Net Earnings available to equity share holders/ PAT	**xxx**	
No. Equity shares (N)		
Earnings per Share (EPS) = (PAT ÷ N)		

4.22.3 Operating Leverage

Operating leverage (OL) maybe defined as the employment of an asset with a fixed cost in the hope that sufficient revenue will be generated to cover all the fixed and variable costs.

The use of assets for which a company pays a fixed cost is called operating leverage.

With fixed costs the percentage change in profits accompanying a change in volume is greater than the percentage change in volume. The higher the turnover of operating assets, the greater will be the revenue in relation to the fixed charge on those assets.
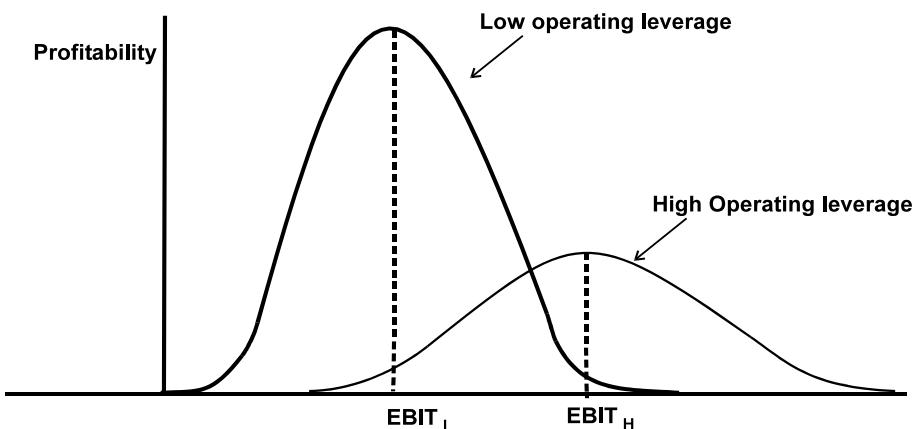
Operating leverage is a function of three factors:

(i) Rupee amount of fixed cost,

(ii) Variable contribution margin, and

(iii) Volume of sales.

$$\textbf{Operating Leverage (OL)} = \frac{\textbf{Contribution(C)}}{\textbf{Earnings before interest and tax (EBIT)}}$$

Where, Contribution (C) = Sales – Variable cost

EBIT = Sales- Variable cost – Fixed cost

4.22.4 Degree of Operating Leverage (DOL): The operating leverage may also be defined as "the firm's ability to use fixed operating cost to magnify the effects of changes in sales on its earnings before interest and taxes."

$$\textbf{Degree of Operating Leverage (DOL)} = \frac{\textbf{Percentage change in EBIT}}{\textbf{Percentage change in Sales}}$$

Or, $= \dfrac{\dfrac{\Delta EBIT}{EBIT}}{\dfrac{\Delta Sales}{Sales}}$

Δ EBIT means changes in EBIT

Δ Sales means changes in sales

When DOL is more than one (1), operating leverage exists. More is the DOL higher is operating leverage.

A positive DOL/ OL means that the firm is operating at higher level than the break- even level and both sales and EBIT moves in the same direction. In case of negative DOL/ OL firm operates at lower than the break-even and EBIT is negative.

Illustration 32: *A Company produces and sells 10,000 shirts. The selling price per shirt is ₹ 500. Variable cost is ₹ 200 per shirt and fixed operating cost is ₹ 25,00,000.*

(a) Calculate operating leverage.

(b) If sales are up by 10%, then what is the impact on EBIT?

Solution

(a) Statement of Profitability

	(₹)
Sales Revenue (10,000 × 500)	50,00,000
Less: Variable Cost (10,000 × 200)	20,00,000
Contribution	30,00,000
Less: Fixed Cost	25,00,000
EBIT	5,00,000

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{30\,\text{lakhs}}{5\,\text{lakhs}} = 6\ \text{times}$$

(b) Operating Leverage (OL) $= \dfrac{\%\,\text{Change in EBIT}}{\%\,\text{Change in Sales}}$

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

$$x = 3,00,000$$

$$\therefore \Delta EBIT = 3,00,000/5,00,000$$

$$= 60\%$$

Illustration 33: *Calculate the operating leverage for each of the four firms A, B, C and D from the following price and cost data:*

	Firms			
	A (₹)	**B (₹)**	**C (₹)**	**D (₹)**
Sale price per unit	20	32	50	70
Variable cost per unit	6	16	20	50
Fixed operating cost	60,000	40,000	1,00,000	Nil

What calculations can you draw with respect to levels of fixed cost and the degree of operating leverage result? Explain. Assume number of units sold is 5,000.

Solution

	Firms			
	A	**B**	**C**	**D**
Sales (units)	5,000	5,000	5,000	5,000
Sales revenue (Units × price) (₹)	1,00,000	1,60,000	2,50,000	3,50,000
Less: Variable cost	(30,000)	(80,000)	(1,00,000)	(2,50,000)
(Units × variable cost per unit) (₹)				
Less: Fixed operating costs (₹)	(60,000)	(40,000)	(1,00,000)	Nil
EBIT	10,000	40,000	50,000	1,00,000

$$DOL = \frac{\text{Current sales (S)} - \text{Variable costs (VC)}}{\text{Current EBIT}}$$

$$DOL_{(A)} = \frac{₹\,1,00,000 - ₹\,30,000}{₹\,10,000} = 7$$

$$DOL_{(B)} = \frac{₹\,1,60,000 - ₹\,80,000}{₹\,40,000} = 2$$

$$DOL_{(C)} = \frac{₹\,2,50,000 - ₹\,1,00,000}{₹\,50,000} = 3$$

$$DOL_{(D)} = \frac{₹\,3,50,000 - ₹\,2,50,000}{₹\,1,00,000} = 1$$

The operating leverage exists only when there are fixed costs. In the case of firm D, there is no magnified effect on the EBIT due to change in sales. A 20 per cent increase in sales has resulted in a 20 per cent increase in EBIT. In the case of other firms, operating leverage exists. It is maximum in firm A, followed by firm C and minimum in firm B. The interception of DOL of 7 is that 1 per cent change in sales results in 7 per cent change in EBIT level in the direction of the change of sales level of firm A.

4.22.5 Financial Leverage: Financial leverage (FL) maybe defined as 'the use of funds with a fixed cost in order to increase earnings per share.' In other words, it is the use of company funds on which it pays a limited return. Financial leverage involves the use of funds obtained at a fixed cost in the hope of increasing the return to common stockholders.

$$\text{Financial Leverage (FL)} = \frac{\text{Earnings before interest and tax (EBIT)}}{\text{Earnings before tax (EBT)}}$$

Where, EBIT   = Sales- Variable cost – Fixed cost

         EBT   = EBIT - Interest

4.22.6 Degree of Financial Leverage (DFL): Degree of financial leverage is the ratio of the percentage increase in earnings per share (EPS) to the percentage increase in earnings before interest and taxes (EBIT). Financial Leverage (FL) is also defined as "the ability of a firm to use fixed financial charges to magnify the effect of changes in EBIT on EPS

$$\text{Degree of Financial Leverage(DFL)} = \frac{\text{Percentage change in earnings per share (EPS)}}{\text{Percentage change in earnigs before interest and tax (EBIT)}}$$

Or,

$$= \frac{\dfrac{\Delta\text{EPS}}{\text{EPS}}}{\dfrac{\Delta\text{EBIT}}{\text{EBIT}}}$$

Δ EPS means change in EPS and Δ EBIT means change in EBIT

When DFL is more than one (1), financial leverage exists. More is DFL higher is financial leverage.

A positive DFL/ FL means firm is operating at a level higher than break-even point and EBIT and EPS moves in the same direction. Negative DFL/ FL indicates the firm is operating at lower than break-even point and EPS is negative.

4.22.7 Financial Leverage as 'Trading on Equity'.: Financial leverage indicates the use of funds with fixed cost like long term debts and preference share capital alongwith equity share capital which is known as trading on equity. The basic aim of financial leverage is to increase the earnings available to equity shareholders using fixed cost fund. A firm is known to have a positive leverage when its earnings are more than the cost of debt. If earnings is equal to or less than cost of debt, it will be an unfavourable leverage. When the quantity of fixed cost fund is relatively high in comparison to equity capital it is said that the firm is ''trading on equity".

4.22.8 Financial Leverage as a 'Double edged Sword'.: On one hand when cost of 'fixed cost fund' is less than the return on investment financial leverage will help to increase return on equity and EPS. The firm will also benefit from the saving of tax on interest on debts etc. However, when cost of debt will be more than the return it will affect return of equity and

EPS unfavourably and as a result firm can be under financial distress. This is why financial leverage is known as "double edged sword".

Effect on EPS and ROE:

When, ROI > Interest – Favourable – Advantage

When, ROI < Interest – Unfavourable – Disadvantage

When, ROI = Interest – Neutral – Neither advantage nor disadvantage.

Illustration 34*: Suppose there are two firms with the same operating leverage, business risk, and probability distribution of EBIT and only differ with respect to their use of debt (capital structure).*

Firm U	*Firm L*
No debt	*₹ 10,000 of 12% debt*
₹ 20,000 in assets	*₹ 20,000 in assets*
40% tax rate	*40% tax rate*

Solution

Firm U: Unleveraged

	Economy		
	Bad	**Avg.**	**Good**
Probability	0.25	0.50	0.25
EBIT	₹ 2,000	₹ 3,000	₹ 4,000
Interest	0	0	0
EBIT	₹ 2000	₹ 3,000	₹ 4,000
Taxes (40%)	800	1,200	1,600
NI	₹ 1,200	₹ 1,800	₹ 2,400

Firm L: Leveraged

	Economy		
	Bad	**Avg.**	**Good**
Probability	0.25	0.50	0.25
EBIT	₹ 2,000	₹ 3,000	₹ 4,000
Interest	1,200	1,200	1,200
EBIT	₹ 800	₹ 1,800	₹ 2,800
Taxes (40%)	320	720	1,120
NI	₹ 480	₹1080	₹ 1,680

*Same as for Firm U.

Ratio comparison between leveraged and unleveraged firms

FIRM U	BAD	AVG.	GOOD
BEP(=EBIT/TOTAL ASSETS)	10.0%	15.0%	20.0%
ROE(=PAT/NETWORTH)	6.0%	9.0%	12.0%
TIE(INTEREST COVERAGE RATIO (=EBIT/INTEREST)	∞	∞	∞

FIRM L	Bad	Avg.	Good
BEP	10.0%	15.0%	20.0%
ROE	4.8%	10.8%	16.8%
TIE	1.67%	2.50%	3.30%

Risk and return for leveraged and unleveraged firms

Expected Values:

	Firm U	Firm L
E(BEP)	15.0%	15.0%
E(ROE)	9.0%	10.8%
E(TIE)	∞	2.5x

Risk Measures:

	Firm U	Firm L
σ_{ROE}	2.12%	4.24%
CV_{ROE}	0.24	0.39

Thus, the effect of leverage on profitability and debt coverage can be seen from the above example. For leverage to raise expected ROE, BEP must be greater than K_d i.e. BEP > K_d because if K_d > BEP, then the interest expense will be higher than the operating income produced by debt-financed assets, so leverage will depress income. As debt increases, TIE decreases because EBIT is unaffected by debt, and interest expense increases (Int Exp = K_d).

Thus, it can be concluded that the basic earning power (BEP) is unaffected by financial leverage. Firm L has higher expected ROE because BEP > K_d and it has much wider ROE (and EPS) swings because of fixed interest charges. Its higher expected return is accompanied by higher risk.

4.22.7 Combined Leverage: Combined leverage maybe defined as the potential use of fixed costs, both operating and financial, which magnifies the effect of sales volume change on the earning per share of the firm.

Combined Leverage (CL)   = Operating Leverage (OL) × Financial Leverage (FL)

$$= \frac{C}{EBIT} \times \frac{EBIT}{EBT}$$

$$= \frac{C}{EBT}$$

4.22.8 Degree of Combined Leverage (DCL) : Degree of combined leverage (DCL) is the ratio of percentage change in earning per share to the percentage change in sales. It indicates the effect the sales changes will have on EPS.

DCL   **= DOL × DFL**

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

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

Illustration 35: *A firm's details are as under:*

Sales (@100 per unit)	*₹ 24,00,000*
Variable Cost	*50%*
Fixed Cost	*₹ 10,00,000*

It has borrowed ₹ 10,00,000 @ 10% p.a. and its equity share capital is ₹ 10,00,000 (₹ 100 each)

Calculate:

(a)   Operating Leverage

(b)   Financial Leverage

(c)   Combined Leverage

(d)   Return on Investment

(e)   If the sales increases by ₹ 6,00,000; what will the new EBIT?

Solution

	(₹)
Sales	24,00,000
Less: Variable cost	12,00,000
Contribution	12,00,000
Less: Fixed cost	10,00,000

EBIT	2,00,000
Less: Interest	1,00,000
EBT	1,00,000
Less: Tax (50%)	50,000
EAT	50,000
No. of equity shares	10,000
EPS	5

(a) Operating Leverage $= \dfrac{12,00,000}{2,00,000} = 6$ times

(b) Financial Leverage $= \dfrac{2,00,000}{1,00,000} = 2$ times

(c) Combined Leverage = OL × FL = 6 × 2 = 12 times.

(d) R.O.I $= \dfrac{50,000}{10,00,000} \times 100 = 5\%$

   Here ROI is calculated as ROE i.e. $\dfrac{\text{EAT} - \text{Pref.Dividend}}{\text{Equity shareholders' fund}}$

(e) Operating Leverage = 6

   $6 = \dfrac{\Delta \text{ EBIT}}{0.25}$

   $\Delta \text{EBIT} = \dfrac{6 \times 1}{4} = 1.5$

   Increase in EBIT = ₹ 2,00,000 × 1.5 = ₹ 3,00,000

   New EBIT = 5,00,000

Illustration 36: *Betatronics Ltd. has the following balance sheet and income statement information:*

Balance Sheet as on March 31ˢᵗ

Liabilities	(₹)	Assets	(₹)
Equity capital (₹ 10 per share)	8,00,000	Net fixed assets	10,00,000
10% Debt	6,00,000	Current assets	9,00,000
Retained earnings	3,50,000		
Current liabilities	1,50,000		
	19,00,000		19,00,000

Income Statement for the year ending March 31

	(₹)
Sales	*3,40,000*
Operating expenses (including ₹ 60,000 depreciation)	*1,20,000*
EBIT	*2,20,000*
Less: Interest	*60,000*
Earnings before tax	*1,60,000*
Less: Taxes	*56,000*
Net Earnings (EAT)	*1,04,000*

(a) Determine the degree of operating, financial and combined leverages at the current sales level, if all operating expenses, other than depreciation, are variable costs.

(b) If total assets remain at the same level, but sales (i) increase by 20 percent and (ii) decrease by 20 percent, what will be the earnings per share at the new sales level?

Solution

(a) Calculation of Degree of Operating (DOL), Financial (DFL) and Combined leverages (DCL).

$$DOL = \frac{₹\ 3,40,000 - ₹\ 60,000}{₹\ 2,20,000}$$ = 1.27

$$DFL = \frac{₹\ 2,20,000}{₹\ 1,60,000}$$ = 1.38

DCL = DOL×DFL = 1.27×1.38 = 1.75

(b) Earnings per share at the new sales level

	Increase by 20%	Decrease by 20%
	(₹)	(₹)
Sales level	4,08,000	2,72,000
Less: Variable expenses	72,000	48,000
Less: Fixed cost	60,000	60,000
Earnings before interest and taxes	2,76,000	1,64,000
Less: Interest	60,000	60,000
Earnings before taxes	2,16,000	1,04,000
Less: Taxes	75,600	36,400
Earnings after taxes (EAT)	1,40,400	67,600
Number of equity shares	80,000	80,000
EPS	1.76	0.85

Working Notes:

(i)   Variable Costs = ₹ 60,000 (total cost − depreciation)

(ii) Variable Costs at:

(a)   Sales level, ₹ 4,08,000 = ₹ 72,000 (increase by 20%)

(b)   Sales level, ₹ 2,72,000 = ₹ 48,000 (decrease by 20%)

Illustration 37: *Calculate the operating leverage, financial leverage and combined leverage from the following data under Situation I and II and Financial Plan A and B:*

Installed Capacity	4,000 units
Actual Production and Sales	75% of the Capacity
Selling Price	₹ 30 Per Unit
Variable Cost	₹ 15 Per Unit

Fixed Cost:

Under Situation I	₹ 15,000
Under Situation-II	₹20,000

Capital Structure:

	Financial Plan	
	A (₹)	B (₹)
Equity	10,000	15,000
Debt (Rate of Interest at 20%)	10,000	5,000
	20,000	20,000

Solution

Operating Leverage:	Situation-I	Situation-II
	(₹)	(₹)
Sales (S)	90,000	90,000
3000 units @ ₹ 30/- per unit		
Less: Variable Cost (VC) @ ₹ 15 per unit	45,000	45,000
Contribution (C)	45,000	45,000
Less: Fixed Cost (FC)	15,000	20,000
Operating Profit (OP)	30,000	25,000
(EBIT)		

(i) *Operating Leverage*

$$\frac{C}{OP} \quad = \qquad ₹\,\frac{45,000}{30,000} \qquad\qquad ₹\,\frac{45,000}{25,000}$$

$$= \qquad\qquad 1.5 \qquad\qquad\qquad 1.8$$

(ii) *Financial Leverages*

	A (₹)	B (₹)
Situation I		
Operating Profit (EBIT)	30,000	30,000
Less: Interest on debt	2,000	1,000
PBT	28,000	29,000

Financial Leverage = $\dfrac{OP}{PBT}$ = ₹ $\dfrac{30,000}{28,000}$ = 1.07 ₹ $\dfrac{30,000}{24,000}$ = 1.04

	A (₹)	B (₹)
Situation-II		
Operating Profit (OP)	25,000	25,000
(EBIT)		
Less: Interest on debt	2,000	1,000
PBT	23,000	24,000

Financial Leverage = $\dfrac{OP}{PBT}$ = ₹ $\dfrac{25,000}{23,000}$ = 1.09 ₹ $\dfrac{25,000}{24,000}$ = 1.04

(iii) *Combined Leverages*

	A (₹)	B (₹)
(a) Situation I	1.5 x 1.07 =1.61	1.5 x 1.04 = 1.56
(b) Situation II	1.8 x 1.09 =1.96	1.8 x 1.04 =1.87

Illustration 38: *A company had the following Balance Sheet as on 31st March, 2014:*

Liabilities	₹ (In crores)	Assets	(₹ In crores)
Equity Share Capital (50 lakhs shares of ₹ 10 each)	5		

Reserves and Surplus	1	Fixed Assets (Net)	12.5
15% Debentures	10	Current Assets	7.5
Current Liabilities	4		
	20		**20**

The additional information given is as under:

Fixed cost per annum (excluding interest)	₹ 4 crores
Variable operating cost ratio	65%
Total assets turnover ratio	2.5
Income Tax rate	30%

Required:

Calculate the following and comment:

(i)   *Earnings Per Share*

(ii)   *Operating Leverage*

(iii) *Financial Leverage*

(iv)   *Combined Leverage*

Solution

Total Assets   = ₹ 20 crores

Total Asset Turnover Ratio   = 2.5

Hence, Total Sales   = 20 × 2.5 = ₹ 50 crores

Computation of Profit after Tax (PAT)

	(₹ in crores)
Sales	50.00
Less: Variable Operating Cost @ 65%	32.50
Contribution	17.50
Less: Fixed Cost (other than Interest)	4.00
EBIT	13.50
Less: Interest on Debentures (15% × 10)	1.50
PBT	12.00
Less: Tax @ 30%	3.60
PAT	8.40

(i)   Earnings per Share

$$\text{EPS} = \frac{8.40 \text{ crores}}{\text{Number of Equity Shares}} = \frac{8.40 \text{ crores}}{50,00,000} = ₹\ 16.80$$

It indicates the amount the company earns per share. Investors use this as a guide while valuing the share and making investment decisions. It is also a indicator used in comparing firms within an industry or industry segment.

(ii)   Operating Leverage

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{17.50}{13.50} = 1.296$$

It indicates the choice of technology and fixed cost in cost structure. It is level specific. When firm operates beyond operating break-even level, then operating leverage is low. It indicates sensitivity of earnings before interest and tax (EBIT) to change in sales at a particular level.

(iii) Financial Leverage

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{PBT}} = \frac{13.50}{12.00} = 1.125$$

The financial leverage is very comfortable since the debt service obligation is small vis-à-vis EBIT.

(iv) Combined Leverage

$$\text{Combined Leverage} \qquad = \frac{\text{Contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{PBT}}$$

Or,   = Operating Leverage × Financial Leverage

= 1.296 × 1.125 = 1.458

The combined leverage studies the choice of fixed cost in cost structure and choice of debt in capital structure. It studies how sensitive the change in EPS is vis-à-vis change in sales. The leverages − operating, financial and combined are measures of risk.

SUMMARY

1. **Cost of Capital:** In simple terms Cost of capital refers to the **discount rate** that is used in determining the present value of the estimated future cash proceeds of the business/new project and eventually deciding whether the business/new project is worth undertaking or now. It is also the **minimum rate of return** that a firm must earn on its investment which will maintain the market value of share at its current level. It can also be stated as the **opportunity cost** of an investment, i.e. the rate of return that a company would otherwise

be able to earn at the same risk level as the investment that has been selected

2. **Components of Cost of Capital:** In order to calculate the specific cost of each type of capital, recognition should be given to the explicit and the implicit cost. The cost of capital can be either explicit or implicit. **The explicit cost** of any source of capital may be defined as the discount rate that equals that present value of the cash inflows that are incremental to the taking of financing opportunity with the present value of its incremental cash outflows. **Implicit cost** is the rate of return associated with the best investment opportunity for the firm and its shareholders that will be foregone if the project presently under consideration by the firm was accepted.

3. **Measurement of Specific Cost of Capital for each source of Capital:** The first step in the measurement of the cost of the capital of the firm is the calculation of the cost of individual sources of raising funds. From the viewpoint of capital budgeting decisions, the long term sources of funds are relevant as they constitute the major sources of financing the fixed assets. In calculating the cost of capital, therefore the focus on long-term funds and which are:-

    Long term debt (including Debentures)

    Preference Shares

    Equity Capital

    Retained Earnings

4. **Weighted Average Cost of Capital:-** WACC (weighted average cost of capital) represents the investors' opportunity cost of taking on the risk of putting money into a company. Since every company has a capital structure i.e. what percentage of funds comes from retained earnings, equity shares, preference shares, debt and bonds, so by taking a weighted average, it can be seen how much cost/interest the company has to pay for every rupee it borrows/invest. This is the weighted average cost of capital.

5. **Capital Structure and Its Factors:** Capital structure refers to the mix of a firm's capitalisation (i.e. mix of long term sources of funds such as debentures, preference share capital, equity share capital and retained earnings for meeting total capital requirment). Capital Structure decision refers to deciding the forms of financing (which sources to be tapped), their actual requirements (amount to be funded) and their relative proportions (mix) in total capitalisation. Normally a finance manager tries to choose a pattern of capital structure which minimises cost of capital and maximises the owners' return. Well, while choosing a suitable financing pattern, certain factors like cost, risk, control, flexibility and other considerations like nature of industry, competition in the industry etc. should be considered. For e.g. Industries facing severe competition also resort to more equity than debt.

6. **Leverage (Operating and Financial):- Operating leverage** exists when a firm has a fixed cost that must be defrayed regardless of volume of business. It can be defined as the firm's ability to use fixed operating costs to magnify the effects of changes in sales on

its earnings before interest and taxes. **Financial leverage** involves the use fixed cost of financing and refers to mix of debt and equity in the capitalisation of a firm. Financial leverage is a superstructure built on the operating leverage. It results from the presence of fixed financial charges in the firm's income stream.

7. **Combined Leverage:-** Combined leverage maybe defined as the potential use of fixed costs, both operating and financial, which magnifies the effect of sales volume change on the earning per share of the firm. Degree of combined leverage (DCL) is the ratio of percentage change in earning per share to the percentage change in sales. It indicates the effect the sales changes will have on EPS.

8. **Optimal Capital Structure (EBIT-EPS Analysis):** The basic objective of financial management is to design an appropriate capital structure which can provide the highest earnings per share (EPS) over the firm's expected range of earnings before interest and taxes (EBIT). PS measures a firm's performance for the investors. The level of EBIT varies from year to year and represents the success of a firm's operations. EBIT-EPS analysis is a vital tool for designing the optimal capital structure of a firm. The objective of this analysis is to find the EBIT level that will equate EPS regardless of the financing plan chosen.

9. **Capital Structure Theories:-** The following approaches explain the relationship between cost of capital, capital structure and value of the firm:

   a. Net income approach

   b. Net operating income approach

   c. Modigliani-Miller approach

   d. Traditional approach.

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5

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Types of Financing

Learning Objectives
After studying this chapter you will be able to :
• Learn about the Different sources of finance available to a business, both internal and external.
• Differentiate between the various long term, medium term and short term sources of finance.
• Understand in detail some of the important sources of financing. This would include Venture Capital financing, lease financing and financing of export trade by banks.
• Understand the concept of Securitization.
• Discuss the financing in the International Market by understanding various financial instruments prevalent in the International Market.

Overview
In this chapter you have to study the different sources of finance and their usage in making sound financial judgments. This chapter deals with long-term, short-term and international sources of finance. It helps you to understand the basics of different forms of finance and their importance therein. Most of the issues discussed in this chapter have practical implications in real life like where to get funds from for starting up, development or expansion of a business and these decisions are crucial for the success of the business. It is also important, therefore, that you understand the various sources of finance open to a business and are able to assess how appropriate these sources are in relation to the needs of the business. The concepts learnt here find application almost in all the other chapters as well.

5.1. Introduction

There are several sources of finance/funds available to any company. An effective appraisal mechanism of various sources of funds available to a company must be instituted in the

company to achieve its main objectives. Some of the parameters that need to be considered while choosing a source of fund are:-

➢   Cost of source of fund

➢   Tenure

➢   Leverage planned by the company

➢   Financial conditions prevalent in the economy

➢   Risk profile of both the company as well as the industry in which the company operates.

Each and every source of fund has some advantages as well as disadvantages.

5.2.   Financial Needs and Sources of Finance of a Business

5.2.1   Financial Needs of a Business: Business enterprises need funds to meet their different types of requirements. All the financial needs of a business may be grouped into the following three categories:

(i)   Long term financial needs: Such needs generally refer to those requirements of funds which are for a period exceeding 5-10 years. All investments in plant, machinery, land, buildings, etc., are considered as long term financial needs. Funds required to finance permanent or hard core working capital should also be procured from long term sources.

(ii)   Medium term financial needs: Such requirements refer to those funds which are required for a period exceeding one year but not exceeding 5 years. For example, if a company resorts to extensive publicity and advertisement campaign then such type of expenses may be written off over a period of 3 to 5 years. These are called deferred revenue expenses and funds required for them are classified in the category of medium term financial needs.

(iii)   Short term financial needs: Such type of financial needs arise to finance current assets such as stock, debtors, cash, etc. Investment in these assets is known as meeting of working capital requirements of the concern. The main characteristic of short term financial needs is that they arise for a short period of time not exceeding the accounting period. i.e., one year.

Basic Principle for Funding Various Needs: The basic principle for meeting the short term financial needs of a concern is that such needs should be met from short term sources, and medium term financial needs from medium term sources and long term financial needs from long term sources.

Accordingly, the method of raising funds is to be decided with reference to the period for which funds are required.

The following section shows at a glance the different sources from where the three aforesaid types of finance can be raised in India:

5.2.2 Sources of Finance of a Business

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                        Sources of Finance
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Long-term
1. Share capital or Equity shares
2. Preference shares
3. Retained earnings
4. Debentures/Bonds of different types
5. Loans from financial institutions
6. Loans from State Financial Corporations
7. Loans from commercial banks
8. Venture capital funding
9. Asset securitisation
10. International financing like Euro-issues, Foreign currency loans

Medium-term
1. Preference shares
2. Debentures/Bonds
3. Public deposits/fixed deposits for duration of three years
4. Medium term loans from Commercial banks, Financial Institutions, State Financial Corporations
5. Lease financing/Hire-Purchase financing
6. External commercial borrowings
7. Euro-issues
8. Foreign Currency bonds

Short-term
1. Trade credit
2. Accrued expenses and deferred income
3. Short term loans like Working Capital Loans from Commercial banks
4. Fixed deposits for a period of 1 year or less
5. Advances received from customers
6. Various short-term provisions

It is evident from the above section that funds can be raised from the same source for meeting different types of financial requirements.

5.2.3 Financial sources of a business can also be classified as follows by using different basis:

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                Financial Sources of a Business
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According to period

(i) Long term sources
(ii) Medium term sources
(iii) Short term sources

According to ownership
(i) Owners capital or equity capital, retained earnings etc.
(ii) Borrowed capital such as debentures, public deposits, loans etc.

According to sources of generation

(i) Internal sources e.g. retained earnings and depreciation

(ii) External sources e.g. debentures, loans etc.
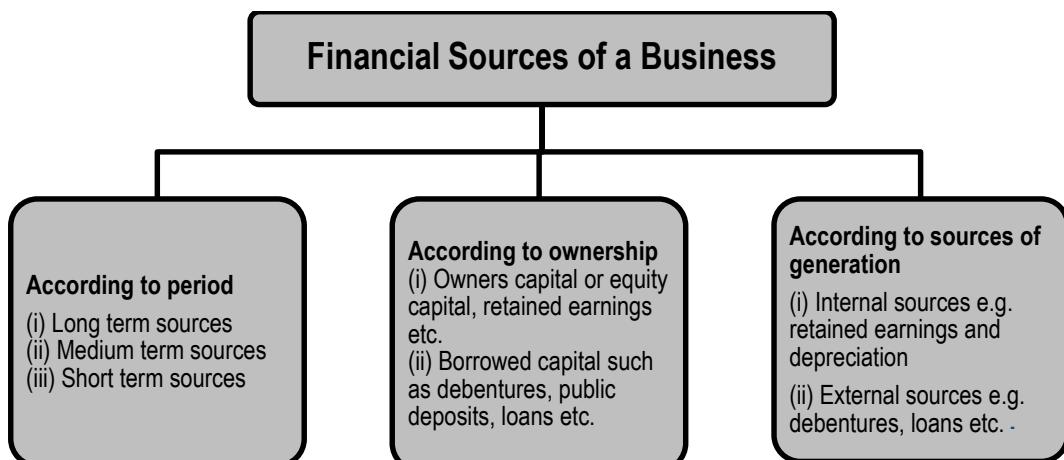
However, for the sake of convenience, the different sources of funds can also be classified into following categories.

(i)   Security financing - financing through shares and debentures.

(ii)   Internal financing - financing through retained earnings, depreciation.

(iii)   Loans financing - this includes both short term and long term loans.

(iv)   International financing.

(v)   Other sources.

5.3. Long-term Sources of Finance

There are different sources of funds available to meet long term financial needs of the business. These sources may be broadly classified into:

➢   Share capital (both equity and preference) &

➢   Debt (including debentures, long term borrowings or other debt instruments).

The different sources of long-term finance can now be discussed:

5.3.1 Owners Capital or Equity Capital: A public limited company may raise funds from promoters or from the investing public by way of owner's capital or equity capital by issuing ordinary equity shares. Some of the characteristics of Owners/Equity Share Capital are:-

➢   It is a source of permanent capital. The holders of such share capital in the company are called equity shareholders or ordinary shareholders.

➢   Equity shareholders are practically owners of the company as they undertake the highest risk.

➢   Equity shareholders are entitled to dividends after the income claims of other stakeholders are satisfied. The dividend payable to them is an appropriation of profits and not a charge against profits.

➢   In the event of winding up, ordinary shareholders can exercise their claim on assets after the claims of the other suppliers of capital have been met.

➢   The cost of ordinary shares is usually the highest. This is due to the fact that such shareholders expect a higher rate of return (as their risk is the highest) on their investment as compared to other suppliers of long-term funds.

➢   Ordinary share capital also provides a security to other suppliers of funds. Any institution giving loan to a company would make sure the debt-equity ratio is comfortable to cover the debt.

Advantages and disadvantages of raising funds by issue of equity shares are:

(i)   It is a permanent source of finance. Since such shares are not redeemable, the company has no liability for cash outflows associated with its redemption.

(ii) Equity capital increases the company's financial base and thus helps further the borrowing powers of the company.

(iii) The company is not obliged legally to pay dividends. Hence in times of uncertainties or when the company is not performing well, dividend payments can be reduced or even suspended.

(iv) The company can make further issue of share capital by making a right issue.

Apart from the above mentioned advantages, equity capital has some disadvantages to the company when compared with other sources of finance. These are as follows:

(i) The cost of ordinary shares is higher because dividends are not tax deductible and also the floatation costs of such issues are higher.

(ii) Investors find ordinary shares riskier because of uncertain dividend payments and capital gains.

(iii) The issue of new equity shares reduces the earning per share of the existing shareholders until and unless the profits are proportionately increased.

(iv) The issue of new equity shares can also reduce the ownership and control of the existing shareholders.

5.3.2 Preference Share Capital: These are a special kind of shares; the holders of such shares enjoy priority, both as regards to the payment of a fixed amount of dividend and also towards repayment of capital on winding up of the company. Some of the characteristics of Preference Share Capital are:-

➢ Long-term funds from preference shares can be raised through a public issue of shares.

➢ Such shares are normally cumulative, *i.e.,* the dividend payable in a year of loss gets carried over to the next year till there are adequate profits to pay the cumulative dividends.

➢ The rate of dividend on preference shares is normally higher than the rate of interest on debentures, loans etc.

➢ Most of preference shares these days carry a stipulation of period and the funds have to be repaid at the end of a stipulated period.

➢ Preference share capital is a hybrid form of financing which imbibes within itself some characteristics of equity capital and some attributes of debt capital. It is similar to equity because preference dividend, like equity dividend is not a tax deductible payment. It resembles debt capital because the rate of preference dividend is fixed.

➢ Cumulative Convertible Preference Shares (CCPs) may also be offered, under which the shares would carry a cumulative dividend of specified limit for a period of say three years after which the shares are converted into equity shares. These shares are attractive for projects with a long gestation period.

➢ Preference share capital may be redeemed at a pre decided future date or at an earlier stage inter alia out of the profits of the company. This enables the promoters to withdraw their capital from the company which is now self-sufficient, and the withdrawn capital may

be reinvested in other profitable ventures.

It may be mentioned that irredeemable preference shares cannot be issued by any company.

Preference shares have gained importance after the Finance bill 1997 as dividends became tax exempted in the hands of the individual investor and are taxable in the hands of the company as tax is imposed on distributed profits at a flat rate. At present, a domestic company paying dividend will have to pay dividend distribution tax @ 15% plus surcharge of 10% plus an education cess equaling 3% (total 16.995%).

Advantages and disadvantages of raising funds by issue of preference shares are:

(i)   No dilution in EPS on enlarged capital base - If equity is issued it reduces EPS, thus affecting the market perception about the company.

(ii)   There is leveraging advantage as it bears a fixed charge. Non-payment of preference dividends does not force company into liquidity.

(iii) There is no risk of takeover as the preference shareholders do not have voting rights except in case where dividend arrears exist.

(iv) The preference dividends are fixed and pre-decided. Hence preference shareholders do not participate in surplus profits as the ordinary shareholders.

(v)   Preference capital can be redeemed after a specified period.

The following are the disadvantages of the preference shares:

(i)   One of the major disadvantages of preference shares is that preference dividend is not tax deductible and so does not provide a tax shield to the company. Hence a preference share is costlier to the company than debt e.g. debenture.

(ii)   Preference dividends are cumulative in nature. This means that although these dividends may be omitted, they shall need to be paid later. Also, if these dividends are not paid, no dividend can be paid to ordinary shareholders. The non-payment of dividend to ordinary shareholders could seriously impair the reputation of the company concerned.

5.3.3 Retained Earnings: Long-term funds may also be provided by accumulating the profits of the company and by ploughing them back into business. Such funds belong to the ordinary shareholders and increase the net worth of the company. A public limited company must plough back a reasonable amount of profit every year keeping in view the legal requirements in this regard and its own expansion plans. Such funds also entail almost no risk. Further, control of present owners is also not diluted by retaining profits.

5.3.4 Debentures or Bonds: Loans can be raised from public by issuing debentures or bonds by public limited companies. Some of the characteristics of Debentures or Bonds are:-

➢   Debentures are normally issued in different denominations ranging from ₹ 100 to ₹ 1,000 and carry different rates of interest.

➢   Normally, debentures are issued on the basis of a debenture trust deed which lists the

terms and conditions on which the debentures are floated.

➢ Debentures are either secured or unsecured.

➢ May or may not be listed on the stock exchange.

➢ The cost of capital raised through debentures is quite low since the interest payable on debentures can be charged as an expense before tax.

➢ From the investors' point of view, debentures offer a more attractive prospect than the preference shares since interest on debentures is payable whether or not the company makes profits.

➢ Debentures are thus instruments for raising long-term debt capital.

➢ The period of maturity normally varies from 3 to 10 years and may also increase for projects having high gestation period.

Debentures can be divided into the following three categories:

(i) *Non-convertible debentures* – These types of debentures do not have any feature of conversion and are repayable on maturity.

(ii) *Fully convertible debentures* – Such debentures are converted into equity shares as per the terms of issue in relation to price and the time of conversion. Interest rates on such debentures are generally less than the non-convertible debentures because of their carrying the attractive feature of getting themselves converted into shares.

(iii) *Partly convertible debentures* – Those debentures which carry features of both convertible and non-convertible debentures belong to this category. The investor has the advantage of having both the features in one debenture.

The issue of convertible debentures has distinct advantages from the point of view of the issuing company. Firstly, such an issue enables the management to raise equity capital indirectly without diluting the equity holding, until the capital raised has started earning an added return to support the additional shares. Secondly, such securities can be issued even when the equity market is not very good. Thirdly, convertible bonds are normally unsecured and, therefore, their issuance may ordinarily not impair the borrowing capacity.

Advantages of raising finance by issue of debentures are:

(i) The cost of debentures is much lower than the cost of preference or equity capital as the interest is tax-deductible. Also, investors consider debenture investment safer than equity or preferred investment and, hence, may require a lower return on debenture investment.

(ii) Debenture financing does not result in dilution of control.

(iii) In a period of rising prices, debenture issue is advantageous. The fixed monetary outgo decreases in real terms as the price level increases.

The disadvantages of debenture financing are:

(i)   Debenture interest and capital repayment are obligatory payments.

(ii)   The protective covenants associated with a debenture issue may be restrictive.

(iii)   Debenture financing enhances the financial risk associated with the firm.

(iv)   Since debentures need to be paid during maturity, a large amount of cash outflow is needed at that time.

Public issue of debentures and private placement to mutual funds now require that the issue be rated by a credit rating agency like CRISIL (Credit Rating and Information Services of India Ltd.). The credit rating is given after evaluating factors like track record of the company, profitability, debt servicing capacity, credit worthiness and the perceived risk of lending.

5.3.5 Loans from Financial Institutions: In India specialised institutions provide long- term financial assistance to industry. Thus, the Industrial Finance Corporation of India, the State Financial Corporations, the Life Insurance Corporation of India, the National Small Industries Corporation Limited, the Industrial Credit and Investment Corporation, the Industrial Development Bank of India, and the Industrial Reconstruction Corporation of India provide term loans to companies.

Such loans are available at different rates of interest under different schemes of financial institutions and are to be repaid according to a stipulated repayment schedule. The loans in many cases stipulate a number of conditions regarding the management and certain other financial policies of the company.

One of the examples of a scheme undertaken through the Financial Institutions to fund textile companies is TUFS (Technology Up-gradation Fund Scheme for Textile and Jute Industry). This scheme was introduced by Ministry of Textile to provide much needed impetus to the textile industry and consequently make Indian Textile exports more competitive in the International Market. Institutions like IDBI, IFCI, SIDBI etc were appointed as nodal agencies for the implementation of this scheme. Some of the highlights of this scheme were:-

➢   It mainly covered the Textile Industry (Spinning, Processing of Fibers, Garment etc).

➢   The loan was to be used mainly for expansion of existing facilities or for modernization of existing facilities.

➢   On the interest paid by the company to the Financial Institution, Ministry of Textile will reimburse the 5 percentage points under the scheme. This would be done if all the conditions of scheme were met by the company.

After Independence, the institutional set up in India for the provision of medium and long term credit for industry has been broadened. The assistance sanctioned and disbursed by these specialised institutions has increased impressively during the years.

5.3.6 Loans from Commercial Banks: The primary role of the commercial banks is to cater to the short term requirements of industry. Of late, however, banks have started taking an interest in long term financing of industries in several ways. Some of the ways are:-

(a) The banks provide long term loans for the purpose of expansion or setting up of new units. Their repayment is usually scheduled over a long period of time. The liquidity of such loans is said to depend on the anticipated income of the borrowers.

The real limitation to the scope of bank activities in this field is that all banks are not well equipped to make appraisal of such loan proposals. Term loan proposals involve an element of risk because of changes in the conditions affecting the borrower. The bank making such a loan, therefore, has to assess the situation to make a proper appraisal. The decision in such cases would depend on various factors affecting the conditions of the industry concerned and the earning potential of the borrower.

(b) As part of the long term funding for a company, the banks also fund the long term working capital requirement (it is also called WCTL i.e. working capital term loan). It is funding of that portion of working capital which is always required (the minimum level) and is not impacted by seasonal requirement of the company. As a matter of fact, a working capital loan is more permanent and long term than a term loan. The reason for making this statement is that a term loan is always repayable on a fixed date and ultimately, a day will come when the account will be totally adjusted. However, in the case of working capital term loan, though it is payable on demand, yet in actual practice it is noticed that the account is never adjusted as such; and, if at all the payment is asked back, it is with a clear purpose and intention of refinance being provided at the beginning of the next year or half year.

(c) To illustrate this point let us presume that two loans are granted on January 1, 2014 (a) to A; term loan of ₹ 60,000/- for 3 years to be paid back in equal half yearly instalments, and (b) to B : cash-credit limit against hypothecation, etc. of ₹ 60,000.

If we make two separate graphs for the two loans, they may appear to be like the figure shown below.
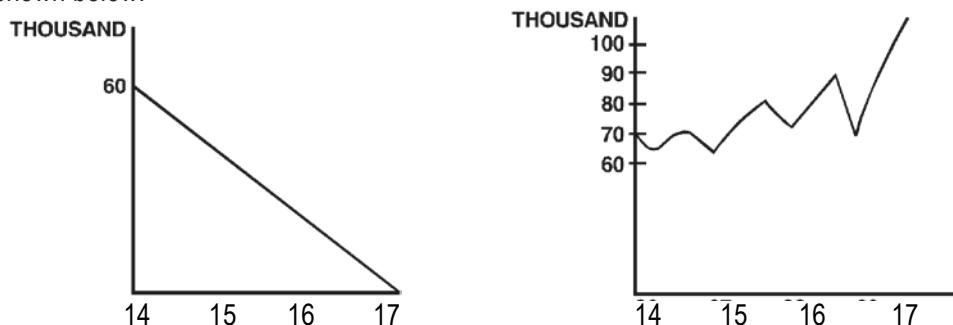
Note : It has been presumed that both the concerns are good. Payment of interest has been ignored. It has been presumed that cash credit limit is being enhanced gradually.

The above graphs clearly indicate that at the end of 2017 the term loan would be fully

settled whereas the cash credit limit may have been enhanced to over a lakh of rupees. It really amounts to providing finances for long term.

This technique of providing long term finance can be technically called as "rolled over for periods exceeding more than one year". Therefore, instead of indulging in term financing by the rolled over method, banks can and should extend credit term after a proper appraisal of applications for terms loans. In fact, as stated above, the degree of liquidity in the provision for regular amortisation of term loans is more than in some of these so called demand loans which are renewed from year to year. Actually, term financing disciplines both the banker and the borrower as long term planning is required to ensure that cash inflows would be adequate to meet the instruments of repayments and allow an active turnover of bank loans. The adoption of the formal term loan lending by commercial banks will not in any way hamper the criteria of liquidity and as a matter of fact, it will introduce flexibility in the operations of the banking system.

The real limitation to the scope of bank activities in this field is that all banks are not well equipped to make appraisal of such loan proposals. Term loan proposals involve an element of risk because of changes in the conditions affecting the borrower. The bank making such a loan, therefore, has to assess the situation to make a proper appraisal. The decision in such cases would depend on various factors affecting the conditions of the industry concerned and the earning potential of the borrower.

Bridge Finance: Bridge finance refers to loans taken by a company normally from commercial banks for a short period because of pending disbursement of loans sanctioned by financial institutions. Though it is a of short term nature but since it is an important step in the facilitation of long term loan, therefore it is being discussed along with the long term sources of funds. Normally, it takes time for financial institutions to disburse loans to companies. However, once the loans are approved by the term lending institutions, companies, in order not to lose further time in starting their projects, arrange short term loans from commercial banks.

The bridge loans are repaid/ adjusted out of the term loans as and when disbursed by the concerned institutions. Bridge loans are normally secured by hypothecating movable assets, personal guarantees and demand promissory notes. Generally, the rate of interest on bridge finance is higher as compared with that on term loans.

Having discussed funding from share capital (equity/preference), raising of debt from financial institutions and banks, we will now discuss some other important sources of long term finance.

5.4. Venture Capital Financing

The venture capital financing refers to financing of new high risky venture promoted by qualified entrepreneurs who lack experience and funds to give shape to their ideas. In broad sense, under venture capital financing venture capitalist make investment to purchase equity or debt securities from inexperienced entrepreneurs who undertake highly risky ventures with a potential of success. Some of the characteristics of Venture Capital Funding are:-

➢   It is basically an equity finance in new companies.

