
STUDY MATERIAL

EXECUTIVE PROGRAMME

FINANCIAL AND

STRATEGIC MANAGEMENT

MODULE 2

PAPER 8



**THE INSTITUTE OF
Company Secretaries of India**

भारतीय कम्पनी सचिव संस्थान

IN PURSUIT OF PROFESSIONAL EXCELLENCE

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EXECUTIVE PROGRAMME FINANCIAL AND STRATEGIC MANAGEMENT

The company secretaries by virtue of their expertise in the corporate laws and procedure are in eminently suitable position to:

- (a) Present to the Board of Directors, the financial, legal and personnel aspects of modernisation, expansion, diversification of the existing projects of new projects;
- (b) Obtain the decision from the Board; and
- (c) Interact effectively with the financial institutions in the process of procuring the finance.

The legal aspects of finance are becoming increasingly important and a Company Secretary is expected to successfully and effectively handle, amongst other things, important aspects such as management of public issues, syndication of loans, obtaining project approvals, raising of finance through public deposits and debentures or bonds etc. All these essentials require expert knowledge of diverse and complex procedures involved. Realising that the services of a Company Secretary could be of immense use in this important area, it was thought necessary to include this paper with a view to equip the students with the requisite fundamentals of the Financial and Strategic Management.

It has been the endeavour to provide a blend of theoretical concepts and practical orientation. Topics, such as, raising finance from financial institutions, dividend policies, etc. requiring legal expertise and procedural knowledge have been written. Topics such as, project appraisal, financial planning, portfolio management and securities analysis, working capital management and capital budgeting decisions, strategic management, business policy; strategic analysis & planning have been written keeping in view the financial and strategic management principles and the practical utility. Ample number of practical problems and case studies have been added to aid the student in their learning process.

Strategy is a broad concept that covers a multitude of different issues, concepts and methods. Strategy requires a significant amount of work to understand and even the experts often find themselves searching for new ways to research and think about the topic. For managers and leaders, strategy is at the centre of the effort to create value for customers to respond to competitive challenges and to build strong organizations. All this leads to make optimum utilization of organization's material and human resources in order to achieve better financial performance, improved qualitative decisions, employee motivation, minimum resistance to change, etc. by using various theories, models and management techniques. An organization always operates in the environment of risk and uncertainty which is the result of operation of multiple forces i.e. economic, technological, legal, political, social and global. Strategic management helps the organization to develop set of decisions and actions resulting in formulation and implementation of strategies designed to achieve the objectives of an organization in a given frame work.

Though efforts have been made to provide a self-contained study material yet it may require regular supplementation as the subject is of a dynamic and fast changing nature. Students are advised to update their knowledge continuously by reading economic dailies, financial magazines and journal and other relevant literature including reference and suggested readings on the subject. Students are expected to learn the art of applying the principles of financial management and strategic management to real business situations and for this case studies in these area would prove to be of immense use.

Besides, as per the Company Secretaries Regulations, 1982, students are expected to be conversant with the amendments to the laws made upto six months preceding the date of examination.

The legislative changes made upto June, 2020 have been incorporated in the study material. However, it may so happen that some developments might have taken place during the printing of the study material and its supply to

the students. The students are therefore, advised to refer to the e-bulletin and other publications for updation of the study material.

Although care has been taken in publishing this study material, yet the possibility of errors, omissions and/or discrepancies cannot be ruled out. This publication is released with an understanding that the Institute shall not be responsible for any errors, omissions and/or discrepancies or any action taken in that behalf.

In case of any discrepancy, error or omission are found in the study material, the Institute shall be obliged if the same are brought to its notice for issue of corrigendum in the Student Company Secretary e-bulletin. For any doubt, students may write to the Directorate of Academics in the Institute for clarification at **academics@icsi.edu**.

EXECUTIVE PROGRAMME
Module 2
Paper 8
Financial and Strategic Management
(Max Marks 100)

Syllabus

Objective:

- Part I:** To provide knowledge of practical aspects of financial management so as to develop skills in taking financial and investment decisions.
- Part II :** To enable students to acquire multidimensional skills as to equip them to comprehend the process of strategy formulation.

Part I
Financial Management (60 marks)

Detailed Contents

- 1. Nature and Scope of Financial Management:** Nature, Scope and Objectives of Financial Management; Risk-Return and Value of the Firm; Objectives of the firm; Profit Maximisation vs. Wealth Maximisation; Emerging roles of Finance Managers.
- 2. Capital Budgeting:** Compounding and Discounting techniques – Concepts of Annuity and Perpetuity; Capital Budgeting Process; Techniques of Capital Budgeting- Discounted and Non- Discounted Cash Flow Methods; Capital Rationing; Risk Evaluation and Sensitivity Analysis.
- 3. Capital Structure:** Introduction- Meaning and Significance; Optimal Capital Structure; Determinants of Capital Structure; Theories of Capital Structure; EBIT - EPS Analysis; EBITDA Analysis; Risk and Leverage; Effects of Leverage on Shareholders' Returns.
- 4. Sources of raising long-term finance and Cost of Capital:** Sources, Meaning, Factors Affecting Cost of Capital; Methods for Calculating cost of capital; Weighted Average Cost of Capital (WACC); Marginal Cost of Capital.
- 5. Project Finance :** Project Planning - Preparation of Project Report, Project Appraisal under Normal Inflationary and Deflationary Conditions; Project Appraisal by Financial Institutions - Lending Policies and Appraisal Norms by Financial Institutions and Banks; Project Review and Control; Social Cost and Benefit Analysis of Project. Term loans from Financial institutions and Banks; Lease and Hire Purchase Finance; Venture Capital Funds; Private Equity; International Finance and Syndication of Loans, Deferred Payment Arrangements; Corporate Taxation and its Impact on Corporate Financing; Financing Cost Escalation.