➤ It can be viewed as a long term investment in growth-oriented small/medium firms.

➤ Apart from providing funds, the investor also provides support in form of sales strategy, business networking and management expertise, enabling the growth of the entrepreneur.

Growth of Venture Capital Financing in India: In India, Venture Capital financing was first the responsibility of developmental financial institutions such as the Industrial Development Bank of India (IDBI) , the Technical Development and Information Corporation of India(now known as ICICI) and the State Finance Corporations(SFCs). In the year 1988, the Government of India took a policy initiative and announced guidelines for Venture Capital Funds (VCFs). In the same year, a Technology Development Fund (TDF) financed by the levy on all payments for technology imports was established This fund was meant to facilitate the financing of innovative and high risk technology programmes through the IDBI.

A major development in venture capital financing in India was in the year 1996 when the Securities and Exchange Board of India (SEBI) issued guidelines for venture capital funds to follow. These guidelines described a venture capital fund as a fund established in the form of a company or trust, which raises money through loans, donations, issue of securities or units and makes or proposes to make investments in accordance with the regulations. This move was instrumental in the entry of various foreign venture capital funds to enter India. Since then, the guidelines have been amended from time to time with the objective of fuelling the growth of Venture Capital activities in India. A few venture capital companies operate as both investment and fund management companies; others set up funds and function as asset management companies.

It is hoped that the changes in the guidelines for the implementation of venture capital schemes in the country would encourage more funds to be set up to give the required momentum for venture capital investment in India.

Some common methods of venture capital financing are as follows:

(i) *Equity financing:* The venture capital undertakings generally require funds for a longer period but may not be able to provide returns to the investors during the initial stages. Therefore, the venture capital finance is generally provided by way of equity share capital. The equity contribution of venture capital firm does not exceed 49% of the total equity capital of venture capital undertakings so that the effective control and ownership remains with the entrepreneur.

(ii) *Conditional loan:* A conditional loan is repayable in the form of a royalty after the venture is able to generate sales. No interest is paid on such loans. In India venture capital financiers charge royalty ranging between 2 and 15 per cent; actual rate depends on other factors of the venture such as gestation period, cash flow patterns, risk and other factors of the enterprise. Some Venture capital financiers give a choice to the enterprise of paying a high rate of interest (which could be well above 20 per cent) instead of royalty on sales once it becomes commercially sound.

(iii) *Income note:* It is a hybrid security which combines the features of both conventional loan

and conditional loan. The entrepreneur has to pay both interest and royalty on sales but at substantially low rates. IDBI's VCF provides funding equal to 80 – 87.50% of the projects cost for commercial application of indigenous technology.

(iv) *Participating debenture:* Such security carries charges in three phases — in the start up phase no interest is charged, next stage a low rate of interest is charged up to a particular level of operation, after that, a high rate of interest is required to be paid.

Factors that a venture capitalist should consider before financing any risky project are as follows:

(i) **Level of expertise of company's management:** Most of venture capitalist believes that the success of a new project is highly dependent on the quality of its management team. They expect that entrepreneur should have a skilled team of managers. Managements also be required to show a high level of commitments to the project.

(ii) **Level of expertise in production:** Venture capital should ensure that entrepreneur and his team should have necessary technical ability to be able to develop and produce new product / service.

(iii) **Nature of new product / service:** The venture capitalist should consider whether the development and production of new product / service should be technically feasible. They should employ experts in their respective fields to examine idea proposed by the entrepreneur.

(iv) **Future Prospects:** Since the degree of risk involved in investing in the company is quite fairly high, venture capitalists should seek to ensure that the prospects for future profits compensate for the risk. Therefore, they should see a detailed business plan setting out the future business strategy.

(v) **Competition:** The venture capitalist should seek assurance that there is actually a market for a new product. Further venture capitalists should see the research carried on by the entrepreneur.

(vi) **Risk borne by entrepreneur:** The venture capitalist is expected to see that the entrepreneur bears a high degree of risk. This will assure them that the entrepreneur have the sufficient level of the commitments to project as they themselves will have a lot of loss, should the project fail.

(vii) **Exit Route:** The venture capitalist should try to establish a number of exist routes. These may include a sale of shares to the public, sale of shares to another business, or sale of shares to original owners.

(viii) **Board membership:** In case of companies, to ensure proper protection of their investment, venture capitalist should require a place on the Board of Directors. This will enable them to have their say on all significant matters affecting the business.

5.5   Debt Securitisation

Securitisation is a process in which illiquid assets are pooled into marketable securities that can be sold to investors. The process leads to the creation of financial instruments that represent ownership interest in, or are secured by a segregated income producing asset or pool of assets. These assets are generally secured by personal or real property such as automobiles, real estate, or equipment loans but in some cases are unsecured.

The following example illustrates the process in a conceptual manner:

A finance company has issued a large number of car loans. It desires to raise further cash so as to be in a position to issue more loans. One way to achieve this goal is by selling all the existing loans, however, in the absence of a liquid secondary market for individual car loans, this may not be feasible. Instead, the company pools a large number of these loans and sells interest in the pool to investors. This process helps the company to raise finances and get the loans off its Balance Sheet. These finances shall help the company disburse further loans. Similarly, the process is beneficial to the investors as it creates a liquid investment in a diversified pool of auto loans, which may be an attractive option to other fixed income instruments. The whole process is carried out in such a way that the ultimate debtors- the car owners – may not be aware of the transaction. They shall continue making payments the way they were doing before, however, these payments shall reach the new investors instead of the company they (the car owners) had financed their car from.

The example provided above illustrates the general concept of securitisation as understood in common spoken English.

Securitisation follows the following process:-

Step 1	Step 2	Step 3	Step 4
SPV (Special Purpose Vehicle) is created to hold title to assets underlying securities as a repository of the assets or claims being securitised.	The originator i.e. the primary financier or the legal holder of assets sells the assets (existing or future) to the SPV.	The SPV, with the help of an investment banker, issues securities which are distributed to investors in form of pass through or pay through certificates.	The SPV pays the originator for the assets with the proceeds from the sale of securities.

The process of securitisation is generally without recourse i.e. the investor bears the credit risk or risk of default and the issuer is under an obligation to pay to investors only if the cash flows are received by him from the collateral. The issuer however, has a right to legal recourse in the event of default. The risk run by the investor can be further reduced through credit enhancement facilities like insurance, letters of credit and guarantees.

In India, the Reserve Bank of India had issued draft guidelines on securitisation of standard

assets in April 2005. These guidelines were applicable to banks, financial institutions and non banking financial companies. The guidelines were suitably modified and brought into effect from February 2006.

5.5.1 Benefits to the Originator

(i)   The assets are shifted off the balance sheet, thus giving the originator recourse to off balance sheet funding.

(ii)   It converts illiquid assets to liquid portfolio.

(iii)   It facilitates better balance sheet management as assets are transferred off balance sheet facilitating satisfaction of capital adequacy norms.

(iv)   The originator's credit rating enhances.

For the investor securitisation opens up new investment avenues. Though the investor bears the credit risk, the securities are tied up to definite assets.

As compared to factoring or bill discounting which largely solves the problems of short term trade financing, securitisation helps to convert a stream of cash receivables into a source of long term finance.

5.6   Lease Financing

Leasing is a general contract between the owner and user of the asset over a specified period of time. The asset is purchased initially by the lessor (leasing company) and thereafter leased to the user (lessee company) which pays a specified rent at periodical intervals. Thus, leasing is an alternative to the purchase of an asset out of own or borrowed funds. Moreover, lease finance can be arranged much faster as compared to term loans from financial institutions.

5.6.1 Types of Lease Contracts: Broadly lease contracts can be divided into following two categories:

(a) Operating Lease (b) Finance Lease.

(a)   Operating Lease: A lease is classified as an operating lease if it does not secure for the lessor the recovery of capital outlay plus a return on the funds invested during the lease term. Normally, these are callable lease and are cancelable with proper notice.

The term of this type of lease is shorter than the asset's economic life. The leasee is obliged to make payment until the lease expiration, which approaches useful life of the asset.

An operating lease is particularly attractive to companies that continually update or replace equipment and want to use equipment without ownership, but also want to return equipment at lease end and avoid technological obsolescence.
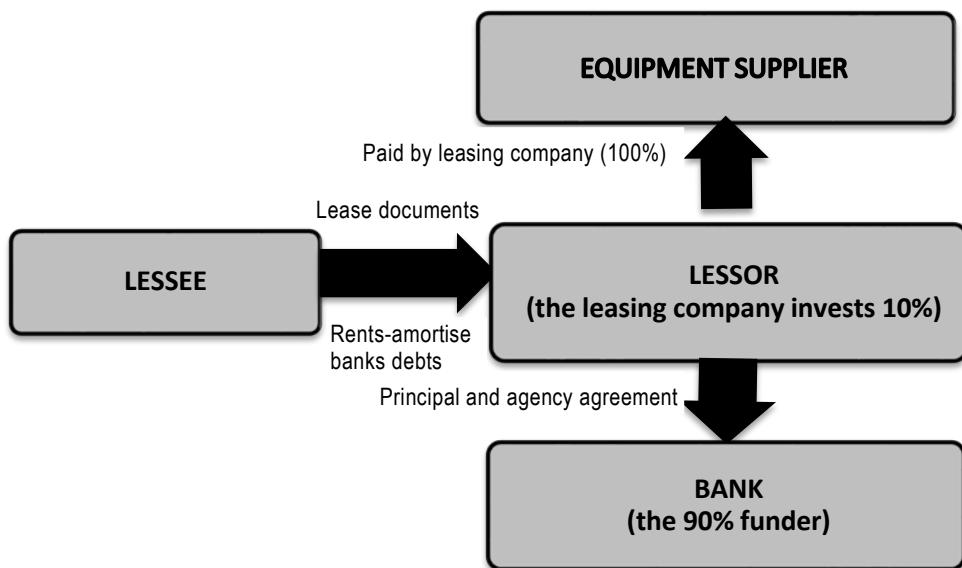
(b) Finance Lease: In contrast to an operating lease, a financial lease is longer term in nature and non-cancelable. In general term, a finance lease can be regarded as any leasing arrangement that is to finance the use of equipment for the major parts of its useful life. The lessee has the right to use the equipment while the lessor retains legal title. It is also called capital lease, at it is nothing but a loan in disguise.

Thus it can be said, a contract involving payments over an obligatory period of specified sums sufficient in total to amortise the capital outlay of the lessor and give some profit.

Comparison between Financial Lease and Operating Lease

	Finance Lease	Operating Lease
1.	The risk and reward incident to ownership are passed on to the lessee. The lessor only remains the legal owner of the asset.	The lessee is only provided the use of the asset for a certain time. Risk incident to ownership belong wholly to the lessor.
2.	The lessee bears the risk of obsolescence.	The lessor bears the risk of obsolescence.
3.	The lessor is interested in his rentals and not in the asset. He must get his principal back along with interest. Therefore, the lease is non-cancellable by either party.	As the lessor does not have difficulty in leasing the same asset to other willing lessor, the lease is kept cancelable by the lessor.
4.	The lessor enters into the transaction only as financier. He does not bear the cost of repairs, maintenance or operations.	Usually, the lessor bears cost of repairs, maintenance or operations.

5.	The lease is usually full payout, that is, the single lease repays the cost of the asset together with the interest.	The lease is usually non-payout, since the lessor expects to lease the same asset over and over again to several users.

5.6.2 Other Types of Leases

(a) Sales and Lease Back : Under this type of lease, the owner of an asset sells the asset to a party (the buyer), who in turn leases back the same asset to the owner in consideration of a lease rentals. Under this arrangement, the asset is not physically exchanged but it all happen in records only. The main advantage of this method is that the lessee can satisfy himself completely regarding the quality of an asset and after possession of the asset convert the sale into a lease agreement.

Under this transaction, the seller assumes the role of lessee and the buyer assumes the role of a lessor. The seller gets the agreed selling price and the buyer gets the lease rentals.

(b) Leveraged Lease : Under this lease, a third party is involved beside lessor and lessee. The lessor borrows a part of the purchase cost (say 80%) of the asset from the third party i.e., lender and asset so purchased is held as security against the loan. The lender is paid off from the lease rentals directly by the lessee and the surplus after meeting the claims of the lender goes to the lessor. The lessor is entitled to claim depreciation allowance.

(c) Sales-aid Lease : Under this lease contract, the lessor enters into a tie up with a manufacturer for marketing the latter's product through his own leasing operations, it is called a sales-aid lease. In consideration of the aid in sales, the manufacturers may grant either credit or a commission to the lessor. Thus, the lessor earns from both sources i.e. from lessee as well as the manufacturer.

(d) Close-ended and Open-ended Leases : In the close-ended lease, the assets get transferred to the lessor at the end of lease, the risk of obsolescence, residual value etc., remain with the lessor being the legal owner of the asset. In the open-ended lease, the lessee has the option of purchasing the asset at the end of the lease period.

In recent years, leasing has become a popular source of financing in India. From the lessee's point of view, leasing has the attraction of eliminating immediate cash outflow, and the lease rentals can be deducted for computing the total income under the Income tax Act. As against this, buying has the advantages of depreciation allowance (including additional depreciation) and interest on borrowed capital being tax-deductible. Thus, an evaluation of the two alternatives is to be made in order to take a decision. Practical problems for lease financing are covered at Final level in paper of Strategic Financial Management.

5.7   Short term Sources of Finance

There are various sources available to meet short- term needs of finance. The different sources are discussed below:

5.7.1 Trade Credit: It represents credit granted by suppliers of goods, etc., as an incident of

sale. The usual duration of such credit is 15 to 90 days. It generates automatically in the course of business and is common to almost all business operations. It can be in the form of an 'open account' or 'bills payable'.

Trade credit is preferred as a source of finance because it is without any explicit cost and till a business is a going concern it keeps on rotating. Another very important characteristic of trade credit is that it enhances automatically with the increase in the volume of business.

5.7.2. Accrued Expenses and Deferred Income: Accrued expenses represent liabilities which a company has to pay for the services which it has already received like wages, taxes, interest and dividends. Such expenses arise out of the day-to-day activities of the company and hence represent a spontaneous source of finance.

Deferred income, on the other hand, reflects the amount of funds received by a company in lieu of goods and services to be provided in the future. Since these receipts increase a company's liquidity, they are also considered to be an important source of spontaneous finance.

5.7.3 Advances from Customers: Manufacturers and contractors engaged in producing or constructing costly goods involving considerable length of manufacturing or construction time usually demand advance money from their customers at the time of accepting their orders for executing their contracts or supplying the goods. This is a cost free source of finance and really useful.

5.7.4 Commercial Paper: A Commercial Paper is an unsecured money market instrument issued in the form of a promissory note. The Reserve Bank of India introduced the commercial paper scheme in the year 1989 with a view to enabling highly rated corporate borrowers to diversify their sources of short-term borrowings and to provide an additional instrument to investors. Subsequently, in addition to the Corporate, Primary Dealers and All India Financial Institutions have also been allowed to issue Commercial Papers. Commercial papers are issued in denominations of ₹ 5 lakhs or multiples thereof and the interest rate is generally linked to the yield on the one-year government bond.

All eligible issuers are required to get the credit rating from Credit Rating Information Services of India Ltd,(CRISIL), or the Investment Information and Credit Rating Agency of India Ltd (ICRA) or the Credit Analysis and Research Ltd (CARE) or the FITCH Ratings India Pvt Ltd or any such other credit rating agency as is specified by the Reserve Bank of India .

5.7.5 Bank Advances: Banks receive deposits from public for different periods at varying rates of interest. These funds are invested and lent in such a manner that when required, they may be called back. Lending results in gross revenues out of which costs, such as interest on deposits, administrative costs, etc., are met and a reasonable profit is made. A bank's lending policy is not merely profit motivated but has to also keep in mind the socio- economic development of the country.

Some of the facilities provided by banks are:-

(i)   Short Term Loans: In a loan account, the entire advance is disbursed at one time either in cash or by transfer to the current account of the borrower. It is a single advance and

given against securities like shares, government securities, life insurance policies and fixed deposit receipts, etc. Except by way of interest and other charges no further adjustments are made in this account. Repayment under the loan account may be the full amount or by way of schedule of repayments agreed upon as in case of term loans.

(ii) ***Overdraft:*** Under this facility, customers are allowed to withdraw in excess of credit balance standing in their Current Account. A fixed limit is, therefore, granted to the borrower within which the borrower is allowed to overdraw his account. Though overdrafts are repayable on demand, they generally continue for long periods by annual renewals of the limits. This is a convenient arrangement for the borrower as he is in a position to avail of the limit sanctioned, according to his requirements. Interest is charged on daily balances.

Since these accounts are operative like cash credit and current accounts, cheque books are provided.

(iii) ***Clean Overdrafts:*** Request for clean advances are entertained only from parties which are financially sound and reputed for their integrity. The bank has to rely upon the personal security of the borrowers. Therefore, while entertaining proposals for clean advances; banks exercise a good deal of restraint since they have no backing of any tangible security. If the parties are already enjoying secured advance facilities, this may be a point in favour and may be taken into account while screening such proposals. The turnover in the account, satisfactory dealings for considerable period and reputation in the market are some of the factors which the bank will normally see. As a safeguard, banks take guarantees from other persons who are credit worthy before granting this facility. A clean advance is generally granted for a short period and must not be continued for long.

(iv) ***Cash Credits:*** Cash Credit is an arrangement under which a customer is allowed an advance up to certain limit against credit granted by bank. Under this arrangement, a customer need not borrow the entire amount of advance at one time; he can only draw to the extent of his requirements and deposit his surplus funds in his account. Interest is not charged on the full amount of the advance but on the amount actually availed of by him.

Generally cash credit limits are sanctioned against the security of tradable goods by way of pledge or hypothecation. Though these accounts are repayable on demand, banks usually do not recall such advances, unless they are compelled to do so by adverse factors. Hypothecation is an equitable charge on movable goods for an amount of debt where neither possession nor ownership is passed on to the creditor. In case of pledge, the borrower delivers the goods to the creditor as security for repayment of debt. Since the banker, as creditor, is in possession of the goods, it is fully secured and in case of emergency it can fall back on the goods for realisation of its advance under proper notice to the borrower.

(v) ***Advances against goods:*** Advances against goods occupy an important place in total bank credit. Goods are security have certain distinct advantages. They provide a reliable source of repayment. Advances against them are safe and liquid. Also, there is a quick turnover in goods, as they are in constant demand. So a banker accepts them as security.

Generally goods are charged to the bank either by way of pledge or by way of hypothecation. The term 'goods' includes all forms of movables which are offered to the bank as security. They may be agricultural commodities or industrial raw materials or partly finished goods.

The Reserve Bank of India issues directives from time to time imposing restrictions on advances against certain commodities. It is obligatory on banks to follow these directives in letter and spirit. The directives also sometimes stipulate changes in the margin.

(vi) *Bills Purchased/Discounted:* These advances are allowed against the security of bills which may be clean or documentary. Bills are sometimes purchased from approved customers in whose favour limits are sanctioned. Before granting a limit the banker satisfies himself as to the credit worthiness of the drawer. Although the term 'bills purchased' gives the impression that the bank becomes the owner or purchaser of such bills, in actual practice the bank holds the bills only as security for the advance. The bank, in addition to the rights against the parties liable on the bills, can also exercise a pledge's rights over the goods covered by the documents.

Usance bills maturing at a future date or sight are discounted by the banks for approved parties. When a bill is discounted, the borrower is paid the present worth. The bankers, however, collect the full amounts on maturity. The difference between these two amounts represents earnings of the bankers for the period. This item of income is called *'discount'.*

Sometimes, overdraft or cash credit limits are allowed against the security of bills. A suitable margin is usually maintained. Here the bill is not a primary security but only a collateral security. The banker in the case, does not become a party to the bill, but merely collects it as an agent for its customer.

When a banker purchases or discounts a bill, he advances against the bill; he has therefore to be very cautious and grant such facilities only to those customers who are creditworthy and have established a steady relationship with the bank. Credit reports are also compiled on the drawees.

(vii) *Advance against documents of title to goods:* A document becomes a document of title to goods when its possession is recognised by law or business custom as possession of the goods. These documents include a bill of lading, dock warehouse keeper's certificate, railway receipt, etc. A person in possession of a document to goods can by endorsement or delivery (or both) of document, enable another person to take delivery of the goods in his right. An advance against the pledge of such documents is equivalent to an advance against the pledge of goods themselves.

(viii) *Advance against supply of bills:* Advances against bills for supply of goods to government or semi-government departments against firm orders after acceptance of tender fall under this category. The other type of bills which also come under this category are bills from contractors for work executed either wholly or partially under firm contracts entered into with the above mentioned Government agencies.

These bills are clean bills without being accompanied by any document of title of goods. But they evidence supply of goods directly to Governmental agencies. Sometimes these bills may be accompanied by inspection notes from representatives of government agencies for having inspected the goods before they are dispatched. If bills are without the inspection report, banks like to examine them with the accepted tender or contract for verifying that the goods supplied under the bills strictly conform to the terms and conditions in the acceptance tender.

These supply bills represent debt in favour of suppliers/contractors, for the goods supplied to the government bodies or work executed under contract from the Government bodies. It is this debt that is assigned to the bank by endorsement of supply bills and executing irrevocable power of attorney in favour of the banks for receiving the amount of supply bills from the Government departments. The power of attorney has got to be registered with the Government department concerned. The banks also take separate letter from the suppliers / contractors instructing the Government body to pay the amount of bills direct to the bank.

Supply bills do not enjoy the legal status of negotiable instruments because they are not bills of exchange. The security available to a banker is by way of assignment of debts represented by the supply bills.

5.7.6 Financing of Export Trade by Banks: Exports play an important role in accelerating the economic growth of developing countries like India. Of the several factors influencing export growth, credit is a very important factor which enables exporters in efficiently executing their export orders. The commercial banks provide short-term export finance mainly by way of pre and post-shipment credit. Export finance is granted in Rupees as well as in foreign currency.

In view of the importance of export credit in maintaining the pace of export growth, RBI has initiated several measures in the recent years to ensure timely and hassle free flow of credit to the export sector. These measures, inter alia, include rationalization and liberalization of export credit interest rates, flexibility in repayment/prepayment of pre-shipment credit, special financial package for large value exporters, export finance for agricultural exports, Gold Card Scheme for exporters etc. Further, banks have been granted freedom by RBI to source funds from abroad without any limit for exclusively for the purpose of granting export credit in foreign currency, which has enabled banks to increase their lending's under export credit in foreign currency substantially during the last few years.

The advances by commercial banks for export financing are in the form of:

(i)   Pre-shipment finance i.e., before shipment of goods.

(ii) Post-shipment finance i.e., after shipment of goods.

5.7.6.1 Pre-Shipment Finance: This generally takes the form of packing credit facility; packing credit is an advance extended by banks to an exporter for the purpose of buying, manufacturing, processing, packing, shipping goods to overseas buyers. Any exporter, having at hand a firm export order placed with him by his foreign buyer or an irrevocable letter of credit opened in his

favour, can approach a bank for availing of packing credit. An advance so taken by an exporter is required to be liquidated within 180 days from the date of its commencement by negotiation of export bills or receipt of export proceeds in an approved manner. Thus packing credit is essentially a short-term advance.

Normally, banks insist upon their customers to lodge with them irrevocable letters of credit opened in favour of the customers by the overseas buyers. The letter of credit and firm sale contracts not only serve as evidence of a definite arrangement for realisation of the export proceeds but also indicate the amount of finance required by the exporter. Packing credit, in the case of customers of long standing, may also be granted against firm contracts entered into by them with overseas buyers.

Types of Packing Credit

(a) *Clean packing credit:* This is an advance made available to an exporter only on production of a firm export order or a letter of credit without exercising any charge or control over raw material or finished goods. It is a clean type of export advance. Each proposal is weighed according to particular requirements of the trade and credit worthiness of the exporter. A suitable margin has to be maintained. Also, Export Credit Guarantee Corporation (ECGC) cover should be obtained by the bank.

(b) *Packing credit against hypothecation of goods:* Export finance is made available on certain terms and conditions where the exporter has pledge able interest and the goods are hypothecated to the bank as security with stipulated margin. At the time of utilising the advance, the exporter is required to submit, along with the firm export order or letter of credit relative stock statements and thereafter continue submitting them every fortnight and/or whenever there is any movement in stocks.

(c) *Packing credit against pledge of goods:* Export finance is made available on certain terms and conditions where the exportable finished goods are pledged to the banks with approved clearing agents who will ship the same from time to time as required by the exporter. The possession of the goods so pledged lies with the bank and is kept under its lock and key.

(d) *E.C.G.C. guarantee:* Any loan given to an exporter for the manufacture, processing, purchasing, or packing of goods meant for export against a firm order qualifies for the packing credit guarantee issued by Export Credit Guarantee Corporation.

(e) *Forward exchange contract:* Another requirement of packing credit facility is that if the export bill is to be drawn in a foreign currency, the exporter should enter into a forward exchange contact with the bank, thereby avoiding risk involved in a possible change in the rate of exchange.

5.7.6.2 Post-shipment Finance: It takes the following forms:

(a) *Purchase/discounting of documentary export bills:* Finance is provided to exporters by purchasing export bills drawn payable at sight or by discounting usance export bills covering confirmed sales and backed by documents including documents of the title of goods such as bill of

lading, post parcel receipts, or air consignment notes.

(b)   *E.C.G.C. Guarantee:* Post-shipment finance, given to an exporter by a bank through purchase, negotiation or discount of an export bill against an order, qualifies for post-shipment export credit guarantee. It is necessary, however, that exporters should obtain a shipment or contracts risk policy of E.C.G.C. Banks insist on the exporters to take a contracts shipments (comprehensive risks) policy covering both political and commercial risks. The Corporation, on acceptance of the policy, will fix credit limits for individual exporters and the Corporation's liability will be limited to the extent of the limit so fixed for the exporter concerned irrespective of the amount of the policy.

(c)   *Advance against export bills sent for collection:* Finance is provided by banks to exporters by way of advance against export bills forwarded through them for collection, taking into account the creditworthiness of the party, nature of goods exported, usance, standing of drawee, etc. appropriate margin is kept.

(d)   *Advance against duty draw backs, cash subsidy, etc.:* To finance export losses sustained by exporters, bank advance against duty draw-back, cash subsidy, etc., receivable by them against export performance. Such advances are of clean nature; hence necessary precaution should be exercised.

Bank providing finance in this manner see that the relative export bills are either negotiated or forwarded for collection through it so that it is in a position to verify the exporter's claims for duty draw-backs, cash subsidy, etc. 'An advance so availed of by an exporter is required to be liquidated within 180 days from the date of shipment of relative goods.

Other facilities extended to exporters:

(i)   On behalf of approved exporters, banks establish letters of credit on their overseas or up country suppliers.

(ii)   Guarantees for waiver of excise duty, etc. due performance of contracts, bond in lieu of cash security deposit, guarantees for advance payments etc., are also issued by banks to approved clients.

(iii)   To approved clients undertaking exports on deferred payment terms, banks also pro- vide finance.

(iv)   Banks also endeavour to secure for their exporter-customers status reports of their buyers and trade information on various commodities through their correspondents.

(v)   Economic intelligence on various countries is also provided by banks to their ex- porter clients.

5.7.7 Inter Corporate Deposits: The companies can borrow funds for a short period say 6 months from other companies which have surplus liquidity. The rate of interest on inter corporate deposits varies depending upon the amount involved and time period.

5.7.8 Certificate of Deposit (CD): The certificate of deposit is a document of title similar to a time deposit receipt issued by a bank except that there is no prescribed interest rate on such funds.

The main advantage of CD is that banker is not required to encash the deposit before maturity

period and the investor is assured of liquidity because he can sell the CD in secondary market.

5.7.9 Public Deposits: Public deposits are very important source of short-term and medium term finances particularly due to credit squeeze by the Reserve Bank of India. A company can accept public deposits subject to the stipulations of Reserve Bank of India from time to time maximum up to 35 per cent of its paid up capital and reserves, from the public and shareholders. These deposits may be accepted for a period of six months to three years. Public deposits are unsecured loans; they should not be used for acquiring fixed assets since they are to be repaid within a period of 3 years. These are mainly used to finance working capital requirements.

5.8.   Other Sources of Financing

5.8.1 Seed Capital Assistance: The Seed capital assistance scheme is designed by IDBI for professionally or technically qualified entrepreneurs and/or persons possessing relevant experience, skills and entrepreneurial traits but lack adequate financial resources. All the projects eligible for financial assistance from IDBI, directly or indirectly through refinance are eligible under the scheme.

The Seed Capital Assistance is interest free but carries a service charge of one per cent per annum for the first five years and at increasing rate thereafter. However, IDBI will have the option to charge interest at such rate as may be determined by IDBI on the loan if the financial position and profitability of the company so permits during the currency of the loan. The repayment schedule is fixed depending upon the repaying capacity of the unit with an initial moratorium upto five years.

The project cost should not exceed ₹ 2 crores and the maximum assistance under the project will be restricted to 50 percent of the required promoter's contribution or ₹ 15 lacs, whichever is lower.

5.8.2 Internal Cash Accruals: Existing profit making companies which undertake an expansion/ diversification programme may be permitted to invest a part of their accumulated reserves or cash profits for creation of capital assets. In such cases, past performance of the company permits the capital expenditure from within the company by way of disinvestment of working/invested funds. In other words, the surplus generated from operations, after meeting all the contractual, statutory and working requirement of funds, is available for further capital expenditure.

5.8.3 Unsecured Loans: Unsecured loans are typically provided by promoters to meet the promoters' contribution norm. These loans are subordinate to institutional loans. The rate of interest chargeable on these loans should be less than or equal to the rate of interest on institutional loans and interest can be paid only after payment of institutional dues. These loans cannot be repaid without the prior approval of financial institutions. Unsecured loans are considered as part of the equity for the purpose of calculating of debt equity ratio.

5.8.4 Deferred Payment Guarantee: Many a time suppliers of machinery provide deferred credit facility under which payment for the purchase of machinery can be made over a period of

time. The entire cost of the machinery is financed and the company is not required to contribute any amount initially towards acquisition of the machinery. Normally, the supplier of machinery insists that bank guarantee should be furnished by the buyer. Such a facility does not have a moratorium period for repayment. Hence, it is advisable only for an existing profit making company.

5.8.5 Capital Incentives: The backward area development incentives available often determine the location of a new industrial unit. These incentives usually consist of a lump sum subsidy and exemption from or deferment of sales tax and octroi duty. The quantum of incentives is determined by the degree of backwardness of the location.

The special capital incentive in the form of a lump sum subsidy is a quantum sanctioned by the implementing agency as a percentage of the fixed capital investment subject to an overall ceiling. This amount forms a part of the long-term means of finance for the project. However, it may be mentioned that the viability of the project must not be dependent on the quantum and availability of incentives. Institutions, while appraising the project, assess the viability of the project per se, without considering the impact of incentives on the cash flows and profitability of the project.

Special capital incentives are sanctioned and released to the units only after they have complied with the requirements of the relevant scheme. The requirements may be classified into initial effective steps and final effective steps.

5.8.6 Deep Discount Bonds: Deep Discount Bonds is a form of zero-interest bonds. These bonds are sold at a discounted value and on maturity face value is paid to the investors. In such bonds, there is no interest payout during lock in period.

IDBI was the first to issue a deep discount bond in India in January, 1992. The bond of a face value of ₹ 1 lakh was sold for ₹ 2,700 with a maturity period of 25 years. The investor could hold the bond for 25 years or seek redemption at the end of every five years with a specified maturity value as shown below:

Holding Period (years)	5	10	15	20	25
Maturity value (₹)	5,700	12,000	25,000	50,000	1,00,000
Annual rate of interest (%)	16.12	16.09	15.99	15.71	15.54

The investor can sell the bonds in stock market and realise the difference between face value (₹ 2,700) and market price as capital gain.

5.8.7 Secured Premium Notes: Secured Premium Notes is issued along with a detachable warrant and is redeemable after a notified period of say 4 to 7 years. The conversion of detachable warrant into equity shares will have to be done within time period notified by the company.

5.8.8 Zero Interest Fully Convertible Debentures: These are fully convertible debentures which do not carry any interest. The debentures are compulsorily and automatically converted after a specified period of time and holders thereof are entitled to new equity shares of the

company at predetermined price. From the point of view of company this kind of instrument is beneficial in the sense that no interest is to be paid on it, if the share price of the company in the market is very high than the investors tends to get equity shares of the company at the lower rate.

5.8.9 Zero Coupon Bonds: A Zero Coupon Bonds does not carry any interest but it is sold by the issuing company at a discount. The difference between the discounted value and maturing or face value represents the interest to be earned by the investor on such bonds.

5.8.10   Double Option Bonds: These have also been recently issued by the IDBI. The face value of each bond is ₹ 5,000. The bond carries interest at 15% per annum compounded half yearly from the date of allotment. The bond has maturity period of 10 years. Each bond has two parts in the form of two separate certificates, one for principal of ₹ 5,000 and other for interest (including redemption premium) of ₹ 16,500. Both these certificates are listed on all major stock exchanges. The investor has the facility of selling either one or both parts anytime he likes.

5.8.11   Option Bonds: These are cumulative and non-cumulative bonds where interest is payable on maturity or periodically. Redemption premium is also offered to attract investors. These were recently issued by IDBI, ICICI etc.

5.8.12   Inflation Bonds: Inflation Bonds are the bonds in which interest rate is adjusted for inflation. Thus, the investor gets interest which is free from the effects of inflation. For example, if the interest rate is 11 per cent and the inflation is 5 per cent, the investor will earn 16 per cent meaning thereby that the investor is protected against inflation.

5.8.13   Floating Rate Bonds: This as the name suggests is bond where the interest rate is not fixed and is allowed to float depending upon the market conditions. This is an ideal instrument which can be resorted to by the issuer to hedge themselves against the volatility in the interest rates. This has become more popular as a money market instrument and has been successfully issued by financial institutions like IDBI, ICICI etc.

5.9   International Financing

The essence of financial management is to raise and utilise the funds raised effectively. There are various avenues for organisations to raise funds either through internal or external sources. The sources of external sources include:

5.9.1 Commercial Banks: Like domestic loans, commercial banks all over the world extend Foreign Currency (FC) loans also for international operations. These banks also provide to overdraw over and above the loan amount.

5.9.2 Development Banks: Development banks offer long & medium term loans including FC loans. Many agencies at the national level offer a number of concessions to foreign companies to invest within their country and to finance exports from their countries. E.g. EXIM Bank of USA.

5.9.3 Discounting of Trade Bills: This is used as a short term financing method. It is used widely in Europe and Asian countries to finance both domestic and international business.

5.9.4 International Agencies: A number of international agencies have emerged over the years to finance international trade & business. The more notable among them include The International Finance Corporation (IFC), The International Bank for Reconstruction and Development (IBRD), The Asian Development Bank (ADB), The International Monetary Fund (IMF), etc.

5.9.5 International Capital Markets: Today, modern organisations including MNC's depend upon sizeable borrowings in Rupees as well as Foreign Currency (FC). In order to cater to the needs of such organisations, international capital markets have sprung all over the globe such as in London.

In international capital market, the availability of FC is assured under the four main systems viz:

* Euro-currency market

* Export credit facilities

* Bonds issues

* Financial Institutions.

The origin of the Euro-currency market was with the dollar denominated bank deposits and loans in Europe particularly in London. Euro-dollar deposits are dollar denominated time deposits available at foreign branches of US banks and at some foreign banks. Banks based in Europe accept dollar denominated deposits and make dollar denominated deposits to the clients. This forms the backbone of the Euro-currency market all over the globe. In this market, funds are made available as loans through syndicated Euro-credit of instruments such as FRN's, FR certificates of deposits.

5.9.6 Financial Instruments: Some of the various financial instruments dealt with in the international market are briefly described below:

(a)   External Commercial Borrowings(ECB) : ECBs refer to commercial loans (in the form of bank loans , buyers credit, suppliers credit, securitised instruments (e.g. floating rate notes and fixed rate bonds) availed from non-resident lenders with minimum average maturity of 3 years. Borrowers can raise ECBs through internationally recognised sources like (i) international banks, (ii) international capital markets, (iii) multilateral financial institutions such as the IFC, ADB etc, (iv) export credit agencies, (v) suppliers of equipment, (vi) foreign collaborators and (vii) foreign equity holders.

External Commercial Borrowings can be accessed under two routes viz (i) Automatic route and (ii) Approval route. Under the Automatic route there is no need to take the RBI/Government approval whereas such approval is necessary under the Approval route. Company's registered under the Companies Act and NGOs engaged in micro finance activities are eligible for the Automatic Route where as Financial Institutions and Banks dealing exclusively in infrastructure or export finance and the ones which had participated

in the textile and steel sector restructuring packages as approved by the government are required to take the Approval Route.

(b) **Euro Bonds:** Euro bonds are debt instruments which are not denominated in the currency of the country in which they are issued. E.g. a Yen note floated in Germany. Such bonds are generally issued in a bearer form rather than as registered bonds and in such cases they do not contain the investor's names or the country of their origin. These bonds are an attractive proposition to investors seeking privacy.

(c) **Foreign Bonds:** These are debt instruments issued by foreign corporations or foreign governments. Such bonds are exposed to default risk, especially the corporate bonds. These bonds are denominated in the currency of the country where they are issued, however, in case these bonds are issued in a currency other than the investors home currency, they are exposed to exchange rate risks. An example of a foreign bond 'A British firm placing Dollar denominated bonds in USA'.

(d) **Fully Hedged Bonds:** As mentioned above, in foreign bonds, the risk of currency fluctuations exists. Fully hedged bonds eliminate the risk by selling in forward markets the entire stream of principal and interest payments.

(e) **Medium Term Notes:** Certain issuers need frequent financing through the Bond route including that of the Euro bond. However it may be costly and ineffective to go in for frequent issues. Instead, investors can follow the MTN programme. Under this programme, several lots of bonds can be issued, all having different features e.g. different coupon rates, different currencies etc. The timing of each lot can be decided keeping in mind the future market opportunities. The entire documentation and various regulatory approvals can be taken at one point of time

(f) **Floating Rate Notes (FRN):** These are issued up to seven years maturity. Interest rates are adjusted to reflect the prevailing exchange rates. They provide cheaper money than foreign loans.

(g) **Euro Commercial Papers (ECP):** ECPs are short term money market instruments. They are for maturities less than one year. They are usually designated in US Dollars.

(h) **Foreign Currency Option:** A FC Option is the right to buy or sell, spot, future or forward, a specified foreign currency. It provides a hedge against financial and economic risks.

(i) **Foreign Currency Futures:** FC Futures are obligations to buy or sell a specified currency in the present for settlement at a future date.

(j) **Foreign Euro Bonds:** In domestic capital markets of various countries the Bonds issues referred to above are known by different names such as Yankee Bonds in the US, Swiss Frances in Switzerland, Samurai Bonds in Tokyo and Bulldogs in UK.

(k) **Euro Convertible Bonds:** A convertible bond is a debt instrument which gives the holders of the bond an option to convert the bonds into a pre-determined number of equity shares of the company. Usually the price of the equity shares at the time of conversion will have

a premium element. These bonds carry a fixed rate of interest and if the issuer company so desires may also include a Call Option (where the issuer company has the option of calling/ buying the bonds for redemption prior to the maturity date) or a Put Option (which gives the holder the option to put/sell his bonds to the issuer company at a pre-determined date and price).

(l)   **Euro Convertible Zero Bonds:** These bonds are structured as a convertible bond. No interest is payable on the bonds. But conversion of bonds takes place on maturity at a pre-determined price. Usually there is a five years maturity period and they are treated as a deferred equity issue.

(m) **Euro Bonds with Equity Warrants:** These bonds carry a coupon rate determined by market rates. The warrants are detachable. Pure bonds are traded at a discount. Fixed Income Funds Management may like to invest for the purposes of regular income.

5.9.7 Euro Issues by Indian Companies: Indian companies are permitted to raise foreign currency resources through issue of ordinary equity shares through Global Depository Receipts(GDRs)/ American Depository Receipts (ADRs) and / or issue of Foreign Currency Convertible Bonds (FCCB) to foreign investors i.e. institutional investors or individuals (including NRIs) residing abroad. Such investment is treated as Foreign Direct Investment. The government guidelines on these issues are covered under the Foreign Currency Convertible Bonds and Ordinary Shares (through depositary receipt mechanism) Scheme, 1993 and notifications issued after the implementation of the said scheme.

(a) **American Depository Receipts (ADRs) :** These are securities offered by non-US companies who want to list on any of the US exchange. Each ADR represents a certain number of a company's regular shares. ADRs allow US investors to buy shares of these companies without the costs of investing directly in a foreign stock exchange. ADRs are issued by an approved New York bank or trust company against the deposit of the original shares. These are deposited in a custodial account in the US. Such receipts have to be issued in accordance with the provisions stipulated by the SEC USA.

ADRs can be traded either by trading existing ADRs or purchasing the shares in the issuer's home market and having new ADRs created, based upon availability and market conditions. When trading in existing ADRs, the trade is executed on the secondary market on the New York Stock Exchange (NYSE) through Depository Trust Company (DTC) without involvement from foreign brokers or custodians. The process of buying new, issued ADRs goes through US brokers, Helsinki Exchanges and DTC as well as Deutsche Bank. When transactions are made, the ADRs change hands, not the certificates. This eliminates the actual transfer of stock certificates between the US and foreign countries.

In a bid to bypass the stringent disclosure norms mandated by the SEC for equity shares, the Indian companies have however, chosen the indirect route to tap the vast American financial market through private debt placement of GDRs listed in London and Luxemberg Stock Exchanges.

The Indian companies have preferred the GDRs to ADRs because the US market exposes them to a higher level or responsibility than a European listing in the areas of disclosure, costs, liabilities and timing. The SECs regulations set up to protect the retail investor base are somewhat more stringent and onerous, even for companies already listed and held by retail investors in their home country. The most onerous aspect of a US listing for the companies is to provide full, half yearly and quarterly accounts in accordance with, or at least reconciled with US GAAPs.

(b) **Global Depository Receipts (GDRs):** These are negotiable certificate held in the bank of one country representing a specific number of shares of a stock traded on the exchange of another country. These financial instruments are used by companies to raise capital in either dollars or Euros. These are mainly traded in European countries and particularly in London.

ADRs/GDRs and the Indian Scenario: Indian companies are shedding their reluctance to tap the US markets. Infosys Technologies was the first Indian company to be listed on Nasdaq in 1999. However, the first Indian firm to issue sponsored GDR or ADR was Reliance industries Limited. Beside, these two companies there are several other Indian firms are also listed in the overseas bourses. These are Wipro, MTNL, State Bank of India, Tata Motors, Dr Reddy's Lab, Ranbaxy, Larsen & Toubro, ITC, ICICI Bank, Hindalco, HDFC Bank and Bajaj Auto.

(c) **Indian Depository Receipts (IDRs):** The concept of the depository receipt mechanism which is used to raise funds in foreign currency has been applied in the Indian Capital Market through the issue of Indian Depository Receipts (IDRs). IDRs are similar to ADRs/GDRs in the sense that foreign companies can issue IDRs to raise funds from the Indian Capital Market in the same lines as an Indian company uses ADRs/GDRs to raise foreign capital. The IDRs are listed and traded in India in the same way as other Indian securities are traded.

SUMMARY

➢ There are several sources of finance/funds available to any company.

➢ All the financial needs of a business may be grouped into the long term or short term financial needs.

➢ There are different sources of funds available to meet long term financial needs of the business. These sources may be broadly classified into share capital (both equity and preference) and debt.

➢ Another important source of long term finance is venture capital financing. It refers to financing of new high risky venture promoted by qualified entrepreneurs who lack experience and funds to give shape to their ideas.

➢ Securitisation is another important source of finance and it is a process in which illiquid assets are pooled into marketable securities that can be sold to investors.

> ➢ Leasing is a very popular source to finance equipments. It is a contract between the owner and user of the asset over a specified period of time in which the asset is purchased initially by the lessor (leasing company) and thereafter leased to the user (lessee company) who pays a specified rent at periodical intervals.
>
> ➢ Some of the short terms sources of funding are Trade Credit, Advances from Customers, Commercial Paper, and Bank Advances etc.
>
> ➢ To support export, the commercial banks provide short term export finance mainly by way of pre and post-shipment credit.
>
> ➢ Every day new creative financial products keep on entering the market. Some of the examples are Seed Capital Assistance, Deep Discount Bonds, Option Bonds, Inflation Bonds etc.
>
> ➢ Today the businesses are allowed to source funds from International Market also. Some of important products are External Commercial Borrowings (ECB), Euro Bonds, American Depository Deposits (ADR) etc.

6

Investment Decisions

Learning Objectives

After studying this chapter you will be able to:

- Define "capital budgeting" and explain the purpose and process of Capital Budgeting for any business.

- Explain the importance of cash flows in capital budgeting decisions and try to explain the basic principles for measuring the same.

- Evaluate investment projects using various capital budgeting techniques like PB (Pay Back), NPV (Net Present Value), PI (Profitability Index), IRR (Internal Rate of Return), MIRR (Modified Internal Rate of Return) and ARR (Accounting Rate of Return).

- Understand the advantages and disadvantages of the above mentioned techniques.

Overview

In this chapter, you will study the capital budgeting decisions, which are essential, fundamental and critical business decisions of a firm. Since these decisions need huge amount of capital outlay, are surrounded by great number of uncertainties and have long-term implications, therefore, there is an underlying need for thoughtful and correct decision-making. Capital budgeting decision-making is a difficult and complicated exercise for the management. These decisions require an overall assessment of future events which are quite uncertain. The basic concept underlying these decisions is investing in assets and projects which provide a greater return as compared to the minimum acceptable rate. In this chapter you will not only study the importance of investment decisions but will also learn about the different tools and techniques which help in arriving at a sound financial decision.

6.1 Capital Budgeting Definition

Capital budgeting is the process of evaluating and selecting long-term investments that are in line with the goal of investors' wealth maximization.

When a business makes a capital investment (assets such as equipment, building, land etc.) it incurs a cash outlay in the expectation of future benefits. The expected benefits generally extend beyond one year in the future. Out of different investment proposals available to a business, it has to choose a proposal that provides the best return and the return equals to, or greater than, that required by the investors.

In simple terms, Capital Budgeting involves:-

➢   Evaluating investment project proposals that are strategic to business overall objectives;

➢   Estimating and evaluating post-tax incremental cash flows for each of the investment proposals; and

➢   Selection an investment proposal that maximizes the return to the investors.

However, Capital Budgeting excludes certain investment decisions, wherein, the benefits of investment proposals cannot be directly quantified. For example, management may be considering a proposal to build a recreation room for employees. The decision in this case will be based on qualitative factors, such as management – employee relations, with less consideration on direct financial returns.

However, most investment proposals considered by management will require quantitative estimates of the benefits to be derived from accepting the project. A bad decision can be detrimental to the value of the organisation over a long period of time.

6.2   Purpose of Capital Budgeting

The capital budgeting decisions are important, crucial and critical business decisions due to following reasons:

(i)   **Substantial expenditure:** Capital budgeting decisions involves the investment of substantial amount of funds. It is therefore necessary for a firm to make such decisions after a thoughtful consideration so as to result in the profitable use of its scarce resources.

   The hasty and incorrect decisions would not only result into huge losses but may also account for the failure of the firm.

(ii)   **Long time period:** The capital budgeting decision has its effect over a long period of time. These decisions not only affect the future benefits and costs of the firm but also influence the rate and direction of growth of the firm.

(iii) **Irreversibility:** Most of the investment decisions are irreversible. Once they are taken, the firm may not be in a position to reverse them back. This is because, as it is difficult to find a buyer for the second-hand capital items.

(iv)   **Complex decision:** The capital investment decision involves an assessment of future events, which in fact is difficult to predict. Further it is quite difficult to estimate in quantitative terms all the benefits or the costs relating to a particular investment decision.

6.3   Capital Budgeting Process

The extent to which the capital budgeting process needs to be formalised and systematic procedures established depends on the size of the organisation; number of projects to be considered; direct financial benefit of each project considered by itself; the composition of the firm's existing assets and management's desire to change that composition; timing of expenditures associated with the projects that are finally accepted.

(i)   **Planning:** The capital budgeting process begins with the identification of potential investment opportunities. The opportunity then enters the planning phase when the potential effect on the firm's fortunes is assessed and the ability of the management of the firm to exploit the opportunity is determined. Opportunities having little merit are rejected and promising opportunities are advanced in the form of a proposal to enter the evaluation phase.

(ii)   **Evaluation:** This phase involves the determination of proposal and its investments, inflows and outflows. Investment appraisal techniques, ranging from the simple payback method and accounting rate of return to the more sophisticated discounted cash flow techniques, are used to appraise the proposals. The technique selected should be the one that enables the manager to make the best decision in the light of prevailing circumstances.

(iii)   **Selection:** Considering the returns and risks associated with the individual projects as well as the cost of capital to the organisation, the organisation will choose among projects so as to maximise shareholders' wealth.

(iv)   **Implementation:**When the final selection has been made, the firm must acquire the necessary funds, purchase the assets, and begin the implementation of the project.

(v)   **Control:** The progress of the project is monitored with the aid of feedback reports. These reports will include capital expenditure progress reports, performance reports comparing actual performance against plans set and post completion audits.

(vi)   **Review:** When a project terminates, or even before, the organisation should review the entire project to explain its success or failure. This phase may have implication for firms planning and evaluation procedures. Further, the review may produce ideas for new proposals to be undertaken in the future.

6.4   Types of Capital Investment Decisions

There are many ways to classify the capital budgeting decision. Generally capital investment decisions are classified in two ways. One way is to classify them on the basis of firm's existence. Another way is to classify them on the basis of decision situation.

6.4.1 On the basis of firm's existence: The capital budgeting decisions are taken by both newly incorporated firms as well as by existing firms. The new firms may be required to take decision in respect of selection of a plant to be installed. The existing firm may be

required to take decisions to meet the requirement of new environment or to face the challenges of competition. These decisions may be classified as follows:

(*i*)   **Replacement and Modernisation decisions:** The replacement and modernisation decisions aim at to improve operating efficiency and to reduce cost. Generally all types of plant and machinery require replacement either because of the economic life of the plant or machinery is over or because it has become technologically outdated. The former decision is known as replacement decisions and latter is known as modernisation decisions. Both replacement and modernisation decisions are called *cost reduction decisions.*

(*ii*) **Expansion decisions:** Existing successful firms may experience growth in demand of their product line. If such firms experience shortage or delay in the delivery of their products due to inadequate production facilities, they may consider proposal to add capacity to existing product line.

(*iii*) **Diversification decisions:** These decisions require evaluation of proposals to diversify into new product lines, new markets etc. for reducing the risk of failure by dealing in different products or by operating in several markets.

Both expansion and diversification decisions are called *revenue expansion decisions.*

6.4.2 On the basis of decision situation: The capital budgeting decisions on the basis of decision situation are classified as follows:

(*i*)   **Mutually exclusive decisions:** The decisions are said to be mutually exclusive if two or more alternative proposals are such that the acceptance of one proposal will exclude the acceptance of the other alternative proposals. For instance, a firm may be considering proposal to install a semi-automatic or highly automatic machine. If the firm installs a semi-automatic machine it excludes the acceptance of proposal to install highly automatic machine.

(*ii*) **Accept-reject decisions:** The accept-reject decisions occur when proposals are independent and do not compete with each other. The firm may accept or reject a proposal on the basis of a minimum return on the required investment. All those proposals which give a higher return than certain desired rate of return are accepted and the rest are rejected.

(*iii*) **Contingent decisions:** The contingent decisions are dependable proposals. The investment in one proposal requires investment in one or more other proposals. For example, if a company accepts a proposal to set up a factory in remote area it may have to invest in infrastructure also e.g. building of roads, houses for employees etc.

6.5   Project Cash Flows

Capital Budgeting analysis considers only incremental cash flows from an investment likely to result due to acceptance of any project. Therefore, one of the most important tasks in capital budgeting is estimating future cash flows for a project. Though among various techniques one

technique (Accounting Rate of Return, discussed in detail later on) is based on profit. Since timing of cash flow may not match with period of profit normally firms may be more interested in cash flows. For example Profit and Loss Account may show a sale of ₹ 100 crore, but actual cash receipt may be lesser. Similarly, for purchase full payment may not have been made by the company. Further, depreciation is a non-cash item as its outflow of cash takes place in the beginning at the time of purchase of machinery and at the end as scrap sale. Thus, due this time difference it is better to eliminate decision on the basis of cash flows rather profit. The final decision we make at the end of the capital budgeting process is no better than the accuracy of our cashflow estimates.

The estimation of costs and benefits are made with the help of inputs provided by marketing, production, engineering, costing, purchase, taxation, and other departments.

The project cash flow stream consists of cash outflows and cash inflows. The costs are denoted as cash outflows whereas the benefits are denoted as cash inflows.

An investment decision implies the choice of an objective, an appraisal technique and the project's life. The objective and technique must be related to definite period of time. The life of the project may be determined by taking into consideration the following factors:

(i)   Technological obsolescence;

(ii)   Physical deterioration; and

(iii) A decline in demand for the output of the project.

No matter how good a company's maintenance policy, its technological forecasting ability or its demand forecasting ability, uncertainty will always be present because of the difficulty in predicting the duration of a project life.

Calculating Cash Flows: Before, we analyze how cash flow is computed in capital budgeting decision following items needs consideration:

(a) Depreciation: As mentioned earlier depreciation is a non-cash item and itself does not affect the cash flow. However, we must consider tax shield or benefit from depreciation in our analysis. Since this benefit reduces cash outflow for taxes it is considered as cash inflow. To understand how depreciation acts as tax shield let us consider following example:

Example

X Ltd. is manufacturing electronic motors fitted in the desert coolers. Its annual turnover is ₹ 30 crore and cash expenses to generate this sale are₹ 25 crore. Suppose if applicable tax rate is 30% and depreciation is ₹ 1.50 crore p.a., then let us see how depreciation shall act as tax shield from the following table showing cash flow under two scenarios one with depreciation and another without depreciation.

	No Depreciation is Charged (₹ Crore)	Depreciation is Charged (₹ Crore)
Total Sales	30.00	30.00
Less: Cost of Goods Sold	25.00	25.00
	5.00	5.00
Less: Depreciation	-	1.50
Profit before tax	5.00	3.50
Tax @ 30%	1.50	1.05
Profit after Tax	3.50	2.45
Add: Depreciation*	-	1.50
Cash Flow	3.50	3.95

* Being a non cash expenditure depreciation has been added back while calculating the cash flow.

(b) Opportunity Cost: Sometimes, managers of a project may overlook some of the cost of the project which are not paid in cash directly i.e. opportunity cost.

This opportunity cost can occur both at the time of initial outlay or during the tenure of the project. For example if a company owns a piece of land acquired 10 years ago for ₹ 1 crore at that time and today it can be sold for ₹ 10 crore. If company uses this piece of land for a project then its sale value i.e. ₹ 10 crore forms the part of initial outlay. The cost of acquisition 10 years ago shall be irrelevant for decision making.

Similarly, alternative cash inflow foregone due to acceptance of any project should be considered as opportunity cost and should be included in our analysis.

(c) Sunk Cost: Another potential problem relates to sunk cost. Sunk cost is an outlay that has already incurred and hence should be excluded from capital budgeting analysis. For example, if a company has paid a sum of ₹ 1,00,000 for consultancy charges to a firm for the preparation of a Project Report for analysis to decide whether to take a particular project or not is irrelevant for analysis as sum has already been paid and shall not affect our decision whether project should be undertaken or not.

(d) Working Capital: Every big project requires working capital because, for every business investment in working capital is must. Therefore, while evaluating the projects initial working capital requirement should be treated as cash outflow and at the end of the project its release should be treated as cash inflow. It is important to note that no depreciation is provided on working capital though it might be possible that at the time of its release its value might have been reduced. Further there may be

also a possibility that additional working capital may be required during the life of the project. In such cases the additional working capital required is treated as cash outflow at that period of time. Similarly, any reduction in working capital shall be treated as cash inflow. It may be noted that if noting has been specifically mentioned for the release of working capital it is assumed that full amount has been realized at the end of the project. However, adjustment on account of increase or decrease in working capital needs to be incorporated.

(e) Allocated Overheads: As discussed in subject of Cost Accounting allocated overheads are charged on the basis of some rational basis such as machine hour, labour hour, direct material consumption etc. Since, expenditures already incurred are allocated to new proposal; they should not be considered as cash flows. However, it is expected that overhead cost shall be increased due to acceptance of any proposal then incremental overhead cost shall be treated as cash outflow.

(f)   Additional Capital Investment: It is not necessary that capital investment shall be required in the beginning of the project. It can also be required during the continuance of the project. In such cases it shall be treated as cash outflows.

Categories of Cash Flows: It is helpful to place project cash flows into three categories:-

(a)   Initial Cash Outflow: The initial cash out flow for a project depends upon the type of capital investment decision as follows:-

(i)   If decision is related to investment in a fresh proposal or an expansion decision then initial cash outflow shall be calculated as follows:

   Cost of New Asset(s)

   +   Installation/Set-Up Costs

   +   Investment in Working Capital

   =   Initial Cash Outflow

(ii)   If decision is related to replacement decision then initial cash outflow shall be calculated as follows:

         Cost of New Asset(s)

   +   Installation/Set-Up Costs

   + (-) Increase (Decrease) in Net Working Capital Level

   -      Net Proceeds from sale of Old Asset *(If it is a replacement situation)*

   +(-) Taxes (tax saving/ loss) due to sale of Old Asset *(If it is a replacement situation)*

   =   Initial Cash Outflow

(b)   Interim Cash Flows: After making the initial cash outflow that is necessary to begin implementing a project, the firm hopes to get benefit from the future cash inflows generated by

the project. As mentioned earlier calculation of cash flows depends on the fact whether analysis is related to fresh project or modernization of existing facilities or replacement of existing machined decision.

(i)   New Project: If analysis is related to a fresh or completely a new project then interim cash flow is calculated as follows:-

Profit after Tax (PAT)

(+)   Non-Cash Expenses (e.g. Depreciation)

<u>- (+) Net increase (decrease) in Working Capital</u>

=   Interim net cash flow for the period

(ii)   Similarly interim cash flow in case of replacement decision shall be calculated as follows:

Net increase (decrease) in Operating Revenue

<u>- (+) Net increase (decrease) in Operating Expenses</u>

=   Net change in income before taxes

<u>- (+) Net increase (decrease) in taxes</u>

=   Net change in income after taxes

<u>+(-) Net increase (decrease) in depreciation charges</u>

=   Incremental net cash flow for the period

(c)   Terminal-Year Incremental Net Cash Flow: We now pay attention to the Net Cash Flow in the terminal year of the project. For the purpose of Terminal Year we will first calculate the incremental net cash flow for the period as calculated in point (b) above and further to it we will make adjustments in order to arrive at Terminal-Year Incremental Net Cash flow as follows:-

Final salvage value (disposal costs) of asset

 (+) Interim Cash Flow

- (+) Taxes (tax saving) due to sale or disposal of asset (Including Depreciation)

<u>(+) Release of Net Working Capital</u>

=   Terminal Year incremental net cash flow

6.6   Basic Principles for Measuring Project Cash Flows

For developing the project cash flows the following principles must be kept in mind:

6.6.1 Block of Assets and Depreciation: From above discussion it is clear that tax shield/ benefit from depreciation is considered while calculating cash flows from the project. However, in India taxable income is calculated as per the provisions of Income Tax Act 1961. The treatment of deprecation is based on the concept of "Block of Assets", which means a

group of assets falling within a particular class of assets. This class of assets can be building, machinery, furniture etc. in respect of which depreciation is charged at same rate. The treatment of tax depends on the fact whether block of asset consist of one asset or several assets. To understand the concept of block of asset let us discuss an example.

Example

Suppose A Ltd. acquired a new machinery for ₹ 1,00,000 depreciable at 20% as per Written Down Value (WDV) method. The machine has an expected life of 5 years with salvage value of ₹ 10,000. The treatment of Depreciation/ Short Term Capital Loss in the 5th year in two cases shall be as follows:

Depreciation for initial 4 years shall be common and WDV at the beginning of the 5th year shall be computed as follows:

	₹
Purchase Price of Machinery	1,00,000
Less: Depreciation @20% for year 1	20,000
WDV at the end of year 1	80,000
Less: Depreciation @20% for year 2	16,000
WDV at the end of year 2	64,000
Less: Depreciation @20% for year 3	12,800
WDV at the end of year 3	51,200
Less: Depreciation @20% for year 4	10,240
WDV at the end of year 4	40,960

(i)   Case 1: There is no other asset in the Block: When there is one asset in the block and block shall cease to exist at the end of 5thyear no deprecation shall be charged in this year and tax benefit/loss on Short Term Capital Loss/ Gain shall be calculated as follows:

	₹
WDV at the beginning of year 5	40,960
Less: Sale value of Machine	10,000
Short Term Capital Loss	30,960
Tax Benefit on STCL @ 30%	9,288

(ii)   Case 2: More than one asset exists in the Block: When more than one asset exists in the block and deprecation shall be charged in the terminal year (5th year) in which asset is sold. The WDV on which depreciation be charged shall be calculated by deducting sale value from the WDV in the beginning of the year.   Tax benefit on Depreciation shall be calculated as follows:

	₹
WDV at the beginning of year 5	40,960
Less: Sale value of Machine	10,000
WDV	30,960
Depreciation @20%	6,192
Tax Benefit on Depreciation @ 30%	1,858

Now suppose if in above two cases sale value of machine is ₹ 50,000, then no depreciation shall be provided in case 2 and tax loss on Short Term Capital Gain in Case 1 shall be computed as follows:

	₹
WDV at the beginning of year 5	40,960
Less: Sale value of Machine	50,000
Short Term Capital Gain	9,040
Tax Loss on STCG @ 30%	2,712

6.6.2 Exclusion of Financing Costs Principle: When cash flows relating to long-term funds are being defined, financing costs of long-term funds (interest on long-term debt and equity dividend) should be excluded from the analysis. The question arises why? The weighted average cost of capital used for evaluating by discounting the cash flows takes into account the cost of long-term funds. Putting it differently, the interest and dividend payments are reflected in the weighted average cost of capital. Hence, if interest on long-term debt and dividend on equity capital are deducted in defining the cash flows, the cost of long-term funds will be counted twice.

The exclusion of financing costs principle means that:

(i)   The interest on long-term debt (or interest) is ignored while computing profits and taxes and;

(ii)   The expected dividends are deemed irrelevant in cash flow analysis.

While dividends pose no difficulty as they come only from profit after taxes, interest needs to be handled properly. Since interest is usually deducted in the process of arriving at profit after tax, an amount equal to 'Interest (1 − Tax rate)' should be added back to the figure of Profit after Tax as shown below:

Profit Before Interest and Tax (1 − Tax rate)

$$= \text{(Profit Before Tax + Interest) (1 − Tax rate)}$$

$$= \text{(Profit Before Tax) (1 − Tax rate) + (Interest) (1 − Tax rate)}$$

$$= \text{Profit After Tax + Interest (1 − Tax rate)}$$

Thus, whether the tax rate is applied directly to the profit before interest and tax figure or whether the tax − adjusted interest, which is simply interest (1 − tax rate), is added to profit after tax, we get the same result.

Example

Suppose XYZ Ltd.'s expected profit for the forthcoming 4 years is as follows:

	Year 1 (₹)	Year 2 (₹)	Year 3 (₹)	Year 4 (₹)
Profit before Interest and Tax	10,000	20,000	40,000	50,000

If interest payable is ₹ 5,000 and tax rate is 30% the profit after tax excluding financing cost shall be as follows:

	Year 1 (₹)	Year 2 (₹)	Year 3 (₹)	Year 4 (₹)
Profit before Interest and Tax	10,000	20,000	40,000	50,000
Less: Interest	5,000	5,000	5,000	5,000
	5,000	15,000	35,000	45,000
Less: Tax @ 30%	1,500	4,500	10,500	13,500
Profit after Tax (PAT)	3,500	10,500	24,500	31,500
Add: Interest (1- t)	3,500	3,500	3,500	3,500
PAT excluding financing cost	7,000	14,000	28,000	35,000

Alternatively

	Year 1 (₹)	Year 2 (₹)	Year 3 (₹)	Year 4 (₹)
Profit before Interest and Tax	10,000	20,000	40,000	50,000
Less: Tax @ 30%	3,000	6,000	12,000	15,000
PAT excluding financing cost	7,000	14,000	28,000	35,000

6.6.3 Post–tax Principle: Tax payments like other payments must be properly deducted in deriving the cash flows. That is, cash flows must be defined in post-tax terms. It is always better to avoid using Pre Tax Cash Flows and using Pre-Tax Discounting Rate.

Illustration 1: *ABC Ltd is evaluating the purchase of a new project with a depreciable base of ₹ 1,00,000; expected economic life of 4 years and change in earnings before taxes and depreciation of ₹ 45,000 in year 1, ₹30,000 in year 2, ₹25,000 in year 3 and ₹35,000 in year 4. Assume straight-line depreciation and a 20% tax rate. You are required to compute relevant cash flows.*

Solution

				₹
				Years
	1	*2*	*3*	*4*
Earnings before tax and depreciation	45,000	30,000	25,000	35,000
Less: Depreciation	25,000	25,000	25,000	25,000
Earnings before tax	20,000	5,000	0	10,000
Less: Tax @20%	4,000	1,000	0	2,000
	16,000	4,000	0	8,000
Add: Depreciation	25,000	25,000	25,000	25,000
Net Cash flow	41,000	29,000	25,000	33,000

Working Note:

Depreciation = ₹1, 00,000÷4

= ₹25,000

6.7   Capital Budgeting Techniques

In order to maximise the return to the shareholders of a company, it is important that the best or most profitable investment projects are selected as the results for making a bad long-term investment decision can be both financially and strategically devastating, particular care needs to be taken with investment project selection and evaluation.

There are a number of techniques available for appraisal of investment proposals and can be classified as presented below:
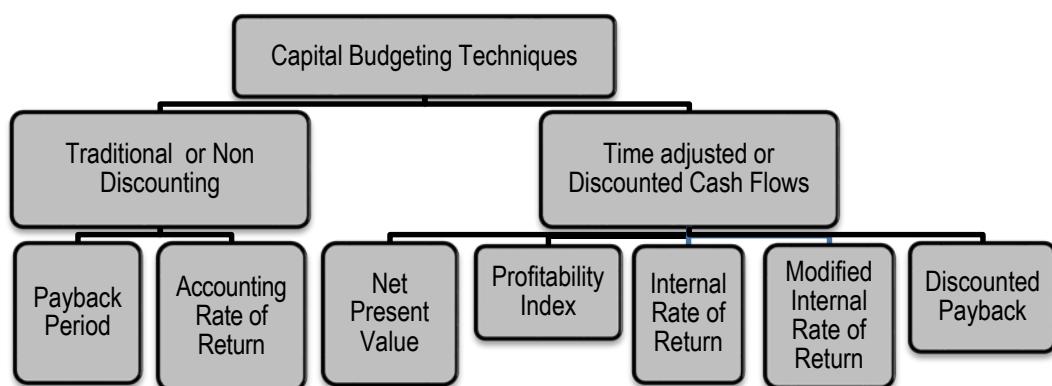
Organizations may use any or more of capital investment evaluation techniques; some organizations use different methods for different types of projects while others may use

multiple methods for evaluating each project. These techniques have been discussed below – net present value, profitability index, internal rate of return, modified internal rate of return, payback period, and accounting (book) rate of return.

6.7.1 Payback Period: The payback period of an investment is the length of time required for the cumulative total net cash flows from the investment to equal the total initial cash outlays. At that point in time, the investor has recovered the money invested in the project.

Steps:-

(a)   The first steps in calculating the payback period is determining the total initial capital investment and

(b)   The second step is calculating/estimating the annual expected after-tax net cash flows over the useful life of the investment.

1.   When the net cash flows are uniform over the useful life of the project, the number of years in the payback period can be calculated using the following equation:

$$\text{Payback period} = \frac{\text{Total initial capital investment}}{\text{Annual expected after - tax net cash inflow}}$$

Example

Suppose a project costs ₹ 20,00,000 and yields annually a profit of ₹ 3,00,000 after depreciation @ 12½% (straight line method) but before tax 50%. The first step would be to calculate the cash inflow from this project. The cash inflow is ₹ 4,00,000 calculated as follows: :

	₹
Profit before tax	3,00,000
Less :Tax @ 50%	1,50,000
Profit after tax	1,50,000
Add :Depreciation written off	2,50,000
Total cash inflow	4,00,000

While calculating cash inflow, depreciation is added back to profit after tax since it does not result in cash outflow. The cash generated from a project therefore is equal to profit after tax plus depreciation. The payback period of the project shall be:

$$\text{Payback period} = \frac{₹\ 20,00,000}{4,00,000} = 5 \text{ Years}$$

Some Accountants calculate payback period after discounting the cash flows by a predetermined rate and the payback period so calculated is called, 'Discounted payback period' (discussed later on).

2.   When the annual net cash flows are not uniform, the cumulative cash inflow from

operations must be calculated for each year. The payback period shall be corresponding period when total of cumulative cash inflows is equal to the initial capital investment. However, if exact sum does not match then the period in which it lies should be identified. After that we need to compute the fraction of the year that is needed to complete the total payback. This method can be understood with the help of an example

Example

Suppose XYZ Ltd. is analyzing a project requiring an initial cash outlay of ₹ 2,00,000 and expected to generate cash inflows as follows:

Year	Annual Cash Inflows
1	80,000
2	60,000
3	60,000
4	20,000

Its payback period shall be computed by using cumulative cash flows as follows:

Year	Annual Cash Inflows	Cumulative Cash Inflows	
1	80,000	80,000	
2	60,000	1,60,000	
3	60,000	2,00,000	←
4	20,000	2,20,000	

Suppose if in above case had the initial outlay been ₹ 2,05,000 then payback period shall be computed as follows:

Year	Annual Cash Inflows	Cumulative Cash Inflows	
1	80,000	80,000	
2	60,000	1,60,000	
3	60,000	2,00,000	
4	20,000	2,20,000	←

From above table it is clear that payback period shall lie between 3 to 4 years. Since upto 3 years a sum of ₹ 2,00,000 shall be recovered balance of ₹ 5,000 shall be recovered in the part (fraction) of 4th year computed as follows:

$$\frac{20,000}{5,000} = \frac{1}{4} \text{ year}$$

Thus, total cash outlay of ₹ 20,500 shall be recovered in 3¼ years' time.

Advantages

➤ It is easy to compute.

➤ It is easy to understand as it provides a quick estimate of the time needed for the organization to recoup the cash invested.

➤ The length of the payback period can also serve as an estimate of a project's risk; the longer the payback period, the riskier the project as long-term predictions are less reliable. In some industries with high obsolescence risk like software industry or in situations where an organization is short on cash, short payback periods often become the determining factor for investments.

Limitations

➤ It ignores the time value of money. As long as the payback periods for two projects are the same, the payback period technique considers them equal as investments, even if one project generates most of its net cash inflows in the early years of the project while the other project generates most of its net cash inflows in the latter years of the payback period.

➤ A second limitation of this technique is its failure to consider an investment's total profitability; it only considers cash flows from the initiation of the project until its payback period and ignores cash flows after the payback period.

➤ Lastly, use of the payback period technique may cause organizations to place too much emphasis on short payback periods thereby ignoring the need to invest in long-term projects that would enhance its competitive position.

6.7.2 Payback Reciprocal: As the name indicates it is the reciprocal of payback period. A major drawback of the payback period method of capital budgeting is that it does not indicate any cut off period for the purpose of investment decision. It is, however, argued that the reciprocal of the payback would be a close approximation of the Internal Rate of Return (later discussed in detail) if the life of the project is at least twice the payback period and the project generates equal amount of the annual cash inflows. In practice, the payback reciprocal is a helpful tool for quickly estimating the rate of return of a project provided its life is at least twice the payback period.

The payback reciprocal can be calculated as follows:

$$\frac{\text{Average annual cash in flow}}{\text{Initial investment}}$$

Example

Suppose a project requires an initial investment of ₹ 20,000 and it would give annual cash inflow of ₹4,000. The useful life of the project is estimated to be 5 years. In this example payback reciprocal will be:

$$\frac{₹\,4,000\times100}{₹\,20,000} = \quad 20\%$$

The above payback reciprocal provides a reasonable approximation of the internal rate of return, i.e. 19%.

6.7.3 Accounting (Book) Rate of Return (ARR): The accounting rate of return of an investment measures the average annual net income of the project (incremental income) as a percentage of the investment.

$$\text{Accounting rate of return} = \frac{\text{Average annual net income}}{\text{Investment}}$$

The numerator is the average annual net income generated by the project over its useful life. The denominator can be either the initial investment (including installation cost) or the average investment over the useful life of the project. Average investment means the average amount of fund remained blocked during the lifetime of the project under consideration. Further ARR can be calculated in a number of ways as shown in the following example.

Example

Suppose Times Ltd. is going to invest in a project a sum of ₹ 3,00,000 having a life span of 3 years. Salvage value of machine is ₹ 90,000. The profit before depreciation for each year is ₹ 1,50,000.

The Profit after Tax and value of Investment in the Beginning and at the End of the each year shall be as follows:

Year	PBT (₹)	Depreciation (₹)	Profit after Dep. (₹)	Value of Investment in (₹)	
				Beginning	End
1	1,50,000	70,000	80,000	3,00,000	2,30,000
2	1,50,000	70,000	80,000	2,30,000	1,60,000
3	1,50,000	70,000	80,000	1,60,000	90,000

The ARR can be computed by following methods as follows:

(a)   Version 1: Annual Basis

$$ARR = \frac{\text{Profit after Depreciation}}{\text{Investment in the begining of the year}}$$

Year	
1	$\dfrac{80,000}{3,00,000} = 26.67\%$

2	$\dfrac{80,000}{2,30,000} = 34.78\%$
3	$\dfrac{80,000}{1,60,000} = 50\%$

Average ARR $= \dfrac{26.67\% + 34.78\% + 50.00\%}{3} = 37.15\%$

(b) Version 2: Total Investment Basis

$$ARR = \dfrac{\text{Average Annual Pr ofit}}{\text{Investment in the begining}} \times 100$$

$$= \dfrac{(80,000 + 80,000 + 80,000)/3}{3,00,000} \times 100$$

= 26.67%

(c) Version 3: Average Investment Basis

$$ARR = \dfrac{\text{Average Annual Pr ofit}}{\text{Average Investment}} \times 100$$

Average Investment = (₹ 3,00,000 + ₹ 90,000)/2 = ₹ 1,95,000

or ½(Initial Investment – Salvage Value) + Salvage Value

= ½(₹ 3,00,000 –₹ 90,000) + ₹ 90,000 = ₹ 1,95,000

$$= \dfrac{80,000}{1,95,000} \times 100 = 41.03\%$$

Further, it is important to note that project may also require additional working capital during its life in addition to initial working capital. In such situation formula for the calculation of average investment shall be modified as follows:

½(Initial Investment – Salvage Value) + Salvage Value+ Additional Working Capital

Continuing above example suppose a sum of ₹ 45,000 is required as additional working capital during the project life then average investment shall be:

= ½ (₹ 3,00,000 – ₹ 90,000) + ₹ 90,000 + ₹ 45,000 = ₹ 2,40,000 and

$$ARR = = \dfrac{80,000}{2,40,000} \times 100 = 33.33\%$$

Some organizations prefer the initial investment because it is objectively determined and is not

influenced by either the choice of the depreciation method or the estimation of the salvage value. Either of these amounts is used in practice but it is important that the same method be used for all investments under consideration.

Advantages

➢   This technique uses readily available data that is routinely generated for financial reports and does not require any special procedures to generate data.

➢   This method may also mirror the method used to evaluate performance on the operating results of an investment and management performance. Using the same procedure in both decision-making and performance evaluation ensures consistency.

➢   Lastly, the calculation of the accounting rate of return method considers all net incomes over the entire life of the project and provides a measure of the investment's profitability.

Limitations

➢   The accounting rate of return technique, like the payback period technique, ignores the time value of money and considers the value of all cash flows to be equal.

➢   The technique uses accounting numbers that are dependent on the organization's choice of accounting procedures, and different accounting procedures, e.g., depreciation methods, can lead to substantially different amounts for an investment's net income and book values.

➢   The method uses net income rather than cash flows; while net income is a useful measure of profitability, the net cash flow is a better measure of an investment's performance.

➢   Furthermore, inclusion of only the book value of the invested asset ignores the fact that a project can require commitments of working capital and other outlays that are not included in the book value of the project.

Illustration 2: *A project requiring an investment of ₹ 10,00,000 and it yields profit after tax and depreciation which is as follows:*

Years	Profit after tax and depreciation
	₹
1	50,000
2	75,000
3	1,25,000
4	1,30,000
5	80,000
Total	4,60,000

Suppose further that at the end of 5 years, the plant and machinery of the project can be sold

for ₹ 80,000. Determine Average Rate of Return.

Solution

In this case the rate of return can be calculated as follows:

$$\frac{\text{Total Profit/No. of years}}{\text{Average investment/Initial Investment}} \times 100$$

(a) *If Initial Investment is considered then,*

$$= \frac{92,000}{10,00,000} \times 100 = 9.2\%$$

This rate is compared with the rate expected on other projects, had the same funds been invested alternatively in those projects. Sometimes, the management compares this rate with the minimum rate (called-cut off rate) they may have in mind. For example, management may decide that they will not undertake any project which has an average annual yield after tax less than 20%. Any capital expenditure proposal which has an average annual yield of less than 20% will be automatically rejected.

(b) *If Average investment is considered, then,*

$$= \frac{92,000}{\text{Average investment}} \times 100 = \frac{92,000}{5,40,000} \times 100 = 17\%$$

Where,

Average Investment = ½ (Initial investment – Salvage value) + Salvage value
= 80,000 + ½ (10,00,000 – 80,000)
= 80,000 + 4,60,000 = 5,40,000

6.7.4 Net Present Value Technique (NPV): The net present value technique is a discounted cash flow method that considers the time value of money in evaluating capital investments. An investment has cash flows throughout its life, and it is assumed that a rupee of cash flow in the early years of an investment is worth more than a rupee of cash flow in a later year.

The net present value method uses a specified discount rate to bring all subsequent net cash inflows after the initial investment to their present values (the time of the initial investment is year 0).

Determining Discount Rate

Theoretically, the discount rate or desired rate of return on an investment is the rate of return the firm would have earned by investing the same funds in the best available alternative investment that has the same risk. Determining the best alternative opportunity available is difficult in practical terms so rather that using the true opportunity cost, organizations often use an alternative measure for the desired rate of return. An organization may establish a

minimum rate of return that all capital projects must meet; this minimum could be based on an industry average or the cost of other investment opportunities. Many organizations choose to use the overall cost of capital or Weighted Average Cost of Capital (WACC) that an organization has incurred in raising funds or expects to incur in raising the funds needed for an investment.

The net present value of a project is the amount, in current value of rupees, the investment earns after paying cost of capital in each period.

Net present value = Present value of net cash inflow - Total net initial investment

Since it might be possible that some additional investment may also be required during the life time of the project then appropriate formula shall be:

Net present value = Present value of cash inflow - Present value of cash outflow

The steps to calculating net present value are:-

1. Determine the net cash inflow in each year of the investment

2. Select the desired rate of return or discounting rate or Weighted Average Cost of Capital.

3. Find the discount factor for each year based on the desired rate of return selected.

4. Determine the present values of the net cash flows by multiplying the cash flows by respective the discount factors of respective period called Present Value (PV) of Cash flows

5. Total the amounts of all PVs of Cash Flows

Decision Rule:

> If NPV ≥ 0   Accept the Proposal
>
> If NPV ≤ 0   Reject the Proposal

Illustration 3: *Compute the net present value for a project with a net investment of ₹ 1, 00,000 and net cash flows year one is ₹55,000; for year two is ₹80,000 and for year three is ₹15,000. Further, the company's cost of capital is 10%?*

[PVIF @ 10% for three years are 0.909, 0.826 and 0.751]

Solution

Year	Net Cash Flows	PVIF @ 10%	Discounted Cash Flows
0	(1,00,000)	1.000	(1,00,000)
1	55,000	0.909	49,995
2	80,000	0.826	66,080
3	15,000	0.751	11,265
Net Present Value			27,340

Recommendation: Since the net present value of the project is positive, the company should accept the project.

Illustration 4: *ABC Ltd is a small company that is currently analyzing capital expenditure proposals for the purchase of equipment; the company uses the net present value technique to evaluate projects. The capital budget is limited to ₹ 500,000 which ABC Ltd believes is the maximum capital it can raise. The initial investment and projected net cash flows for each project are shown below. The cost of capital of ABC Ltd is 12%. You are required to compute the NPV of the different projects.*

	Project A	*Project B*	*Project C*	*Project D*
Initial Investment	*200,000*	*190,000*	*250,000*	*210,000*
Project Cash Inflows				
Year 1	*50,000*	*40,000*	*75,000*	*75,000*
2	*50,000*	*50,000*	*75,000*	*75,000*
3	*50,000*	*70,000*	*60,000*	*60,000*
4	*50,000*	*75,000*	*80,000*	*40,000*
5	*50,000*	*75,000*	*100,000*	*20,000*

Solution

Calculation of net present value:

Period	*Present value factor*	*Project A*	*Project B*	*Project C*	*Project D*
0	1.000	(2,00,000)	(1,90,000)	(2,50,000)	(2,10,000)
1	0.893	44,650	35,720	66,975	66,975
2	0.797	39,850	39,850	59,775	59,775
3	0.712	35,600	49,840	42,720	42,720
4	0.636	31,800	47,700	50,880	25,440
5	0.567	28,350	42,525	56,700	11,340
Net present value		(19,750)	25,635	27,050	(3,750)

Advantages

➢ NPV method takes into account the time value of money.

➢ The whole stream of cash flows is considered.

➢ The net present value can be seen as the addition to the wealth of share holders. The criterion of NPV is thus in conformity with basic financial objectives.

➢ The NPV uses the discounted cash flows i.e., expresses cash flows in terms of current rupees. The NPVs of different projects therefore can be compared. It implies that each project can be evaluated independent of others on its own merit.

Limitations

➢ It involves difficult calculations.

➢ The application of this method necessitates forecasting cash flows and the discount rate. Thus accuracy of NPV depends on accurate estimation of these two factors which may be quite difficult in practice.

The decision under NPV method is based on absolutemeasure. It ignores the difference in initial outflows, size of different proposals etc. while evaluating mutually exclusive projects.

6.7.5 Desirability Factor/Profitability Index/Present Value Index Method (PI): In the above illustration the students may have seen how with the help of discounted cash flow technique, the two alternative proposals for capital expenditure can be compared. In certain cases we have to compare a number of proposals each involving different amounts of cash inflows.

One of the methods of comparing such proposals is to work out what is known as the '*Desirability factor*', or '*Profitability index*' or '*Present Value Index Method*'.

Mathematically:

The desirability factor is calculated as below:

$$\frac{\text{Sum of discounted cash in flows}}{\text{Initial cash outlay Or Total discounted cash outflow (as the case may)}}$$

Decision Rule:

If PI ≥ 1   Accept the Proposal

If PI ≤ 1   Reject the Proposal

Illustration 5: *Suppose we have three projects involving discounted cash outflow of ₹ 5,50,000, ₹ 75,000 and ₹ 1,00,20,000 respectively. Suppose further that the sum of discounted cash inflows for these projects are ₹ 6,50,000, ₹ 95,000 and ₹ 1,00,30,000 respectively. Calculate the desirability factors for the three projects.*

Solution

The desirability factors for the three projects would be as follows:

1. $\dfrac{₹\ 6,50,000}{₹\ 5,50,000} = 1.18$

2. $\dfrac{₹\ 95,000}{₹\ 75,000} = 1.27$

3. $\dfrac{₹\ 1,00,30,000}{₹\ 1,00,20,000} = 1.001$

It would be seen that in absolute terms project 3 gives the highest cash inflows yet its desirability factor is low. This is because the outflow is also very high. The Desirability/ Profitability Index factor helps us in ranking various projects.

Advantages

➢ The method also uses the concept of time value of money and is a better project evaluation technique than NPV.

Limitations

➢ Profitability index fails as a guide in resolving capital rationingwhere projects are indivisible.

➢ Once a single large project with high NPV is selected, possibility of accepting several small projects which together may have higher NPV than the single project is excluded.

➢ Also situations may arise where a project with a lower profitability index selected may generate cash flows in such a way that another project can be taken up one or two years later, the total NPV in such case being more than the one with a project with highest Profitability Index.

The Profitability Index approach thus cannot be used indiscriminately but all other type of alternatives of projects will have to be worked out.

6.7.6 Internal Rate of Return Method (IRR): The internal rate of return method considers the time value of money, the initial cash investment, and all cash flows from the investment. But unlike the net present value method, the internal rate of return method does not use the desired rate of return but estimates the discount rate that makes the present value of subsequent net cash flows equal to the initial investment. This discount rate is called IRR.

IRR Definition: Internal rate of return for an investment proposal is the discount rate that equates the present value of the expected net cash flows with the initial cash outflow.

This IRR is then compared to a criterion rate of return that can be the organization's desired rate of return for evaluating capital investments.

Calculating IRR: The procedures for computing the internal rate of return vary with the pattern of net cash flows over the useful life of an investment.

Scenario 1: For an investment with uniform cash flows over its life, the following equation is used:

Step 1: Total initial investment = Annual net cash flow x Annuity discount factor of the discount rate for the number of periods of the investment's useful life

If A is the annuity discount factor, then

$$A = \frac{\text{Total initial cash disbursements and commitments for the investment}}{\text{Annual (equal) net cash flows from the investment}}$$

Step 2: Once A has been calculated, the discount rate is the interest rate that has the same discounting factor as A in the annuity table along the row for the number of periods of the useful life of the investment. If exact value of 'A' could be find in Present Value Annuity Factor (PVAF) table corresponding to the period of the project the respective discounting factor or

rate shall be IRR. However, it rarely happens therefore we follow the method discussed below:

Step 1: Compute approximate payback period also called fake payback period.

Step 2: Locate this value in PVAF table corresponding to period of life of the project. The value may be falling between two discounting rates.

Step 3: Discount cash flows using these two discounting rates.

Step 4: Use following Interpolation Formula:

$$= LR + \frac{\text{NPV at LR}}{\text{NPV at LR - NPV at HR}} \times (HR - LR)$$

Where

LR = Lower Rate

HR = Higher Rate

Illustration 6: *A Ltd. is evaluating a project involving an outlay of ₹ 10,00,000 resulting in an annual cash inflow of ₹ 2,50,000 for 6 years. Assuming salvage value of the project is zero determine the IRR of the project.*

Solution

First of all we shall find an approximation of the payback period:

$$\frac{1,00,000}{25,000} = 4$$

Now we shall this figure in the PVAF table corresponding to 6 year row.

The value 4 lies between values 4.111 and 3.998 correspondingly discounting rates 12% and 13% respectively.

NPV @ 12%

$NPV_{12\%}$= (1,00,000) + 4.111 x 25,000 = 2,775

$NPV_{13\%}$= (1,00,000) + 3.998 x 25,000 = (50)

The internal rate of return is, thus, more than 12% but less than 13%. The exact rate can be obtained by interpolation:

$$IRR \quad = 12\% + \frac{2,775}{2,775 \text{ - } (50)} \times (13\% - 12\%)$$

$$= 12\% + \frac{2,775}{2,825} = 12.98\%$$

$$IRR \quad = 12.98\%$$

Scenario 2: When the net cash flows are not uniform over the life of the investment, the

determination of the discount rate can involve trial and error and interpolation between discounting rates as mentioned above. However, IRR can also be found out by using following procedure:

Step 1: Discount the cash flow at any random rate say 10%, 15% or 20% randomly.

Step 2: If resultant NPV is negative then discount cash flows again by lower discounting rate to make NPV positive. Conversely, if resultant NPV is positive then again discount cash flows by higher discounting rate to make NPV negative.

Step 3: Use following Interpolation Formula:

$$= LR + \frac{NPV \text{ at } LR}{NPV \text{ at } LR - NPV \text{ at } HR} \times (HR - LR)$$

Where

LR = Lower Rate

HR = Higher Rate

Illustration 7: *Calculate the internal rate of return of an investment of ₹ 1, 36,000 which yields the following cash inflows:*

Year	Cash Inflows (in ₹)
1	*30,000*
2	*40,000*
3	*60,000*
4	*30,000*
5	*20,000*

Solution

Let us discount cash flows by 10%.

Year	Cash Inflows (₹)	Discounting factor at 10%	Present Value (₹)
1	30,000	0.909	27,270
2	40,000	0.826	33,040
3	60,000	0.751	45,060
4	30,000	0.683	20,490
5	20,000	0.621	12,420
		Total present value	1,38,280

The present value at 10% comes to ₹ 1,38,280, which is more than the initial investment. Therefore, a higher discount rate is suggested, say, 12%.

Year	Cash Inflows (₹)	Discounting factor at 12%	Present Value (₹)
1	30,000	0.893	26,790
2	40,000	0.797	31,880
3	60,000	0.712	42,720
4	30,000	0.636	19,080
5	20,000	0.567	11,340
		Total present value	1,31,810

The internal rate of return is, thus, more than 10% but less than 12%. The exact rate can be obtained by interpolation:

$$\text{IRR} = \left[10 + \left(\frac{₹\,1,38,280 - ₹\,1,36,000}{₹\,1,38,280 - ₹\,1,31,810}\right)\right] \times 2$$

$$= 10 + \left(\frac{2280}{6470} \times 2\right) = 10 + 0.70$$

$$\text{IRR} = 10.70\%$$

Illustration 8: *A company proposes to install machine involving a capital cost of ₹ 3,60,000. The life of the machine is 5 years and its salvage value at the end of the life is nil. The machine will produce the net operating income after depreciation of ₹ 68,000 per annum. The company's tax rate is 45%.*

The Net Present Value factors for 5 years are as under:

Discounting rate	:	14	15	16	17	18
Cumulative factor	:	3.43	3.35	3.27	3.20	3.13

You are required to calculate the internal rate of return of the proposal.

Solution

Computation of Cash inflow per annum	(₹)
Net operating income per annum	68,000
Less: Tax @ 45%	30,600
Profit after tax	37,400
Add: Depreciation	72,000
(₹3,60,000 / 5 years)	
Cash inflow	1,09,400

The IRR of the investment can be found as follows:

NPV = −₹3,60,000 + ₹1,09,400 (PVAF$_5$, r) = 0

or PVA F_5,r (Cumulative factor) = $\dfrac{₹\ 3,60,000}{₹\ 1,09,400} = 3.29$

Computation of Internal Rate of Return

Discounting Rate	*15%*	*16%*
Cumulative factor	3.35	3.27
PV of Inflows	3,66,490	3,57,738
	(₹1,09,400×3.35)	(₹1,09,400×3.27)
Initial outlay (₹)	3,60,000	3,60,000
NPV (₹)	6,490	(2,262)

$$\text{IRR} = 15 + \left[\frac{6,490}{6,490 + 2,262}\right] = 15 + 0.74$$

= 15.74%.