6. **Dividend Policy:** Introduction- Types; Determinants and Constraints of Dividend Policy; Forms of Dividend; Different Dividend Theories.
7. **Working Capital :** Meaning, Types, Determinants and Assessment of Working Capital Requirements, Negative Working Capital; Operating Cycle Concept and Applications of Quantitative Techniques; Management of Working Capital - Cash Receivables Inventories; Financing of Working Capital; Banking Norms and Macro Aspects; Factoring and Forfaiting.
8. **Security Analysis:** Measuring of Systematic and Unsystematic Risk; Fundamental Analysis (Economic, Industry and Company); Technical Analysis and Efficient Market Hypothesis.
9. **Portfolio Management:** Meaning, Objectives; Portfolio Theory -Traditional Approach; Markowitz Portfolio Theory; Modern Approach - CAPM Model; Economic Value Added; Sharpe Single & Multi Index Model; Risk Adjusted Measure of Performance.

Part II

Strategic Management (40 Marks)

10. **Introduction to Management:** An Overview of functions of management.
11. **Introduction to Strategic Management:** An Overview- Meaning & Process; Strategic Leadership; Functions and Importance for Professionals like Company Secretaries; Environmental Influences of Business- Characteristics and Components of Business Environment, Factors of Micro & Macro Environment of Business; Competitive Environment and Porter's Five Force Model.
12. **Business Policy and Formulation of Functional Strategy:** Introduction to Business Policy; Framework of Strategic Management; Strategic Decision Model; Vision; Mission; Objectives and Goals; Strategic Levels of the Organization; Formulation of Functional Strategy-Formulation of Financial; Marketing; Production; Human Resource and Logistics strategies.
13. **Strategic Analysis and Planning:** Situational Analysis, Strategic Choices-SWOT and TOWS Analysis; PERT (Programme Evaluation Review Technique) and CPM (Critical Path Method); Portfolio analysis-Boston Consulting Group (BCG) growth-share Matrix, Ansoff's Product Growth Matrix, ADL Matrix and General Electric (GE) Model; Strategic Planning; Strategic Alternatives-Glueck and Jauch and Michael Porter's Generic Strategies.
14. **Strategic Implementation and Control:** Issues in Strategy Implementation; Various Organizational Structures and Strategy Implementation; Leadership and its forms ; Strategic Change and Control.
15. **Analysing Strategic Edge :** Introduction to Business Process Reengineering; Concept of Benchmarking; Introduction to Total Quality Management and Six Sigma.

LESSON WISE SUMMARY

Financial and Strategic Management

PART I – FINANCIAL MANAGEMENT

Lesson 1: Nature, Significance and Scope of Financial Management

Lesson 1 covers the nature, scope and objectives of Financial Management, risk-return and value of the firm, objective of the firm: profit maximisation vs. wealth maximisation and emerging role of finance managers. Financial Management deals with procurement of funds and its effective utilizations in the business. It is concerned with investment, financing and dividend decisions in relation to objectives of the company. Financial management is very important for an organisation as it brings economic growth and development through investment, financing, dividend and risk management decision which help companies to undertake better projects. Lack of financial management in business will lead to losses and closure of business.

Lesson 2: Capital Budgeting

This lesson covers time value of money, capital budgeting process, its need and importance, kinds of capital budgeting decisions, capital expenditure control, capital rationing, various methods of capital budgeting- non-discounted and discounted cash flow techniques, risk evaluation and sensitivity analysis, simulation for risk evaluation and some case studies on capital budgeting. Capital budgeting refers to long-term planning for proposed capital outlays and their financing. Thus, it includes both raising of long-term funds as well as their utilisation. It may, thus, be defined as the firm's formal process for acquisition and investment of capital. Capital budgeting requires use of various methods including statistical techniques which have been discussed in the chapter.

Lesson 3: Capital Structure

Capital Structure of a firm is a reflection of the overall investment and financing strategy of the firm. It shows how much reliance is being placed by the firm on external sources of finance and how much internal accruals are being used to finance expansions. Optimal capital structure means arrangement of various components of the structure in tune with both the long-term and short term objectives of the firm. This chapter comprises of nature, scope and significance of capital structure, factors affecting capital structure, capital structure vis a vis financial structure, planning and designing of capital structure, optimal capital structure, capital structure & valuation, theories of capital structure, types of leverage – operating leverage, financial leverage, combined leverage, EBIT-EPS analysis and effect of leverages on return on equity.

Lesson 4: Sources of Raising Long Term Finance and Cost of Capital

A business requires funds to purchase fixed assets like land and building, plant and machinery, furniture etc. These assets may be regarded as the foundation of a business. The cost of capital is the required rate of return that a firm must achieve in order to cover the cost of generating funds in the marketplace. It is used as a discount rate in determining the present value of future cash flows associated with capital projects. In this lesson we will study Sources of Long Term Finance, cost of capital, factors affecting the cost of capital, calculation of cost of capital of for different sources of finance, calculation of weighted cost of capital and marginal cost of capital.