6.7.6.1   Acceptance Rule: The use of IRR, as a criterion to accept capital investment decision involves a comparison of IRR with the required rate of return known as cut off rate. The project should the accepted if IRR is greater than cut-off rate. If IRR is equal to cut off rate the firm is indifferent. If IRR less than cut off rate the project is rejected. Thus,

If IRR ≥ Cut-off Rate or WACC   Accept the Proposal

If PI ≤ Cut-off Rate or WACC   Reject the Proposal

6.7.6.2   Internal Rate of Return and Mutually Exclusive Projects: Projects are called mutually exclusive, when the selection of one precludes the selection of others e.g. in case a company owns a piece of land which can be put to use for either of the two different projects S or L, then such projects are mutually exclusive to each other i.e. the selection of one project necessarily means the rejection of the other. Refer to the figure below:
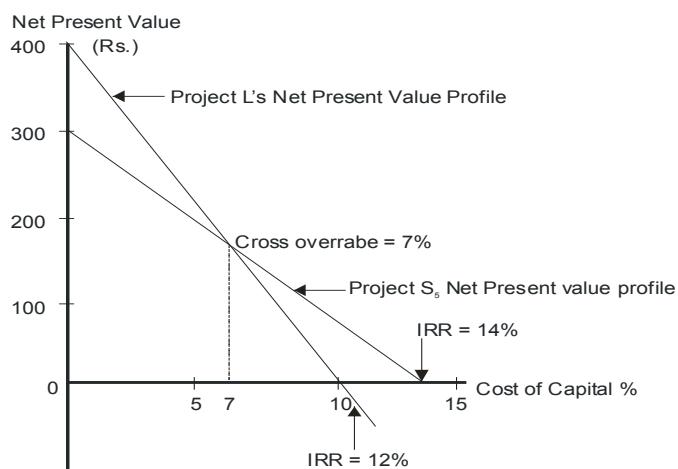
As long as the cost of capital is greater than the crossover rate of 7 %, then (1) NPV^S is larger than NPV^L and (2) IRR^S exceeds IRR^L. Hence, if the cut off rate or the cost of capital is greater than 7%, both the methods shall lead to selection of project S. However, if the cost of capital is less than 7%, the NPV method ranks Project L higher, but the IRR method indicates that the Project S is better.

As can be seen from the above discussion, mutually exclusive projects can create problems with the IRR technique because IRR is expressed as a percentage and does not take into account the scale of investment or the quantum of money earned.

Let us consider another example of two mutually exclusive projects A and B with the following details,

Cash flows

	Year 0	Year 1	IRR	NPV(10%)
Project A	(₹ 1,00,000)	₹1,50,000	50%	₹ 36,360
Project B	(₹ 5,00,000)	₹ 6,25,000	25%	₹ 68,180

Project A earns a return of 50% which is more than what Project B earns; however the NPV of Project B is greater than that of Project A. Acceptance of Project A means that Project B must be rejected since the two Projects are mutually exclusive. Acceptance of Project A also implies that the total investment will be ₹ 4,00,000 less than if Project B had been accepted, ₹ 4,00,000 being the difference between the initial investment of the two projects. Assuming that the funds are freely available at 10%, the total capital expenditure of the company should be ideally equal to the sum total of all outflows provided they earn more than 10% along with the chosen project from amongst the mutually exclusive. Hence, in case the smaller of the two Projects i.e. Project A is selected, the implication will be of rejecting the investment of additional funds required by the larger investment. This shall lead to a reduction in the shareholders wealth and thus, such an action shall be against the very basic tenets of Financial Management.

In the above mentioned example the larger of the two projects had the lower IRR, but never the less provided for the wealth maximising choice. However, it is not safe to assume that a choice can be made between mutually exclusive projects using IRR in cases where the larger project also happens to have the higher IRR. Consider the following two Projects A and B with their relevant cash flows;

Year	A	B
	₹	₹
0	(9,00,000)	(8,00,000)
1	7,00,000	62,500
2	6,00,000	6,00,000
3	4,00,000	6,00,000
4	50,000	6,00,000

In this case Project A is the larger investment and also has a higher IRR as shown below,

Year	(₹)	r =46%	PV(₹)	(₹)	r =35%	PV(₹)
0	(9,00,000)	1.0	(9,00,000)	(8,00,000)	1.0	(8,00,000)
1	7,00,000	0.6849	4,79, 430	62,500	0.7407	46,294
2	6,00,000	0.4691	2,81,460	6,00,000	0.5487	3,29,220
3	4,00,000	0.3213	1,28,520	6,00,000	0.4064	2,43,840
4	50,000	0.2201	11,005	6,00,000	0.3011	1,80,660
			(415)			14

IRR of Project A = 46%

IRR of Project B = 35%

However, in case the relevant discounting factor is taken as 5%, the NPV of the two projects provides a different picture as follows;

	Project A				Project B	
Year	(₹)	r= 5%	PV(₹)	(₹)	r= 5%	PV(₹)
0	(9,00,000)	1.0	(9,00,000)	(8,00,000)	1.0	(8,00,000)
1	7,00,000	0.9524	6,66,680	62,500	0.9524	59,525
2	6,00,000	0.9070	5,44,200	6,00,000	0.9070	5,44,200
3	4,00,000	0.8638	3,45,520	6,00,000	0.8638	5,18,280
4	50,000	0.8227	41,135	6,00,000	0.8227	4,93,620
		NPV	6,97,535			8,15,625

As may be seen from the above, Project B should be the one to be selected even though its IRR is lower than that of Project A. This decision shall need to be taken in spite of the fact that Project A has a larger investment coupled with a higher IRR as compared with Project B. This type of an anomalous situation arises because of the reinvestment assumptions implicit in the two evaluation methods of NPV and IRR.

6.7.6.3 The Reinvestment Assumption: The Net Present Value technique assumes that all cash flows can be reinvested at the discount rate used for calculating the NPV. This is a logical assumption since the use of the NPV technique implies that all projects which provide a higher return than the discounting factor are accepted.

In contrast, IRR technique assumes that all cash flows are reinvested at the projects IRR. This assumption means that projects with heavy cash flows in the early years will be favoured by the IRR method vis-à-vis projects which have got heavy cash flows in the later years. This implicit reinvestment assumption means that Projects like A, with cash flows concentrated in the earlier years of life will be preferred by the method relative to Projects such as B.

6.7.6.4 Multiple Internal Rate of Return: In cases where project cash flows change signs or reverse during the life of a project e.g. an initial cash outflow is followed by cash inflows and

subsequently followed by a major cash outflow , there may be more than one IRR. The following graph of discount rate versus NPV may be used as an illustration;
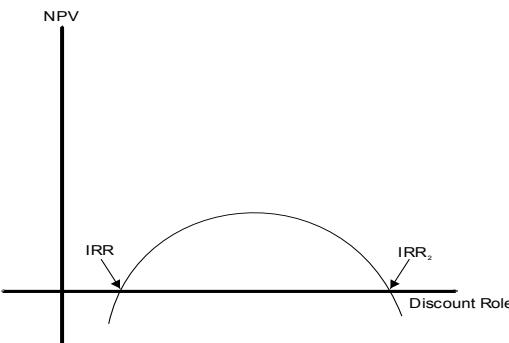
In such situations if the cost of capital is less than the two IRR's, a decision can be made easily, however otherwise the IRR decision rule may turn out to be misleading as the project should only be invested if the cost of capital is between IRR_1 and IRR_2. To understand the concept of multiple IRR it is necessary to understand the implicit re investment assumption in both NPV and IRR techniques.

Advantages

➢ This method makes use of the concept of time value of money.

➢ All the cash flows in the project are considered.

➢ IRR is easier to use as instantaneous understanding of desirability can be determined by comparing it with the cost of capital

➢ IRR technique helps in achieving the objective of minimisation of shareholders wealth.

Limitations

➢ The calculation process is tedious if there are more than one cash outflows interspersed between the cash inflows, there can be multiple IRR, the interpretation of which is difficult.

➢ The IRR approach creates a peculiar situation if we compare two projects with different inflow/outflow patterns.

➢ It is assumed that under this method all the future cash inflows of a proposal are reinvested at a rate equal to the IRR. It is ridiculous to imagine that the same firm has a ability to reinvest the cash flows at a rate equal to IRR.

➢ If mutually exclusive projects are considered as investment options which have considerably different cash outlays. A project with a larger fund commitment but lower IRR contributes more in terms of absolute NPV and increases the shareholders' wealth. In such situation decisions based only on IRR criterion may not be correct.

6.7.7 Modified Internal Rate of Return (MIRR): As mentioned earlier, there are several limitations attached with the concept of the conventional Internal Rate of Return. The MIRR addresses some of these deficiencies e.g., it eliminates multiple IRR rates; it addresses the reinvestment rate issue and produces results which are consistent with the Net Present Value method. This method is also called Terminal Value method.

Under this method, all cash flows, apart from the initial investment, are brought to the terminal value using an appropriate discount rate(usually the Cost of Capital). This results in a single stream of cash inflow in the terminal year. The MIRR is obtained by assuming a single outflow in the zeroth year and the terminal cash in flow as mentioned above. The discount rate which equates the present value of the terminal cash inflow to the zeroth year outflow is called the MIRR.

The decision criterion of MIRR is same as IRR i.e. you accept an investment if MIRR is larger than required rate of return and reject if it is lower than the required rate of return.

Illustration 9: *An investment of ₹ 1,36,000 yields the following cash inflows (profits before depreciation but after tax). Determine MIRR considering 8% as cost of capital.*

Year	₹
1	30,000
2	40,000
3	60,000
4	30,000
5	20,000
	1,80,000

Solution

Year	Cashflow ₹
0	1,36,000

The MIRR is calculated on the basis of investing the inflows at the cost of capital. The table below shows the valued of the inflows if they are immediately reinvested at 8%.

Year	Cash flow	@8% reinvestment rate factor factor.	₹
1	30,000	1.3605*	40,815
2	40,000	1.2597	50,388
3	60,000	1.1664	69,984
4	30,000	1.0800	32,400
5	20,000	1.0000	20,000
			2,13,587

* Investment of ₹ 1 at the end of the year 1 is reinvested for 4 years (at the end of 5 years) shall become $1(1.08)^4 = 1.3605$. Similarly reinvestment rate factor for remaining years shall be calculated. Please note investment at the end of 5th year shall be reinvested for zero year hence reinvestment rate factor shall be 1.00.

The total cash outflow in year 0 (₹ 1,36,000) is compared with the possible inflow at year 5 and the resulting figure of $\dfrac{1,36,000}{2,13,587}$ = 0.6367 is the discount factor in year 5. By looking at the year 5 row in the present value tables, you will see that this gives a return of 9%. This means that the ₹ 2,13,587 received in year 5 is equivalent to ₹ 1,36,000 in year 0 if the discount rate is 9%. Alternatively, we can compute MIRR as follows:

Total return = $\dfrac{2,13,587}{1,36,000}$ = 1.5705

MIRR = $\sqrt[1/5]{1.5705}$ - 1 = 9%.

6.7.8 Comparison of Net Present Value and Internal Rate of Return Methods

Similarity

➢ Both the net present value and the internal rate of return methods are discounted cash flow methods which mean that they consider the time value of money.

➢ Both these techniques consider all cash flows over the expected useful life of the investment.

Different conclusion in the following scenarios

There are circumstances/scenarios under which the net present value method and the internal rate of return methods will reach different conclusions. Let's discuss these scenarios:-

Scenario 1 – Scale or Size Disparity

Being IRR a relative measure and NPV an absolute measure in case of disparity in scale or size both may give contradicting ranking. This can be understood with the help of following illustration:

Illustration 10: *Suppose there are two Project A and Project B are under consideration. The cash flows associated with these projects are as follows:*

Year	Project A	Project B
0	(1,00,000)	(3,00,000)
1	50,000	1,40,000
2	60,000	1,90,000
3	40,000	1,00,000

Assuming Cost of Capital equal to 10% which project should be accepted as per NPV Method and IRR Method.

Solution

Net Present Value of Projects

Year	Cash Inflows Project A (₹)	Cash Inflows Project B (₹)	Present Value Factor @ 10%	PV of Project A (₹)	PV of Project B (₹)
0	(1,00,000)	(3,00,000)	1.000	(1,00,000)	(3,00,000)
1	50,000	1,40,000	0.909	45,450	1,27,260
2	60,000	1,90,000	0.826	49,560	1,56,940
3	40,000	1,00,000	0.751	30,040	75,100
				25,050	59,300

Internal Rate of Returns of projects

Since by discounting cash flows at 10% we are getting values very far from zero. Therefore, let us discount cash flows using 20% discounting rate.

Year	Cash Inflows Project A (₹)	Cash Inflows Project B (₹)	Present Value Factor @ 20%	PV of Project A (₹)	PV of Project B (₹)
0	(1,00,000)	(3,00,000)	1.000	(1,00,000)	(3,00,000)
1	50,000	1,40,000	0.833	41,650	1,16,620
2	60,000	1,90,000	0.694	41,640	1,31,860
3	40,000	1,00,000	0.579	23,160	57,900
				6,450	6,380

Since by discounting cash flows at 20% we are getting values far from zero. Therefore, let us discount cash flows using 25% discounting rate.

Year	Cash Inflows Project A (₹)	Cash Inflows Project B (₹)	Present Value Factor @ 25%	PV of Project A (₹)	PV of Project B (₹)
0	(1,00,000)	(3,00,000)	1.000	(1,00,000)	(3,00,000)
1	50,000	1,40,000	0.800	40,000	1,12,000
2	60,000	1,90,000	0.640	38,400	1,21,600
3	40,000	1,00,000	0.512	20,480	51,200
				(1,120)	(15,200)

The internal rate of return is, thus, more than 20% but less than 25%. The exact rate can be obtained by interpolation:

$$IRR_A = 20\% + \frac{6{,}450}{6{,}450 \text{ - } (1{,}120)} \times (25\% - 20\%)$$

$$= 20\% + \left(\frac{6{,}450}{7{,}570} \text{ x } 5\% \right) = 24.26\%$$

$$IRR_B = 20\% + \frac{6{,}380}{6{,}380 \text{ - } (15{,}200)} \times (25\% - 20\%)$$

$$= 20\% + \left(\frac{6{,}380}{21{,}580} \text{ x } 5\% \right) = 21.48\%$$

Overall Position

	Project A	Project B
NPV @ 10%	25,050	59,300
IRR	24.26%	21.48%

Thus there is contradiction in ranking by two methods.

Scenario 2 – Time Disparity in Cash Flows

It might be possible that overall cash flows may be more or less same in the projects but there may be disparity in their flows i.e. larger part of cash inflows may be occurred in the beginning or end of the project. In such situation there may be difference in the ranking of projects as per two methods.

Illustration 11: *Suppose ABC Ltd. is considering two Project X and Project Y for investment. The cash flows associated with these projects are as follows:*

Year	Project X	Project Y
0	(2,50,000)	(3,00,000)
1	2,00,000	50,000
2	1,00,000	1,00,000
3	50,000	3,00,000

Assuming Cost of Capital be 10%, which project should be accepted as per NPV Method and IRR Method.

Solution

Net Present Value of Projects

Year	Cash Inflows Project X (₹)	Cash Inflows Project Y (₹)	Present Value Factor @ 10%	PV of Project X (₹)	PV of Project Y (₹)
0	(2,50,000)	(3,00,000)	1.000	(2,50,000)	(3,00,000)
1	2,00,000	50,000	0.909	1,81,800	45,450

2	1,00,000	1,00,000	0.826	82,600	82,600
3	50,000	3,00,000	0.751	37,550	2,25,300
				51,950	53,350

Internal Rate of Returns of projects

Since by discounting cash flows at 10% we are getting values far from zero. Therefore, let us discount cash flows using 20% discounting rate.

Year	Cash Inflows Project X (₹)	Cash Inflows Project Y (₹)	Present Value Factor @ 20%	PV of Project X (₹)	PV of Project Y (₹)
0	(2,50,000)	(3,00,000)	1.000	(2,50,000)	(3,00,000)
1	2,00,000	50,000	0.833	1,66,600	41,650
2	1,00,000	1,00,000	0.694	69,400	69,400
3	50,000	3,00,000	0.579	28,950	1,73,700
				14,950	(15,250)

Since by discounting cash flows at 20% we are getting value of Project X is positive and value of Project Y is negative. Therefore, let us discount cash flows of Project X using 25% discounting rate and Project Y using discount rate of 15%.

Year	Cash Inflows Project X (₹)	Present Value Factor @ 25%	PV of Project X (₹)	Cash Inflows Project Y (₹)	Present Value Factor @ 15%	PV of Project Y (₹)
0	(2,50,000)	1.000	(2,50,000)	(3,00,000)	1.000	(3,00,000)
1	2,00,000	0.800	1,60,000	50,000	0.870	43,500
2	1,00,000	0.640	64,000	1,00,000	0.756	75,600
3	50,000	0.512	25,600	3,00,000	0.658	1,97,400
			(400)			16,500

The internal rate can be obtained by interpolation:

$$IRR_X = 20\% + \frac{14,950}{14,950 - (400)} \times (25\% - 20\%)$$

$$= 20\% + \left(\frac{14,950}{15,350} \times 5\% \right) = 24.87\%$$

$$IRR_B = 15\% + \frac{16,500}{16,500 - (15,250)} \times (20\% - 15\%) = 15\% + \left(\frac{16,500}{31,750} \times 5\% \right) = 17.60\%$$

Overall Position

	Project A	Project B
NPV @ 10%	51,950	53,350
IRR	24.87%	17.60%

Thus there is contradiction in ranking by two methods.

Scenario 3 – Disparity in life of Proposals (Unequal Lives)

Conflict in ranking may also arise if we are comparing two projects (especially mutually exclusive) having unequal lives.

Illustration 12: *Suppose MVA Ltd. is considering two Project A and Project B for investment. The cash flows associated with these projects are as follows:*

Year	Project A	Project B
0	(5,00,000)	(5,00,000)
1	7,50,000	2,00,000
2		2,00,000
3		7,00,000

Assuming Cost of Capital equal to 12%, which project should be accepted as per NPV Method and IRR Method?

Solution

Net Present Value of Projects

Year	Cash Inflows Project A (₹)	Cash Inflows Project B (₹)	Present Value Factor @ 12%	PV of Project A (₹)	PV of Project B (₹)
0	(5,00,000)	(5,00,000)	1.000	(5,00,000)	(5,00,000)
1	7,50,000	2,00,000	0.893	6,69,750	1,78,600
2		2,00,000	0.797		1,59,400
3		7,00,000	0.712		4,98,400
				1,69,750	3,36,400

Internal Rate of Returns of projects

Let us discount cash flows using 50% discounting rate.

Year	Cash Inflows Project A (₹)	Cash Inflows Project B (₹)	Present Value Factor @ 50%	PV of Project A (₹)	PV of Project B (₹)
0	(5,00,000)	(5,00,000)	1.000	(5,00,000)	(5,00,000)
1	7,50,000	2,00,000	0.667	5,00,025	1,33,400

2		2,00,000	0.444		88,800
3		7,00,000	0.296		2,07,200
				25	(70,600)

Since, IRR of project A shall be 50% as NPV is almost near to zero. Further, by discounting cash flows at 50% we are getting NPV of Project B negative, let us discount cash flows of Project B using 15% discounting rate.

Year	Cash Inflows Project B (₹)	Present Value Factor @ 15%	PV of Project B (₹)
0	(5,00,000)	1.000	(5,00,000)
1	2,00,000	0.870	1,74,000
2	2,00,000	0.756	1,51,200
3	7,00,000	0.658	4,60,600
			2,85,800

The internal rate can be obtained by interpolation:

$$\text{IRR}_B = 15\% + \frac{2,85,800}{2,85,800 - (70,600)} \times (50\% - 15\%)$$

$$= 15\% + \left(\frac{2,85,800}{3,56,400} \times 35\% \right) = 43.07\%$$

Overall Position

	Project A	Project B
NPV @ 10%	1,69,750	3,36,400
IRR	50.00%	43.07%

Thus there is contradiction in ranking by two methods.

6.7.9 Discounted Payback Period Method: Some accountants prefers to calculate payback period after discounting the cash flow by a predetermined rate and the payback period so calculated is called, *'Discounted payback period'*. One of the most popular economic criteria for evaluating capital projects also is the payback period. Payback period is the time required for cumulative cash inflows to recover the cash outflows of the project.

This is considered to be superior than simple payback period method because it takes into account time value of money.

For example, a ₹ 30,000 cash outlay for a project with annual cash inflows of ₹ 6,000 would have a payback of 5 years (₹ 30,000 / ₹ 6,000).

The problem with the Payback Period is that it ignores the time value of money. In order to correct this, we can use discounted cash flows in calculating the payback period. Referring back to our example, if we discount the cash inflows at 15% required rate of return we have:

Year	Cash Flow	PVF@15%	PV	Cumulative PV	
1	6,000	0.870	5,220	5,220	
2	6,000	0.756	4,536	9,756	
3	6,000	0.658	3,948	13,704	
4	6,000	0.572	3,432	17,136	
5	6,000	0.497	2,982	20,118	
6	6,000	0.432	2,592	22,710	
7	6,000	0.376	2,256	24,966	
8	6,000	0.327	1,962	26,928	
9	6,000	0.284	1,704	28,632	
10	6,000	0.247	1,482	30,114	←

The cumulative total of discounted cash flows after ten years is ₹30,114. Therefore, our discounted payback is approximately 10 years as opposed to 5 years under simple payback. It should be noted that as the required rate of return increases, the distortion between simple payback and discounted payback grows. Discounted Payback is more appropriate way of measuring the payback period since it considers the time value of money.

6.8   Special Cases

6.8.1 Capital Budgeting under Capital Rationing: As discussed earlier, if project has positive NPV it should be accepted with an objective of maximisation of wealth of shareholder. However, there may be a situation due to resource (capital) constraints (rationing) a firm may have to select some projects among various projects, all having positive NPVs. Broadly two scenarios may influence the method of evaluation to be adopted.

(i)   If projects are independent of each other and are divisible in nature: In such situation NPV Rule should be modified and accordingly projects should be ranked on the basis of 'NPV per Rupee of Capital 'method.

(ii)   If projects are not divisible: In such situation projects shall be ranked on the basis of absolute NPV and should be mixed up to the point available resources are exhausted.

Illustration 13: *Shiva Limited is planning its capital investment programme for next year. It has five projects all of which give a positive NPV at the company cut-off rate of 15 percent, the investment outflows and present values being as follows:*

Project	Investment	NPV @ 15%
	₹'000	₹'000
A	(50)	15.4
B	(40)	18.7
C	(25)	10.1
D	(30)	11.2
E	(35)	19.3

The company is limited to a capital spending of ₹ 1,20,000.

You are required to optimise the returns from a package of projects within the capital spending limit. The projects are independent of each other and are divisible (i.e., part-project is possible).

Solution

Computation of NPVs per Re. 1 of Investment and Ranking of the Projects

Project	Investment	NPV @ 15%	NPV per ₹1	Ranking
	₹'000	₹'000	invested	
A	(50)	15.4	0.31	5
B	(40)	18.7	0.47	2
C	(25)	10.1	0.40	3
D	(30)	11.2	0.37	4
E	(35)	19.3	0.55	1

Building up of a Programme of Projects based on their Rankings

Project	Investment ₹'000	NPV @ 15% ₹ '000	
E	(35)	19.3	
B	(40)	18.7	
C	(25)	10.1	
D	(20)	7.5	(2/3 of project total)
	120	55.6	

Thus Project A should be rejected and only two-third of Project D be undertaken. If the projects are not divisible then other combinations can be examined as:

	Investment ₹ '000	NPV @ 15% ₹'000
E + B + C	100	48.1
E + B + D	105	49.2

In this case E + B + D would be preferable as it provides a higher NPV despite D ranking lower than C.

6.8.2 Projects with unequal lives: Sometimes firm may be faced with any of the following problems:

(i)   Retaining an old asset or replace it with new one.

(ii)   Choosing one proposal among two proposal (Mutually Exclusive).

Although, while evaluating the proposals above scenarios do not pose any special problems if they have same life period. But problem arises in case projects have unequal lives. In such situations we can deal with the problem by following any of the following method:

(i)   Replacement Chain Method

(ii)   Equivalent Annualized Criterion

These two methods can be understood with the help of following illustration.

Illustration 14:   *R plc is considering to modernize its production facilities and it has two proposals under consideration. The expected cash flows associated with these project and their NPV as per discounting rate of 12% and IRR is as follows:*

	Cash Flow	
Year	Project A (£)	Project B (£)
0	(40,00,000)	(20,00,000)
1	8,00,000	7,00,000
2	14,00,000	13,00,000
3	13,00,000	12,00,000
4	12,00,000	
5	11,00,000	
6	10,00,000	
NPV @12%	£6,49,094	£5,15,488
IRR	17.47%	25.20%

Which project should R plc accept?

Solution

Although from NPV point of view Project A appears to be better but from IRR point of view Project B appears to be better. Since, both projects have unequal lives selection on the basis of these two methods shall not be proper. In such situation we shall use any of the following method:

(i) *Replacement Chain (Common Life) Method:* Since the life of the Project A is 6 years and Project B is 3 years to equalize lives we can have second opportunity of investing in project B after one time investing. The position of cash flows in such situation shall be as follows:

NPV of extended life of 6 years of Project B shall be £ 8,82,403 and IRR of 25.20%. Accordingly, with extended life NPV of Project B it appears to be more attractive.

(ii) *Equivalent Annualized Criterion:* Method discussed above has one drawback when we have to compare two projects one has a life of 3 years and other has 5 years. In such case the above method shall require analysis of a period of 15 years i.e. common multiple of these two values. The simple solution to this problem is use of Equivalent Annualised Criterion involving following steps:

(a) Compute NPV using the WACC or discounting rate.

(b) Compute Present Value Annuity Factor (PVAF) of discounting factor used above for the period of each project.

(c) Divide NPV computed under step (a) by PVAF as computed under step (b) and compare the values.

Accordingly, for proposal under consideration:

	Project A	Project B
NPV @ 12%	£6,49,094	£5,15,488
PVAF @12%	4.112	2.402
Equivalent Annualized Criterion	£1,57,854	£2,14,608

Thus, Project B should be selected.

Illustration 15: *Alpha Company is considering the following investment projects:*

Projects	Cash Flows (₹)			
	C_0	C_1	C_2	C_3
A	-10,000	+10,000		
B	-10,000	+7,500	+7,500	
C	-10,000	+2,000	+4,000	+12,000
D	-10,000	+10,000	+3,000	+3,000

(a) Rank the projects according to each of the following methods: (i) Payback, (ii) ARR, (iii) IRR and (iv) NPV, assuming discount rates of 10 and 30 per cent.

(b) Assuming the projects are independent, which one should be accepted? If the projects are mutually exclusive, which project is the best?

Solution

(a) (i)   Payback Period

Project A : 10,000/10,000 = 1 year

Project B: 10,000/7,500   = 1 1/3 years.

Project C: $2 \text{ years} + \dfrac{10,000 - 6,000}{12,000} = 2\dfrac{1}{3} \text{ years}$

Project D: 1 year.

(ii)   ARR

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

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

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

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

Note: This net cash proceed includes recovery of investment also. Therefore, net cash earnings are found by deducting initial investment.

(iii) IRR

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

Project B: This project produces an annuity of ₹ 7,500 for two years. Therefore, the required PVAF is: 10,000/7,500 = 1.33.
This factor is found under 32% column. Therefore, r = 32%

Project C: Since cash flows are uneven, the trial and error method will be followed. Using 20% rate of discount the NPV is + ₹1,389. At 30% rate of discount, the NPV is -₹633. The true rate of return should be less than 30%. At 27% rate of discount it is found that the NPV is -₹86 and at 26% +₹105. Through interpolation, we find r = 26.5%

Project D: In this case also by using the trial and error method, it is found that at 37.6% rate of discount NPV becomes almost zero.
Therefore, r = 37.6%.

(iv) NPV

Project A:

at 10%	-10,000+10,000×0.909 = -910
at 30%	-10,000+10,000×0.769 = -2,310

Project B:

at 10%	-10,000+7,500(0.909+0.826) = 3,013
at 30%	-10,000+7,500(0.769+0.592)= +208

Project C:

at 10%	-10,000+2,000×0.909+4,000×0.826+12,000×0.751 = +4,134
at 30%	-10,000+2,000×0.769+4,000×0.592+12,000×0.455 =-633

Project D:

at 10%	-10,000+10,000×0.909+3,000×(0.826+0.751) =+ 3,821
at 30%	-10,000+10,000×0.769+3,000×(0.592+0.455) = + 831

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

Ranks					
Projects	**PBP**	**ARR**	**IRR**	**NPV (10%)**	**NPV (30%)**
A	1	4	4	4	4
B	2	2	2	3	2
C	3	1	3	1	3
D	1	3	1	2	1

(b)   Payback and ARR are theoretically unsound method for choosing between the investment projects. Between the two time-adjusted (DCF) investment criteria, NPV and IRR, NPV gives consistent results. If the projects are independent (and there is no capital rationing), either IRR or NPV can be used since the same set of projects will be accepted by any of the methods. In the present case, except Project A all the three projects should be accepted if the discount rate is 10%. Only Projects B and D should be undertaken if the discount rate is 30%.

If it is assumed that the projects are mutually exclusive, then under the assumption of 30% discount rate, the choice is between B and D (A and C are unprofitable). Both criteria IRR and NPV give the same results – D is the best. Under the assumption of 10% discount rate, ranking according to IRR and NPV conflict (except for Project A). If the IRR rule is followed, Project D should be accepted. But the NPV rule tells that Project C is the best. The NPV rule generally gives consistent results in conformity with

the wealth maximization principle. Therefore, Project C should be accepted following the NPV rule.

Illustration 16: *The expected cash flows of three projects are given below. The cost of capital is 10 per cent.*

(a) *Calculate the payback period, net present value, internal rate of return and accounting rate of return of each project.*

(b) *Show the rankings of the projects by each of the four methods.*

Period	Project A (₹)	Project B (₹)	Project C (₹)
0	(5,000)	(5,000)	(5,000)
1	900	700	2,000
2	900	800	2,000
3	900	900	2,000
4	900	1,000	1,000
5	900	1,100	
6	900	1,200	
7	900	1,300	
8	900	1,400	
9	900	1,500	
10	900	1,600	

Solution

(a) *Payback Period Method*

A = 5 + (500/900) = 5.56 years

B = 5 + (500/1,200) = 5.42 years

C = 2 + (1,000/2,000) = 2.5 years

Net Present Value

NPV_A = (− 5,000) + (900×6.145) = (5,000) + 5,530.5 = ₹530.5

NPV_B is calculated as follows:

Year	Cash flow (₹)	10% discount factor	Present value (₹)
0	(5000)	1.000	(5,000)
1	700	0.909	636
2	800	0.826	661
3	900	0.751	676
4	1000	0.683	683
5	1100	0.621	683

6	1200	0.564	677
7	1300	0.513	667
8	1400	0.467	654
9	1500	0.424	636
10	1600	0.386	<u>618</u>
			<u>1591</u>

NPV_C is calculated as follows:

Year	Cash flow (₹)	10% discount factor	Present value (₹)
0	(5000)	1.000	(5,000)
1	2000	0.909	1,818
2	2000	0.826	1,652
3	2000	0.751	1,502
4	1000	0.683	<u>683</u>
			<u>655</u>

Internal Rate of Return

NPV at 12% = (5,000) + 900×5.650

$\qquad$ = (5,000) + 5085= 85

NPV at 13% = (5,000) + 900×5.426

$\qquad$ = (5,000) + 4,883.40= -116.60

$IRR_A \quad = 12 + \left[\dfrac{85}{85 + 116.60} \right] \times (13 - 12) = 12 + 0.42$

$IRR_A \quad = 12.42\%.$

IRR_B

Year	Cash flow (₹)	10% discount factor	Present value (₹)	20% discount factor	Present value (₹)
0	(5,000)	1.000	(5,000)	1.000	(5,000)
1	700	0.909	636	0.833	583
2	800	0.826	661	0.694	555
3	900	0.751	676	0.579	521
4	1,000	0.683	683	0.482	482
5	1,100	0.621	683	0.402	442
6	1,200	0.564	677	0.335	402

7	1,300	0.513	667	0.279	363
8	1,400	0.467	654	0.233	326
9	1,500	0.424	636	0.194	291
10	1,600	0.386	<u>618</u>	0.162	<u>259</u>
			<u>1,591</u>		<u>(776)</u>

Interpolating: $IRR_B=$

$$10\% + \frac{1,591}{(1,591 + 776)} \times (20\%\text{-}10\%) = 10\% + 6.72\% = 16.72\%$$

IRR$_C$

Year	Cash flow (₹)	15% discount factor	Present value (₹)	18% discount factor	Present value (₹)
0	(5,000)	1.000	(5,000)	1.000	(5,000)
1	2,000	0.870	1,740	0.847	1,694
2	2,000	0.756	1,512	0.718	1,436
3	2,000	0.658	1,316	0.609	1,218
4	1,000	0.572	<u>572</u>	0.516	<u>516</u>
			<u>140</u>		<u>(136)</u>

Interpolating: $IRR_C = 15\% + \dfrac{140}{(140 + 136)} \times (18\%\text{-}15\%) = 15\% + 1.52\% = 16.52\%$

Accounting Rate of Return

ARR_A: Average capital employed = $\dfrac{5,000}{2}$ = ₹ 2,500

Average accounting profit = $\dfrac{(9,000 - 5,000)}{10}$ = ₹ 400

$ARR_A = \dfrac{(400 \times 100)}{2,500} = 16\,\text{per cent}$

ARR_B: Average accounting profit = $\dfrac{(11,500 - 5,000)}{10}$ = ₹ 650

$ARR_B = \dfrac{(650 \times 100)}{2,500} = 26\,\text{per cent}$

$$ARR_C: \text{Average accounting profit} = \frac{(7{,}000 - 5{,}000)}{4} = ₹\,500$$

$$ARR_C = \frac{(500 \times 100)}{2{,}500} = 20 \text{ per cent}$$

(b)   **Summary of Results**

Project	A	B	C
Payback (years)	5.5	5.4	2.5
ARR (%)	16	26	20
IRR (%)	12.42	16.72	16.52
NPV (₹)	530.50	1,591	655

Comparison of Rankings

Method	Payback	ARR	IRR	NPV
1	C	B	B	B
2	B	C	C	C
3	A	A	A	A

Illustration 17: *Lockwood Limited wants to replace its old machine with a new automatic machine. Two models A and B are available at the same cost of ₹ 5 lakhs each. Salvage value of the old machine is ₹ 1 lakh. The utilities of the existing machine can be used if the company purchases A. Additional cost of utilities to be purchased in that case are ₹ 1 lakh. If the company purchases B then all the existing utilities will have to be replaced with new utilities costing ₹ 2 lakhs. The salvage value of the old utilities will be ₹ 0.20 lakhs. The earnings after taxation are expected to be:*

Year	(cash in-flows of)		
	A ₹	B ₹	P.V. Factor @ 15%
1	1,00,000	2,00,000	0.87
2	1,50,000	2,10,000	0.76
3	1,80,000	1,80,000	0.66
4	2,00,000	1,70,000	0.57
5	1,70,000	40,000	0.50
Salvage Value at the end of Year 5	50,000	60,000	

The targeted return on capital is 15%. You are required to (i) Compute, for the two machines separately, net present value, discounted payback period and desirability factor and (ii) Advice which of the machines is to be selected?

Solution

(i)   Expenditure at year zero   *(₹in lakhs)*

Particulars	A	B
Cost of Machine	5.00	5.00
Cost of Utilities	1.00	2.00
Salvage of Old Machine	(1.00)	(1.00)
Salvage of Old Utilities	–	(0.20)
Total Expenditure (Net)	5.00	5.80

(ii) Discounted Value of Cash inflows

(₹ in lakhs)

Year	NPV Factor @ 15%	Machine A		Machine B	
		Cash inflows	Discounted value of inflows	Cash Flows	Discounted value of inflows
0	1.00	(5.00)	(5.00)	(5.80)	(5.80)
1	0.87	1.00	0.87	2.00	1.74
2	0.76	1.50	1.14	2.10	1.60
3	0.66	1.80	1.19	1.80	1.19
4	0.57	2.00	1.14	1.70	0.97
5	0.50	1.70	0.85	0.40	0.20
Salvage	0.50	0.50	0.25	0.60	0.30
			5.44		6.00
Net Present Value			(+)0.44		(+)0.20

Since the Net present Value of both the machines is positive both are acceptable.

(iii) Discounted Pay-back Period   *(₹ in lakhs)*

Year	Machine A		Machine B	
	Discounted cash inflows	Cumulative Discounted cash inflows	Discounted cash inflows	Cumulative Discounted cash inflows
1	0.87	0.87	1.74	1.74
2	1.14	2.01	1.60	3.34
3	1.19	3.20	1.19	4.53
4	1.14	4.34	0.97	5.50
5	1.10*	5.44	0.50	6.00

* Includes salvage value

Discounted Payback Period (For A and B):

$$4 \text{ years } + \left(\frac{0.66}{1.10}\right) \times 1 = 4.6 \text{ years} \qquad 4 \text{ years } + \left(\frac{0.30}{0.50}\right) \times 1 = 4.6 \text{ years}$$

Profitability Index: $\dfrac{\text{Sum } of \ present \ value \ of \ net \ cash \ inflow}{Initial \ cash \ outlay}$

$$\frac{₹ \ 5.44 \text{ lakhs}}{₹ \ 5.00 \text{ lakhs}} = 1.088 \text{ (A)} \qquad \frac{₹ \ 6.00 \text{ lakhs}}{₹ \ 5.80 \text{ lakhs}} = 1.034 \text{ (B)}$$

(iv) Since the absolute surplus in the case of A is more than B and also the desirability factor, it is better to choose A.

The discounted payback period in both the cases is same, also the net present value is positive in both the cases but the desirability factor (profitability index) is higher in the case of Machine A, it is therefore better to choose Machine A.

Illustration 18: *Hindlever Company is considering a new product line to supplement its range line. It is anticipated that the new product line will involve cash investments of ₹ 7,00,000 at time 0 and ₹ 10,00,000 in year 1. After-tax cash inflows of ₹ 2,50,000 are expected in year 2, ₹ 3,00,000 in year 3, ₹ 3,50,000 in year 4 and ₹ 4,00,000 each year thereafter through year 10. Although the product line might be viable after year 10, the company prefers to be conservative and end all calculations at that time.*

(a) If the required rate of return is 15 per cent, what is the net present value of the project? Is it acceptable?

(b) What would be the case if the required rate of return were 10 per cent?

(c) What is its internal rate of return?

(d) What is the project's payback period?

Solution

(a)

Year	Cash flow	Discount Factor (15%)	Present value
	₹		₹
0	(7,00,000)	1.000	(7,00,000)
1	(10,00,000)	0.870	(8,70,000)
2	2,50,000	0.756	1,89,000
3	3,00,000	0.658	1,97,400
4	3,50,000	0.572	2,00,200
5–10	4,00,000	2.163	8,65,200
		Net Present Value	= (1,18,200)

As the net present value is negative, the project is unacceptable.

(b) Similarly, NPV at 10% discount rate can be computed as follows:

Year	Cash flow	Discount Factor (10%)	Present value
	₹		₹
0	(7,00,000)	1.000	(7,00,000)
1	(10,00,000)	0.909	(9,09,000)
2	2,50,000	0.826	2,06,500
3	3,00,000	0.751	2,25,300
4	3,50,000	0.683	2,39,050
5–10	4,00,000	2.974	11,89,600
		Net Present Value	= 2,51,450

Since NPV = ₹2,51,849 i.e. positive, hence the project would be acceptable.

(c) IRR $= 10\% + \dfrac{2,51,450}{3,69,650} \times 5$

$= 10\% + 3.4012$

IRR $= 13.40\%$

(d) Payback Period = 6 years:

–₹ 7,00,000 – ₹ 10,00,000 + ₹ 2,50,000 + ₹ 3,00,000 + ₹ 3,50,000 + ₹ 4,00,000 + ₹ 4,00,000 = 0

Illustration 19*: Elite Cooker Company is evaluating three investment situations: (1) produce a new line of aluminum skillets, (2) expand its existing cooker line to include several new sizes, and (3) develop a new, higher-quality line of cookers. If only the project in question is undertaken, the expected present values and the amounts of investment required are:*

Project	Investment required	Present value of Future Cash-Flows
	₹	₹
1	2,00,000	2,90,000
2	1,15,000	1,85,000
3	2,70,000	4,00,000

If projects 1 and 2 are jointly undertaken, there will be no economies; the investments required and present values will simply be the sum of the parts. With projects 1 and 3, economies are possible in investment because one of the machines acquired can be used in both production processes. The total investment required for projects 1 and 3 combined is ₹ 4,40,000. If projects 2 and 3 are undertaken, there are economies to be achieved in marketing and producing the products but not in investment. The expected present value of future cash flows for projects 2 and 3 is ₹ 6,20,000. If all three projects are undertaken simultaneously, the economies noted will still hold. However, a ₹ 1,25,000 extension on the plant will be

necessary, as space is not available for all three projects. Which project or projects should be chosen?

Solution

Project	Investment Required	Present value of Future Cash Flows	Net Present value
	₹	₹	₹
1	2,00,000	2,90,000	90,000
2	1,15,000	1,85,000	70,000
3	2,70,000	4,00,000	1,30,000
1 and 2	3,15,000	4,75,000	1,60,000
1 and 3	4,40,000	6,90,000	2,50,000
2 and 3	3,85,000	6,20,000	2,35,000
1, 2 and 3	6,80,000*	9,10,000	2,30,000

* ₹2,00,000 + ₹1,15,000 + ₹2,70,000 + ₹1,25,000 – [(₹2,00,000 + ₹2,70,000) - ₹4,40,000]

Advise: Projects 1 and 3 should be chosen, as they provide the highest net present value.

Illustration 20: *Cello Limited is considering buying a new machine which would have a useful economic life of five years, a cost of ₹ 1,25,000 and a scrap value of ₹ 30,000, with 80 per cent of the cost being payable at the start of the project and 20 per cent at the end of the first year. The machine would produce 50,000 units per annum of a new project with an estimated selling price of ₹ 3 per unit. Direct costs would be ₹ 1.75 per unit and annual fixed costs, including depreciation calculated on a straight- line basis, would be ₹ 40,000 per annum.*

In the first year and the second year, special sales promotion expenditure, not included in the above costs, would be incurred, amounting to ₹ 10,000 and ₹ 15,000 respectively.

Evaluate the project using the NPV method of investment appraisal, assuming the company's cost of capital to be 10 percent.

Solution

Calculation of Net Cash flows

Contribution = (3.00 – 1.75)×50,000 = ₹62,500

Fixed costs = 40,000 – [(1,25,000 – 30,000)/5] = ₹21,000

Year	Capital (₹)	Contribution (₹)	Fixed costs (₹)	Adverts (₹)	Net cash flow (₹)
0	(1,00,000)				(1,00,000)
1	(25,000)	62,500	(21,000)	(10,000)	6,500
2		62,500	(21,000)	(15,000)	26,500
3		62,500	(21,000)		41,500

| 4 | | 62,500 | (21,000) | | 41,500 |
| 5 | 30,000 | 62,500 | (21,000) | | 71,500 |

Calculation of Net Present Value

Year	Net cash flow (₹)	10% discount factor	Present value (₹)
0	(1,00,000)	1.000	(1,00,000)
1	6,500	0.909	5,909
2	26,500	0.826	21,889
3	41,500	0.751	31,167
4	41,500	0.683	28,345
5	71,500	0.621	<u>44,402</u>
			<u>31,712</u>

The net present value of the project is ₹ 31,712.

SUMMARY

➤ Capital budgeting is the process of evaluating and selecting long-term investments that are in line with the goal of investor's wealth maximization.

➤ The capital budgeting decisions are important, crucial and critical business decisions due to substantial expenditure involved; long period for the recovery of benefits; irreversibility of decisions and the complexity involved in capital investment decisions.

➤ One of the most important tasks in capital budgeting is estimating future cash flows for a project. The final decision we make at the end of the capital budgeting process is no better than the accuracy of our cash-flow estimates.

➤ Tax payments like other payments must be properly deducted in deriving the cash flows. That is, cash flows must be defined in post-tax terms.

➤ There are a number of capital budgeting techniques available for appraisal of investment proposals and can be classified as traditional (non-discounted) and time-adjusted (discounted).

➤ The most common traditional capital budgeting techniques are Payback Period and Accounting (Book) Rate of Return.

$$\text{Payback period} = \frac{\text{Total initial capital investment}}{\text{Annual expected after-tax net cash flow}}$$

$$\text{Payback Reciprocal} = \frac{\text{Average annual cash in flow}}{\text{Initial investment}}$$

➤ The most common time-adjusted capital budgeting techniques are Net Present Value Technique and Internal Rate of Return Method.

7

Management of Working Capital

UNIT – I : MEANING, CONCEPT AND POLICIES OF WORKING CAPITAL

Learning Objectives

After studying this chapter you will be able to:

- Discuss in detail about working capital management, its meanings and its significance to any business/firm.

- Understand the concept of operating cycle and the estimation of working capital needs.

- Understand the need for a business to invest in current assets.

- Know why it is important to manage efficiently the current assets and current liabilities?

- Discuss the financing of working capital.

Overview

This chapter introduces you to the concept of working capital management i.e. management of the capital needed by a firm for its day-to-day activity. Here you also study the management of cash, marketable securities, accounts receivables, account payable, accruals and different means of short-term financing.