Lesson 5: Project Finance

Project decisions are taken by the management with basic objective to maximize returns on the investment being made in a project. Project financing is a loan structure that relies primarily on the project's cash flow for repayment, with the project's assets, rights and interests held as secondary security or collateral. In this lesson we will understand the meaning of Project Planning, Project Appraisal by various Financial Institutions, Project Evaluation Technique, Loan Documentation, Loan Syndication – Bridge Loans against Sanctioned Loan, Monitoring the progress of units assisted by the Financial Institutions, Social Cost – Benefit Analysis, Project Review and Control and Follow-up Reports and Procedures.

Lesson 6: Dividend Policy

Dividend policy determines what portion of earnings will be paid out to stock holders and what portion will be retained in the business to finance long-term growth. Dividend decision is one of the crucial parts of the financial manager, as it determines the amount available for financing the organisation long term growth and it plays very important part in the financial management. This lesson includes types of dividend policies, determinants and constraints of dividend policy, type/ forms of dividend, different dividend theories – Walter's Model, Gordon's Model, Modigliani-Miller Hypothesis of Dividend Irrelevance Policy etc.

Lesson 7: Working Capital

The capital which is required to finance current assets is called working capital. It is the capital of a business which is used to carry out day-to-day business operations of a firm. Working capital is vital for the proper and smooth functioning of an organisation. Therefore, it is very necessary for a corporate professional to know about management of different constituents of working capital. In this lesson we will study the meaning, types, determinants and assessment of working capital requirements, concept of negative working capital, operating cycle concept and applications of quantitative techniques, financing of working capital; Banking norms and macro aspects, cash management, inventories management, receivables management, factoring and forfeiting.

Lesson 8: Security Analysis

Investment may be defined as a conscious act on the part of a person that involves deployment of money in securities issued by firms with a view to obtain a target rate of return over a specified period of time. Securities are the instruments issued by seekers of funds in the investment market to the providers of funds in lieu of funds. Security analysis is about valuing the securities using publicly available information. In this chapter we will cover the concept of investment and security analysis, investment vs. speculation, risks and its types, approaches to valuation of a security, fundamental analysis, technical analysis and efficient market theory.

Lesson 9: Portfolio Management

Portfolio Management is the art and science of making decision about investment mix and policy matching investment to objectives, asset allocation and balancing risk against performance. Portfolio Analysis seeks to analyze the pattern of returns emanating from a portfolio of securities, i.e. a number of securities that absorb a proportion of total amount of investment. This chapter covers meaning, objectives; portfolio theory, Traditional Approach; Fixed and Variable Income Securities, Markowitz Portfolio Theory, Modern Approach - CAPM Model, Sharpe Single & Multi Index Model, Arbitrage Pricing Theory (APT), Risk Adjusted Measure of Performance and Economic Value Added.

Lesson 10: Practical Questions and Case Studies

This lesson includes various practical questions and case studies on lessons covered. Ample solved illustrations have been provided in this chapter to provide the students with the methodology for solving the questions efficiently.

PART II – STRATEGIC MANAGEMENT

Chapter 11 : Introduction to Management

Management is an indispensable facet of the economic life of all human beings and of every business organisation too. This is so because, it is concerned with leading and effective utilization of financial resources of aof human, physical and business, so that the set objectives and goals may be accomplished in a desired manner. The object of this chapter is to enable the students to understand the concept and features of management, its various theories propounded by management researchers from time to time and most importantly, the functions of management.

Chapter 12 : Introduction to Strategic Management

Strategic Management is a discipline that deals with long-term development of an organisation with a clear-cut vision about organisational purpose, scope of activities and objectives. It provides overall direction to the organisation and includes specifying the organization's objectives, developing policies and plans designed to accomplish these objectives, allocating resources to for the implementation of such plans. The purpose of this chapter is to understand the concept of strategic management and its process. This chapter also enables the reader to understand the functions performed by a strategic leader and the environmental influences of business.

Chapter 13 : Business Policy and Formulation of Functional Strategy

This chapter throws a light on the core concepts of business policy. Business Policy is the study of the functions and responsibilities of senior management, the crucial problems that affect success in the total enterprise and the decisions that determine the direction of the organisation and shape its future. It describes in detail about the roles and responsibilities of top level management, significant issues affecting organizational success and the decisions affecting organization in long-run. The objective of this chapter is to enable the students to understand the concepts related to business policy.

Chapter 14 : Strategic Analysis and Planning

This chapter studies strategic analysis and planning for providing overall direction to the organisation and specifying the organization's objectives, developing policies and plans designed to achieve these objectives, and then allocating resources to implement the plans. All this requires a careful analysis of the vision, mission, objectives, goals and resources of the organisation and in-depth analysis of the external environment.

Chapter 15 : Strategic Implementation and Control

The implementation of policies and strategies is concerned with the design and management of systems to achieve the best integration of people, structures, processes and resources in reaching organization objectives. Strategy implementation may also consist of securing resources, organizing these resources and directing the use of these resources within and outside the organization. A good strategy without effective implementation can hardly be expected to succeed in the performance. Implementation of strategy in an organization covers a number of inter-related decisions, choices, and a broad range of activities such as the commitments and cooperation of all units, sections and departments. The objective of this chapter is to assist the students to understand the issues in Strategy Implementation; various organizational structures and strategy implementation; and concepts of strategic change and control.

Chapter 16 : Analysing Strategic Edge

In order to boost effectiveness and produce higher quality products for end customer, it is important to analyse strategic edge. This is also important for enabling new business growth and expansion and also to save cost by improving efficiency in the production process. The objective of this chapter is to assist the students to understand the tools and techniques of strategic management such as Business Process Reengineering, Benchmarking, Total Quality Management and Six Sigma etc.

LIST OF RECOMMENDED BOOKS

PAPER 8 : FINANCIAL AND STRATEGIC MANAGEMENT

1. M Y Khan & P K Jain : Basic Financial Management ; McGraw Hill Education (India) Pvt Ltd.
2. R. P. Rustagi : Financial Management – Theory, Concepts and Problems; Taxmann Publications (P) Ltd.
3. Prasanna Chandra : Investment Analysis and Portfolio Management ; McGraw Hill Education (India) Pvt Ltd.
4. I M Pandey : Financial Management; Vikas Publication House Ltd.
5. Eugene F Brigham & Michael C Ehrhardt : Financial Management – Theory and Practice; Cengage Learning (India) Pvt Ltd.
6. J Van Horne & John M. Wachowicz : Fundamentals of Financial Management ; Pearson Education Ltd.
7. L.M. Prasad : Strategic Management; Sultan Chand & Sons, New Delhi
8. Upendra Kachru : Strategic Management; McGraw Hill Education (India) Pvt Ltd.
9. S N Chary : Production and Operations Management; McGraw Hill Education (India) Pvt. Ltd.

ARRANGEMENT OF STUDY LESSONS

Module-2 Paper 8 FINANCIAL AND STRATEGIC MANAGEMENT

Sl. No.	Lesson Title
Part I: Financial Management	
1.	Nature, Significance and Scope of Financial Management
2.	Capital Budgeting
3.	Capital Structure
4.	Sources of raising Long term Finance and Cost of Capital
5.	Project Finance
6.	Dividend Policy
7.	Working Capital
8.	Security Analysis
9.	Portfolio Management
10.	Practical Problems and Case Studies
Part II: Strategic Management	
11.	Introduction to Management
12.	Introduction to Strategic Management
13.	Business Policy and Formulation of Functional Strategy
14.	Strategic Analysis and Planning
15.	Strategic Implementation and Control
16.	Analysing Strategic Edge

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Lesson 1

Nature, Significance and Scope of Financial Management

LESSON OUTLINE

- Introduction
- Nature, Scope and Objectives of Financial Management
- Risk-Return and Value of the Firm
- Objective of the Firm : Profit Maximisation Vs. Wealth Maximisation
- Emerging role of Finance Managers
- LESSON ROUND UP
- TEST YOURSELF

LEARNING OBJECTIVES

The objective of any business is to create value for its stakeholders. In financial terms, value is represented by market value of shares. The key objective of financial management is to create wealth for business, generate cash and gain maximum profits from the investments considering the risks involved.

Good financial management is very important for an organisation. It brings economic growth and development through prudent investment, financing, dividend and risk management decisions. Lack of financial management in business will lead to losses and closure of business.

In the developed state of a capital market, raising funds is not a problem; the real problem is to put the capital resources to efficient use through effective financial planning, financial organization and financial control and to deal with tasks like ensuring the availability of funds, allocating them for different uses, managing them, investing funds, controlling costs, forecasting financial requirements, doing profit planning and estimating rate of return on investment and assessment of working capital etc.

The object of the study is to enable the students understand –

- Objective of Financial Management
- Nature, Significance, and Scope of Financial Management
- Financial Management Decisions
- Investment, Financial and Dividend
- Decision Making Process
- Economic Value Added – real growth of the organization
- Liquidity and Profitability
- Financial Distress and Insolvency
- Role and Function of Finance Managers

If you want to rear financial blessings, you have to sow financially. – Joel Osteen

Thoughtful financial planning can easily take a backseat to daily life. – Suze Orman

INTRODUCTION

MEANING OF FINANCE

Finance is the backbone of any business. It helps in defining the feasible area of operation for any type of business activities and therefore is the foundation for any strategic planning. It may also be defined as an art or a science of managing money. Finance function is the procurement of funds and their effective utilization in business concerns.

Webster's Ninth New Collegiate Dictionary defines finance as the 'Science on study of the management of funds' and the management of fund as the system that includes the circulation of money, the granting of credit, the making of investments, and the provision of banking facilities.

MEANING OF BUSINESS FINANCE

According to the **Wheeler**, "Business finance is that business activity which concerns with the acquisition and conversion of capital funds in meeting financial needs and overall objectives of a business enterprise". According to the **Guthumann** and **Dougall**, "Business finance can broadly be defined as the activity concerned with planning, raising, controlling, administering of the funds used in the business".

In the words of **Parhter** and **Wert**, "Business finance deals primarily with raising, administering and disbursing funds by privately owned business units operating in non-financial fields of industry".

The starting point and ending point of any business is money. Efficient financial planning, budgeting, financial forecasting, cash management, credit administration, investment analysis and fund procurement of the business are important for sustainable development in the present dynamic global business environment.

DEFINITION OF FINANCIAL MANAGEMENT

Financial management is an integral part of overall management. The term financial management has been defined by different experts as under :

"It is concerned with the efficient use of an important economic resource namely, capital funds". – **Solomon**

Financial management "as an application of general managerial principles to the area of financial decision-making. – **Howard and Upton**

Financial management "is an area of financial decision-making, harmonizing individual motives and enterprise goals". – **Weston and Brigham**

Financial management "is the operational activity of a business that is responsible for obtaining and effectively utilizing the funds necessary for efficient operations. – **Joseph and Massie**

Thus, financial management is broadly concerned with raising of funds, creating value to the assets of the business enterprise by efficient allocation of funds. It is the study of integration of the flow of funds in the most optimal manner to maximize the returns of a firm by taking proper decisions in utilizing the funds. In other words, raising of funds should involve minimum cost and to bring maximum returns.