Two most important points to remember while studying working capital management are:

(a) The optimal level of investment in current assets, and
(b) The appropriate mix of short-term and long-term financing used to support this investment in current assets.

The chapter also delves upon the different approaches to management of working capital with the objective of maintaining optimum balance of each of the working capital components.

Similarly, the different forms of financing which you have gone through in Chapter Five on Types of Financing also have an implication in this chapter. Here the sources of short term financing are re-visited.

7.1   Meaning and Concept of Working Capital

In accounting term working capital is the difference between the current assets and current liabilities. If we break down the components of working capital we will found working capital as follows:

Working Capital = Current Assets – Current Liabilities

Current Assets: An asset is classified as current when:

(i)   It is expected to be realised or intends to be sold or consumed in normal operating cycle of the entity;
(ii)   The asset is held primarily for the purpose of trading;
(iii) It is expected to be realised within twelve months after the reporting period;
(iv) It is non- restricted cash or cash equivalent.

Generally current assets of an entity, for the purpose of working capital management can be grouped into the following main heads:

(a)   Inventory (raw material, work in process and finished goods)

(b)   Receivables (trade receivables and bills receivables)

(c)   Cash or cash equivalents (short-term marketable securities)

(d)   Prepaid expenses

Current Liabilities: A liability is classified as current when:

(i)   It is expected to be settled in normal operating cycle of the entity.

(ii)   The liability is held primarily for the purpose of trading

(iii) It is expected to be settled within twelve months after the reporting period

Generally current liabilities of an entity, for the purpose of working capital management can be grouped into the following main heads:

(a)   Payable (trade payables and bills receivables)

(b)   Outstanding payments (wages & salary etc.)

The concept of working capital can also be explained through two angles.

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                        ┌──────────────────┐
                        │ Working capital  │
                        └──────────────────┘
              ┌───────────────────┴───────────────────┐
    ┌──────────────────────┐              ┌──────────────────────┐
    │ On the basis of Value │              │ On the basis of Time │
    └──────────────────────┘              └──────────────────────┘
      ┌──────────┴──────────┐              ┌──────────┴──────────┐
 ┌─────────┐          ┌─────────┐    ┌────────────┐       ┌────────────┐
 │  Gross  │          │   Net   │    │ Permanent  │       │ Flactuating│
 └─────────┘          └─────────┘    └────────────┘       └────────────┘
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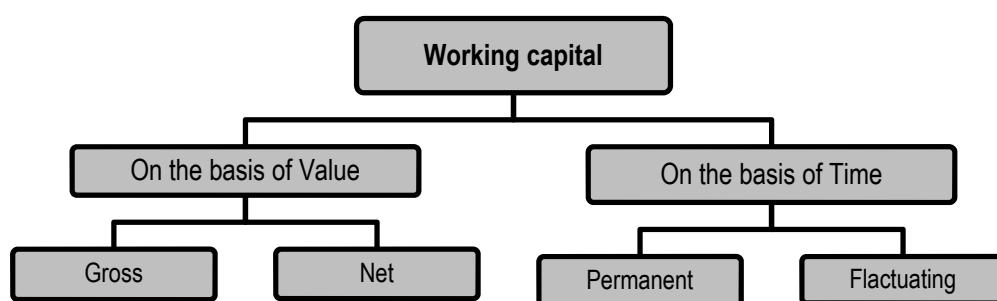
(a)   Value : From the value point of view, Working Capital can be defined as Gross Working Capital or Net Working Capital.

Gross working capital refers to the firm's investment in current assets.

Net working capital refers to the difference between current assets and current liabilities.

A positive working capital indicates the company's ability to pay its short-term liabilities. On the other hand a negative working capital shows inability of an entity to meet its short-term liabilities.

(b)   Time: From the point of view of time, working capital can be divided into two categories viz., Permanent and Fluctuating (temporary).

Permanent working capital refers to the base working capital, which is the minimum level of investment in the current assets that is carried by the entity at all times to carry its day to day activities.

Temporary working capital refers to that part of total working capital, which is required by an entity in addition to the permanent working capital. It is also called variable working capital which is used to finance the short term working capital requirements which arises due to fluctuation in sales volume.

The following diagrams shows Permanent and Temporary or Fluctuating or variable working capital:
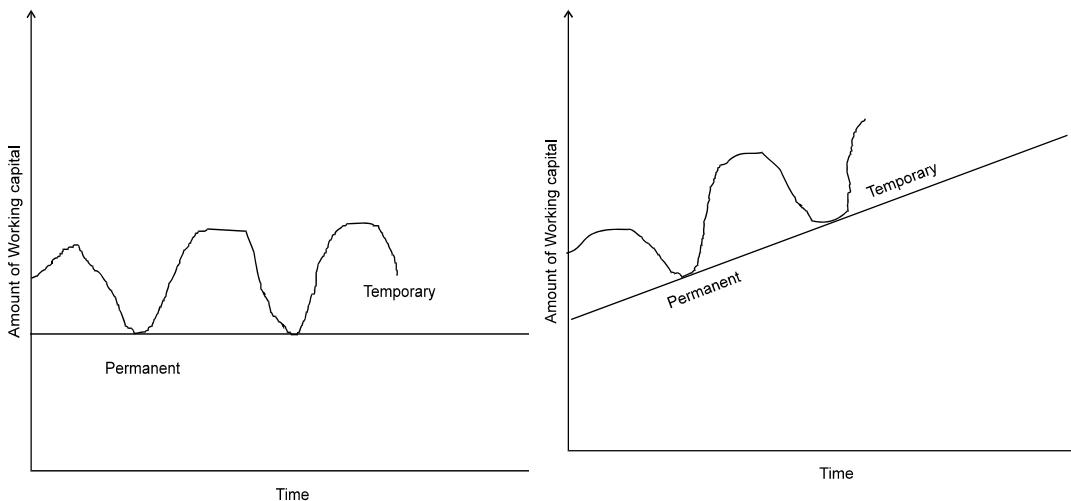
Both kinds of working capital i.e. permanent and fluctuating (temporary) are necessary to facilitate production and sales through the operating cycle.

7.2   Significance of Working Capital

7.2.1 Importance of Adequate Working Capital: Management of working capital is an essential task of the finance manager. He has to ensure that the amount of working capital available with his concern is neither too large nor too small for its requirements.

A large amount of working capital would mean that the company has idle funds. Since funds have a cost, the company has to pay huge amount as interest on such funds.

If the firm has inadequate working capital, such firm runs the risk of insolvency. Paucity of working capital may lead to a situation where the firm may not be able to meet its liabilities.

The various studies conducted by the Bureau of Public Enterprises have shown that one of the reasons for the poor performance of public sector undertakings in our country has been the large amount of funds locked up in working capital. This results in over capitalization. Over capitalization implies that a company has too large funds for its requirements, resulting in a low rate of return, a situation which implies a less than optimal use of resources. A firm, therefore, has to be very careful in estimating its working capital requirements.

Maintaining adequate working capital is not just important in the short-term. Sufficient liquidity must be maintained in order to ensure the survival of the business in the long-term as well. When businesses make investment decisions they must not only consider the financial outlay involved with acquiring the new machine or the new building, etc., but must also take account of the additional current assets that are usually required with any expansion of activity. For e.g.:-

➢ Increased production leads to holding of additional stocks of raw materials and work-in-progress.

➢ An increased sale usually means that the level of debtors will increase.

➢ A general increase in the firm's scale of operations tends to imply a need for greater levels of working capital.

A question then arises what is an optimum amount of working capital for a firm? We can say that a firm should neither have too high an amount of working capital nor should the same be too low. It is the job of the finance manager to estimate the requirements of working capital carefully and determine the optimum level of investment in working capital.

7.2.2 Optimum Working Capital: If a company's current assets do not exceed its current liabilities, then it may run into trouble with creditors that want their money quickly.

Current ratio (current assets/current liabilities) (along with acid test ratio to supplement it) has traditionally been considered the best indicator of the working capital situation.

It is understood that a current ratio of 2 (two) for a manufacturing firm implies that the firm has an optimum amount of working capital. This is supplemented by Acid Test Ratio (Quick assets/Current liabilities) which should be at least 1 (one). Thus it is considered that there is a comfortable liquidity position if liquid current assets are equal to current liabilities.

Bankers, financial institutions, financial analysts, investors and other people interested in financial statements have, for years, considered the current ratio at 'two' and the acid test ratio at 'one' as indicators of a good working capital situation. As a thumb rule, this may be quite adequate.

However, it should be remembered that optimum working capital can be determined only with reference to the particular circumstances of a specific situation. Thus, in a company where the

inventories are easily saleable and the sundry debtors are as good as liquid cash, the current ratio may be lower than 2 and yet firm may be sound.

In nutshell, a firm should have adequate working capital to run its business operations. Both excessive as well as inadequate working capital positions are dangerous.

7.3   Determinants of Working Capital

Working capital management is concerned with:-

a)   Maintaining adequate working capital (management of the level of individual current assets and the current liabilities) AND

b)   Financing of the working capital.

For the point a) above, a Finance Manager needs to plan and compute the working capital requirement for its business. And once the requirement has been computed he needs to ensure that it is financed properly. This whole exercise is nothing but Working Capital Management.

Sound financial and statistical techniques, supported by judgment should be used to predict the quantum of working capital required at different times.

Some of the factors which need to be considered while planning for working capital requirement are:-

Cash – Identify the cash balance which allows for the business to meet day-to-day expenses, but reduces cash holding costs.

Inventory – Identify the level of inventory which allows for uninterrupted production but reduces the investment in raw materials and hence increases cash flow; the techniques like Just in Time (JIT) and Economic order quantity (EOQ) are used for this.

Receivables – Identify the appropriate credit policy, i.e., credit terms which will attract customers, such that any impact on cash flows and the cash conversion cycle will be offset by increased revenue and hence Return on Capital (or vice versa). The tools like Discounts and allowances are used for this.

Short-term Financing Options – Inventory is ideally financed by credit granted by the supplier; dependent on the cash conversion cycle, it may however, be necessary to utilize a bank loan (or overdraft), or to "convert debtors to cash" through "factoring" in order to finance working capital requirements.

Nature of Business - For e.g. in a business of restaurant, most of the sales are in Cash. Therefore need for working capital is very less.

Market and Demand Conditions - For e.g. if an item's demand far exceeds its production, the working capital requirement would be less as investment in finished goods inventory would be very less.

Technology and Manufacturing Policies - For e.g. in some businesses the demand for goods is seasonal, in that case a business may follow a policy for steady production through out over

the whole year or instead may choose policy of production only during the demand season.

Operating Efficiency – A company can reduce the working capital requirement by eliminating waste, improving coordination etc.

Price Level Changes – For e.g. rising prices necessitate the use of more funds for maintaining an existing level of activity. For the same level of current assets, higher cash outlays are required. Therefore the effect of rising prices is that a higher amount of working capital is required.

7.4   Management of Working Capital

The working capital of an entity can be termed as for example, life blood if an entity is compared with a living body; lubricant/ fuel if is an entity is compared with an engine. Working capital is required for smooth functioning of the business of an entity as lack of this may interrupt the ordinary activities. Hence, the working capital needs adequate attention and efficient management. When we talk about the management it involves 3 Es i.e. Economy, Efficiency and Effectiveness and all these three are required for the working capital management.

The scope of working capital management can be grouped into two broad areas (i) Profitability and Liquidity and (ii) Investment and Financing Decision.

Scope of Working Capital Management	
Liquidity and Profitability	**Investment and Financing**

7.4.1 Liquidity and Profitability: For uninterrupted and smooth functioning of the day to day business of an entity it is important to maintain liquidity of funds evenly. As we have already learnt in previous chapters that each rupee of capital bears some cost. So, while maintaining liquidity the cost aspect needs to be borne in mind. Unnecessary tying up of funds in idle assets not only reduces the liquidity but also reducing the opportunity to earn better return from a productive asset. Hence, a trade-off is required between the liquidity and profitability which increases the profitability without disturbing the day to day functioning. This requires 3Es as discussed above i.e. economy in financing, efficiency in utilisation and effectiveness in achieving the intended objectives.

The trade-off between the components of working capital can be summarised as follows:

Component of Working Capital	Advantages of higher side (Profitability)	Trade-off (between Profitability and Liquidity)	Advantages of lower side (Liquidity)
Inventory	Fewer stock-outs increase the profitability.	Use techniques like EOQ, JIT etc. to carry optimum level of inventory.	Lower inventory requires less capital but endangered stock-

			out and loss of goodwill.
Receivables	Higher Credit period attract customers and increase revenue	Evaluate the credit policy; use the services of debt management (factoring) agencies.	Cash sales provide liquidity but fails to boost sales and revenue
Pre-payment of expenses	Reduces uncertainty and profitable in inflationary environment.	Cost-benefit analysis required	Improves or maintains liquidity.
Cash and Cash equivalents	Payables are honoured in time, improves the goodwill and helpful in getting future discounts.	Cash budgets and other cash management techniques can be used	Cash can be invested in some other investment avenues
Payables and Expenses	Capital can be used in some other investment avenues	Evaluate the credit policy and related cost.	Payables are honoured in time, improves the goodwill and helpful in getting future discounts.

7.4.2 Investment and Financing: Working capital policy is a function of two decisions, first, investment in working capital and the second is financing of the this investment. Investment in working capital is concerned with the level of investment in the current assets. It gives the answer of 'How much' fund to be tied in to achieve the organisation objectives (i.e. Effectiveness of fund). Financing decision concerned with the arrangement of funds to finance the working capital. It gives the answer 'Where from' fund to be sourced' at lowest cost as possible (i.e. Economy). Financing decision, we will discuss this in later unit of this chapter.

Investment of working capital: How much to be invested in current assets as working capital is a matter of policy decision by an entity. It has to be decided in the light of organisational objectives, trade policies and financial (cost-benefit) considerations. There is not set rules for deciding the level of investment in working capital. Some organisations due to its peculiarity require more investment than others. For example a infrastructure development company requires more investment in its working capital as there may be huge inventory in the form of work in process on the other hand a company which is engaged in fast food business, comparatively requires less investment. Hence, level of investment depends on the various factors listed below:

(a) Nature of Industry: Construction companies, breweries etc. requires large investment in working capital due long gestation period.

(b)   Types of products: Consumer durable has large inventory as compared to perishable products.

(c)   Manufacturing vs Trading vs Service: A manufacturing entity has to maintain three levels of inventory i.e. raw material, work-in-process and finished goods whereas a trading and a service entity has to maintain inventory only in the form of trading stock and consumables respectively.

(d)   Volume of sales: Where the sales are high, there is a possibility of high receivables as well.

(e)   Credit policy: An entity whose credit policy is liberal has not only high level of receivables but requires more capital to fund raw material purchases.

7.4.3 Approaches of working capital investment: Based on the organisational policy and risk-return trade off, working capital investment decisions are categorised into three approaches i.e. aggressive, conservative and moderate.
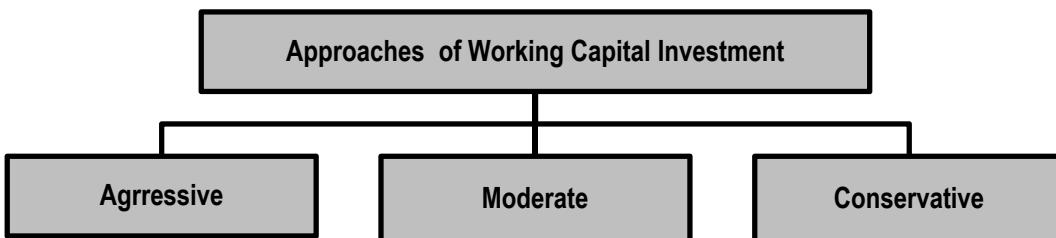
(a)   Aggressive: Here investment in working capital is kept at minimal investment in current assets which means the entity does hold lower level of inventory, follow strict credit policy, keeps less cash balance etc. The advantage of this approach is that lower level of fund is tied in the working capital which results in lower financial costs but the flip side could be that the organisation could not grow which leads to lower utilisation of fixed assets and long term debts. In the long run firm stay behind the competitors.

(b)   Conservative: In this approach of organisation use to invest high capital in current assets. Organisations use to keep inventory level higher, follows liberal credit policies, and cash balance as high as to meet any current liabilities immediately. The advantage of this approach are higher sales volume, increased demand due to liberal credit policy and increase goodwill among the suppliers due to payment in short time. The disadvantages are increase cost of capital, higher risk of bad debts, shortage of liquidity in long run to longer operating cycles.

(c)   Moderate: This approach is in between the above two approaches. Under this approach a balance between the risk and return is maintained to gain more by using the funds in very efficient manner.
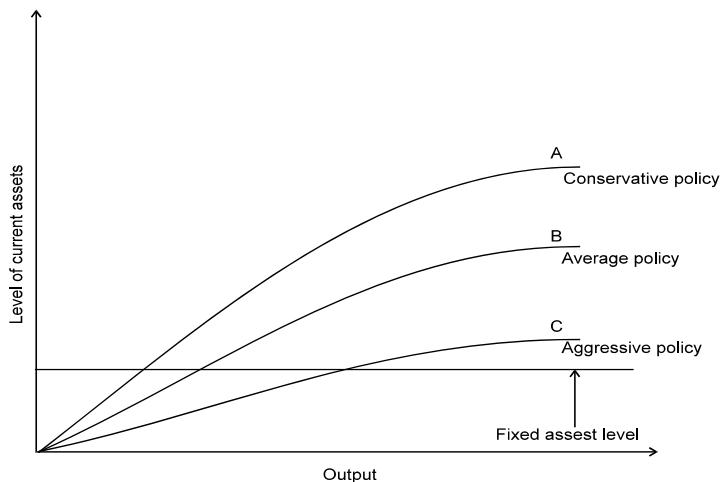
7.4.4 Current Assets to Fixed Assets Ratio: The finance manager is required to determine the optimum level of current assets so that the shareholders value is maximized.

A firm needs fixed and current assets to support a particular level of output.

As the firm's output and sales increases, the need for current assets also increases. Generally, current assets do not increase in direct proportion to output; current assets may increase at a decreasing rate with output. As the output increases, the firm starts using its current asset more efficiently.

The level of the current assets can be measured by creating a relationship between current assets and fixed assets. Dividing current assets by fixed assets gives current assets/fixed assets ratio.

Assuming a constant level of fixed assets, a higher current assets/fixed assets ratio indicates a conservative current assets policy and a lower current assets/fixed assets ratio means an aggressive current assets policy assuming all factors to be constant.

A conservative policy implies greater liquidity and lower risk whereas an aggressive policy indicates higher risk and poor liquidity. Moderate current assets policy will fall in the middle of conservative and aggressive policies. The current assets policy of most of the firms may fall between these two extreme policies.

The following illustration explains the risk-return trade off of various working capital management policies, viz., conservative, aggressive and moderate.

Illustration 1 : *A firm has the following data for the year ending 31st March, 2014:*

	(₹)
Sales (1,00,000 @ ₹ 20)	*20,00,000*
Earnings before Interest and Taxes	*2,00,000*
Fixed Assets	*5,00,000*

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

Effect of Alternative Working Capital Policies

Working Capital Policy	Conservative (₹)	Moderate (₹)	Aggressive (₹)
Sales	20,00,000	20,00,000	20,00,000
Earnings before Interest and Taxes (EBIT)	2,00,000	2,00,000	2,00,000
Current Assets	5,00,000	4,00,000	3,00,000
Fixed Assets	5,00,000	5,00,000	5,00,000
Total Assets	10,00,000	9,00,000	8,00,000
Return on Total Assets (EBIT÷ Total Assets)	20%	22.22%	25%
Current Assets/Fixed Assets	1.00	0.80	0.60

The aforesaid calculation shows that the conservative policy provides greater liquidity (solvency) to the firm, but lower return on total assets. On the other hand, the aggressive policy gives higher return, but low liquidity and thus is very risky. The moderate policy generates return higher than Conservative policy but lower than aggressive policy. This is less risky than aggressive policy but more risky than conservative policy.

In determining the optimum level of current assets, the firm should balance the profitability – solvency tangle by minimizing total costs – Cost of liquidity and cost of illiquidity.

7.5 Estimating Working Capital Needs

Operating cycle is one of the most reliable methods of Computation of Working Capital.

However, other methods like ratio of sales and ratio of fixed investment may also be used to determine the Working Capital requirements. These methods are briefly explained as follows:

(i)   **Current Assets Holding Period:** To estimate working capital needs based on the average holding period of current assets and relating them to costs based on the company's experience in the previous year. This method is essentially based on the Operating Cycle Concept.

(ii) **Ratio of Sales:** To estimate working capital needs as a ratio of sales on the assumption that current assets change with changes in sales.

(iii) **Ratio of Fixed Investments:** To estimate Working Capital requirements as a percentage of fixed investments.

A number of factors will, however, be impacting the choice of method of estimating Working Capital. Factors such as seasonal fluctuations, accurate sales forecast, investment cost and

variability in sales price would generally be considered. The production cycle and credit and collection policies of the firm will have an impact on Working Capital requirements. Therefore, they should be given due weightage in projecting Working Capital requirements.

7.6   Operating or Working Capital Cycle

A useful tool for managing working capital is the operating cycle.

The operating cycle analyzes the accounts receivable, inventory and accounts payable cycles in terms of number of days. For example:

➢   Accounts receivables are analyzed by the average number of days it takes to collect an account.

➢   Inventory is analyzed by the average number of days it takes to turn over the sale of a product (from the point it comes in the store to the point it is converted to cash or an account receivable).

➢   Accounts payables are analyzed by the average number of days it takes to pay a supplier invoice.

Operating/Working Capital Cycle Definition

Working Capital cycle indicates the length of time between a company's paying for materials, entering into stock and receiving the cash from sales of finished goods. It can be determined by adding the number of days required for each stage in the cycle. For example, a company holds raw materials on an average for 60 days, it gets credit from the supplier for 15 days, production process needs 15 days, finished goods are held for 30 days and 30 days credit is extended to debtors. The total of all these, 120 days, i.e., 60 – 15 + 15 + 30 + 30 days is the total working capital cycle.

Working Capital Cycle
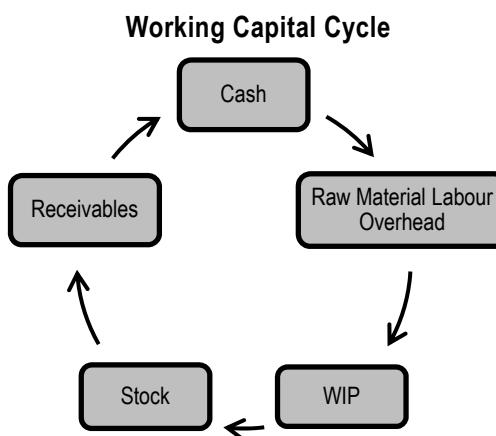
Most businesses cannot finance the operating cycle (accounts receivable days + inventory days) with accounts payable financing alone. Consequently, working capital financing is needed. This

shortfall is typically covered by the net profits generated internally or by externally borrowed funds or by a combination of the two.

The faster a business expands the more cash it will need for working capital and investment. The cheapest and best sources of cash exist as working capital right within business. Good management of working capital will generate cash which will help improve profits and reduce risks. Bear in mind that the cost of providing credit to customers and holding stocks can represent a substantial proportion of a firm's total profits.

Each component of working capital (namely inventory, receivables and payables) has two dimensions ......TIME ....and MONEY, when it comes to managing working capital then time is money. If you can get money to move faster around the cycle (e.g. collect monies due from debtors more quickly) or reduce the amount of money tied up (e.g. reduce inventory levels relative to sales), the business will generate more cash or it will need to borrow less money to fund working capital. Similarly, if you can negotiate improved terms with suppliers e.g. get longer credit or an increased credit limit; you are effectively creating free finance to help fund future sales.

If you..................	Then ....
Collect receivables (debtors) faster	You release cash from the cycle
Collect receivables (debtors) slower	Your receivables soak up cash.
Get better credit (in terms of duration or amount) from suppliers.	You increase your cash resources.
Shift inventory (stocks) faster	You free up cash.
Move inventory (stocks) slower.	You consume more cash.

The determination of operating capital cycle helps in the forecast, control and management of working capital. The length of operating cycle is the indicator of performance of management. The net operating cycle represents the time interval for which the firm has to negotiate for Working Capital from its bankers. It enables to determine accurately the amount of working capital needed for the continuous operation of business activities.

The duration of working capital cycle may vary depending on the nature of the business.

In the form of an equation, the operating cycle process can be expressed as follows:

Operating Cycle   =   R + W + F + D – C

Where,

R =	Raw material storage period
W =	Work-in-progress holding period
F =	Finished goods storage period
D =	Receivables (Debtors) collection period.
C =	Credit period allowed by suppliers (Creditors).

The various components of Operating Cycle may be calculated as shown below:

(1)	Raw Material Storage Period	$= \dfrac{\text{Average stock of raw material}}{\text{Average Cost of Raw Material Consumption per day}}$
(2)	Work-in-Progress holding period	$= \dfrac{\text{Average Work}-\text{in}-\text{progress inventory}}{\text{Average Cost of Production per day}}$
(3)	Finished Goods storage period	$= \dfrac{\text{Average stock of finished goods}}{\text{Average Cost of Goods Sold per day}}$
(4)	Receivables (Debtors) collection period	$= \dfrac{\text{Average Receivables}}{\text{Average Credit Sales per day}}$
(5)	Credit period allowed by suppliers (Creditors)	$= \dfrac{\text{Average Payables}}{\text{Average Credit Purchases per day}}$

7.6.1 Working Capital Based on Operating Cycle: One of the methods for forecasting working capital requirement is based on the concept of operating cycle. The calculation of operating cycle and the formula for estimating working capital on its basis has been demonstrated with the help of following illustration:

Illustration 2 : *From the following information of XYZ Ltd., you are required to calculate :*

(a)   Net operating cycle period.

(b)   Number of operating cycles in a year.

		(₹)
(i)	*Raw material inventory consumed during the year*	*6,00,000*
(ii)	*Average stock of raw material*	*50,000*
(iii)	*Work-in-progress inventory*	*5,00,000*
(iv)	*Average work-in-progress inventory*	*30,000*
(v)	*Finished goods inventory*	*8,00,000*
(vi)	*Average finished goods stock held*	*40,000*
(vii)	*Average collection period from debtors*	*45 days*
(viii)	*Average credit period availed*	*30 days*
(ix)	*No. of days in a year*	*360 days*

Solution

(a) Calculation of Net Operating Cycle period of XYZ Ltd.

$$\text{Raw Material storage period (R)} = \frac{\text{Average stock of raw material}}{\text{Average Cost of Raw Material Consumption per day}}$$

$$= \frac{₹50,000}{₹6,00,000 \div 360 \text{ days}} = \frac{₹50,000}{1,667} = 30 \text{ days}$$

$$\text{Work-in-progress holding period (W)} = \frac{\text{Average Work} - \text{in} - \text{progress inventory}}{\text{Average Cost of Production per day}}$$

$$= \frac{₹30,000}{₹5,00,000 \div 360 \text{ days}} = \frac{₹30,000}{1,389} = 22 \text{ days}$$

$$\text{Finished Goods storage period (F)} = \frac{\text{Average stock of finished goods}}{\text{Average Cost of Goods Sold per day}}$$

$$= \frac{₹40,000}{₹8,00,000 \div 360 \text{ days}} = \frac{₹40,000}{2,222} = 18 \text{ days}$$

Receivables (Debtors) collection period (D) = 45 days

Credit Period allowed by creditors (C) = 30 days

Net Operating Cycle = R + W + F+ D – C

$$= 30 + 22 + 18 + 45 – 30 = 85 \text{ days}$$

(b) Number of Operating Cycles in a year $= \dfrac{\text{No. of days in a year}}{\text{Operating Cycle period}} = \dfrac{360 \text{ days}}{85 \text{ days}} = 4.23 \text{ times}$

7.6.2 Estimation of Amount of Different Components of Current Assets and Current Liabilities: The various constituents of current assets and current liabilities have a direct bearing on the computation of working capital and the operating cycle. The holding period of various constituents of Current Assets and Current Liabilities cycle may either contract or expand the net operating cycle period.

Shorter the operating cycle period, lower will be the requirement of working capital and *vice-versa.*

Estimation of Current Assets

The estimates of various components of working capital may be made as follows:

(i) Raw Materials Inventory: The funds to be invested in raw materials inventory may be estimated on the basis of production budget, the estimated cost per unit and average holding period of raw material inventory by using the following formula:

$$\frac{\text{Estimated Pr oduction (units)}}{12 \text{months} / 365 \text{days} *} \times \text{Estimated Cost per unit} \times \text{Average raw material storage period}$$

(ii) Work-in-Progress Inventory: The funds to be invested in work-in-progress can be estimated by the following formula:

$$\frac{\text{Estimated Pr oduction (units)}}{12 \text{months} / 365 \text{days} *} \times \text{Estimated WIP cost per unit} \times \text{Average W-I-P holding period}$$

(iii) Finished Goods: The funds to be invested in finished goods inventory can be estimated with the help of following formula:

$$\frac{\text{Estimated Pr oduction (units)}}{12 \text{months} / 365 \text{days} *} \times \text{Estimated Cost of production per unit} \times \text{Average finished goods}$$

storage period

(iv) Receivables (Debtors): Funds to be invested in trade receivables (debtors) may be estimated with the help of following formula:

$$\frac{\text{Estimated credit sales unit}}{12 \text{months} / 365 \text{days} *} \times \text{Cost of sales (excluding depreciation) per unit} \times \text{Average receivable}$$

collection period

(v) Cash and Cash equivalents: Minimum desired Cash and Bank balance to be maintained by the firm has to be added in the current assets for the computation of working capital.

Estimation of Current Liabilities

Current liabilities are deducted from the current assets to get working capital. Hence, the amount of working capital is lowered to the extent of current liabilities (other than bank credit) arising in the normal course of business. The important current liabilities like trade payables, wages and overheads can be estimated as follows:

(i) Trade Payables: Trade payable can be estimated on the basis of material purchase budget and the credit purchase.

$$\frac{\text{Estimated credit purchase}}{12 \text{months} / 365 \text{days} *} \times \text{Credit period allowed by suppliers}$$

(ii) Direct Wages: It is estimated with the help of direct wages budget.

$$\frac{\text{Estimated labour hours} \times \text{wages rate per hour}}{12 \text{months} / 365 \text{days} *} \times \text{Average time lag in payment of wages}$$

(iii) Overheads (other than depreciation and amortization):

$$\frac{\text{Estimated Overheads}}{12 \text{months} / 360 \text{days} *} \times \text{Average time lag in payment of overheads}$$

Number of days in a year may be taken as 365 or 360 days.

Estimation of Working Capital Requirements

		Amount	Amount	Amount
I.	**Current Assets:**			
	Inventories:			
	-Raw Materials	---		
	-Work-in-process	---		
	-Finished goods	---	---	
	Receivables:			
	-Trade debtors	---		
	-Bills	---	---	
	Minimum Cash Balance		---	
	Gross Working Capital		**---**	**---**
II.	Current Liabilities:			
	Trade Payables		---	
	Bills Payables		---	
	Wages Payables		---	
	Payables for overheads		---	---
III.	**Excess of Current Assets over Current Liabilities [I – II]**			**---**
IV.	Add: Safety Margin			---
V.	**Net Working Capital [III + IV]**			**---**

The following illustration shows the process of working capital estimation:

Illustration 3: *On 1st January, the Managing Director of Naureen Ltd. wishes to know the amount of working capital that will be required during the year. From the following information prepare the working capital requirements forecast.*

Production during the previous year was 60,000 units. It is planned that this level of activity would be maintained during the present year.

The expected ratios of the cost to selling prices are Raw materials 60%, Direct wages 10% and Overheads 20%.

Raw materials are expected to remain in store for an average of 2 months before issue to production.

Each unit is expected to be in process for one month, the raw materials being fed into the pipeline immediately and the labour and overhead costs accruing evenly during the month.

Finished goods will stay in the warehouse awaiting dispatch to customers for approximately 3 months.

Credit allowed by creditors is 2 months from the date of delivery of raw material.

Credit allowed to debtors is 3 months from the date of dispatch.

Selling price is ₹ 5 per unit.

There is a regular production and sales cycle.

Wages and overheads are paid on the 1st of each month for the previous month.

The company normally keeps cash in hand to the extent of ₹ 20,000.

Solution

Working Notes:

1. **Raw material inventory:** The cost of materials for the whole year is 60% of the Sales value.

    Hence it is 60,000 units × ₹ 5 × $\dfrac{60}{100} = ₹\,1,80,000$. The monthly consumption of raw material would be ₹ 15,000. Raw material requirements would be for two months; hence raw materials in stock would be ₹ 30,000.

2. **Work-in-process:** (Students may give special attention to this point). It is stated that each unit of production is expected to be in process for one month).

		(₹)
(a)	Raw materials in work-in-process (being one month's raw material requirements)	15,000
(b)	Labour costs in work-in-process (It is stated that it accrues evenly during the month. Thus, on the first day of each month it would be zero and on the last day of month the work-in-process would include one month's labour costs. On an average therefore, it would be equivalent to ½ of the month's labour costs) $\left(\dfrac{10\% \text{ of } (60,000 \ \times \ ₹5)}{12\,\text{months}} \times 0.5\,\text{month} \right)$	1,250
(c)	Overheads (For ½ month as explained above)	2,500

	$\left(\dfrac{20\% \text{ of } (60{,}000 \times ₹5)}{12\,\text{months}} \times 0.5\,\text{month}\right)$	
	Total work-in-process	18,750

3. **Finished goods inventory:** (3 month's cost of production)

Raw materials $\left(\dfrac{60\% \text{ of } (60{,}000 \times ₹5)}{12\,\text{months}} \times 3\,\text{months}\right)$		45,000
Labour $\left(\dfrac{10\% \text{ of } (60{,}000 \times ₹5)}{12\,\text{months}} \times 3\,\text{months}\right)$		7,500
Overheads $\left(\dfrac{20\% \text{ of } (60{,}000 \times ₹5)}{12\,\text{months}} \times 3\,\text{months}\right)$		15,000
		67,500

4. **Debtors:** The total cost of sales = 2,70,000.

Therefore, debtors = ₹2,70,000 × $\dfrac{3}{12}$ = ₹67,500

Total Cost of Sales = RM + Wages + Overheads + Opening Finished goods inventory – Closing finished goods inventory.

= ₹1,80,000 + ₹30,000 + ₹60,000 + ₹67,500 – ₹67,500 = ₹2,70,000.

5. **Creditors:** Suppliers allow a two months' credit period. Hence, the average amount of creditors would be two months consumption of raw materials i.e. $\left(\dfrac{60\% \text{ of } (60{,}000 \times ₹5)}{12\,\text{months}} \times 2\,\text{months}\right)$ = ₹ 30,000.

6. **Direct Wages payable:** $\left(\dfrac{10\% \text{ of } (60{,}000 \times ₹5)}{12\,\text{months}} \times 1\,\text{month}\right)$ = ₹ 2,500

7. **Overheads Payable:** $\left(\dfrac{20\% \text{ of } (60{,}000 \times ₹5)}{12\,\text{months}} \times 1\,\text{month}\right)$ = ₹ 5,000

Here it has been assumed that inventory level is uniform throughout the year, therefore opening inventory equals closing inventory.

Statement of Working Capital Required:

	(₹)	(₹)
Current Assets:		
Raw materials inventory (Refer to working note 1)	30,000	
Working–in-process (Refer to working note 2)	18,750	
Finished goods inventory (Refer to working note 3)	67,500	
Debtors (Refer to working note 4)	67,500	
Cash	20,000	2,03,750
Current Liabilities:		
Creditors (Refer to working note 5)	30,000	
Direct wages payable (Refer to working note 6)	2,500	
Overheads payable (Refer to working note 7)	5,000	(37,500)
Estimated working capital requirements		1,66,250

7.6.3 Working Capital Requirement Estimation based on Cash Cost: We have already seen that working capital is the difference between current assets and current liabilities. To estimate requirements of working capital, we have to forecast the amount required for each item of current assets and current liabilities.

In practice another approach may also be useful in estimating working capital requirements. This approach is based on the fact that in the case of current assets, like sundry debtors and finished goods, etc., the exact amount of funds blocked is less than the amount of such current assets. For example:

➢ If we have sundry debtors worth ₹ 1 lakh and our cost of production is ₹ 75,000, the actual amount of funds blocked in sundry debtors is ₹ 75,000 the cost of sundry debtors, the rest (₹ 25,000) is profit.

➢ Again some of the cost items also are non-cash costs; depreciation is a non-cash cost item. Suppose out of ₹ 75,000, ₹ 5,000 is depreciation; then it is obvious that the actual funds blocked in terms of sundry debtors totalling ₹ 1 lakh is only ₹ 70,000. In other words, ₹ 70,000 is the amount of funds required to finance sundry debtors worth ₹ 1 lakh.

➢ Similarly, in the case of finished goods which are valued at cost, non-cash costs may be excluded to work out the amount of funds blocked.

Many experts, therefore, calculate the working capital requirements by working out the cash costs of finished goods and sundry debtors. Under this approach, the debtors are calculated not as a percentage of sales value but as a percentage of cash costs. Similarly, finished goods are valued according to cash costs.

Illustration 4 : *The following annual figures relate to XYZ Co.,*

	(₹)
Sales (at two months' credit)	*36,00,000*
Materials consumed (suppliers extend two months' credit)	*9,00,000*
Wages paid (1 month lag in payment)	*7,20,000*
Cash manufacturing expenses	*9,60,000*
Administrative expenses (1 month lag in payment)	*2,40,000*
Sales promotion expenses (paid quarterly in advance)	*1,20,000*

The company sells its products on gross profit of 25%. Depreciation is considered as a part of the cost of production. It keeps one month's stock each of raw materials and finished goods, and a cash balance of ₹ 1,00,000.

Assuming a 20% safety margin, work out the working capital requirements of the company on cash cost basis. Ignore work-in-process.

Solution

<p align="center">**Statement of Working Capital requirements (cash cost basis)**</p>

	(₹)	(₹)
A. Current Asset		
Inventory:		
Raw materials $\left(\dfrac{₹9,00,000}{12\,months} \times 1\,month \right)$	75,000	
Finished Goods $\left(\dfrac{₹25,80,000}{12\,months} \times 1\,month \right)$	2,15,000	
Receivables (Debtors) $\left(\dfrac{₹29,40,000}{12\,months} \times 2\,months \right)$	4,90,000	
Sales Promotion expenses paid in advance $\left(\dfrac{₹1,20,000}{12\,months} \times 3\,months \right)$	30,000	
Cash balance	1,00,000	9,10,000
Gross Working Capital		9,10,000

B. Current Liabilities:		
Payables:		
Creditors for materials $\left(\dfrac{₹9,00,000}{12\,months}\times 2\,months\right)$	1,50,000	
Wages outstanding $\left(\dfrac{₹7,20,000}{12\,months}\times 1\,month\right)$	60,000	
Manufacturing expenses outstanding $\left(\dfrac{₹9,60,000}{12\,months}\times 1\,month\right)$	80,000	
Administrative expenses outstanding $\left(\dfrac{₹2,40,000}{12\,months}\times 1\,month\right)$	20,000	3,10,000
Net working capital (A - B)		6,00,000
Add: Safety margin @ 20%		1,20,000
Total Working Capital requirements		7,20,000

Working Notes:

(i)	**Computation of Annual Cash Cost of Production**	(₹)
	Material consumed	9,00,000
	Wages	7,20,000
	Manufacturing expenses	9,60,000
	Total cash cost of production	25,80,000
(ii)	**Computation of Annual Cash Cost of Sales:**	(₹)
	Cash cost of production as in (i) above	25,80,000
	Administrative Expenses	2,40,000
	Sales promotion expenses	1,20,000
Total cash cost of sales		29,40,000

Since, the cash manufacturing expenses is already given in the question hence, the amount of depreciation need not to be computed. However, if it were required to be then it could be computed as follows:

	(₹)
Sales	36,00,000
Less: Gross profit (25% of ₹36,00,000)	(9,00,000)
Cost of Production (including depreciation)	27,00,000
Less: Cash Cost of Production (as calculated above)	(25,80,000)
Depreciation (Balancing figure)	1,20,000

Illustration 5 : *PQ Ltd., a company newly commencing business in 2013 has the following projected Profit and Loss Account:*

	(₹)	(₹)
Sales		2,10,000
Cost of goods sold		1,53,000
Gross Profit		57,000
Administrative Expenses	14,000	
Selling Expenses	13,000	27,000
Profit before tax		30,000
Provision for taxation		10,000
Profit after tax		20,000
The cost of goods sold has been arrived at as under:		
Materials used	84,000	
Wages and manufacturing Expenses	62,500	
Depreciation	23,500	
	1,70,000	
Less: Stock of Finished goods		
(10% of goods produced not yet sold)	17,000	
	1,53,000	

The figure given above relate only to finished goods and not to work-in-progress. Goods equal to 15% of the year's production (in terms of physical units) will be in process on the average requiring full materials but only 40% of the other expenses. The company believes in keeping materials equal to two months' consumption in stock.

All expenses will be paid one month in advance. Suppliers of materials will extend 1-1/2 months credit. Sales will be 20% for cash and the rest at two months' credit. 70% of the Income tax will be paid in advance in quarterly installments. The company wishes to keep ₹ 8,000 in cash. 10% has to be added to the estimated figure for unforeseen contingencies.

Prepare an estimate of working capital.

Note: All workings should form part of the answer.

Solution

Statement showing the requirements of Working Capital

Particulars	(₹)	(₹)
A. Current Assets:		
Inventory:		
Stock of Raw material (₹96,600 × 2/12)	16,100	
Stock of Work-in-progress (As per Working Note)	16,350	
Stock of Finished goods (₹1,46,500 × 10/100)	14,650	
Receivables (Debtors) (₹1,27,080 × 2/12)	21,180	
Cash in Hand	8,000	
Prepaid Expenses:		
Wages & Mfg. Expenses (₹66,250 × 1/12)	5,521	
Administrative expenses (₹14,000 × 1/12)	1,167	
Selling & Distribution Expenses (₹13,000 × 1/12)	1,083	
Advance taxes paid {(70% of ₹10,000)× 3/12}	1,750	
Gross Working Capital	85,801	85,801
B. Current Liabilities:		
Payables for Raw materials (₹1,12,700 × 1.5/12)	14,088	
Provision for Taxation (Net of Advance Tax) (₹10,000 × 30/100)	3,000	
Total Current Liabilities	17,088	17,088
C. Excess of CA over CL		68,713
Add: 10% for unforeseen contingencies		6,871
Net Working Capital requirements		75,584

Working Notes:

(i)   Calculation of Stock of Work-in-progress

Particulars	(₹)
Raw Material (₹ 84,000 × 15%)	12,600
Wages & Mfg. Expenses (₹62,500 × 15% × 40%)	3,750
Total	16,350

(ii)   Calculation of Stock of Finished Goods and Cost of Sales

Particulars	(₹)
Direct material Cost [₹ 84,000 + ₹ 12,600]	96,600
Wages & Mfg. Expenses [₹ 62,500 + ₹ 3,750]	66,250
Depreciation	0
Gross Factory Cost	1,62,850
Less: Closing W.I.P	(16,350)
Cost of goods produced	1,46,500
Less: Closing stock	(14,650)
	1,31,850
Add: Administrative Expenses	14,000
Cost of Goods Sold	1,45,850
Add: Selling and Distribution Expenses	13,000
Total Cash Cost of Sales	1,58,850
Debtors (80% of cash cost of sales)	1,27,080

(iii) Calculation of Credit Purchase

Particulars	(₹)
Raw material consumed	96,600
Add: Closing Stock	16,100
Less: Opening Stock	-
Purchases	1,12,700

Illustration 6*: M.A. Limited is commencing a new project for manufacture of a plastic component. The following cost information has been ascertained for annual production of 12,000 units which is the full capacity:*

	Costs per unit (₹)
Materials	40.00
Direct labour and variable expenses	20.00
Fixed manufacturing expenses	6.00
Depreciation	10.00
Fixed administration expenses	4.00
	80.00

The selling price per unit is expected to be ₹ 96 and the selling expenses ₹ 5 per unit, 80% of which is variable.

In the first two years of operations, production and sales are expected to be as follows:

Year	Production (No. of units)	Sales (No. of units)
1	6,000	5,000
2	9,000	8,500

To assess the working capital requirements, the following additional information is available:

(a)	Stock of materials	2.25 months' average consumption
(b)	Work-in-process	Nil
(c)	Debtors	1 month's average sales.
(d)	Cash balance	₹ 10,000
(e)	Creditors for supply of materials	1 month's average purchase during the year.
(f)	Creditors for expenses	1 month's average of all expenses during the year.

Prepare, for the two years:

(i)   A projected statement of Profit/Loss (Ignoring taxation); and

(ii)   A projected statement of working capital requirements.