NATURE, SCOPE AND OBJECTIVES OF FINANCIAL MANAGEMENT

In modern times, we cannot imagine a world without the use of money. In fact, money is the life-blood of business because all our economic activities are carried out through the use of money. For carrying on business, we need resources which are pooled in terms of money. It is used for obtaining physical and material resources for carrying out productive activities and business operations which affect sales and pay compensation to suppliers of resources, physical as well as monetary. Hence financial management is considered as an organic function of a business and has rightly become an important one.

A group of experts defines Financial Management as simply the task of providing funds needed by the business or

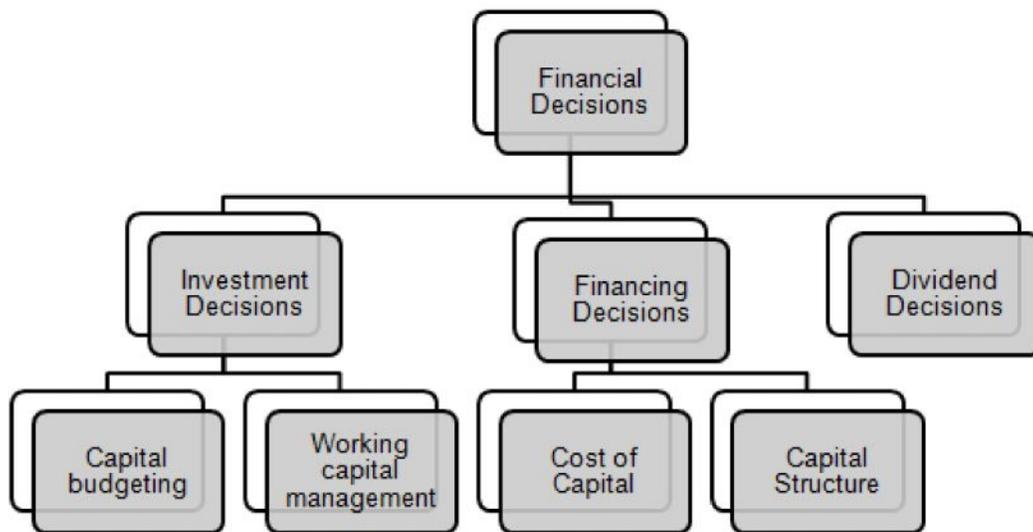
enterprise on terms that are most favourable in the light of its objectives. The approach, thus, is concerned almost exclusively with the procurement of funds and could be widened to include instruments, institutions and practices through which funds are raised. It also covers the legal and accounting relationship between a company and its sources of funds. Financial Management is certainly broader than procurement of funds.

Other set of experts assume that finance is concerned with cash. Since every business transaction involves cash directly or indirectly, finance may be assumed to be concerned with everything that takes place in the conduct of a business. Obviously, it is too broad.

The third set of people whose point of view has been widely accepted considers Financial Management as procurement of funds and their effective utilisations in the business; though there are other non-profit making organisations like schools, associations, government agencies etc., where funds are procured and used. So, Financial Management has not only to see that funds can be raised for installing plant and machinery at a cost; but it has also to see that additional profits adequately compensate for the costs and risks borne by the business while setting up the project.

Thus, from the point of view of a corporate unit, financial management is related not only to 'fund-raising' but encompasses wider perspective of managing the finances for the company efficiently. In the developed state of a capital market, raising funds is not a problem; the real problem is to put the capital resources to efficient use through effective financial planning, financial organisation and financial control and to deal with tasks like ensuring the availability of funds, allocating them for different uses, managing them, investing funds, controlling costs, forecasting financial requirements, doing profit planning and estimating rate of return on investment and assessing working capital etc.

Financial Management, to be more precise, is, thus concerned with investment, financing and dividend decisions in relation to objectives of the company. Such decisions have to take care of the interests of the shareholders. They are upheld by maximisation of shareholders' wealth which depends upon increase in the net worth of capital invested in the business plus ploughed back profits for growth and prosperity of the company. It is for such reasons that the market is prepared to pay a lower or higher price for the shares of some company or the other. Nature of Financial Management therefore can be judged by the study of the nature of investment, financing and dividend decisions.



Types of Financial Decisions

INVESTMENT DECISIONS

Investment decision is the most important decision for value creation. Investment ordinarily means utilisation of money for profits or returns. This could be done by creating physical assets with the money and carrying on business or purchasing shares or debentures of a company. Investments necessarily involve uncertainty, and are therefore necessarily risky. Within a firm, a finance manager decides that in which activity resources of the firm are to be channelised. A marketing manager may like to have a new show room, a production manager a new lathe and a personnel manager higher wages for labour, which may lead to regular and efficient production. Over and above, the top management may like to enter an entirely new area of production like a textile company entering electronics. All these are the ventures which are likely to increase profits. But resources are limited. Hence, the problem of accepting one proposal and leaving other persists. All investment proposals have to be evaluated in relation to expected return and risk.

Capital budgeting is a major aspect of investment decision making process and would be studied in detail in Lesson 2. Investment decisions and capital budgeting are considered as synonymous in the business world. Investment decisions are concerned with the question whether adding to capital assets today will increase the revenue of tomorrow to cover costs. Thus investment decisions are commitments of monetary resources at different times in expectation of economic returns in future. Choice is required to be made amongst available resources and avenues for investment. As such investment decisions are concerned with the choice of acquiring real assets, over the time period, in a productive process. In making such a choice consideration of certain aspects is essential viz., need for investment, factors affecting decisions, risk- return criteria for evaluating investment decisions and selection of a particular alternative from amongst the various options available.