Solution

(i)   **M.A. Limited**
Projected Statement of Profit / Loss
(Ignoring Taxation)

	Year 1	Year 2
Production (Units)	6,000	9,000
Sales (Units)	5,000	8,500
	(₹)	(₹)
Sales revenue (A)	4,80,000	8,16,000
(Sales unit × ₹ 96)		

Cost of production:		
Materials cost (Units produced × ₹ 40)	2,40,000	3,60,000
Direct labour and variable expenses (Units produced × ₹ 20)	1,20,000	1,80,000
Fixed manufacturing expenses (Production Capacity: 12,000 units × ₹ 6)	72,000	72,000
Depreciation (Production Capacity : 12,000 units × ₹ 10)	1,20,000	1,20,000
Fixed administration expenses (Production Capacity : 12,000 units × ₹ 4)	48,000	48,000
Total Costs of Production	6,00,000	7,80,000
Add: Opening stock of finished goods (Year 1 : Nil; Year 2 : 1,000 units)	---	1,00,000
Cost of Goods available for sale (Year 1: 6,000 units; Year 2: 10,000 units)	6,00,000	8,80,000
Less: Closing stock of finished goods at average cost (year 1: 1000 units, year 2 : 1500 units) (Cost of Production × Closing stock/ units produced)	(1,00,000)	(1,32,000)
Cost of Goods Sold	5,00,000	7,48,000
Add: Selling expenses – Variable (Sales unit × ₹ 4)	20,000	34,000
Add: Selling expenses -Fixed (12,000 units × ₹1)	12,000	12,000
Cost of Sales : (B)	5,32,000	7,94,000
Profit (+) / Loss (-): (A - B)	(-) 52,000	(+) 22,000

Working Notes:

1. **Calculation of creditors for supply of materials:**

	Year 1 (₹)	Year 2 (₹)
Materials consumed during the year	2,40,000	3,60,000
Add: Closing stock (2.25 month's average consumption)	45,000	67,500
	2,85,000	4,27,500
Less: Opening Stock	---	45,000
Purchases during the year	2,85,000	3,82,500
Average purchases per month (Creditors)	23,750	31,875

2.   **Creditors for expenses:**

	Year 1 (₹)	Year 2 (₹)
Direct labour and variable expenses	1,20,000	1,80,000
Fixed manufacturing expenses	72,000	72,000
Fixed administration expenses	48,000	48,000
Selling expenses (variable + fixed)	32,000	46,000
Total (including	2,72,000	3,46,000
Average per month	22,667	28,833

(ii)   Projected Statement of Working Capital requirements

	Year 1 (₹)	Year 2 (₹)
Current Assets:		
Inventories:		
-Stock of materials (2.25 month's average consumption)	45,000	67,500
-Finished goods	1,00,000	1,32,000
Debtors (1 month's average sales) (including profit)	40,000	68,000
Cash	10,000	10,000
Total Current Assets/ Gross working capital (A)	1,95,000	2,77,500
Current Liabilities:		
Creditors for supply of materials (Refer to working note 1)	23,750	31,875
Creditors for expenses (Refer to working note 2)	22,667	28,833
Total Current Liabilities: (B)	46,417	60,708
Estimated Working Capital Requirements: (A-B)	1,48,583	2,16,792

Projected Statement of Working Capital Requirement (Cash Cost Basis)

	Year 1 (₹)	Year 2 (₹)
(A) Current Assets		
Inventories:		
- Stock of Raw Material (6,000 units × ₹ 40 × 2.25/12); (9,000 units × ₹ 40 × 2.25 /12)	45,000	67,500

- Finished Goods (Refer working note 3)	80,000	1,11,000
Receivables (Debtors) (Refer working note 4)	36,000	56,250
Minimum Cash balance	10,000	10,000
Total Current Assets/ Gross working capital (A)	1,71,000	2,44,750
(B) Current Liabilities		
Creditors for raw material (Refer working note 1)	23,750	31,875
Creditors for Expenses (Refer working note 2)	22,667	28,833
Total Current Liabilities	46,417	60,708
Net Working Capital (A – B)	1,24,583	1,84,042

Working Note:

3. **Cash Cost of Production:**

	Year 1 (₹)	Year 2 (₹)
Cost of Production as per projected Statement of P&L	6,00,000	7,80,000
Less: Depreciation	1,20,000	1,20,000
Cash Cost of Production	4,80,000	6,60,000
Add: Opening Stock at Average Cost:	--	80,000
Cash Cost of Goods Available for sale	4,80,000	7,40,000
Less : Closing Stock at Avg. Cost $\left(\dfrac{₹\,4,80,000\times1,000}{6,000}\right)$; $\left(\dfrac{₹\,7,40,000\times1,500}{10,000}\right)$	(80,000)	(1,11,000)
Cash Cost of Goods Sold	4,00,000	6,29,000

4. **Receivables (Debtors)**

	Year 1 (₹)	Year 2 (₹)
Cash Cost of Goods Sold	4,00,000	6,29,000
Add : Variable Expenses @ ₹ 4	20,000	34,000
Add : Total Fixed Selling expenses (12,000 units × ₹1)	12,000	12,000
Cash Cost of Debtors	4,32,000	6,75,000
Average Debtors	36,000	56,250

Illustration 7: *Aneja Limited, a newly formed company, has applied to the commercial bank for the first time for financing its working capital requirements. The following information is available about the projections for the current year:*

Estimated level of activity: 1,04,000 completed units of production plus 4,000 units of work-in-progress. Based on the above activity, estimated cost per unit is:

Raw material	*₹ 80 per unit*
Direct wages	*₹ 30 per unit*
Overheads (exclusive of depreciation)	*₹ 60 per unit*
Total cost	*₹ 170 per unit*
Selling price	*₹ 200 per unit*

Raw materials in stock: Average 4 weeks consumption, work-in-progress (assume 50% completion stage in respect of conversion cost) (materials issued at the start of the processing).

Finished goods in stock	*8,000 units*
Credit allowed by suppliers	*Average 4 weeks*
Credit allowed to debtors/receivables	*Average 8 weeks*
Lag in payment of wages	*Average 1.5 weeks*

Cash at banks (for smooth operation) is expected to be ₹ 25,000.

Assume that production is carried on evenly throughout the year (52 weeks) and wages and overheads accrue similarly. All sales are on credit basis only.

You are required to calculate the net working capital required.

Solution

Calculation of Net Working Capital requirement:

	(₹)	(₹)
A. Current Assets:		
Inventories:		
- Raw material stock (Refer to Working note 3)	6,64,615	
- Work in progress stock (Refer to Working note 2)	5,00,000	
- Finished goods stock (Refer to Working note 4)	13,60,000	
Receivables (Debtors) (Refer to Working note 5)	25,40,769	
Cash and Bank balance	25,000	
Gross Working Capital	50,60,384	50,60,384
B. Current Liabilities:		
Creditors for raw materials	7,15,740	

(Refer to Working note 6)		
Creditors for wages (Refer to Working note 7)	91,731	
	8,07,471	8,07,471
Net Working Capital (A - B)		42,52,913

Working Notes:

1. **Annual cost of production**

	(₹)
Raw material requirements {(1,04,000 units × ₹ 80)+ ₹3,20,000}	86,40,000
Direct wages {(1,04,000 units × ₹ 30) + ₹60,000}	31,80,000
Overheads (exclusive of depreciation) {(1,04,000 × ₹ 60)+ ₹1,20,000}	63,60,000
Gross Factory Cost	1,81,80,000
Less: Closing W.I.P	(5,00,000)
Cost of Goods Produced	1,76,80,000
Less: Closing Stock of Finished Goods (₹1,76,80,000 × 8,000/1,04,000)	(13,60,000)
Total Cash Cost of Sales	1,63,20,000

2. **Work in progress stock**

	(₹)
Raw material requirements (4,000 units × ₹ 80)	3,20,000
Direct wages (50% × 4,000 units × ₹ 30)	60,000
Overheads (50% × 4,000 units × ₹ 60)	1,20,000
	5,00,000

3. **Raw material stock**

   It is given that raw material in stock is average 4 weeks consumption. Since, the company is newly formed, the raw material requirement for production and work in progress will be issued and consumed during the year.

   Hence, the raw material consumption for the year (52 weeks) is as follows:

	(₹)
For Finished goods (1,04,000 × ₹ 80)	83,20,000
For Work in progress (4,000 × ₹ 80)	3,20,000
	86,40,000

Raw material stock $\dfrac{₹\ 86,40,000}{52\ \text{weeks}} \times 4\ \text{weeks}$ i.e. ₹ 6,64,615

4. **Finished goods stock:** 8,000 units @ ₹ 170 per unit = ₹ 13,60,000

5. **Debtors for sale:** $1,63,20,000 \times \dfrac{8}{52} = $ ₹ 25,10,769

6. Creditors for raw material:

Material Consumed (₹ 83,20,000 + ₹ 3,20,000)	₹ 86,40,000
Add: Closing stock of raw material	₹ 6,64,615
	₹ 93,04,615

Credit allowed by suppliers = $\dfrac{₹\ 93,04,615}{52\ \text{weeks}} \times 4\ \text{weeks}$ = ₹ 7,15,740

7. Creditors for wages

Outstanding wage payment = $\dfrac{₹\ 31,80,000}{52\ \text{weeks}} \times 1.5\ \text{weeks}$ = ₹ 91,731

7.6.4 Effect of Double Shift Working on Working Capital Requirements:

The greatest economy in introducing double shift is the greater use of fixed assets. Though production increases but little or very marginal funds may be required for additional assets.

But increase in the number of hours of production has an effect on the working capital requirements. Let's see the impact of double shift on some of the components of working capital:-

➢ It is obvious that in double shift working, an increase in stocks will be required as the production rises. However, it is quite possible that the increase may not be proportionate to the rise in production since the minimum level of stocks may not be very much higher. Thus, it is quite likely that the level of stocks may not be required to be doubled as the production goes up two-fold.

➢ The amount of materials in process will not change due to double shift working since work started in the first shift will be completed in the second; hence, capital tied up in materials in process will be the same as with single shift working. As such the cost of work-in-process will not change unless the second shift's workers are paid at a higher rate.

Illustration 8: *Samreen Enterprises has been operating its manufacturing facilities till 31.3.2016 on a single shift working with the following cost structure:*

	Per unit (₹)
Cost of Materials	*6.00*
Wages (out of which 40% fixed)	*5.00*
Overheads (out of which 80% fixed)	*5.00*

Profit	*2.00*
Selling Price	*18.00*

Sales during 2015-16 – ₹ 4,32,000.

As at 31.3.2016 the company held:

	(₹)
Stock of raw materials (at cost)	*36,000*
Work-in-progress (valued at prime cost)	*22,000*
Finished goods (valued at total cost)	*72,000*
Sundry debtors	*1,08,000*

In view of increased market demand, it is proposed to double production by working an extra shift. It is expected that a 10% discount will be available from suppliers of raw materials in view of increased volume of business. Selling price will remain the same. The credit period allowed to customers will remain unaltered. Credit availed of from suppliers will continue to remain at the present level i.e., 2 months. Lag in payment of wages and expenses will continue to remain half a month.

You are required to assess the additional working capital requirements, if the policy to increase output is implemented.

Solution

> *This question can be solved using two approaches:*
>
> *(i)   To assess the impact of double shift for long term as a matter of production policy.*
>
> *(ii)   To assess the impact of double shift to mitigate the immediate demand for next year only.*
>
> *The first approach is more appropriate and fulfilling the requirement of the question.*

Workings:

(1)   Statement of cost at single shift and double shift working

	24,000 units		48,000 Units	
	Per unit (₹)	**Total (₹)**	**Per unit (₹)**	**Total (₹)**
Raw materials	6.00	1,44,000	5.40	2,59,200
Wages - Variable	3.00	72,000	3.00	1,44,000
Fixed	2.00	48,000	1.00	48,000
Overheads - Variable	1.00	24,000	1.00	48,000
Fixed	4.00	96,000	2.00	96,000
Total cost	16.00	3,84,000	12.40	5,95,200
Profit	2.00	48,000	5.60	2,68,800
	18.00	4,32,000	18.00	8,64,000

(2) Sales in units 2015-16 $= \dfrac{\text{Sales}}{\text{Unit selling price}} = \dfrac{₹\ 4,32,000}{₹\ 18} = 24,000$ units

(3) Stock of Raw Materials in units on 31.3.2016 $= \dfrac{\text{Value of stock}}{\text{Cost per unit}} = \dfrac{₹\ 36,000}{6} = 6,000$ units

(4) Stock of work-in-progress in units on 31.3.2016

$= \dfrac{\text{Value of work} - \text{in} - \text{progress}}{\text{Prime Cost per unit}} = \dfrac{₹\ 22,000}{(₹\ 6 + ₹\ 5)} = 2,000 \text{ units}$

(5) Stock of finished goods in units 2015-16 $= \dfrac{\text{Value of stock}}{\text{Total Cost per unit}} = \dfrac{₹\ 72,000}{₹\ 16} = 4,500$ units.

(i) **Assessment of impact of double shift for long term as a matter of production policy:**

Comparative Statement of Working Capital Requirement

	Single Shift			Double Shift		
	Unit	Rate (₹)	Amount (₹)	Unit	Rate (₹)	Amount (₹)
Current Assets						
Inventories :						
Raw Materials	6,000	6.00	36,000	12,000	5.40	64,800
Work-in-Progress	2,000	11.00	22,000	2,000	9.40	18,800
Finished Goods	4,500	16.00	72,000	9,000	12.40	1,11,600
Sundry Debtors	6,000	16.00	96,000	12,000	12.40	1,48,800
Total Current Assets: (A)			2,26,000			3,44,000
Current Liabilities						
Creditors for Materials	4,000	6.00	24,000	8,000	5.40	43,200
Creditors for Wages	1,000	5.00	5,000	2,000	4.00	8,000
Creditors for Expenses	1,000	5.00	5,000	2,000	3.00	6,000
Total Current Liabilities: (B)			34,000			57,200
Working Capital: (A) – (B)			1,92,000			2,86,800

Additional Working Capital requirement = ₹ 2,86,800 – ₹ 1,92,000 = ₹ 94,800

(ii)   Assessment of the impact of double shift to mitigate the immediate demand for next year only.

Workings:

(6)   Calculation of no. of units to be sold:

No. of units to be Produced	48,000
Add: Opening stock of finished goods	4,500
Less: Closing stock of finished goods	(9,000)
No. of units to be Sold	43,500

(7)   Calculation of Material to be consumed and materials to be purchased in units:

No. of units Produced	48,000
Add: Closing stock of WIP	2,000
Less: Opening stock of finished goods	(2,000)
Raw Materials to be consumed in units	48,000
Add: Closing stock of Raw material	12,000
Less: Opening stock of Raw material	(6,000)
Raw Materials to be purchased (in units)	54,000

(8)   Credit allowed by suppliers:

$$\frac{\text{No. of units to purchased} \times \text{Cost per unit}}{12\,\text{months}} \times 2\,\text{months} = \frac{54,000 \times ₹5.40}{12\,\text{months}} \times 2\,\text{months} = ₹48,600$$

Comparative Statement of Working Capital Requirement

	Single Shift			Double Shift		
	Unit	Rate (₹)	Amount (₹)	Unit	Rate (₹)	Amount (₹)
Current Assets						
Inventories :						
Raw Materials	6,000	6.00	36,000	12,000	5.40	64,800
Work-in-Progress	2,000	11.00	22,000	2,000	9.40	18,800
Finished Goods	4,500	16.00	72,000	9,000	12.40	1,11,600
Sundry Debtors	6,000	16.00	96,000	12,000	12.40	1,48,800
Total Current Assets: (A)			2,26,000			3,44,000

Current Liabilities						
Creditors for Materials	4,000	6.00	24,000	9,000	5.40	48,600
Creditors for Wages	1,000	5.00	5,000	2,000	4.00	8,000
Creditors for Expenses	1,000	5.00	5,000	2,000	3.00	6,000
Total Current Liabilities: (B)			34,000			62,600
Working Capital: (A) – (B)			1,92,000			2,81,400

Additional Working Capital requirement = ₹ 2,81,400 – ₹ 1,92,000 = ₹ 89,400

Notes:

(i)   The quantity of material in process will not change due to double shift working since work started in the first shift will be completed in the second shift.

(ii) It is given in the question that the WIP is valued at prime cost hence, it is assumed that the WIP is 100% complete in respect of material and labour.

(iii) In absence of any information on proportion of credit sales to total sales, debtors quantity has been doubled for double shift.

(iv) It is assumed that all purchases are on credit.

(v)   The valuation of work-in-progress based on prime cost as per the policy of the company is as under.

	Single shift (₹)	Double shift (₹)
Materials	6.00	5.40
Wages – Variable	3.00	3.00
Fixed	2.00	1.00
	11.00	9.40

UNIT – II : TREASURY AND CASH MANAGEMENT

7.7 Treasury Management: Meaning

In the wake of the competitive business environment resulting from the liberalization of the economy, there is a pressure to manage cash scientifically. The demand for funds for expansions coupled with high interest rates, foreign exchange volatility and the growing volume of financial transactions have necessitated efficient management of money.

Treasury management is defined as 'the corporate handling of all financial matters, the generation of external and internal funds for business, the management of currencies and cash flows and the complex, strategies, policies and procedures of corporate finance.'

The treasury management mainly deals with:-

➢ Working capital management; and

➢ Financial risk management (It includes forex and interest rate management).

The key goals of treasury management are:-

➢ Maximize the return on the available cash;

➢ Minimize interest cost on borrowings;

➢ Mobilise as much cash as possible for corporate ventures (in case of need); and

➢ Effective dealing in forex, money and commodity markets to reduce risks arising because of fluctuating exchange rates, interest rates and prices which can affect the profitability of the organization.

7.8 Functions of Treasury Department

1. **Cash Management:** It involves efficient cash collection process and managing payment of cash both inside the organisation and to third parties.

    There may be complete centralization within a group treasury or the treasury may simply advise subsidiaries and divisions on policy matter viz., collection/payment periods, discounts, etc.

    Treasury will also manage surplus funds in an investment portfolio. Investment policy will consider future needs for liquid funds and acceptable levels of risk as determined by company policy.

2. **Currency Management:** The treasury department manages the foreign currency risk exposure of the company. In a large multinational company (MNC) the first step will usually be to set off intra-group indebtedness. The use of matching receipts and payments in the same currency will save transaction costs. Treasury might advise on the currency to be used when invoicing overseas sales.

The treasury will manage any net exchange exposures in accordance with company policy. If risks are to be minimized then forward contracts can be used either to buy or sell currency forward.

3. **Funding Management:** Treasury department is responsible for planning and sourcing the company's short, medium and long-term cash needs. Treasury department will also participate in the decision on capital structure and forecast future interest and foreign currency rates.

4. **Banking:** It is important that a company maintains a good relationship with its bankers. Treasury department carry out negotiations with bankers and act as the initial point of contact with them. Short-term finance can come in the form of bank loans or through the sale of commercial paper in the money market.

5. **Corporate Finance:** Treasury department is involved with both acquisition and divestment activities within the group. In addition it will often have responsibility for investor relations. The latter activity has assumed increased importance in markets where share-price performance is regarded as crucial and may affect the company's ability to undertake acquisition activity or, if the price falls drastically, render it vulnerable to a hostile bid.

7.9   Management of Cash

Management of cash is an important function of the finance manager. It 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.

The main objectives of cash management for a business are:-

➢   Provide adequate cash to each of its units;

➢   No funds are blocked in idle cash; and

➢   The surplus cash (if any) should be invested in order to maximize returns for the business.

A cash management scheme therefore, is a delicate balance between the twin objectives of liquidity and costs.

7.9.1 The Need for Cash: The following are three basic considerations in determining the amount of cash or liquidity as have been outlined by Lord Keynes:

➢   *Transaction need:* Cash facilitates the meeting of the day-to-day expenses and other debt payments. Normally, inflows of cash from operations should be sufficient for this purpose. But sometimes this inflow may be temporarily blocked. In such cases, it is only the reserve cash balance that can enable the firm to make its payments in time.

➤ *Speculative needs:* Cash may be held in order to take advantage of profitable opportunities that may present themselves and which may be lost for want of ready cash/settlement.

➤ *Precautionary needs:* Cash may be held to act as for providing safety against unexpected events. Safety as is explained by the saying that a man has only three friends an old wife, an old dog and money at bank.

7.9.2 Cash Planning: Cash Planning is a technique to plan and control the use of cash. This protects the financial conditions of the firm by developing a projected cash statement from a forecast of expected cash inflows and outflows for a given period. This may be done periodically either on daily, weekly or monthly basis. The period and frequency of cash planning generally depends upon the size of the firm and philosophy of management. As firms grows and business operations become complex, cash planning becomes inevitable for continuing success.

The very first step in this direction is to estimate the requirement of cash. For this purpose cash flow statements and cash budget are required to be prepared. The technique of preparing cash flow and funds flow statements have already been discussed in this book. The preparation of cash budget has however, been demonstrated here.

7.9.3 Cash Budget: Cash Budget is the most significant device to plan for and control cash receipts and payments. This represents cash requirements of business during the budget period.

The various purposes of cash budgets are:-

➤ Coordinate the timings of cash needs. It identifies the period(s) when there might either be a shortage of cash or an abnormally large cash requirement;

➤ It also helps to pinpoint period(s) when there is likely to be excess cash;

➤ It enables firm which has sufficient cash to take advantage like cash discounts on its accounts payable; and

➤ Lastly it helps to plan/arrange adequately needed funds (avoiding excess/shortage of cash) on favorable terms.

On the basis of cash budget, the firm can decide to invest surplus cash in marketable securities and earn profits.

Main Components of Cash Budget

Preparation of cash budget involves the following steps:-

(a) Selection of the period of time to be covered by the budget. It is also defining the planning horizon.

(b) Selection of factors that have a bearing on cash flows. The factors that generate cash flows are generally divided into following two categories:-

    i.   Operating (cash flows generated by operations of the firm); and

    ii. Financial (cash flows generated by financial activities of the firm).

The following figure highlights the cash surplus and cash shortage position over the period of cash budget for preplanning to take corrective and necessary steps.
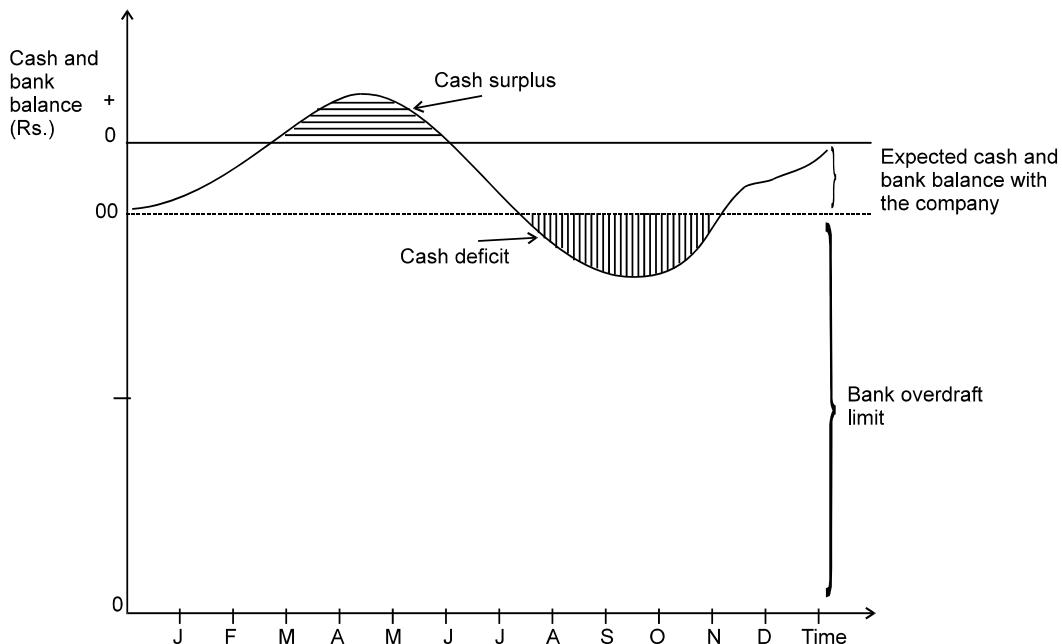
7.10 Methods of Cash Flow Budgeting

A cash budget can be prepared in the following ways:

1. **Receipts and Payments Method:** In this method all the expected receipts and payments for budget period are considered. All the cash inflow and outflow of all functional budgets including capital expenditure budgets are considered. Accruals and adjustments in accounts will not affect the cash flow budget. Anticipated cash inflow is added to the opening balance of cash and all cash payments are deducted from this to arrive at the closing balance of cash. This method is commonly used in business organizations.

2. **Adjusted Income Method:** In this method the annual cash flows are calculated by adjusting the sales revenues and cost figures for delays in receipts and payments (change in debtors and creditors) and eliminating non-cash items such as depreciation.

3. **Adjusted Balance Sheet Method:** In this method, the budgeted balance sheet is predicted by expressing each type of asset and short-term liabilities as percentage of the expected sales. The profit is also calculated as a percentage of sales, so that the increase in owner's equity can be forecasted. Known adjustments, may be made to long-term liabilities and the balance sheet will then show if additional finance is needed.

It is important to note that the capital budget will also be considered in the preparation of cash flow budget because the annual budget may disclose a need for new capital investments and

also, the costs and revenues of any new projects coming on stream will need to be incorporated in the short-term budgets.

The Cash Budget can be prepared for short period or for long period.

7.10.1 Cash budget for short period: Preparation of cash budget month by month would require the following estimates:

(a) *As regards receipts*:

　　1.　Receipts from debtors;

　　2.　Cash Sales; and

　　3.　Any other source of receipts of cash (say, dividend from a subsidiary company)

(b) *As regards payments:*

　　1.　Payments to be made for purchases;

　　2.　Payments to be made for expenses;

　　3.　Payments that are made periodically but not every month;

　　　　(i)　Debenture interest;

　　　　(ii)　Income tax paid in advance;

　　　　(iii)　Sales tax etc.

　　4.　Special payments to be made in a particular month, for example, dividends to shareholders, redemption of debentures, repayments of loan, payment of assets acquired, etc.

Format of Cash Budget

<center>

_____Co. Ltd.
Cash Budget
Period_____

</center>

	Month 1	**Month 2**	**Month 3**	**.......**	**Month 12**
Receipts:					
1.　Opening balance					
2.　Collection from debtors					
3.　Cash sales					
4.　Loans from banks					
5.　Share capital					
6.　Miscellaneous receipts					
7.　Other items					
Total					

Payments:						
1.	Payments to creditors					
2.	Wages					
3.	Overheads					
	(a)					
	(b)					
	(c)					
4.	Interest					
5.	Dividend					
6.	Corporate tax					
7.	Capital expenditure					
8.	Other items					
	Total					
Closing balance						
[Surplus (+)/Shortfall (-)]						

Students are required to do good practice in preparing the cash budgets. The following illustration will show how short term cash budgets can be prepared.

Illustration 9: *Prepare monthly cash budget for six months beginning from April 2014 on the basis of the following information:-*

(i) *Estimated monthly sales are as follows:-*

	₹		₹
January	1,00,000	June	80,000
February	1,20,000	July	1,00,000
March	1,40,000	August	80,000
April	80,000	September	60,000
May	60,000	October	1,00,000

(ii) *Wages and salaries are estimated to be payable as follows:-*

	₹		₹
April	9,000	July	10,000
May	8,000	August	9,000
June	10,000	September	9,000

(iii) Of the sales, 80% is on credit and 20% for cash. 75% of the credit sales are collected within one month and the balance in two months. There are no bad debt losses.

(iv) Purchases amount to 80% of sales and are made on credit and paid for in the month preceding the sales.

(v) The firm has 10% debentures of ₹ 1,20,000. Interest on these has to be paid quarterly in January, April and so on.

(vi) The firm is to make an advance payment of tax of ₹ 5,000 in July, 2014.

(vii) The firm had a cash balance of ₹ 20,000 on April 1, 2014, which is the minimum desired level of cash balance. Any cash surplus/deficit above/below this level is made up by temporary investments/liquidation of temporary investments or temporary borrowings at the end of each month (interest on these to be ignored).

Solution

Workings:

Collection from debtors:

(Amount in ₹)

	February	March	April	May	June	July	August	September
Total sales	1,20,000	1,40,000	80,000	60,000	80,000	1,00,000	80,000	60,000
Credit sales (80% of total sales)	96,000	1,12,000	64,000	48,000	64,000	80,000	64,000	48,000
Collections:								
One month		72,000	84,000	48,000	36,000	48,000	60,000	48,000
Two months			24,000	28,000	16,000	12,000	16,000	20,000
Total collections			1,08,000	76,000	52,000	60,000	76,000	68,000

Monthly Cash Budget for Six months, April to September, 2014

(Amount in ₹)

Receipts:	*April*	*May*	*June*	*July*	*August*	*September*
Opening balance	20,000	20,000	20,000	20,000	20,000	20,000
Cash sales	16,000	12,000	16,000	20,000	16,000	12,000
Collection from debtors	1,08,000	76,000	52,000	60,000	76,000	68,000
Total cash available (A)	1,44,000	1,08,000	88,000	1,00,000	1,12,000	1,00,000
Payments:						
Purchases	48,000	64,000	80,000	64,000	48,000	80,000
Wages & salaries	9,000	8,000	10,000	10,000	9,000	9,000

Interest on debentures	3,000	---	----	3,000	---	----
Tax payment	---	---	----	5,000	----	----
Total payments (B)	60,000	72,000	90,000	82,000	57,000	89,000
Minimum cash balance desired	20,000	20,000	20,000	20,000	20,000	20,000
Total cash needed (C)	80,000	92,000	1,10,000	1,02,000	77,000	1,09,000
Surplus - deficit (A-C)	64,000	16,000	(22,000)	(2,000)	35,000	(9,000)
Investment/financing Temporary Investments	(64,000)	(16,000)	----		(35,000)	-----
Liquidation of temporary investments or temporary borrowings	----	----	22,000	2,000	----	9,000
Total effect of investment/financing (D)	(64,000)	(16,000)	22,000	2,000	(35,000)	9,000
Closing cash balance (A+D-B)	20,000	20,000	20,000	20,000	20,000	20,000

Illustration 10 : *From the following information relating to a departmental store, you are required to prepare for the three months ending 31st March, 2014:-*

(a)   Month-wise cash budget on receipts and payments basis; and

(b)   Statement of Sources and uses of funds for the three months period.

It is anticipated that the working capital at 1st January, 2014 will be as follows:-

	₹ in '000's
Cash in hand and at bank	*545*
Short term investments	*300*
Debtors	*2,570*
Stock	*1,300*
Trade creditors	*2,110*
Other creditors	*200*
Dividends payable	*485*
Tax due	*320*
Plant	*800*

Budgeted Profit Statement:			*₹ in '000's*
	January	*February*	*March*
Sales	*2,100*	*1,800*	*1,700*
Cost of sales	*1,635*	*1,405*	*1,330*
Gross Profit	*465*	*395*	*370*

Administrative, Selling and Distribution Expenses	315	270	255
Net Profit before tax	150	125	115
Budgeted balances at the end of each months:	₹ in '000's		
	31st Jan.	28th Feb.	31st March
Short term investments	700	---	200
Debtors	2,600	2,500	2,350
Stock	1,200	1,100	1,000
Trade creditors	2,000	1,950	1,900
Other creditors	200	200	200
Dividends payable	485	--	--
Tax due	320	320	320
Plant (depreciation ignored)	800	1,600	1,550

Depreciation amount to ₹ 60,000 is included in the budgeted expenditure for each month.

Solution

Workings:		₹ in '000'		
(1)	*Payments to creditors:*	Jan. 2014	Feb.2014	March, 2014
	Cost of Sales	1,635	1,405	1,330
	Add Closing Stocks	1,200	1,100	1,000
		2,835	2,505	2,330
	Less: Opening Stocks	1,300	1,200	1,100
	Purchases	1,535	1,305	1,230
	Add: Trade Creditors, Opening balance	2,110	2,000	1,950
		3,645	3,305	3,180
	Less: Trade Creditors, closing balance	2,000	1,950	1,900
	Payment	1,645	1,355	1,280
(2)	*Receipts from debtors:*			
	Debtors, Opening balances	2,570	2,600	2,500
	Add: Sales	2,100	1,800	1,700
		4,670	4,400	4,200
	Less: Debtors, closing balance	2,600	2,500	2,350
	Receipt	2,070	1,900	1,850

CASH BUDGET

(a)   3 months ending 31st March, 2014

			(₹, in 000's)
	January, 2014	*Feb. 2014*	*March, 2014*
Opening cash balances	545	315	65
Add: Receipts:			
From Debtors	2,070	1,900	1,850
Sale of Investments	---	700	----
Sale of Plant	---	---	50
Total (A)	2,615	2,915	1,965
Deduct: Payments			
Creditors	1,645	1,355	1,280
Expenses	255	210	195
Capital Expenditure	---	800	---
Payment of dividend	---	485	---
Purchase of investments	400	---	200
Total payments (B)	2,300	2,850	1,675
Closing cash balance (A - B)	315	65	290

(b)   Statement of Sources and uses of Funds for the Three Month Period Ending 31st March, 2014

Sources:	₹ '000	₹ '000
Funds from operation:		
Net profit	390	
Add: Depreciation	180	570
Sale of plant		50
		620
Decrease in Working Capital		665
Total		1,285
Uses:		
Purchase of plant		800
Payment by dividends		485
Total		1,285

Statement of Changes in Working Capital

	January,14 ₹ 000	March, 14 ₹ 000	Increase ₹ 000	Decrease ₹ 000
Current Assets				
Cash in hand and at Bank	545	290		255
Short term Investments	300	200		100
Debtors	2,570	2,350		220
Stock	1,300	1,000		300
	4,715	3,840		
Current Liabilities				
Trade Creditors	2,110	1,900	210	---
Other Creditors	200	200	---	---
Tax Due	320	320	---	---
	2,630	2,420		
Working Capital	2,085	1,420		
Decrease		665	665	
	2,085	2,085	875	875

Illustration 11 : *The following information relates to Zeta Limited, a publishing company:*

The selling price of a book is ₹ 15, and sales are made on credit through a book club and invoiced on the last day of the month.

Variable costs of production per book are materials (₹ 5), labour (₹ 4), and overhead (₹ 2)

The sales manager has forecasted the following volumes:

	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
No. of Books	1,000	1,000	1,000	1,250	1,500	2,000	1,900	2,200	2,200	2,300

Customers are expected to pay as follows:

One month after the sale	40%
Two months after the sale	60%

The company produces the books two months before they are sold and the creditors for materials are paid two months after production.

Variable overheads are paid in the month following production and are expected to increase by 25% in April; 75% of wages are paid in the month of production and 25% in the following month. A wage increase of 12.5% will take place on 1st March.

The company is going through a restructuring and will sell one of its freehold properties in May for ₹ 25,000, but it is also planning to buy a new printing press in May for ₹ 10,000. Depreciation is currently ₹ 1,000 per month, and will rise to ₹ 1,500 after the purchase of the new machine.

The company's corporation tax (of ₹ 10,000) is due for payment in March.

The company presently has a cash balance at bank on 31 December 2013, of ₹ 1,500.

You are required to prepare a cash budget for the six months from January to June.

Solution

Workings:

1.   Sale receipts

Month	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Forecast sales (S)	1,000	1,000	1,000	1,250	1,500	2,000	1,900	2,200
	₹	₹	₹	₹	₹	₹	₹	₹
S×15	15,000	15,000	15,000	18,750	22,500	30,000	28,500	33,000
Debtors pay:								
1 month 40%		6,000	6,000	6,000	7,500	9,000	12,000	11,400
2 month 60%		-	9,000	9,000	9,000	11,250	13,500	18,000
	-	-	15,000	15,000	16,500	20,250	25,500	29,400

2.   Payment for materials – books produced two months before sale

Month	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Qty produced (Q)	1,000	1,250	1,500	2,000	1,900	2,200	2,200	2,300
	₹	₹	₹	₹	₹	₹	₹	₹
Materials (Q×5)	5,000	6,250	7,500	10,000	9,500	11,000	11,000	11,500
Paid (2 months after)	-	-	5,000	6,250	7,500	10,000	9,500	11,000

3.   Variable overheads

Month	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Qty produced (Q)	1,000	1,250	1,500	2,000	1,900	2,200	2,200	2,300
	₹	₹	₹	₹	₹	₹	₹	₹
Var. overhead (Q×2)	2,000	2,500	3,000	4,000	3,800			
Var. overhead (Q×2.50)						5,500	5,500	5,750
Paid one month later		2,000	2,500	3,000	4,000	3,800	5,500	5,500

4.   Wages payments

Month	Dec	Jan	Feb	Mar	Apr	May	Jun
Qty produced (Q)	1,250	1,500	2,000	1,900	2,200	2,200	2,300
	₹	₹	₹	₹	₹	₹	₹
Wages (Q × 4)	5,000	6,000	8,000				
Wages (Q × 4.50)				8,550	9,900	9,900	10,350
75% this month	3,750	4,500	6,000	6,412	7,425	7,425	7,762
25% this month		1,250	1,500	2,000	2,137	2,475	2,475
		5,750	7,500	8,412	9,562	9,900	10,237

Cash budget – six months ended June

	Jan	Feb	Mar	Apr	May	Jun
	₹	₹	₹	₹	₹	₹
Receipts:						
Credit sales	15,000	15,000	16,500	20,250	25,500	29,400
Premises disposal	-	-	-	-	25,000	-
	15,000	15,000	16,500	20,250	50,500	29,400
Payments:						
Materials	5,000	6,250	7,500	10,000	9,500	11,000
Var. overheads	2,500	3,000	4,000	3,800	5,500	5,500
Wages	5,750	7,500	8,412	9,562	9,900	10,237
Fixed assets	-	-	-	-	10,000	-
Corporation tax	-	-	10,000	-	-	-
	13,250	16,750	29,912	23,362	34,900	26,737
Net cash flow	1,750	(1,750)	(13,412)	(3,112)	15,600	2,663
Balance b/f	1,500	3,250	1,500	(11,912)	(15,024)	576
Cumulative cash flow	3,250	1,500	(11,912)	(15,024)	576	3,239

7.10.2   Cash Budget for long period: Long-range cash forecast often resemble the projected sources and application of funds statement. The following procedure may be adopted to prepare long-range cash forecasts:

(i)   Take the cash at bank and in the beginning of the year:

(ii) *Add:*

    (a) Trading profit (before tax) expected to be earned;

    (b) Depreciation and other development expenses incurred to be written off;

    (c) Sale proceeds of assets';

    (d) Proceeds of fresh issue of shares or debentures; and

    (e) Reduction in working capital that is current assets (except cash) less current liabilities.

(iii) Deduct:

    (a) Dividends to be paid.

    (b) Cost of assets to be purchased.

    (c) Taxes to be paid.

    (d) Debentures or shares to be redeemed.

    (e) Increase in working capital.

Illustration 12: *You are given below the Profit & Loss Accounts for two years for a company:*

Profit and Loss Account

	Year 1	Year 2		Year 1	Year 2
	₹	₹		₹	₹
To Opening stock	80,00,000	1,00,00,000	By Sales	8,00,00,000	10,00,00,000
To Raw materials	3,00,00,000	4,00,00,000	By Closing stock	1,00,00,000	1,50,00,000
To Stores	1,00,00,000	1,20,00,000	By Misc. Income	10,00,000	10,00,000
To Manufacturing Expenses	1,00,00,000	1,60,00,000			
To Other Expenses	1,00,00,000	1,00,00,000			
To Depreciation	1,00,00,000	1,00,00,000			
To Net Profit	1,30,00,000	1,80,00,000			
	9,10,00,000	11,60,00,000		9,10,00,000	11,60,00,000

Sales are expected to be ₹ 12,00,00,000 in year 3.

As a result, other expenses will increase by ₹ 50,00,000 besides other charges. Only raw materials are in stock. Assume sales and purchases are in cash terms and the closing stock is expected to go up by the same amount as between year 1 and 2. You may assume that no dividend is being paid. The Company can use 75% of the cash generated to service a loan. How much cash from operations will be available in year 3 for the purpose? Ignore income tax.

Solution

Projected Profit and Loss Account for the year 3

	Year 2 Actual (₹ in lakhs)	Year 3 Projected (₹ in lakhs)		Year 2 Actual (₹ in lakhs)	Year 3 Projected (₹ in lakhs)
To Materials consumed	350	420	By Sales	1,000	1,200
To Stores	120	144	By Misc. Income	10	10
To Mfg. Expenses	160	192			
To Other expenses	100	150			
To Depreciation	100	100			
To Net profit	180	204			
	1,010	1,210		1,010	1,210

Cash Flow:

	(₹ in lakhs)
Profit	204
Add: Depreciation	100
	304
Less: Cash required for increase in stock	50
Net cash inflow	254

Available for servicing the loan: 75% of ₹ 2,54,00,000 or ₹ 1,90,50,000

Working Notes:

(i)   Material consumed in year 2: 35% of sales.

Likely consumption in year 3 : $₹\,1,200 \times \dfrac{35}{100}$ or ₹ 420 (lakhs)

(ii)   Stores are 12% of sales, as in year 2.

(iii) Manufacturing expenses are 16% of sales.

Note: The above also shows how a projected profit and loss account is prepared.

Illustration 13 *: From the information and the assumption that the cash balance in hand on 1st January 2014 is ₹ 72,500 prepare a cash budget.*

Assume that 50 per cent of total sales are cash sales. Assets are to be acquired in the months of February and April. Therefore, provisions should be made for the payment of ₹ 8,000 and

₹ 25,000 for the same. An application has been made to the bank for the grant of a loan of ₹ 30,000 and it is hoped that the loan amount will be received in the month of May.

It is anticipated that a dividend of ₹ 35,000 will be paid in June. Debtors are allowed one month's credit. Creditors for materials purchased and overheads grant one month's credit. Sales commission at 3 per cent on sales is paid to the salesman each month.

Month	Sales (₹)	Materials Purchases (₹)	Salaries & Wages (₹)	Production Overheads (₹)	Office and Selling Overheads (₹)
January	72,000	25,000	10,000	6,000	5,500
February	97,000	31,000	12,100	6,300	6,700
March	86,000	25,500	10,600	6,000	7,500
April	88,600	30,600	25,000	6,500	8,900
May	1,02,500	37,000	22,000	8,000	11,000
June	1,08,700	38,800	23,000	8,200	11,500

Solution

Cash Budget

	Jan ₹	Feb ₹	Mar ₹	Apr ₹	May ₹	June ₹	Total ₹
Receipts							
Cash sales	36,000	48,500	43,000	44,300	51,250	54,350	2,77,400
Collections from debtors	-	36,000	48,500	43,000	44,300	51,250	2,23,050
Bank loan	-	-	-	-	30,000	-	30,000
Total	36,000	84,500	91,500	87,300	1,25,550	1,05,600	5,30,450
Payments							
Materials	-	25,000	31,000	25,500	30,600	37,000	1,49,100
Salaries and wages	10,000	12,100	10,600	25,000	22,000	23,000	1,02,700
Production overheads	-	6,000	6,300	6,000	6,500	8,000	32,800
Office & selling overheads	-	5,500	6,700	7,500	8,900	11,000	39,600
Sales commission	2,160	2,910	2,580	2,658	3,075	3,261	16,644
Capital expenditure	-	8,000	-	25,000	-	-	33,000
Dividend	-	-	-	-	-	35,000	35,000
Total	12,160	59,510	57,180	91,658	71,075	1,17,261	4,08,844
Net cash flow	23,840	24,990	34,320	(4,358)	54,475	(11,661)	1,21,606
Balance, beginning of month	72,500	96,340	1,21,330	1,55,650	1,51,292	2,05,767	1,94,106
Balance, end of month	96,340	1,21,330	1,55,650	1,51,292	2,05,767	1,94,106	3,15,712

Illustration 14 : *Consider the balance sheet of Maya Limited at December 31 (in thousands). The company has received a large order and anticipates the need to go to its bank to increase its borrowings. As a result, it has to forecast its cash requirements for January, February and March. Typically, the company collects 20 per cent of its sales in the month of sale, 70 per cent in the subsequent month, and 10 per cent in the second month after the sale. All sales are credit sales.*

	₹		₹
Cash	50	Accounts payable	360
Accounts receivable	530	Bank loan	400
Inventories	545	Accruals	212
Current assets	1,125	Current liabilities	972
Net fixed assets	1,836	Long-term debt	450
		Common stock	100
		Retained earnings	1,439
Total assets	2,961	Total liabilities and equity	2,961

Purchases of raw materials are made in the month prior to the sale and amount to 60 per cent of sales in the subsequent month. Payments for these purchases occur in the month after the purchase. Labour costs, including overtime, are expected to be ₹ 1,50,000 in January, ₹ 2,00,000 in February, and ₹ 1,60,000 in March. Selling, administrative, taxes, and other cash expenses are expected to be ₹ 1,00,000 per month for January through March. Actual sales in November and December and projected sales for January through April are as follows (in thousands):

	₹		₹		₹
November	500	January	600	March	650
December	600	February	1,000	April	750

On the basis of this information:

(a) *Prepare a cash budget for the months of January, February, and March.*

(b) *Determine the amount of additional bank borrowings necessary to maintain a cash balance of ₹ 50,000 at all times.*

(c) *Prepare a pro forma balance sheet for March 31.*

Solution

(a)   **Cash Budget**   *(in thousands)*

	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
	₹	₹	₹	₹	₹	₹
Sales	500	600	600	1,000	650	750
Collections, current month's sales			120	200	130	

Collections, previous month's sales		420	420	700
Collections, previous 2 month's sales		50	60	60
Total cash receipts		590	680	890
Purchases	360	600	390	450
Payment for purchases		360	600	390
Labour costs		150	200	160
Other expenses		100	100	100
Total cash disbursements		610	900	650
Receipts less disbursements		(20)	(220)	240

(b)

	Jan.	Feb.	Mar.
	₹	₹	₹
Additional borrowings	20	220	(240)
Cumulative borrowings	420	640	400

The amount of financing peaks in February owing to the need to pay for purchases made the previous month and higher labour costs. In March, substantial collections are made on the prior month's billings, causing large net cash inflow sufficient to pay off the additional borrowings.