Investment decisions have, thus, become the most important area in the decision making process of a company. Such decisions are essentially made after evaluating the different proposals with reference to growth and profitability projections of the company. The choice helps achieve the long term objectives of the company i.e., survival and growth, preserving market share of its products and retaining leadership in its production activity. The company likes to avail of the economic opportunity for which investment decisions are taken viz., (1) expansion of the productive process to meet the existing excessive demand in local market, exploit the global market, and to avail of the advantages and economies of the expanded scale of production. (2) replacement of an existing asset, plant and machinery or building, necessary for taking advantages of technological innovations, minimising cost of production by replacing obsolete and worn out plants, increasing efficiency of labour, etc. (3) The choice of equipment establishes the need for investment decisions based on the question of quality and latest technology. (4) Re-allocation of capital is another area of investment, to ensure asset allocation in tune with the production policy. (5) Mergers, acquisitions, re-organisations and rehabilitation are all concerned with economic and financial involvement and are governed by investment decisions.

Thus, investment decisions encompass wide and complex matters involving the following areas:

- capital budgeting
- cost of capital
- measuring risk
- management of liquidity and current assets
- expansion and contraction involving business failure and re-organisations
- buy or hire or lease an asset.

Factors affecting investment decisions are essentially the ingredients of investment decisions. Capital is a scarce resource and its supply cost is very high. Optimal investment decisions need to be made taking into consideration such factors as are given below viz. (1) Estimation of capital outlays and the future earnings of the proposed project focusing on the task of value engineering and market forecasting; (2) availability of capital

and considerations of cost of capital focusing attention on financial analysis; and (3) a set of standards by which to select a project for implementation and maximising returns therefrom focusing attention on logic and arithmetic.

FINANCING DECISIONS

Determining the best capital structure or Financing decision is the next step in financial management for executing the investment decision once taken. A look at the balance-sheet of a sample company indicates that it obtains finances from shareholders, ordinary or preference, debentureholders on long-term basis, financial institutions as long-term loans, banks and others as short-term loans and the like. Financing decisions are concerned with the determination of how much funds to procure from amongst the various avenues available i.e. the financing mix or capital structure. Efforts are made to obtain an optimal financing mix for a particular company. This necessitates study of the capital structure as also the short and intermediate term financing plans of the company. In lesson 3, we would study in detail how the change in capital structure can impact the valuation of a firm.

In more advanced companies, financing decision today, has become fully integrated with top-management policy formulation via capital budgeting, long-range planning, evaluation of alternate uses of funds, and establishment of measurable standards of performance in financial terms.

Financial decision making is concerned more and more with the questions as to how cost of funds be measured, proposals for capital using projects be evaluated, or how far the financing policy influences cost of capital or should corporate funds be committed to or withheld from certain purposes and how the expected returns on projects be measured. In lesson 4, the technique of cost of capital has been elaborated.

Optimal use of funds has become a new concern of financing decisions and top managements in corporate sector are more concerned with planning the sources and uses of funds and measuring performance. New measurement techniques, utilising computers, have facilitated efficient capital allocation through financing decisions. Both Investment decision and financial decisions are jointly made as an effective way of financial management in corporate units. No doubt, the purview of these decisions is separate, but they affect each other. Financial decisions, as discussed earlier, encompass determination of the proportion of equity capital to debt to achieve an optimal capital structure, and to balance the fixed and working capital requirements in the financial structure of the company. This important area of financing decision making, aims at maximising returns on investment and minimising the risk. The risk and return analysis is a common tool for investment and financing decisions for designing an optimal capital structure of a corporate unit. It may be mentioned that debt adds to the riskiness of the capital structure of a firm. This part of financial management is the analysis of company through earnings before interest and taxes, variable costs, contribution. It is called a study of operating leverages. Further, the earnings per share to be given to shareholders is analysed through the technique of financial leverage. When study of both these aspects is made it is known as combined leverage. The leverage concepts have been discussed in detail in lesson 3.

DIVIDEND DECISIONS

The dividend decision is another major area of financial management. The financial manager must decide whether the firm should distribute all profits or retain them or distribute a portion and retain the balance. Theoretically, this decision should depend on whether the company or its shareholders are in the position to better utilise the funds, and to earn a higher rate of return on funds. However, in practice, both dividends and retention of profits are important financial signals to the market, which continuously tries to assess the future profitability and risk of a company. A number of other factors like the market price of shares, the trend of earning, the tax position of the shareholders, cash flow position, requirement of funds for future growth, and restrictions under the Companies Act etc. also play an important role in the determination of dividend policy of business enterprise. The finance manager has to take a decision regarding optimum dividend payout ratio, he also has to take decisions relating to bonus issue and interim dividend. An analysis of the impact of dividend decision on the market value of the firm has been made in lesson 6.

6 EP-F&SM

It can be said that investment, financing and dividend decision are inter-related to each other. Financial Management is concerned with all three investment, financing and dividend decisions in relation to objectives of the company. Investment ordinarily means profitable utilization of funds. Investment decisions are concerned with the question whether adding to capital assets today will increase the net worth of the firm. Financing is next step in financial management for executing the investment decision once taken. Financial decision making is concerned with the question as to how funds requirements should be met keeping in view their cost, and how far the financing policy influences cost of capital. The dividend decision is another major area of financial management. It helps the financial manager in deciding whether the firm should distribute all profits or retain them or distribute a portion and retain the balance. Management needs to ensure that enough funding is available at the right time to meet the needs of the business. Hence, making of financial policy in taking three important decision of business viz. Financing, Investing and Dividend are always helpful to the management to take key corporate decision like expansion, diversification etc.