(c)   **Pro forma Balance Sheet, March 31 (in thousands)**

	₹		₹
Cash	50	Accounts payable	450
Accounts receivable	620	Bank loan	400
Inventories	635	Accruals	212
Current assets	1,305	Current liabilities	1,062
Net fixed assets	1,836	Long-term debt	450
		Common stock	100
		Retained earnings	1,529
Total assets	3,141	Total liabilities and equity	3,141

Accounts receivable = Sales in March × 0.8 + Sales in February × 0.1

Inventories   =   ₹ 545 + Total purchases January through March − Total sales January through March × 0.6

Accounts payable   =   Purchases in March

Retained earnings   =   ₹ 1,439 + Sales − Payment for purchases − Labour costs and − Other expenses, all for January through March

7.10.3   Managing Cash Collection and Disbursements: Having prepared the cash budget, the finance manager should ensure that there is not a significant deviation between projected cash flows and actual cash flows.

To achieve this cash management efficiency will have to be improved through a proper control of cash collection and disbursement.

The twin objectives in managing the cash flows should be:-

➢   Accelerate cash collections as much as possible; and

➢   Decelerate or delay cash disbursements.

Let's discuss each of the two objectives individually.

7.10.4   Accelerating Cash Collections: A firm can conserve cash and reduce its requirements for cash balances if it can speed up its cash collections by issuing invoices quickly or by reducing the time lag between a customer pays bill and the cheque is collected and funds become available for the firm's use.

A firm can use decentralized collection system known as concentration banking and lock box system to speed up cash collection and reduce float time.

(i)   **Concentration Banking:** In concentration banking the company establishes a number of strategic collection centres in different regions instead of a single collection centre at the head office. This system reduces the period between the time a customer mails in his remittances and the time when they become spendable funds with the company. Payments received by the different collection centers are deposited with their respective local banks which in turn transfer all surplus funds to the concentration bank of head office. The concentration bank with which the company has its major bank account is generally located at the headquarters. Concentration banking is one important and popular way of reducing the size of the float.

(ii)   **Lock Box System:** Another means to accelerate the flow of funds is a lock box system. While concentration banking, remittances are received by a collection centre and deposited in the bank after processing. The purpose of lock box system is to eliminate the time between the receipts of remittances by the company and deposited in the bank. A lock box arrangement usually is on regional basis which a company chooses according to its billing patterns.

Under this arrangement, the company rents the local post-office box and authorizes its bank at each of the locations to pick up remittances in the boxes. Customers are billed with instructions to mail their remittances to the lock boxes. The bank picks up the mail several times a day and deposits the cheques in the company's account. The cheques may be micro-filmed for record purposes and cleared for collection. The company receives a deposit slip and lists all payments together with any other material in the envelope. This procedure frees the company from handling and depositing the cheques.

The main advantage of lock box system is that cheques are deposited with the banks sooner and become collected funds sooner than if they were processed by the company prior to deposit. In other words lag between the time cheques are received by the company and the time they are actually deposited in the bank is eliminated.

The main drawback of lock box system is the cost of its operation. The bank provides a number of services in addition to usual clearing of cheques and requires compensation for them. Since the cost is almost directly proportional to the number of cheques deposited. Lock box arrangements are usually not profitable if the average remittance is small. The appropriate rule for deciding whether or not to use a lock box system or for that matter, concentration banking, is simply to compare the added cost of the most efficient system with the marginal income that can be generated from the released funds. If costs are less than income, the system is profitable, if the system is not profitable, it is not worth undertaking.

Different Kinds of Float with reference to Management of Cash: The term float is used to refer to the periods that affect cash as it moves through the different stages of the collection process. Four kinds of float with reference to management of cash are:

➢ *Billing float:* An invoice is the formal document that a seller prepares and sends to the purchaser as the payment request for goods sold or services provided. The time between the sale and the mailing of the invoice is the billing float.

➢ *Mail float:* This is the time when a cheque is being processed by post office, messenger service or other means of delivery.

➢ *Cheque processing float:* This is the time required for the seller to sort, record and deposit the cheque after it has been received by the company.

➢ *Banking processing float:* This is the time from the deposit of the cheque to the crediting of funds in the sellers account.

7.10.5 Controlling Payments: An effective control over payments can also cause faster turnover of cash. This is possible only by making payments on the due date, making excessive use of draft (bill of exchange) instead of cheques.

Availability of cash can be maximized by playing the float. In this, a firm estimates accurately the time when the cheques issued will be presented for encashment and thus utilizes the float period to its advantage by issuing more cheques but having in the bank account only so much cash balance as will be sufficient to honour those cheques which are actually expected to be presented on a particular date.

Also company may make payment to its outstation suppliers by a cheque and send it through mail. The delay in transit and collection of the cheque, will be used to increase the float.

Illustration 15 : *Prachi Ltd is a manufacturing company producing and selling a range of cleaning products to wholesale customers. It has three suppliers and two customers. Prachi Ltd relies on its cleared funds forecast to manage its cash.*

You are an accounting technician for the company and have been asked to prepare a cleared funds forecast for the period Monday 7 January to Friday 11 January 2014 inclusive. You have been provided with the following information:

(1)   Receipts from customers

Customer name	Credit terms	Payment method	7 Jan 2014 sales	7 Dec 2013 sales
W Ltd	1 calendar month	BACS	₹ 150,000	₹ 130,000
X Ltd	None	Cheque	₹ 180,000	₹ 160,000

(a)   Receipt of money by BACS (Bankers' Automated Clearing Services) is instantaneous.

(b)   X Ltd's cheque will be paid into Prachi Ltd's bank account on the same day as the sale is made and will clear on the third day following this (excluding day of payment).

(2)   Payments to suppliers

Supplier name	Credit terms	Payment method	7 Jan 2014 purchases	7 Dec 2013 purchases	7 Nov 2013 purchases
A Ltd	1 calendar month	Standing order	₹ 65,000	₹ 55,000	₹ 45,000
B Ltd	2 calendar months	Cheque	₹ 85,000	₹ 80,000	₹ 75,000
C Ltd	None	Cheque	₹ 95,000	₹ 90,000	₹ 85,000

(a)   Prachi Ltd has set up a standing order for ₹ 45,000 a month to pay for supplies from A Ltd. This will leave Prachi's bank account on 7 January. Every few months, an adjustment is made to reflect the actual cost of supplies purchased (you do NOT need to make this adjustment).

(b)   Prachi Ltd will send out, by post, cheques to B Ltd and C Ltd on 7 January. The amounts will leave its bank account on the second day following this (excluding the day of posting).

(3)   Wages and salaries

	December 2013	January 2014
Weekly wages	₹ 12,000	₹ 13,000
Monthly salaries	₹ 56,000	₹ 59,000

(a)   Factory workers are paid cash wages (weekly). They will be paid one week's wages, on 11 January, for the last week's work done in December (i.e. they work a week in hand).

(b)   All the office workers are paid salaries (monthly) by BACS. Salaries for December will be paid on 7 January.

(4)   Other miscellaneous payments

(a)   Every Monday morning, the petty cashier withdraws ₹ 200 from the company bank account for the petty cash. The money leaves Prachi's bank account straight away.

(b)   The room cleaner is paid ₹ 30 from petty cash every Wednesday morning.

(c)   Office stationery will be ordered by telephone on Tuesday 8 January to the value of ₹ 300. This is paid for by company debit card. Such payments are generally seen to leave the company account on the next working day.

(d)   Five new softwares will be ordered over the Internet on 10 January at a total cost of ₹ 6,500. A cheque will be sent out on the same day. The amount will leave Prachi Ltd's bank account on the second day following this (excluding the day of posting).

(5)   Other information

The balance on Prachi's bank account will be ₹ 200,000 on 7 January 2014. This represents both the book balance and the cleared funds.

Required:

Prepare a cleared funds forecast for the period Monday 7 January to Friday 7 January 2014 inclusive using the information provided. Show clearly the uncleared funds float each day.

Solution:

Cleared Funds Forecast

	7 Jan 14 (Monday) ₹	8 Jan 14 (Tuesday) ₹	9 Jan 14 (Wednesday) ₹	10 Jan 14 (Thursday) ₹	11 Jan 14 (Friday) ₹
Receipts					
W Ltd	1,30,000	0	0	0	0
X Ltd	0	0	0	1,80,000	0
(a)	**1,30,000**	**0**	**0**	**1,80,000**	**0**
Payments					
A Ltd	45,000	0	0	0	0
B Ltd	0	0	75,000	0	0
C Ltd	0	0	95,000	0	0
Wages	0	0	0	0	12,000
Salaries	56,000	0	0	0	0
Petty Cash	200	0	0	0	0
Stationery	0	0	300	0	0
(b)	**1,01,200**	**0**	**1,70,300**	**0**	**12,000**
Cleared excess Receipts over payments (a) – (b)	28,800	0	(170,300)	80,000	(12,000)

Cleared balance b/f	200,000	228,800	228,800	58,500	238,500
Cleared balance c/f (c)	**2,28,800**	**2,28,800**	**58,500**	**2,38,500**	**2,26,500**
Uncleared funds float					
Receipts	180,000	180,000	180,000	0	0
Payments	(170,000)	(170,300)	0	(6,500)	(6,500)
(d)	**10,000**	**9,700**	**180,000**	**(6,500)**	**(6,500)**
Total book balance c/f	**2,38,800**	**2,38,500**	**2,38,500**	**2,32,000**	**2,20,000**
(c) + (d)					

10.6 Determining the Optimum Cash Balance : A firm should maintain optimum cash balance to cater to the day-to-day operations. It may also carry additional cash as a buffer or safety stock. The amount of cash balance will depend on the risk-return trade off. The firm should maintain an optimum level i.e. just enough, i.e. neither too much nor too little cash balance. This, however, poses a question. How to determine the optimum cash balance if cash flows are predictable and if they are not predictable?

7.11 Cash Management Models

In recent years several types of mathematical models have been developed which helps to determine the optimum cash balance to be carried by a business organization.

The purpose of all these models is to ensure that cash does not remain idle unnecessarily and at the same time the firm is not confronted with a situation of cash shortage.

All these models can be put in two categories:-

➢   Inventory type models; and

➢   Stochastic models.

Inventory type models have been constructed to aid the finance manager to determine optimum cash balance of his firm. William J. Baumol's economic order quantity model applies equally to cash management problems under conditions of certainty or where the cash flows are predictable.

However, in a situation where the EOQ Model is not applicable, stochastic model of cash management helps in determining the optimum level of cash balance. It happens when the demand for cash is stochastic and not known in advance.

7.11.1 William J. Baumol's Economic Order Quantity Model, (1952): According to this model, optimum cash level is that level of cash where the carrying costs and transactions costs are the minimum.

The carrying costs refer to the cost of holding cash, namely, the interest foregone on marketable securities. The transaction costs refer to the cost involved in getting the marketable securities converted into cash. This happens when the firm falls short of cash and has to sell the securities resulting in clerical, brokerage, registration and other costs.

The optimum cash balance according to this model will be that point where these two costs are minimum. The formula for determining optimum cash balance is:

$$C = \sqrt{\frac{2U \times P}{S}}$$

Where,   C = Optimum cash balance

U = Annual (or monthly) cash disbursement

P = Fixed cost per transaction.

S = Opportunity cost of one rupee p.a. (or p.m.)

This can be explained with the following diagram:

Optimum Cash Balance
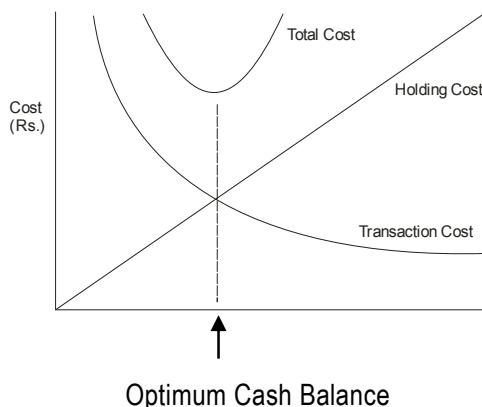
The model is based on the following assumptions:

(i)   Cash needs of the firm are known with certainty.

(ii)   The cash is used uniformly over a period of time and it is also known with certainty.

(iii) The holding cost is known and it is constant.

(iv)   The transaction cost also remains constant.

Illustration 16 : *A firm maintains a separate account for cash disbursement. Total disbursement are ₹ 1,05,000 per month or ₹ 12,60,000 per year. Administrative and transaction cost of transferring cash to disbursement account is ₹ 20 per transfer. Marketable securities yield is 8% per annum.*

Determine the optimum cash balance according to William J. Baumol model.

Solution

The optimum cash balance C = $\sqrt{\dfrac{2 \times ₹12,60,000 \times ₹20}{0.08}}$ = ₹ 25,100
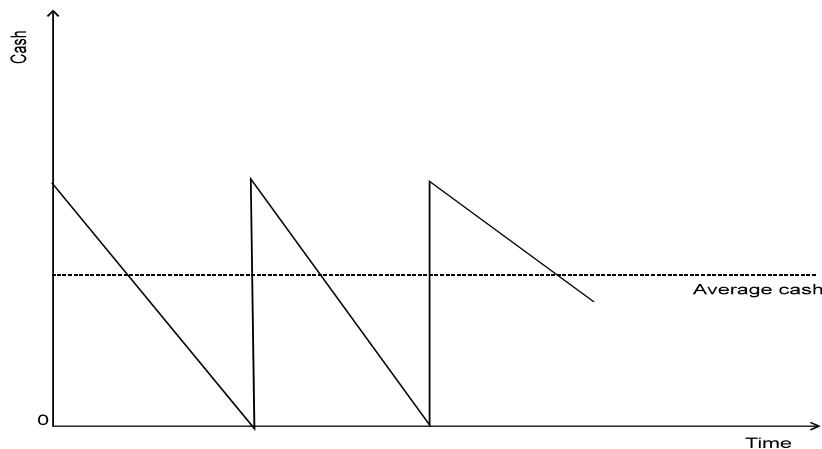
The limitation of the Baumol's model is that it does not allow the cash flows to fluctuate. Firms in practice do not use their cash balance uniformly nor are they able to predict daily cash inflows and outflows. The Miller-Orr (MO) model overcomes this shortcoming and allows for daily cash flow variation.

7.11.2 Miller-Orr Cash Management Model (1966): According to this model the net cash flow is completely stochastic.

When changes in cash balance occur randomly the application of control theory serves a useful purpose. The Miller-Orr model is one of such control limit models.

This model is designed to determine the time and size of transfers between an investment account and cash account. In this model control limits are set for cash balances. These limits may consist of h as upper limit, z as the return point; and zero as the lower limit.

➢   When the cash balance reaches the upper limit, the transfer of cash equal to h – z is invested in marketable securities account.

➢   When it touches the lower limit, a transfer from marketable securities account to cash account is made.

➢   During the period when cash balance stays between (h, z) and (z, 0) i.e. high and low limits no transactions between cash and marketable securities account is made.

The high and low limits of cash balance are set up on the basis of fixed cost associated with the securities transactions, the opportunity cost of holding cash and the degree of likely fluctuations in cash balances. These limits satisfy the demands for cash at the lowest possible total costs. The following diagram illustrates the Miller-Orr model.
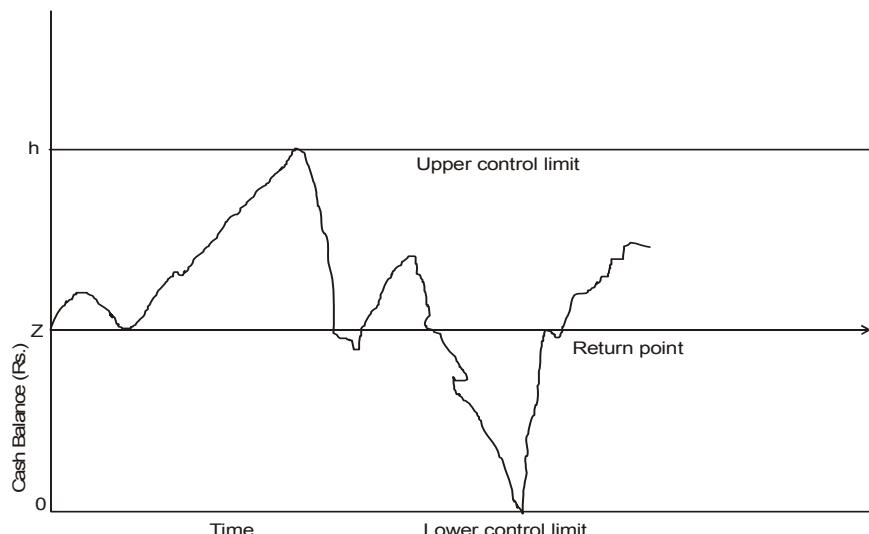
The MO Model is more realistic since it allows variations in cash balance within lower and upper limits. The finance manager can set the limits according to the firm's liquidity requirements i.e., maintaining minimum and maximum cash balance.

7.12 Recent Developments in Cash Management

It is important to understand the latest developments in the field of cash management, since it has a great impact on how we manage our cash. Both technological advancement and desire to reduce cost of operations has led to some innovative techniques in managing cash. Some of them are:-

7.12.1 Electronic Fund Transfer: With the developments which took place in the Information technology, the present banking system is switching over to the computerisation of banks branches to offer efficient banking services and cash management services to their customers. The network will be linked to the different branches, banks. This will help the customers in the following ways:

➢ Instant updation of accounts.

➢ The quick transfer of funds.

➢ Instant information about foreign exchange rates.

7.12.2 Zero Balance Account: For efficient cash management some firms employ an extensive policy of substituting marketable securities for cash by the use of zero balance accounts. Every day the firm totals the cheques presented for payment against the account. The firm transfers the balance amount of cash in the account if any, for buying marketable securities. In case of shortage of cash the firm sells the marketable securities.

7.12.3 Money Market Operations: One of the tasks of *'treasury function'* of larger companies is the investment of surplus funds in the money market. The chief characteristic of money market banking is one of size. Banks obtain funds by competing in the money market for the deposits by the companies, public authorities, High Net worth Investors (HNI), and other banks. Deposits are made for specific periods ranging from overnight to one year; highly competitive rates which reflect supply and demand on a daily, even hourly basis are quoted. Consequently, the rates can fluctuate quite dramatically, especially for the shorter-term deposits. Surplus funds can thus be invested in money market easily.

7.12.4 Petty Cash Imprest System: For better control on cash, generally the companies use petty cash imprest system wherein the day-to-day petty expenses are estimated taking into account past experience and future needs and generally a week's requirement of cash will be kept separate for making petty expenses. Again, the next week will commence with the pre-determined balance. This will reduce the strain of the management in managing petty cash expenses and help in the managing cash efficiently.

7.12.5 Management of Temporary Cash Surplus: Temporary cash surpluses can be profitably invested in the following:

➢ Short-term deposits in Banks and financial institutions.

➢ Short-term debt market instruments.

➢ Long-term debt instruments.

➢ Shares of Blue chip listed companies.

7.12.6 Electronic Cash Management System: Most of the cash management systems now-a-days are electronically based, since 'speed' is the essence of any cash management system. Electronically, transfer of data as well as funds play a key role in any cash management system. Various elements in the process of cash management are linked through a satellite. Various places that are interlinked may be the place where the instrument is collected, the place where cash is to be transferred in company's account, the place where the payment is to be transferred etc.

Certain networked cash management system may also provide a very limited access to third parties like parties having very regular dealings of receipts and payments with the company etc. A finance company accepting deposits from public through sub-brokers may give a limited access to sub-brokers to verify the collections made through him for determination of his commission among other things.

Electronic-scientific cash management results in:

➢ Significant saving in time.

➢ Decrease in interest costs.

➢ Less paper work.

➢ Greater accounting accuracy.

➢ More control over time and funds.

➢ Supports electronic payments.

➢ Faster transfer of funds from one location to another, where required.

➢ Speedy conversion of various instruments into cash.

➢ Making available funds wherever required, whenever required.

➢ Reduction in the amount of 'idle float' to the maximum possible extent.

➢ Ensures no idle funds are placed at any place in the organization.

➢ It makes inter-bank balancing of funds much easier.

➢ It is a true form of centralised 'Cash Management'.

➢ Produces faster electronic reconciliation.

➢ Allows for detection of book-keeping errors.

➢ Reduces the number of cheques issued.

➢ Earns interest income or reduce interest expense.

7.12.7 Virtual Banking: The practice of banking has undergone a significant change in the nineties. While banks are striving to strengthen customer base and relationship and move towards relationship banking, customers are increasingly moving away from the confines of traditional branch banking and are seeking the convenience of remote electronic banking services. And even within the broad spectrum of electronic banking the virtual banking has gained prominence

Broadly virtual banking denotes the provision of banking and related services through extensive use of information technology without direct recourse to the bank by the customer. The origin of virtual banking in the developed countries can be traced back to the seventies with the installation of Automated Teller Machines (ATMs). Subsequently, driven by the competitive market environment as well as various technological and customer pressures, other types of virtual banking services have grown in prominence throughout the world.

The Reserve Bank of India has been taking a number of initiatives, which will facilitate the active involvement of commercial banks in the sophisticated cash management system. One of the pre-requisites to ensure faster and reliable mobility of funds in a country is to have an efficient payment system. Considering the importance of speed in payment system to the economy, the RBI has taken numerous measures since mid-Eighties to strengthen the payments mechanism in the country.

Introduction of computerized settlement of clearing transactions, use of Magnetic Ink Character Recognition (MICR) technology, provision of inter-city clearing facilities and high value clearing facilities, Electronic Clearing Service Scheme (ECSS), Electronic Funds Transfer (EFT) scheme, Delivery vs. Payment (DVP) for Government securities transactions, setting up of Indian Financial Network (INFINET) are some of the significant developments.

Introduction of Centralised Funds Management System (CFMS), Securities Services System (SSS), Real Time Gross Settlement System (RTGS) and Structured Financial Messaging System (SFMS) are the other top priority items on the agenda to transform the existing system into a state-of-the art payment infrastructure in India.

The current vision envisaged for the payment systems reforms is one, which contemplates linking up of at least all important bank branches with the domestic payment systems network thereby facilitating cross border connectivity. With the help of the systems already put in place in India and which are coming into being, both banks and corporates can exercise effective control over the cash management.

Advantages

The advantages of virtual banking services are as follows:

➢   Lower cost of handling a transaction.

➢   The increased speed of response to customer requirements.

➢   The lower cost of operating branch network along with reduced staff costs leads to cost efficiency.

➢   Virtual banking allows the possibility of improved and a range of services being made available to the customer rapidly, accurately and at his convenience.

The popularity which virtual banking services have won among customers is due to the speed, convenience and round the clock access they offer.

7.13 Management of Marketable Securities

Management of marketable securities is an integral part of investment of cash as this may serve both the purposes of liquidity and cash, provided choice of investment is made correctly. As the working capital needs are fluctuating, it is possible to park excess funds in some short term securities, which can be liquidated when need for cash is felt. The selection of securities should be guided by three principles.

➢   *Safety*: Return and risks go hand in hand. As the objective in this investment is ensuring liquidity, minimum risk is the criterion of selection.

➢   *Maturity:* Matching of maturity and forecasted cash needs is essential. Prices of long term securities fluctuate more with changes in interest rates and are therefore, more risky.

➢   *Marketability:* It refers to the convenience, speed and cost at which a security can be converted into cash. If the security can be sold quickly without loss of time and price it is highly liquid or marketable.

The choice of marketable securities is mainly limited to Government treasury bills, Deposits with banks and Inter-corporate deposits. Units of Unit Trust of India and commercial papers of corporates are other attractive means of parking surplus funds for companies along with deposits with sister concerns or associate companies.

Besides this Money Market Mutual Funds (MMMFs) have also emerged as one of the avenues of short-term investment. They focus on short-term marketable securities such as Treasury bills, commercial papers certificate of deposits or call money market. There is a lock in period of 30 days after which the investment may be converted into cash. They offer attractive yields, and are popular with institutional investors and some big companies.

Illustration 17 : *The following information is available in respect of Saitrading company:*

(i)   On an average, debtors are collected after 45 days; inventories have an average holding period of 75 days and creditor's payment period on an average is 30 days.

(ii)   The firm spends a total of ₹ 120 lakhs annually at a constant rate.

(iii) It can earn 10 per cent on investments.

From the above information, you are required to calculate:

(a)   The cash cycle and cash turnover,

(b)   Minimum amounts of cash to be maintained to meet payments as they become due,

(c)   Savings by reducing the average inventory holding period by 30 days.

Solution

(a) Cash cycle = 45 days + 75 days – 30 days = 90 days (3 months)

Cash turnover = 12 months (360 days)/3 months (90 days) = 4.

(b) Minimum operating cash = Total operating annual outlay/cash turnover, that is, ₹ 120 lakhs/4 = ₹ 30 lakhs.

(c) Cash cycle = 45 days + 45 days – 30 days = 60 days (2 months).

Cash turnover = 12 months (360 days)/2 months (60 days) = 6.

Minimum operating cash = ₹ 120 lakhs/6 = ₹ 20 lakhs.

Reduction in investments = ₹ 30 lakhs – ₹ 20 lakhs = ₹ 10 lakhs.

Savings = 0.10 × ₹ 10 lakhs = ₹ 1 lakh.

UNIT – III : MANAGEMENT OF INVENTORY

7.14 Inventory Management

Inventories constitute a major element of working capital. It is, therefore, important that investment in inventory is property controlled. The objectives of inventory management are, to a great extent, similar to the objectives of cash management. Inventory management covers a large number of problems including fixation of minimum and maximum levels, determining the size of inventory to be carried, deciding about the issues, receipts and inspection procedures, determining the economic order quantity, proper storage facilities, keeping check over obsolescence and ensuring control over movement of inventories.

The aspects concerning control over inventories have been discussed in Paper 3 : Part 1 - Cost Accounting.

Some illustrations are given for your practice.

Illustration 18 : *A company's requirements for ten days are 6,300 units. The ordering cost per order is ₹ 10 and the carrying cost per unit is ₹ 0.26. You are required to calculate the economic order quantity.*

Solution

The economic order quantity is:

$$EOQ = \sqrt{\frac{2 \times 6{,}300 \times 10}{0.26}} = \sqrt{\frac{1{,}26{,}000}{0.26}} = 700 \text{ units (approx)}.$$

Illustration 19 *: Marvel Limited uses a large quantity of salt in its production process. Annual consumption is 60,000 tonnes over a 50-week working year. It costs ₹ 100 to initiate and process an order and delivery follow two weeks later. Storage costs for the salt are estimated at 10 paise per tonne per annum. The current practice is to order twice a year when the stock falls to 10,000 tonnes. Recommend an appropriate ordering policy for Marvel Limited, and contrast it with the cost of the current policy.*

Solution

The recommended policy should be based on the EOQ model.

F = ₹ 100 per order

S = 60,000 tonnes per year

H = ₹ 0.10 per tonne per year

Substituting : $EOQ = \sqrt{\dfrac{2 \times 100 \times 60{,}000}{0.10}}$ = 10,954 tonnes per order

Number of orders per year = 60,000/10,954 = 5.5 orders

Re-order level = 2×60,000/50 = 2,400 tonnes

Total cost of optimum policy = holding costs + ordering costs

$$= (0.1×10954)/2 + (100×60,000)/10,954$$

$$= 547.70 + 547.74 = ₹ 1,095$$

To compare the optimum policy with the current policy, the average level of stock under the current policy must be found. An order is placed when stock falls to 10,000 tonnes, but the lead time is two weeks. The stock used in that time is (60,000×2)/50 = 2,400 tonnes. Before delivery, inventory has fallen to (10,000 – 2,400) = 7,600 tonnes. Orders are made twice per year, and so the order size = 60,000/2 = 30,000 tonnes. The order will increase stock level to 30,000 + 7,600 = 37,600 tonnes. Hence the average stock level = 7,600 + (30,000/2) = 22,600 tonnes. Total costs of current policy = (0.1×22,600) + (100×2) = ₹ 2,460 per year.

Advise: The recommended policy should be adopted as the costs (₹ 1,365 per year) are less than the current policy.

Illustration 20 : *Pureair Company is a distributor of air filters to retail stores. It buys its filters from several manufacturers. Filters are ordered in lot sizes of 1,000 and each order costs ₹ 40 to place. Demand from retail stores is 20,000 filters per month, and carrying cost is ₹ 0.10 a filter per month.*

(a)   *What is the optimal order quantity with respect to so many lot sizes?*

(b)   *What would be the optimal order quantity if the carrying cost were ₹ 0.05 a filter per month?*

(c)   *What would be the optimal order quantity if ordering costs were ₹ 10?*

Solution

(a) $EOQ^* = \sqrt{\dfrac{2(20)(40)}{100}} = 4$

Carrying costs = ₹ 0.10 × 1,000 = ₹ 100. The optimal order size would be 4,000 filters, which represents five orders a month.

(b) $EOQ^* = \sqrt{\dfrac{2(20)(40)}{50}} = 5.66$

Since the lot size is 1,000 filters, the company would order 6,000 filters each time. The lower the carrying cost, the more important ordering costs become relatively, and the larger the optimal order size.

(c) $EOQ^* = \sqrt{\dfrac{2(20)(10)}{100}} = 2$

The lower the order cost, the more important carrying costs become relatively and the smaller the optimal order size.

<div style="background:black;color:white;text-align:center;font-weight:bold;">UNIT – IV : MANAGEMENT OF RECEIVABLES</div>

7.15 Meaning and Objective

Management of receivables refers to planning and controlling of 'debt' owed to the firm from customer on account of credit sales. It is also known as trade credit management.

The basic objective of management of receivables (debtors) is to optimise the return on investment on these assets.

Large amounts are tied up in receivables, there are chances of bad debts and there will be cost of collection of debts. On the contrary, if the investment in receivables is low, the sales may be restricted, since the competitors may offer more liberal terms. Therefore, management of receivables is an important issue and requires proper policies and their implementation.

7.16 Aspects of Management of Debtors

There are basically three aspects of management of receivables:

1. *Credit Policy:* The credit policy is to be determined. Decision of Credit standards, Credit terms and collection efforts is included in Credit policy. It involves a trade off between the profits on additional sales that arise due to credit being extended on the one hand and the cost of carrying those debtors and bad debt losses on the other. This seeks to decide credit period, cash discount and other relevant matters. The credit period is generally stated in terms of net days. For example if the firm's credit terms are "net 50". It is expected that customers will repay credit obligations not later than 50 days.

    Further, the cash discount policy of the firm specifies:

    (a) The rate of cash discount.

    (b) The cash discount period; and

    (c) The net credit period.

    For example, the credit terms may be expressed as "3/15 net 60". This means that a 3% discount will be granted if the customer pays within 15 days; if he does not avail the offer he must make payment within 60 days.

2. *Credit Analysis:* This requires the finance manager to determine as to how risky it is to advance credit to a particular party.

3. *Control of Receivable:* This requires finance manager to follow up debtors and decide about a suitable credit collection policy. It involves both laying down of credit policies and execution of such policies.

    There is always cost of maintaining receivables which comprises of following costs:

    (i)   The company requires additional funds as resources are blocked in receivables which involves a cost in the form of interest (loan funds) or opportunity cost (own funds)

(ii)   Administrative costs which include record keeping, investigation of credit worthiness etc.

(iii)   Collection costs.

(iv)   Defaulting costs.

7.17 Factors Determining Credit Policy

The credit policy is an important factor determining both the quantity and the quality of accounts receivables. Various factors determine the size of the investment a company makes in accounts receivables. They are, for instance:

(i)   The effect of credit on the volume of sales;

(ii)   Credit terms;

(iii)   Cash discount;

(iv)   Policies and practices of the firm for selecting credit customers;

(v)   Paying practices and habits of the customers;

(vi)   The firm's policy and practice of collection; and

(vii)   The degree of operating efficiency in the billing, record keeping and adjustment function, other costs such as interest, collection costs and bad debts etc., would also have an impact on the size of the investment in receivables. The rising trend in these costs would depress the size of investment in receivables.

The firm may follow a lenient or a stringent credit policy. The firm which follows a lenient credit policy sells on credit to customers on very liberal terms and standards. On the contrary a firm following a stringent credit policy sells on credit on a highly selective basis only to those customers who have proper credit worthiness and who are financially sound.

Any increase in accounts receivables that is, additional extension of trade credit not only results in higher sales but also requires additional financing to support the increased investment in accounts receivables. The costs of credit investigations and collection efforts and the chances of bad debts are also increased.

7.18 Factors under the Control of the Finance Manager

The finance manager has operating responsibility for the management of the investment in receivables. His involvement includes:-

(a)   Supervising the administration of credit;

(b)   Contribute to top management decisions relating to the best credit policies of the firm;

(c)   Deciding the criteria for selection of credit applications; and

(d)   Speed up the conversion of receivables into cash by aggressive collection policy.

In summary the finance manager has to strike a balance between the cost of increased investment in receivables and profits from the higher levels of sales.

7.19 Approaches to Evaluation of Credit Policies

There are basically two methods of evaluating the credit policies to be adopted by a Company – Total Approach and Incremental Approach. The formats for the two approaches are given as under:

Statement showing the Evaluation of Credit Policies (based on Total Approach)

Particulars	Present Policy	Proposed Policy I	Proposed Policy II	Proposed Policy III
	₹	₹	₹	₹
A. Expected Profit:				
(a) Credit Sales	……….	………….	………..	……….
(b) Total Cost other than Bad Debts and Cash Discount				
(i) Variable Costs	………	………….	……….	……….
(ii) Fixed Costs	………	………….	……….	……….
	………	……….	……….	…….
(c) Bad Debts	………	………….	……….	……….
(d) Cash discount				
(e) Expected Net Profit before Tax (a-b-c-d)	………	……….	……….	………….
(f) Less: Tax	……...	……….	……….	………
(g) Expected Profit after Tax	………	……….	……….	………
B. Opportunity Cost of Investments in Receivables locked up in Collection Period	..……	……….	……….	………
Net Benefits (A – B)	……….	……….	……….	……….

Advise: The Policy……. should be adopted since the net benefits under this policy are higher as compared to other policies.

Here

(i)   Total Fixed Cost = [Average Cost per unit – Variable Cost per unit] x No. of units sold on credit
under Present Policy

(ii) Opportunity Cost = Total Cost of Credit Sales x $\dfrac{\text{Collection period (Days)}}{365 \, (\text{or } 360)}$ x $\dfrac{\text{Required Rate of Return}}{100}$

Statement showing the Evaluation of Credit Policies (based on Incremental Approach)

Particulars	*Present Policy days*	*Proposed Policy I days*	*Proposed Policy II days*	*Proposed Policy III days*
	₹	₹	₹	₹
A. Incremental Expected Profit:				
Credit Sales	……….	………….	………..	……….
(a) Incremental Credit Sales	……….	………….	………..	……….
(b) Less: Incremental Costs of Credit Sales				
(i) Variable Costs	……….	………….	………..	……….
(ii) Fixed Costs	……….	………….	………..	……….
(c) Incremental Bad Debt Losses	……….	………….	………..	……….
(d) Incremental Cash Discount	……….	………….	………..	……….
(e) Incremental Expected Profit (a-b-c-d)	……….	………….	………..	……….
(f) Less: Tax	……….	………….	………..	……….
(g) Incremental Expected Profit after Tax	……….	………….	………..	……….
	……….	………….	………..	……….
B. Required Return on Incremental Investments:				
(a) Cost of Credit Sales	……….	………….	………..	……….
(b) Collection Period (in days)	……….	………….	………..	……….
(c) Investment in Receivable (a x b/365 or 360)	……….	………….	………..	……….
(d) Incremental Investment in Receivables	……….	………….	………..	……….
(e) Required Rate of Return (in %)	……….	………….	………..	……….
(f) Required Return on Incremental Investments (d x e)	……….	………….	………..	……….
Incremental Net Benefits (A – B)	……….	………….	………..	……….

Advise: The Policy ……….should be adopted since net benefits under this policy are higher as compared to other policies.

Here:

(i) Total Fixed Cost = [Average Cost per unit – Variable Cost per unit] x No. of units sold on credit
under Present Policy

(ii) Opportunity Cost = Total Cost of Credit Sales x $\dfrac{\text{Collection period (Days)}}{365 \,(\text{or } 360)}$ x $\dfrac{\text{Required Rate of Return}}{100}$

Illustration 21 : *A trader whose current sales are in the region of ₹ 6 lakhs per annum and an average collection period of 30 days wants to pursue a more liberal policy to improve sales. A study made by a management consultant reveals the following information:-*

Credit Policy	Increase in collection period	Increase in sales	Present default anticipated
A	10 days	₹ 30,000	1.5%
B	20 days	₹ 48,000	2%
C	30 days	₹ 75,000	3%
D	45 days	₹ 90,000	4%

The selling price per unit is ₹ 3. Average cost per unit is ₹ 2.25 and variable costs per unit are ₹ 2. The current bad debt loss is 1%. Required return on additional investment is 20%. Assume a 360 days year.

Which of the above policies would you recommend for adoption?

Solution

A. Statement showing the Evaluation of Debtors Policies (Total Approach)

Particulars		Present Policy 30 days	Proposed Policy A 40 days	Proposed Policy B 50 days	Proposed Policy C 60 days	Proposed Policy D 75 days
		₹	₹	₹	₹	₹
A.	**Expected Profit:**					
	(a) Credit Sales	6,00,000	6,30,000	6,48,000	6,75,000	6,90,000
	(b) Total Cost other than Bad Debts					
	(i) Variable Costs	4,00,000	4,20,000	4,32,000	4,50,000	4,60,000
	[Sales x ₹ 2/₹ 3]					
	(ii) Fixed Costs	50,000	50,000	50,000	50,000	50,000
		4,50,000	4,70,000	4,82,000	5,00,000	5,10,000
	(c) Bad Debts	6,000	9,450	12,960	20,250	27,600
	(d) Expected Profit [(a) – (b) – (c)]	1,44,000	1,50,550	1,53,040	1,54,750	1,52,400

B.	Opportunity Cost of Investments in Receivables	7,500	10,444	13,389	16,667	21,250
C.	Net Benefits (A – B)	1,36,500	1,40,106	1,39,651	1,38,083	1,31,150

Recommendation: The Proposed Policy A (i.e. increase in collection period by 10 days or total 40 days) should be adopted since the net benefits under this policy are higher as compared to other policies.

Working Notes:

(i) **Calculation of Fixed Cost** = [Average Cost per unit – Variable Cost per unit] x No. of Units sold

= [₹ 2.25 - ₹ 2.00] x (₹ 6,00,000/3)

= ₹ 0.25 x 2,00,000 = ₹ 50,000

(ii) **Calculation of Opportunity Cost of Average Investments**

$$\text{Opportunity Cost} = \text{Total Cost} \times \frac{\text{Collection period}}{360} \times \frac{\text{Rate of Return}}{100}$$

Present Policy $= 4,50,000 \times \dfrac{30}{360} \times \dfrac{20}{100} = 7,500$

Policy A $= 4,70,000 \times \dfrac{40}{360} \times \dfrac{20}{100} = 10,444$

Policy B $= 4,82,000 \times \dfrac{50}{360} \times \dfrac{20}{100} = 13,389$

Policy C $= 5,00,000 \times \dfrac{60}{360} \times \dfrac{20}{100} = 16,667$

Policy D $= 5,10,000 \times \dfrac{75}{360} \times \dfrac{20}{100} = 21,250$

B. Another method of solving the problem is **Incremental Approach**. Here we assume that sales are all credit sales.

Particulars	Present Policy 30 days	Proposed Policy A 40 days	Proposed Policy B 50 days	Proposed Policy C 60 days	Proposed Policy D 75 days
	₹	₹	₹	₹	₹
A. Incremental Expected Profit:					
(a) Incremental Credit Sales		30,000	48,000	75,000	90,000
(b) Incremental Costs					

(i) Variable Costs	4,00,000	20,000	32,000	50,000	60,000
(ii) Fixed Costs	50,000	-	-	-	-
(c) Incremental Bad Debt Losses	6,000	3,450	6,960	14,250	21,600
(d) Incremental Expected Profit (a – b –c)]		6,550	9,040	10,750	8,400
B. Required Return on Incremental Investments:					
(a) Cost of Credit Sales	4,50,000	4,70,000	4,82,000	5,00,000	5,10,000
(b) Collection period	30	40	50	60	75
(c) Investment in Receivable (a x b/360)	37,500	52,222	66,944	83,333	1,06,250
(d) Incremental Investment in Receivables	-	14,722	29,444	45,833	68,750
(e) Required Rate of Return (in %)		20	20	20	20
(f) Required Return on Incremental Investments (d x e)	-	2,944	5,889	9,167	13,750
C. Net Benefits (A – B)	**-**	3,606	3,151	1,583	5,350

Recommendation: The Proposed Policy A should be adopted since the net benefits under this policy are higher than those under other policies.

C.   Another method of solving the problem is by computing the **Expected Rate of Return**.

$$\text{Expected Rate of Return} = \frac{\text{Incremental Expected Profit}}{\text{Incremental Investment in Receivables}} \times 100$$

$$\text{For Policy A} = \frac{₹\,6,550}{₹\,14,722} \times 100 = 44.49\%$$

$$\text{For Policy B} = \frac{₹\,9,040}{₹\,29,444} \times 100 = 30.70\%$$

$$\text{For Policy C} = \frac{₹\,10,750}{₹\,45,833} \times 100 = 23.45\%$$

$$\text{For Policy D} = \frac{₹\,8,400}{₹\,68,750} \times 100 = 12.22\%$$

Recommendation: The Proposed Policy A should be adopted since the Expected Rate of Return (44.49%) is more than the Required Rate of Return (20%) and is highest among the given policies compared.

Illustration 22 : *XYZ Corporation is considering relaxing its present credit policy and is in the process of evaluating two proposed policies. Currently, the firm has annual credit sales of ₹ 50 lakhs and accounts receivable turnover ratio of 4 times a year. The current level of loss due to bad debts is ₹ 1,50,000. The firm is required to give a return of 25% on the investment in new accounts receivables. The company's variable costs are 70% of the selling price. Given the following information, which is the better option?*

(Amount in ₹)

	Present Policy	Policy Option I	Policy Option I
Annual credit sales	50,00,000	60,00,000	67,50,000
Accounts receivable turnover ratio	4 times	3 times	2.4 times
Bad debt losses	1,50,000	3,00,000	4,50,000

Solution

Statement showing the Evaluation of Debtors Policies

	Particulars	Present Policy	Proposed Policy I	Proposed Policy II
		₹	₹	₹
A	**Expected Profit:**			
	(a) Credit Sales	50,00,000	60,00,000	67,50,000
	(b) Total Cost other than Bad Debts:			
	(i) Variable Costs	35,00,000	42,00,000	47,25,000
	(c) Bad Debts	1,50,000	3,00,000	4,50,000
	(d) Expected Profit [(a) – (b) – (c)]	13,50,000	15,00,000	15,75,000
B	**Opportunity Cost of Investments in Receivables**	2,18,750	3,50,000	4,92,188
C	**Net Benefits (A – B)**	11,31,250	11,50,000	10,82,812

Recommendation: The Proposed Policy I should be adopted since the net benefits under this policy are higher as compared to other policies.

Working Note: Calculation of Opportunity Cost of Average Investments

$$\text{Opportunity Cost} = \text{Total Cost} \times \frac{\text{Collection period}}{12} \times \frac{\text{Rate of Return}}{100}$$

Present Policy   = ₹ 35,00,000 x 3/12 x 25%   = ₹ 2,18,750

Proposed Policy I   = ₹ 42,00,000 x 4/12 x 25%   = ₹ 3,50,000

Proposed Policy II   = ₹ 47,25,000 x 5/12 x 25%   = ₹ 4,92,188

Illustration 23:

PQR Ltd. having an annual sales of ₹ 30 lakhs, is re-considering its present collection policy. At present, the average collection period is 50 days and the bad debt losses are 5% of sales. The company is incurring an expenditure of ₹ 30,000 on account of collection of receivables. Cost of funds is 10 percent.

The alternative policies are as under:

	Alternative I	*Alternative II*
Average Collection Period	*40 days*	*30 days*
Bad Debt Losses	*4% of sales*	*3% of sales*
Collection Expenses	*₹ 60,000*	*₹ 95,000*

Evaluate the alternatives on the basis of incremental approach and state which alternative is more beneficial.

Solution

Evaluation of Alternative Collection Programmes

	Present Policy	*Alternative I*	*Alternative II*
	₹	₹	₹
Sales Revenues	30,00,000	30,00,000	30,00,000
Average Collection Period (ACP) (days)	50	40	30
Receivables (₹) $\left(\text{Sales} \times \dfrac{\text{ACP}}{360}\right)$	4,16,667	3,33,333	2,50,000
Reduction in Receivables from Present Level (₹)	–	83,334	1,66,667
Savings in Interest @ 10% p.a. **(A)**	–	₹ 8,333	₹ 16,667
% of Bad Debt Loss	5%	4%	3%
Amount (₹)	1,50,000	1,20,000	90,000
Reduction in Bad Debts from Present Level **(B)**	–	30,000	60,000
Incremental Benefits from Present Level **(C) = (A) + (B)**	–	38,333	76,667
Collection Expenses (₹)	30,000	60,000	95,000
Incremental Collection Expenses from Present Level **(D)**	–	30,000	65,000
Incremental Net Benefit **(C – D)**	–	₹ 8,333	₹ 11,667

Conclusion: From the analysis it is apparent that Alternative I has a benefit of ₹ 8,333 and Alternative II has a benefit of ₹ 11,667 over present level. Alternative II has a benefit of ₹ 3,334 more than Alternative I. Hence Alternative II is more viable.

(*Note:* In absence of Cost of Sales, sales has been taken for purpose of calculating investment in receivables. 1 year = 360 days.)

Illustration 24 : *As a part of the strategy to increase sales and profits, the sales manager of a company proposes to sell goods to a group of new customers with 10% risk of non-payment. This group would require one and a half months credit and is likely to increase sales by ₹ 1,00,000 p.a. Production and Selling expenses amount to 80% of sales and the income-tax rate is 50%. The company's minimum required rate of return (after tax) is 25%.*

Should the sales manager's proposal be accepted?