DECISION CRITERIA

Decision criteria depends upon the objective to be achieved through the instrumentality of decision making process. The main objectives which a business organisation pursues are maximisation of return and minimisation of costs.

A fair decision criterion should distinguish between acceptable and unacceptable proposals and solve the problem of selection of the best alternatives from amongst the various alternatives available in a given situation to achieve the above objectives. A fair decision criterion should follow the following two fundamental principles i.e. (1) the "Bigger and Better" principle; (2) "A Bird in Hand is Better than Two in the Bush" principle. The first principle suggests that bigger benefits are preferable to smaller ones; whereas the second one suggests that early benefits are preferable to later benefits.

Decision criteria in financial management can be studied under two separate heads viz. The criteria for investment decisions; and the criteria for the financing decisions.

Criteria for investment decisions are mainly concerned with planning and control of capital expenditure through budgeting process following the tools of analysis viz. pay back period, accounting rate of return, discounted cash flow methods e.g., net present value method, etc. We shall discuss these methods for evaluating investment decisions in detail in the study relating to capital budgeting in Lesson 2. However, the essence and the inherent spirit in these techniques is based on logic which helps in the decision making process.

Both the above principles are based on the assumption "other things being equal" which is a rare reality. But in practice the decision process very much adheres to these principles particularly in the areas of capital budgeting decisions and determining the cost of capital in project financing proposals.

As a matter of fact, these techniques have been founded on the following decision criteria:

1. Urgency: The use of 'urgency' is treated as criterion for selection of investment projects in many corporate units/ business enterprises/government set up. Urgency is assessed on the following basis:

- (a) it provides sufficient justification for undertaking a project;
- (b) it provides immediate contribution for attainment of objectives of the project; and
- (c) it maximises profits.

Although urgency as criterion lacks objectivity, being non-quantifiable, yet it definitely provides an ordinal ranking scale for selection of projects on preferential pre-exemption basis.

2. Pay back: Time is of essence while selecting this criterion for investment decisions. The decision is taken on the basis of quickness in pay off of the investments. Pay back simply measures the time required for cash flows from the project to return the initial investment to the firm's account. Projects, on the basis of this criterion, having quicker pay backs are preferred.

Pay back decision criterion does not follow the principles laid down above viz. “the bigger and better” and “bird in hand”. It ignores the first principle completely as it does not take into account the cash flows after investment has been recovered. It also does not satisfy entirely the second principle as it assigns zero value to the receipts, subsequent to recovery of the amount.

3. Rate of return: It provides another decision criterion based on accounting records or projected statements to measure profitability as annual percentage of capital employed. Rate of return is arrived at following two different methods for treating income in the analysis which give different results. In the first case, average income generated from investment is taken after deduction of depreciation charge. In second case, the original cost is taken as denominator rather than average investment. This gives the simple yearly rate of return. This is based on “bigger and better” principle. This criterion can be applied either against average investment in the year selected for study or simply against initial cost.

4. Undiscounted benefit-cost ratio: It is the ratio between the aggregate benefits and the cost of project. Benefits are taken at face value. The ratio may be “gross” or “net”. It is “gross” when calculated with benefits without deducting depreciation. In the net version, depreciation is deducted from benefits before computing the results. Both ratios give identical ranking. Net ratio equals the gross ratio minus 1. This relationship makes it simple to calculate gross ratio and then to arrive at net ratio.

This criterion is compatible with the “bigger and better” principle. But it does not follow the second principle of “bird in hand” as early receipts are given identical weights to later receipts in the project’s life.

5. Discounted benefit-cost ratio: This ratio is more reliable as it is based on present value of future benefits and costs. It may also be gross or net like the one discussed earlier. It takes into account all incomes whenever received and to this extent complies with “bigger and better” principle. Early receipts are given more weight than late receipts on account of introduction of discount factor.

This ratio satisfies the requirements of both the principles and is a good criterion for decision making.

6. Present value method: This concept is useful as a decision criterion because it reveals the fact that the value of money is constantly declining as a rupee received today is more in value than the rupee at the end of a year. Besides, if the rupee is invested today it will fetch a return on investment and accumulate to Re. 1 (1+i) at the end of ‘n’ period. Hence a rupee received at the end of ‘n’ period is worth $1/(1+i)^n$ now. Investment decisions require comparison of present value with the cost of assets, and if the present value exceeds the cost, the investment is rendered acceptable. The practical application of concept of time value of money would be discussed in chapter 2.

Another off-shoot of this criterion is net present value method which is closely related to cost-benefit ratio. It takes into account all income and its timing with appropriate weights. Here difference of present value of benefits and costs is considered as against the ratio in cost-benefit analysis. This criterion is useful for acceptance of projects showing positive net present value at the company’s cost of capital rate. It can be used for choosing between mutually exclusive projects by considering whether incremental investment yields a positive net present value.

7. Internal rate of return: It is a widely used criterion for investment decisions. It takes interest factor into account. It is known as marginal efficiency of capital or rate of return over cost. It stipulates rate of discount which will equate the present value of the net benefits with the cost of the project. This method satisfies both these principles and would be elaborated with practical examples in Chapter 2.