Also find the degree of risk of non-payment that the company should be willing to assume if the required rate of return (after tax) were (i) 30%, (ii) 40% and (iii) 60%.

Solution

Statement showing the Evaluation of Proposal

Particulars	₹
A. **Expected Profit:**	
Net Sales	1,00,000
Less: Production and Selling Expenses @ 80%	80,000
Profit before providing for Bad Debts	20,000
Less: Bad Debts @10%	10,000
Profit before Tax	10,000
Less: Tax @ 50%	5,000
Profit after Tax	5,000
B. **Opportunity Cost of Investment in Receivables**	2,500
C. **Net Benefits (A – B)**	2,500

Advise: The sales manager's proposal should be accepted.

Working Note: Calculation of Opportunity Cost of Funds

$$\text{Opportunity Cost} = \text{Total Cost of Credit Sales} \times \frac{\text{Collection period}}{12} \times \frac{\text{Required Rate of Return}}{100}$$

$$= ₹\ 80,000 \times \frac{1.5}{12} \times \frac{25}{100} = ₹\ 2,500$$

Statement showing the Acceptable Degree of Risk of Non-payment

Particulars	Required Rate of Return		
	30%	*40%*	*60%*
Sales	1,00,000	1,00,000	1,00,000
Less: Production and Sales Expenses	80,000	80,000	80,000
Profit before providing for Bad Debts	20,000	20,000	20,000
Less: Bad Debts (assume X)	X	X	X
Profit before tax	20,000 – X	20,000 – X	20,000 – X
Less: Tax @ 50%	(20,000 – X) 0.5	(20,000 – X) 0.5	(20,000 – X) 0.5
Profit after Tax	10,000 –0.5X	10,000 –0.5X	10,000 –0.5X
Required Return (given)	30% of 10,000*	40% of 10,000*	60% of 10,000*
	= ₹ 3,000	= ₹ 4,000	= ₹ 6,000

*Average Debtors $= \text{Total Cost of Credit Sales} \times \dfrac{\text{Collection period}}{12}$

$$= ₹\ 80,000 \times \dfrac{1.5}{12} = ₹\ 10,000$$

Computation of the value and percentage of X in each case is as follows:

Case I	10,000 – 0.5x	= 3,000
	0.5x	= 7,000
	X	= 7,000/0.5 = ₹ 14,000

Bad Debts as % of sales = ₹ 14,000/₹1,00,000 x 100 = 14%

Case II	10,000 – 0.5x	= 4,000
	0.5x	= 6,000
	X	= 6,000/0.5 = ₹ 12,000

Bad Debts as % of sales = ₹ 12,000/₹1,00,000 x 100 = 12%

Case III	10,000 – 0.5x	= 6,000
	0.5x	= 4,000
	X	= 4,000/0.5 = ₹ 8,000

Bad Debts as % of sales = ₹ 8,000/₹1,00,000 x 100 = 8%

Thus, it is found that the Acceptable Degree of risk of non-payment is 14%, 12% and 8% if required rate of return (after tax) is 30%, 40% and 60% respectively.

Illustration 25 : *Slow Payers are regular customers of Goods Dealers Ltd., Calcutta and have approached the sellers for extension of a credit facility for enabling them to purchase goods from Goods Dealers Ltd. On an analysis of past performance and on the basis of information supplied, the following pattern of payment schedule emerges in regard to Slow Payers:*

	Pattern of Payment Schedule
At the end of 30 days	*15% of the bill*
At the end of 60 days	*34% of the bill.*
At the end of 90 days	*30% of the bill.*
At the end of 100 days	*20% of the bill.*
Non-recovery	*1% of the bill.*

Slow Payers want to enter into a firm commitment for purchase of goods of ₹ 15 lakhs in 2013, deliveries to be made in equal quantities on the first day of each quarter in the calendar year. The price per unit of commodity is ₹ 150 on which a profit of ₹ 5 per unit is expected to be made. It is anticipated by Goods Dealers Ltd., that taking up of this contract would mean an extra recurring expenditure of ₹ 5,000 per annum. If the opportunity cost of funds in the hands of Goods Dealers is 24% per annum, would you as the finance manager of the seller recommend the grant of credit to Slow Payers? Workings should form part of your answer. Assume year of 360 days.

Solution

Statement showing the Evaluation of Debtors Policies

Particulars	*Proposed Policy ₹*
A. Expected Profit:	
(a) Credit Sales	15,00,000
(b) Total Cost	
(i) Variable Costs	14,50,000
(ii) Recurring Costs	5,000
	14,55,000
(c) Bad Debts	15,000
(d) Expected Profit [(a) – (b) – (c)]	30,000
B. Opportunity Cost of Investments in Receivables	68,787
C. Net Benefits (A – B)	(38,787)

Recommendation: The Proposed Policy should not be adopted since the net benefits under this policy are negative

Working Note: Calculation of Opportunity Cost of Average Investments

$$\text{Opportunity Cost} = \text{Total Cost} \times \frac{\text{Collection period}}{365} \times \frac{\text{Rate of Return}}{100}$$

Particulars	15%	34%	30%	20%	Total
A. Total Cost	2,18,250	4,94,700	4,36,500	2,91,000	14,40,450
B. Collection period	30/365	60/365	90/365	100/365	
C. Required Rate of Return	24%	24%	24%	24%	
D. Opportunity Cost (A x B x C)	4,305	19,517	25,831	19,134	68,787

7.20 Financing Receivables

Pledging of accounts receivables and Factoring have emerged as the important sources of financing of accounts receivables now-a-days.

(i)   Pledging: This refers to the use of a firm's receivable to secure a short term loan. A firm's receivables can be termed as its most liquid assets and this serve as prime collateral for a secured loan. The lender scrutinizes the quality of the accounts receivables, selects acceptable accounts, creates a lien on the collateral and fixes the percentage of financing receivables which ranges around 50 to 90%. The major advantage of pledging accounts receivables is the ease and flexibility it provides to the borrower. Moreover, financing is done regularly. This, however, suffers on account of high cost of financing.

(ii)   Factoring: Factoring is a relatively new concept in financing of accounts receivables. This refers to outright sale of accounts receivables to a factor or a financial agency. A factor is a firm that acquires the receivables of other firms. The factoring lays down the conditions of the sale in a factoring agreement. The factoring agency bears the right of collection and services the accounts for a fee.
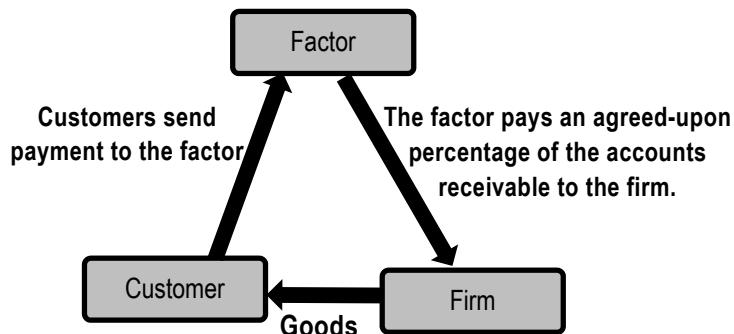
Normally, factoring is the arrangement on a non-recourse basis where in the event of default the loss is borne by this factor. However, in a factoring arrangement with recourse, in such situation, the accounts receivables will be turned back to the firm by the factor for resolution.

There are a number of financial distributors providing factoring services in India. Some commercial banks and other financial agencies provide this service. The biggest advantages of factoring are the immediate conversion of receivables into cash and predicted pattern of cash flows. Financing receivables with the help of factoring can help a company having liquidity without creating a net liability on its financial condition. Besides, factoring is a flexible financial tool providing timely funds, efficient record keepings and effective management of the collection process. This is not considered to be as a loan. There is no debt repayment, no compromise to balance sheet, no long term agreements or delays associated with other methods of raising capital. Factoring allows the firm to use cash for the growth needs of business.

The basic format of evaluating factoring proposal are given as under:

Statement showing the Evaluation of Factoring Proposal

	Particulars	₹
A.	**Annual Savings (Benefit) on taking Factoring Service**	
	Cost of Credit Administration saved	………..
	Bad Debts avoided	…………
	Interest saved due to reduction in Average collection period (Wherever applicable)	…………
	[Cost of Annual Credit Sales × Rate of Interest × (Present Collection Period – New Collection Period)/360* days]	
	Total	………..
B.	**Annual Cost of Factoring to the Firm:**	
	Factoring Commission [Annual credit Sales × % of Commission (or calculated annually)]	………..
	Interest Charged by Factor on advance (or calculated annually)	…………
	[Amount available for advance or (Annual Credit Sales – Factoring Commission – Factoring Reserve)] × $[\frac{\text{Collection Period (days)}}{360*} \times \text{Rate of Interest}]$	
	Total	………..
C.	**Net Annual Benefits/Cost of Factoring to the Firm:**	
	Rate of Effective Cost of Factoring to the Firm $= \frac{\text{Net Annual cost of Factoring}}{\text{Amount available for advance}} \times 100$ or	………..

	$\dfrac{\text{Net annual Cost of Factoring}}{\text{Advances to be paid}} \times 100$	
	Advances to be paid = (Amount available for advance – Interest deducted by factor)	

*1 Year is taken as 360 days

Advise:

1. The company should avail Factoring services if rate of effective Cost of Factoring to the firm is less than the existing cost of borrowing or if availing services of factoring results in to positive Net Annual Benefits.

2. The company should not avail Factoring services if the Rate of Effective Cost of Factoring to the Firm is more than the existing cost of borrowing.

Illustration 26: *A Factoring firm has credit sales of ₹ 360 lakhs and its average collection period is 30 days. The financial controller estimates, bad debt losses are around 2% of credit sales. The firm spends ₹ 1,40,000 annually on debtors administration. This cost comprises of telephonic and fax bills along with salaries of staff members. These are the avoidable costs. A Factoring firm has offered to buy the firm's receivables. The factor will charge 1% commission and will pay an advance against receivables on an interest @15% p.a. after withholding 10% as reserve. What should the firm do?*

Assume 360 days in a year.

Solution

Working notes:

Average level of receivables = ₹ 360 lakhs × $\dfrac{30}{360}$ = 30 lakhs

Factoring Commission = 1% of ₹ 30,00,000	=		₹ 30,000
Reserve = 10% of ₹ 30,00,000	=		₹ 3,00,000
Total (i)	=		₹ 3,30,000

Thus, the amount available for advance is

Average level of receivables	₹ 30,00,000
Less: Total (i) from above	₹ 3,30,000
(ii)	₹ 26,70,000
Less: Interest @ 15% p.a. for 30 days	₹ 33,375
Net Amount of Advance available.	₹ 26,36,625

Evaluation of Factoring Proposal

	Particulars	₹	₹
A.	**Savings (Benefit) to the firm**		
	Cost of Credit administration	₹ 1,40,000	₹ 1,40,000
	Cost of bad-debt losses	0.02 x 360 lakhs	₹ 7,20,000
	Total		₹ 8,60,000
B.	**Cost to the Firm:**		
	Factoring Commission [Annual credit Sales × % of Commission (or calculated annually)]	₹ 30,00,000x$\dfrac{360}{30}$	₹ 3,60,000
	Interest Charges	₹ 33,375x$\dfrac{360}{30}$	₹ 4,00,500
	Total		₹ 7,60,500
C.	**Net Benefits to the Firm: (A-B)**		₹ 99,500

Advice: Since the savings to the firm exceeds the cost to the firm on account of factoring, therefore, the proposal is acceptable.

7.21 Innovations in Receivable Management

During the recent years, a number of tools, techniques, practices and measures have been invented to increase effectiveness in accounts receivable management.

Following are the major determinants for significant innovations in accounts receivable management and process efficiency.

1. **Re-engineering Receivable Process:** In some of the organizations real cost reductions and performance improvements have been achieved by re-engineering in accounts receivable process. Re-engineering is a fundamental re-think and re-design of business processes by incorporating modern business approaches. The nature of accounts receivables is such that decisions made elsewhere in the organization are likely to affect the level of resources that are expended on the management of accounts receivables.

    The following aspects provide an opportunity to improve the management of accounts receivables:

    (a) **Centralisation:** Centralisation of high nature transactions of accounts receivables and payable is one of the practice for better efficiency. This focuses attention on specialized groups for speedy recovery.

    (b) **Alternative Payment Strategies:** Alternative payment strategies in addition to traditional practices result into efficiencies in the management of accounts receivables. It is observed that payment of accounts outstanding is likely to be

quicker where a number of payment alternatives are made available to customers. Besides, this convenient payment method is a marketing tool that is of benefit in attracting and retaining customers. The following alternative modes of payment may also be used alongwith traditional methods like Cheque Book etc., for making timely payment, added customer service, reducing remittance processing costs and improved cash flows and better debtor turnover.

(i) *Direct debit:* I.e., authorization for the transfer of funds from the purchaser's bank account.

(ii) *Integrated Voice Response*: This system uses human operators and a computer based system to allow customers to make payment over phone, generally by credit card. This system has proved to be beneficial in the orgnisations processing a large number of payments regularly.

(iii) *Collection by a third party*: The payment can be collected by an authorized external firm. The payments can be made by cash, cheque, credit card or Electronic fund transfer. Banks may also be acting as collecting agents of their customers and directly depositing the collections in customers' bank accounts.

(iv) *Lock Box Processing:* Under this system an outsourced partner captures cheques and invoice data and transmits the file to the client firm for processing in that firm's systems.

(v) Payments via Internet.

(c) Customer Orientation: Where individual customers or a group of customers have some strategic importance to the firm a case study approach may be followed to develop good customer relations. A critical study of this group may lead to formation of a strategy for prompt settlement of debt.

2. **Evaluation of Risk:** Risk evaluation is a major component in the establishment of an effective control mechanism. Once risks have been properly assessed controls can be introduced to either contain the risk to an acceptable level or to eliminate them entirely. This also provides an opportunity for removing inefficient practices. This involves a re-think of processes and questioning the way that tasks are performed. This also opens the way for efficiency and effectiveness benefits in the management of accounts receivables.

3. **Use of Latest Technology:** Technological developments now-a-days provides an opportunity for improvement in accounts receivables process. The major innovations available are the integration of systems used in the management of accounts receivables, the automation and the use of e-commerce.

(a) E-commerce refers to the use of computer and electronic telecommunication technologies, particularly on an inter-organisational level, to support trading in goods and services. It uses technologies such as Electronic Data Inter-change (EDI), Electronic Mail, Electronic Funds Transfer (EFT) and Electronic Catalogue Systems

to allow the buyer and seller to transact business by exchange of information between computer application systems.

(b) Automated Accounts Receivable Management Systems: Now-a-days all the big companies develop and maintain automated receivable management systems. Manual systems of recording the transactions and managing receivables are not only cumbersome but ultimately costly also. These integrated systems automatically update all the accounting records affected by a transaction. For example, if a transaction of credit sale is to be recorded, the system increases the amount the customer owes to the firm, reduces the inventory for the item purchased, and records the sale. This system of a company allows the application and tracking of receivables and collections, using the automated receivables system allows the company to store important information for an unlimited number of customers and transactions, and accommodate efficient processing of customer payments and adjustments.

4. **Receivable Collection Practices:** The aim of debtors' collection should be to reduce, monitor and control the accounts receivable at the same time maintain customer goodwill. The fundamental rule of sound receivable management should be to reduce the time lag between the sale and collection. Any delays that lengthen this span causes receivables to unnecessary build up and increase the risk of bad debts. This is equally true for the delays caused by billing and collection procedures as it is for delays caused by the customer.

The following are major receivable collection procedures and practices:

(i)   Issue of Invoice.

(ii)   Open account or open-end credit.

(iii) Credit terms or time limits.

(iv) Periodic statements.

(v)   Use of payment incentives and penalties.

(vi) Record keeping and Continuous Audit.

(vii) Export Factoring: Factors provide comprehensive credit management, loss protection collection services and provision of working capital to the firms exporting internationally.

(viii) Business Process Outsourcing: This refers to a strategic business tool whereby an outside agency takes over the entire responsibility for managing a business process.

5. **Use of Financial tools/techniques:** The finance manager while managing accounts receivables uses a number of financial tools and techniques. Some of them have been described hereby as follows:

(i)   Credit analysis: While determining the credit terms, the firm has to evaluate individual customers in respect of their credit worthiness and the possibility of bad debts. For this purpose, the firm has to ascertain credit rating of prospective customers.

Credit rating: An important task for the finance manager is to rate the various debtors who seek credit facility. This involves decisions regarding individual parties so as to ascertain how much credit can be extended and for how long. In foreign countries specialized agencies are engaged in the task of providing rating information regarding individual parties. Dun and Broad street is one such source.

The finance manager has to look into the credit-worthiness of a party and sanction credit limit only after he is convinced that the party is sound. This would involve an analysis of the financial status of the party, its reputation and previous record of meeting commitments.

The credit manager here has to employ a number of sources to obtain credit information. The following are the important sources:

Trade references; Bank references; Credit bureau reports; Past experience; Published financial statements; and Salesman's interview and reports.

Once the credit-worthiness of a client is ascertained, the next question is to set a limit of the credit. In all such enquiries, the credit manager must be discreet and should always have the interest of high sales in view.

(ii)   **Decision tree analysis of granting credit:** The decision whether to grant credit or not is a decision involving costs and benefits. When a customer pays, the seller makes profit but when he fails to pay the amount of cost going into the product is also gone. If the relative chances of recovering the dues can be decided it can form a probability distribution of payment or non-payment. If the chances of recovery are 9 out of 10 then probability of recovery is 0.9 and that of default is 0.1.

Credit evaluation of a customer shows that the probability of recovery is 0.9 and that of default is 0.1. the revenue from the order is ₹ 5 lakhs and cost is ₹ 4 lakhs. The decision is whether credit should be granted or not.

The analysis is presented in the following diagram.
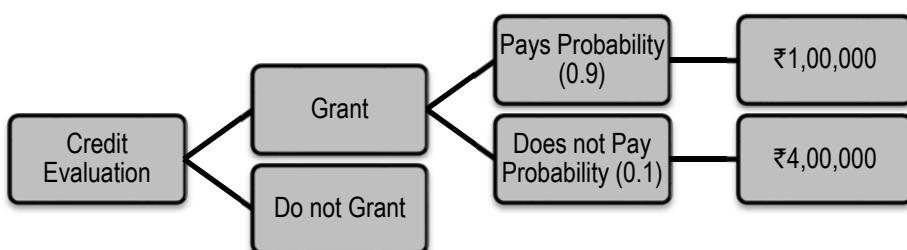
The weighted net benefit is ₹ [1,00,000 × 0.9 i.e. 90,000 – 0.1 × 4,00,000 i.e. 40,000] = 50,000. So credit should be granted.

(iii) **Control of receivables:** Another aspect of management of debtors is the control of receivables. Merely setting of standards and framing a credit policy is not sufficient; it is, equally important to control receivables.

(iv) **Collection policy:** Efficient and timely collection of debtors ensures that the bad debt losses are reduced to the minimum and the average collection period is shorter. If a firm spends more resources on collection of debts, it is likely to have smaller bad debts. Thus, a firm must work out the optimum amount that it should spend on collection of debtors. This involves a trade-off between the level of expenditure on the one hand and decrease in bad debt losses and investment in debtors on the other.

The collection cell of a firm has to work in a manner that it does not create too much resentment amongst the customers. On the other hand, it has to keep the amount of the outstanding in check. Hence, it has to work in a very smoothen manner and diplomatically.

It is important that clear-cut procedures regarding credit collection are set up. Such procedures must answer questions like the following:

(a) How long should a debtor balance be allowed to exist before collection process is started?

(b) What should be the procedure of follow up with defaulting customer? How reminders are to be sent and how should each successive reminder be drafted?

(c) Should there be collection machinery whereby personal calls by company's representatives are made?

(d) What should be the procedure for dealing with doubtful accounts? Is legal action to be instituted? How should account be handled?

7.22 Monitoring of Receivables

(i) **Computation of average age of receivables:** It involves computation of average collection period.

(ii) **Ageing Schedule:** When receivables are analysed according to their age, the process is known as preparing the ageing schedules of receivables. The computation of average age of receivables is a quick and effective method of comparing the liquidity of receivables with the liquidity of receivables in the past and also comparing liquidity of one firm with the liquidity of the other competitive firm. It also helps the firm to predict collection pattern of receivables in future. This comparison can be made periodically. The purpose of classifying receivables by age groups is to have a closer control over the quality of individual accounts. It requires going back to the receivables ledger where the dates of each customer's purchases and payments are available. The ageing schedule, by indicating a tendency for old accounts to accumulate, provides a useful supplement to average collection period of receivables/sales analysis. Because an analysis of receivables in terms of associated dates of sales enables the firm to recognise the recent increases, and slumps in sales. To ascertain the condition of receivables for control purposes, it may be

considered desirable to compare the current ageing schedule with an earlier ageing schedule in the same firm and also to compare this information with the experience of other firms. The following is an illustration of the ageing schedule of receivables:-

Ageing Schedule

Age Classes (Days)	As on 30th June, 2014			As on 30th September, 2014		
	Month of Sale	*Balance of Receivables*	*Percentage to total*	*Month of Sale*	*Balance of Receivables*	*Percentage to total*
		(₹)			*(₹)*	
1-30	June	41,500	11.9	September	1,00,000	22.7
31-60	May	74,200	21.4	August	2,50,000	56.8
61-90	April	1,85,600	53.4	July	48,000	10.9
91-120	March	35,300	10.2	June	40,000	9.1
121 and more	Earlier	10,800	3.1	Earlier	2,000	0.5
		3,47,400	100		4,40,000	100

The above ageing schedule shows a substantial improvement in the liquidity of receivables for the quarter ending September, 2014 as compared with the liquidity of receivables for the quarter ending June, 2014. It could be possible due to greater collection efforts of the firm.

(iii) Collection Programme:

(a) Monitoring the state of receivables.

(b) Intimation to customers when due date approaches.

(c) Telegraphic and telephonic advice to customers on the due date.

(d) Threat of legal action on overdue A/cs.

(e) Legal action on overdue A/cs.

The following diagram shows the relationship between collection expenses and bad debt losses which have to be established as initial increase in collection expenses may have only a small impact on bad debt losses.
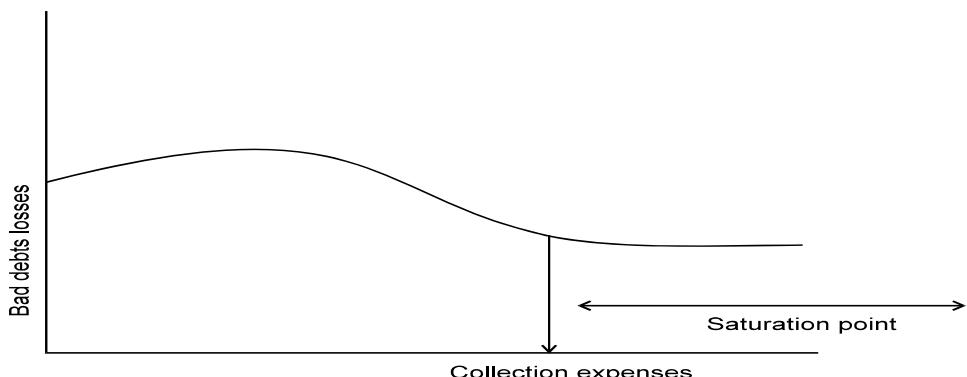
Illustration 27 : *Mosaic Limited has current sales of ₹ 15 lakhs per year. Cost of sales is 75 per cent of sales and bad debts are one per cent of sales. Cost of sales comprises 80 per cent variable costs and 20 per cent fixed costs, while the company's required rate of return is 12 per cent. Mosaic Limited currently allows customers 30 days' credit, but is considering increasing this to 60 days' credit in order to increase sales.*

It has been estimated that this change in policy will increase sales by 15 per cent, while bad debts will increase from one per cent to four per cent. It is not expected that the policy change will result in an increase in fixed costs and creditors and stock will be unchanged.

Should Mosaic Limited introduce the proposed policy? (Assume a 360 days year)

Solution

New level of sales will be 15,00,000×1.15 = ₹ 17,25,000

Variable costs are 80% ×75% = 60% of sales

Contribution from sales is therefore 40% of sales

Fixed Cost are 20 % x 75% = 15% of sales

Particulars	₹	₹
Proposed investment in debtors = Variable Cost + Fixed Cost* = (17,25,000 x 60%) + (15,00,000 x 15%) $$= (10,35,000 + 2,25,000) \times \frac{60}{360}$$		2,10,000
Current investment in debtors = [(15,00,000×60%) + (15,00,000 x 15%)] x $\frac{30}{360}$		93,750
Increase in investment in debtors		1,16,250
Increase in contribution = 15% ×15,00,000×40%		90,000
New level of bad debts = (17,25,000×4%)	69,000	
Current level of bad debts (15, 00,000 x 1%)	15,000	

Increase in bad debts		(54,000)
Additional financing costs = 1,60,274×12% =		(13,950)
Savings by introducing change in policy		22,050

* Fixed Cost is taken at existing level in case of proposed investment as well

Advise: Mosaic Limited should introduce the proposed policy.

Illustration 28: *Misha Limited presently gives terms of net 30 days. It has ₹ 6 crores in sales, and its average collection period is 45 days. To stimulate demand, the company may give terms of net 60 days. If it does instigate these terms, sales are expected to increase by 15 per cent. After the change, the average collection period is expected to be 75 days, with no difference in payment habits between old and new customers. Variable costs are ₹ 0.80 for every ₹ 1.00 of sales, and the company's required rate of return on investment in receivables is 20 per cent. Should the company extend its credit period? (Assume a 360 days year).*

Solution

$$\text{Receivable turnover} = \frac{360}{75} = 4.8$$

Particulars	₹
1. Additional sales= 6 crores x 15%	90,00,000
2. Profitability of additional sales = ₹ 90,00,000 × 0.2	18,00,000
3. Additional receivables associated with the new sales $= \dfrac{₹\,90,00,000}{4.8}$	18,75,000
4. Additional investment in receivables associated with the new sales = ₹ 18,75,000 × 0.8	15,00,000
5. New level of receivables associated with the original sales $= \dfrac{₹\,6,00,00,000}{4.8}$	₹ 1,25,00,000
6. Old level of receivables associated with the original sales $= \dfrac{₹\,6,00,00,000}{8}$	₹ 75,00,000
7. Incremental receivable investment, original sales(New level-old level)	₹ 50,00,000
8. Incremental Investment = ₹ 50,00,000 x 0.8	₹ 40,00,000
9. Total increase in receivable investment = ₹ 15,00,000 + ₹ 40,00,000	₹ 55,00,000
10. Carrying cost of additional investment = .20 x ₹ 55,00,000	₹ 11,00,000

Advise : As the incremental carrying cost is less than the incremental profitability, the company should lengthen its credit period from 30 to 60 days.

Illustration 29: *The Megatherm Corporation has just acquired a large account. As a result, it needs an additional ₹ 75,000 in working capital immediately. It has been determined that there are three feasible sources of funds:*

(a) *Trade credit: The company buys about ₹ 50,000 of materials per month on terms of 3/30, net 90. Discounts are taken.*

(b) *Bank loan: The firm's bank will lend ₹ 1,00,000 at 13 per cent. A 10 per cent compensating balance will be required, which otherwise would not be maintained by the company.*

(c) *A factor will buy the company's receivables (₹ 1,00,000 per month), which have a collection period of 60 days. The factor will advance up to 75 per cent of the face value of the receivables at 12 per cent on an annual basis. The factor will also charge a 2 per cent fee on all receivables purchased. It has been estimated that the factor's services will save the company a credit department expense and bad-debt expenses of ₹ 1,500 per month.*

On the basis of annual percentage cost, which alternative should the company select?

Solution

(a) *Cost of trade credit*: If discounts are not taken, upto ₹ 97,000 can be raised after the second month. The real cost of not taking advantage of the discount would be

$$\frac{3}{97} \times \frac{365}{60} = 18.81\%$$

(b) *Cost of bank loan*: Assuming the compensating balance would not otherwise be maintained, the real cost of not taking advantage of the discount would be

$$\frac{13}{90} = 14.44\%$$

(c) *Cost of factoring*: The factor fee for the year would be

$$2\% \times ₹ \ 12,00,000 = ₹ \ 24,000$$

The savings effected, however, would be ₹ 18,000, giving a net factoring cost of ₹ 6,000. Borrowing ₹ 75,000 on the receivables would thus cost

$$\frac{\left(12\%\right)\ \left(₹\ 75,000\right)\ +\ ₹\ 6,000}{₹\ 75,000}\ =\ \frac{₹\ 9,000\ +\ ₹\ 6,000}{₹\ 75,000}\ =\ 20.00\%$$

Advise: Bank borrowing would be the cheapest source of funds.

Illustration 30: *The Dolce Company purchases raw materials on terms of 2/10, net 30. A review of the company's records by the owner, Mr. Gupta, revealed that payments are usually made*

15 days after purchases are received. When asked why the firm did not take advantage of its discounts, the accountant, Mr. Ram, replied that it cost only 2 per cent for these funds, whereas a bank loan would cost the company 12 per cent.

(a)   What mistake is Ram making?

(b)   What is the real cost of not taking advantage of the discount?

(c)   If the firm could not borrow from the bank and was forced to resort to the use of trade credit funds, what suggestion might be made to Ram that would reduce the annual interest cost?

Solution

(a) Ram is confusing the percentage cost of using funds for 5 days with the cost of using funds for a year. These costs are clearly not comparable. One must be converted to the time scale of the other.

(b) $\dfrac{2}{98} \times \dfrac{365}{5} = 149.0\%$

(c) Assuming that the firm has made the decision not to take the cash discount, it makes no sense to pay before the due date. In this case, payment 30 days after purchases are received rather than 15 would reduce the annual interest cost to 37.2 per cent.

UNIT – V : MANAGEMENT OF PAYABLES (CREDITORS)

7.23 Introduction

There is an old age saying in business that if you can buy well then you can sell well. Management of your creditors and suppliers is just as important as the management of your debtors.

Trade creditor is a spontaneous source of finance in the sense that it arises from ordinary business transaction. But it is also important to look after your creditors - slow payment by you may create ill-feeling and your supplies could be disrupted and also create a bad image for your company.

Creditors are a vital part of effective cash management and should be managed carefully to enhance the cash position.

7.24 Cost and Benefits of Trade Credit

(a) Cost of Availing Trade Credit

Normally it is considered that the trade credit does not carry any cost. However, it carries the following costs:

(i) **Price:** There is often a discount on the price that the firm undergoes when it uses trade credit, since it can take advantage of the discount only if it pays immediately. This discount can translate into a high implicit cost.

(ii) **Loss of goodwill:** If the credit is overstepped, suppliers may discriminate against delinquent customers if supplies become short. As with the effect of any loss of goodwill, it depends very much on the relative market strengths of the parties involved.

(iii) **Cost of managing:** Management of creditors involves administrative and accounting costs that would otherwise be incurred.

(iv) **Conditions:** Sometimes most of the suppliers insist that for availing the credit facility the order should be of some minimum size or even on regular basis.

(b) Cost of Not Taking Trade Credit

On the other hand the costs of not availing credit facilities are as under:

(i) Impact of Inflation: If inflation persists then the borrowers are favoured over the lenders with the levels of interest rates not seeming totally to redress the balance.

(ii) Interest: Trade credit is a type of interest free loan, therefore failure to avail this facility has an interest cost. This cost is further increased if interest rates are higher.

(iii) Inconvenience: Sometimes it may also cause inconvenience to the supplier if the supplier is geared to the deferred payment.

7.25 Computation of Cost of Payables

By using the trade credit judiciously, a firm can reduce the effect of growth or burden on investments in Working Capital.

Now question arises how to calculate the cost of not taking the discount.

The following equation can be used to calculate nominal cost, on an annual basis of not taking the discount:

$$\frac{d}{100-d} \times \frac{365 \, \text{days}}{t}$$

However the above formula does not take into account the compounding effect and therefore, the cost of credit shall be even higher. The cost of lost cash discount can be estimated by the formula:

$$\left(\frac{100}{100-d}\right)^{\frac{365}{t}} - 1$$

Where,

d =   Size of discount i.e. for 6% discount, d=6

t =   The reduction in the payment period in days, necessary to obtain the early discount or Days Credit Outstanding – Discount Period.

Illustration 31: *Suppose ABC Ltd. has been offered credit terms from its major supplier of 2/10, net 45. Hence the company has the choice of paying ₹ 10 per ₹ 100 or to invest ₹ 98 for an additional 35 days and eventually pay the supplier ₹ 100 per ₹ 100. The decision as to whether the discount should be accepted depends on the opportunity cost of investing ₹ 98 for 35 days. What should the company do?*

Solution

If the company does not avail the cash discount and pays the amount after 45 days, the implied cost of interest per annum would be approximately:

$$\left(\frac{100}{100-2}\right)^{\frac{365}{35}} - 1 = 23.5\%$$

Now let us assume that ABC Ltd. can invest the additional cash and can obtain an annual return of 25% and if the amount of invoice is ₹ 10,000. The alternatives are as follows:

	Refuse discount	Accept discount
	₹	₹
Payment to supplier	10,000	9,800
Return from investing ₹ 9,800 between day 10 and day 45: $\dfrac{35}{365} \times ₹\, 9,800 \times 25\%$	(235)	
Net Cost	9,765	9,800

Advise : Thus it is better for the company to refuse the discount, as return on cash retained is more than the saving on account of discount.

UNIT – VI: FINANCING OF WORKING CAPITAL

7.26 Introduction

After determining the amount of working capital required, the next step to be taken by the finance manager is to arrange the funds.

As discussed earlier, it is advisable that the finance manager bifurcates the working capital requirements between the permanent working capital and temporary working capital.

The permanent working capital is always needed irrespective of sales fluctuations, hence should be financed by the long-term sources such as debt and equity. On the contrary the temporary working capital may be financed by the short-term sources of finance.

Broadly speaking, the working capital finance may be classified between the two categories:

(i)   Spontaneous sources; and

(ii)   Negotiable sources.

Spontaneous Sources: Spontaneous sources of finance are those which naturally arise in the course of business operations. Trade credit, credit from employees, credit from suppliers of services, etc. are some of the examples which may be quoted in this respect.

Negotiated Sources: On the other hand the negotiated sources, as the name implies, are those which have to be specifically negotiated with lenders say, commercial banks, financial institutions, general public etc.

The finance manager has to be very careful while selecting a particular source, or a combination thereof for financing of working capital. Generally, the following parameters will guide his decisions in this respect:

(i)   Cost factor

(ii)   Impact on credit rating

(iii) Feasibility

(iv)   Reliability

(v)   Restrictions

(vi)   Hedging approach or matching approach i.e., Financing of assets with the same maturity as of assets.

7.27 Sources of Finance

7.27.1 Spontaneous Sources of Finance

(a)   Trade Credit: As outlined above trade credit is a spontaneous source of finance which is normally extended to the purchaser organization by the sellers or services providers. This source of financing working capital is more important since it contributes to about one-third of the total short-

term requirements. The dependence on this source is higher due to lesser cost of finance as compared with other sources. Trade credit is guaranteed when a company acquires supplies, merchandise or materials and does not pay immediately. If a buyer is able to get the credit without completing much formality, it is termed as 'open account trade credit.'

(b)   Bills Payable: On the other hand in the case of "Bills Payable" the purchaser will have to give a written promise to pay the amount of the bill/invoice either on demand or at a fixed future date to the seller or the bearer of the note.

Due to its simplicity, easy availability and lesser explicit cost, the dependence on this source is much more in all small or big organizations. Especially, for small enterprises this form of credit is more helpful to small and medium enterprises. The amount of such financing depends on the volume of purchases and the payment timing.

(c)   Accrued Expenses: Another spontaneous source of short-term financing is the accrued expenses or the outstanding expenses liabilities. The accrued expenses refer to the services availed by the firm, but the payment for which has yet to be made. It is a built in and an automatic source of finance as most of the services like wages, salaries, taxes, duties etc., are paid at the end of the period. The accrued expenses represent an interest free source of finance. There is no explicit or implicit cost associated with the accrued expenses and the firm can ensure liquidity by accruing these expenses.

7.27.2 Inter-corporate Loans and Deposits: Sometimes, organizations having surplus funds invest for shot-term period with other organizations. The rate of interest will be higher than the bank rate of interest and depends on the financial soundness of the borrower company. This source of finance reduces dependence on bank financing.

7.27.3   Commercial Papers: Commercial Paper (CP) is an unsecured promissory note issued by a firm to raise funds for a short period. This is an instrument that enables highly rated corporate borrowers for short-term borrowings and provides an additional financial instrument to investors with a freely negotiable interest rate. The maturity period ranges from minimum 7 days to less than 1 year from the date of issue. CP can be issued in denomination of ₹ 5 lakhs or multiples thereof.

Advantages of CP: From the point of the issuing company, CP provides the following benefits:

(a)   CP is sold on an unsecured basis and does not contain any restrictive conditions.

(b)   Maturing CP can be repaid by selling new CP and thus can provide a continuous source of funds.

(c)   Maturity of CP can be tailored to suit the requirement of the issuing firm.

(d)   CP can be issued as a source of fund even when money market is tight.

(e)   Generally, the cost of CP to the issuing firm is lower than the cost of commercial bank loans.

However, CP as a source of financing has its own limitations:

(i)   Only highly credit rating firms can use it. New and moderately rated firm generally are not in a position to issue CP.

(ii)   CP can neither be redeemed before maturity nor can be extended beyond maturity.

7.27.4 Funds Generated from Operations: Funds generated from operations, during an accounting period, increase working capital by an equivalent amount. The two main components of funds generated from operations are profit and depreciation. Working capital will increase by the extent of funds generated from operations. Students may refer to funds flow statement given earlier in this chapter.

7.27.5 Public Deposits: Deposits from the public are one of the important sources of finance particularly for well established big companies with huge capital base for short and medium-term.

7.27.6 Bills Discounting: Bill discounting is recognized as an important short term Financial Instrument and it is widely used method of short term financing. In a process of bill discounting, the supplier of goods draws a bill of exchange with direction to the buyer to pay a certain amount of money after a certain period, and gets its acceptance from the buyer or drawee of the bill.

7.27.7 Bill Rediscounting Scheme: The Bill rediscounting Scheme was introduced by Reserve Bank of India with effect from 1st November, 1970 in order to extend the use of the bill of exchange as an instrument for providing credit and the creation of a bill market in India with a facility for the rediscounting of eligible bills by banks. Under the bills rediscounting scheme, all licensed scheduled banks are eligible to offer bills of exchange to the Reserve Bank for rediscount.

7.27.8 Factoring: Students may refer to the unit on Receivable Management wherein the concept of factoring has been discussed. Factoring is a method of financing whereby a firm sells its trade debts at a discount to a financial institution. In other words, factoring is a continuous arrangement between a financial institution, (namely the factor) and a firm (namely the client) which sells goods and services to trade customers on credit. As per this arrangement, the factor purchases the client's trade debts including accounts receivables either with or without recourse to the client, and thus, exercises control over the credit extended to the customers and administers the sales ledger of his client. To put it in a layman's language, a factor is an agent who collects the dues of his client for a certain fee.

The differences between Factoring and Bills discounting are as follows:

(i)   Factoring is called as 'Invoice factoring' whereas bills discounting is known as "Invoice discounting".

(ii)   In factoring the parties are known as client, factor and debtor whereas in bills discounting they are known as Drawer, Drawee and Payee.

(iii) Factoring is a sort of management of book debts whereas bills discounting is a sort of borrowing from commercial banks.

(iv) For factoring there is no specific Act; whereas in the case of bills discounting, the Negotiable Instrument Act is applicable.

7.28 Working Capital Finance from Banks

Banks in India today constitute the major suppliers of working capital credit to any business activity. Recently, some term lending financial institutions have also announced schemes for working capital financing. The two committees viz., Tandon Committee and Chore Committee have evolved definite guidelines and parameters in working capital financing, which have laid the foundations for development and innovation in the area.

7.28.1 Instructions on Working Capital Finance by Banks

Assessment of Working Capital

➤ Reserve Bank of India has withdrawn the prescription, in regard to assessment of working capital needs, based on the concept of Maximum Permissible Bank Finance, in April 1997. Banks are now free to evolve, with the approval of their Boards, methods for assessing the working capital requirements of borrowers, within the prudential guidelines and exposure norms prescribed. Banks, however, have to take into account Reserve Bank's instructions relating to directed credit (such as priority sector, export, etc.), and prohibition of credit (such as bridge finance, rediscounting of bills earlier discounted by NBFCs) while formulating their lending policies.

➤ With the above liberalizations, all the instructions relating to MPBF issued by RBI from time to time stand withdrawn. Further, various instructions/guidelines issued to banks with objective of ensuring lending discipline in appraisal, sanction, monitoring and utilization of bank finance cease to be mandatory. However, banks have the option of incorporating such of the instructions/guidelines as are considered necessary in their lending policies/procedures.

7.29 Forms of Bank Credit

The bank credit will generally be in the following forms:

➤ **Cash Credit:** This facility will be given by the banker to the customers by giving certain amount of credit facility on continuous basis. The borrower will not be allowed to exceed the limits sanctioned by the bank.

➤ **Bank Overdraft:** It is a short-term borrowing facility made available to the companies in case of urgent need of funds. The banks will impose limits on the amount they can lend. When the borrowed funds are no longer required they can quickly and easily be repaid. The banks issue overdrafts with a right to call them in at short notice.

➤ **Bills Discounting:** The Company which sells goods on credit will normally draw a bill on the buyer who will accept it and sends it to the seller of goods. The seller, in turn discounts the bill with his banker. The banker will generally earmark the discounting bill limit.

➢ **Bills Acceptance:** To obtain finance under this type of arrangement a company draws a bill of exchange on bank. The bank accepts the bill thereby promising to pay out the amount of the bill at some specified future date.

➢ **Line of Credit:** Line of Credit is a commitment by a bank to lend a certain amount of funds on demand specifying the maximum amount.

➢ **Letter of Credit:** It is an arrangement by which the issuing bank on the instructions of a customer or on its own behalf undertakes to pay or accept or negotiate or authorizes another bank to do so against stipulated documents subject to compliance with specified terms and conditions.

➢ **Bank Guarantees:** Bank guarantee is one of the facilities that the commercial banks extend on behalf of their clients in favour of third parties who will be the beneficiaries of the guarantees.

SUMMARY

➢ Working Capital Management involves managing the balance between firm's short-term assets and its short-term liabilities.

➢ From the value point of view, Working Capital can be defined as Gross Working Capital or Net Working Capital.

➢ From the point of view of time, the term working capital can be divided into two categories viz., Permanent and temporary.

➢ A large amount of working capital would mean that the company has idle funds. Since funds have a cost, the company has to pay huge amount as interest on such funds. If the firm has inadequate working capital, such firm runs the risk of insolvency.

➢ Some of the items/factors which need to be considered while planning for working capital requirement are nature of business, market and demand conditions, operating efficiency, credit policy etc.

➢ Finance manager has to pay particular attention to the levels of current assets and their financing. To decide the levels and financing of current assets, the risk return trade off must be taken into account.

➢ In determining the optimum level of current assets, the firm should balance the profitability – Solvency tangle by minimizing total costs.

➢ Working Capital cycle indicates the length of time between a company's paying for materials, entering into stock and receiving the cash from sales of finished goods. It can be determined by adding the number of days required for each stage in the cycle.

➢ Treasury management is defined as 'the corporate handling of all financial matters, the generation of external and internal funds for business, the management of currencies and cash flows and the complex, strategies, policies and procedures of corporate finance

> ➢ The main objectives of cash management for a business are:-
>
>   i. Provide adequate cash to each of its units;
>
>   ii. No funds are blocked in idle cash; and
>
>   iii. The surplus cash (if any) should be invested in order to maximize returns for the business.
>
> ➢ Cash Budget is the most significant device to plan for and control cash receipts and payments.
>
>   This represents cash requirements of business during the budget period. The various purposes of cash budgets are:-
>
>   i. Coordinate the timings of cash needs. It identifies the period(s) when there might either be shortage of cash or an abnormally large cash requirement;
>
>   ii. It also helps to pinpoint period(s) when there is likely to be excess cash;
>
>   iii. It enables firm which has sufficient cash to take advantage like cash discounts on its accounts payable;
>
>   iv. Lastly it helps to plan/arrange adequately needed funds (avoiding excess/ shortage of cash) on favorable terms.
>
> ➢ Large amounts are tied up in sundry debtors, there are chances of bad debts and there will be cost of collection of debts. On the contrary, if the investment in sundry debtors is low, the sales may be restricted, since the competitors may offer more liberal terms. Therefore, management of sundry debtors is an important issue and requires proper policies and their implementation.
>
> ➢ There are basically three aspects of management of sundry debtors: Credit policy, Credit Analysis and Control of receivable
>
> ➢ Trade creditor is a spontaneous source of finance in the sense that it arises from ordinary business transaction. But it is also important to look after your creditors - slow payment by you may create ill-feeling and your supplies could be disrupted and also create a bad image for your company.
>
> ➢ Creditors are a vital part of effective cash management and should be managed carefully to enhance the cash position.
>
> ➢ As discussed earlier, it is advisable that the finance manager bifurcates the working capital requirements between the permanent working capital and temporary working capital.
>
> ➢ The permanent working capital is always needed irrespective of sales fluctuations, hence should be financed by the long-term sources such as debt and equity. On the contrary the temporary working capital may be financed by the short-term sources of finance.

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DETAILED CONTENTS : MODULE – 2

UNIT VI : FINANCING OF WORKING CAPITAL

APPENDIX