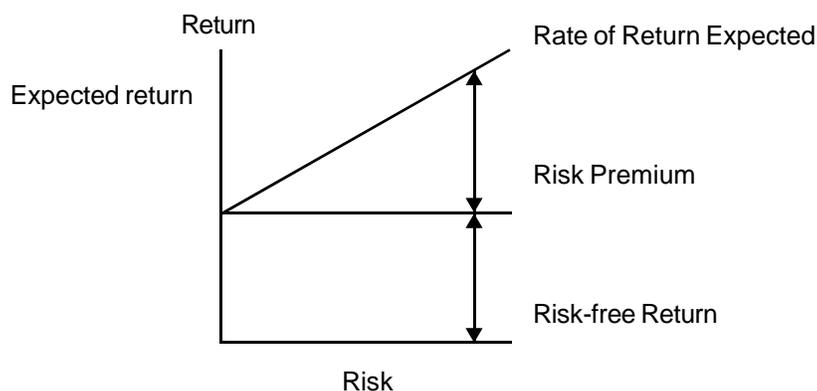
The capital structure of a corporate unit contains two important parameters viz., the owners’ capital known as equity and the debt which represents interest of debenture holders in the assets of the company. The factors responsible for inclusion of debt in the capital structure of a company are tax-savings, easier to sell, lower cost of floatation and services, lower cost of capital, the advantage of leverage, no dilution of equity and probable loss of control, logical to consolidate and fund short-term indebtedness by a bond issue, advantageous in the inflationary trends of rising interest rates and improvement in financial ratios.

There is no alternative for a company to equity financing to meet its requirement for funds. Debt can be raised by

a company only on an adequate equity base which serves as a cushion for debt financing. The study of effect of leverage is the main focus point to determine the best mix of debt and equity sources of funds. It is, therefore, desired to consider this criterion for financing decision making in relation to leverage and cost of capital.

VALUE OF FIRM-RISK AND RETURN

Financial decisions incur different degree of risk. An investor's decision to invest in risk free government bonds has less risk as interest rate is known and the risk of default is very less. On the other hand, an investor would incur more risk if he decides to invest in shares, as the return is not certain. However, the investor can expect a lower return from government bond and higher from shares. Risk and expected return move in tandem; the greater the risk the greater would be the expected return. The following figure shows the risk-return relationship.

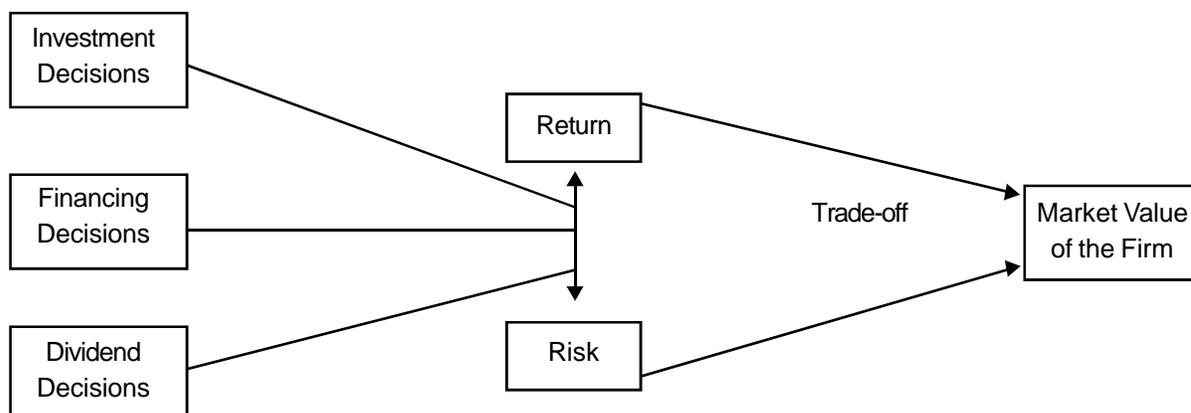


The Risk-return relationship

As discussed earlier, a finance manager has to take various types of decision- investment decisions, financing decisions and dividend decisions. A finance manager takes these decisions in the light of the objective of wealth maximisation as reflected in the market price of the shares. The finance manager should also know as to what are the factors which may affect the market price of the shares. The various decisions will be taken in the light of these factors, otherwise any attempt to achieve the objective of maximisation of market price of the shares may not be achieved.

A finance manager cannot avoid the risk altogether nor he takes a decision by considering the return aspect only. Usually, as the return from an investment increases, the risk associated with it also increases. In an attempt to increase the return, the finance manager will have to undertake greater degree of risk also. Therefore, a finance manager is often required to trade-off between the risk and return. At the time of taking any decision, the finance manager tries to achieve the proper balance between the consideration of risk and return associated with various financial management decisions to maximise the market value of the firm. A particular combination of risk and return where both are optimized may be known as Risk-return trade off and at this level of risk-return, the market price of the shares will be maximised.

The figure below demonstrates the relationship between market value of the firm, return and risk, on the one hand and financial management decision on the other.



LIQUIDITY

Liquidity is an important concept in financial management and is defined as ability of the business to meet its short-term obligations. It shows the quickness with which a business/company can convert its assets into cash to pay what it owes in the near future. According to Ezra Soloman, it measures a company's ability to meet expected as well as unexpected requirements of cash to expand its assets, reduce its liabilities and cover up any operating losses. Liquidity, as a decision criterion, is widely used in financial management. It is used for managing liquid resources or current assets or near cash assets so as to enhance the effectiveness with which they are utilised with a view to minimising costs. It also focuses attention on the availability of funds. Enhancement of liquidity enables a corporate body to have more funds from the market.

While using liquidity as a decision criterion, the management makes use of ratios. They give a bird's eye view of the current liquidity position or shortages thereof. A company will like to have liquid resources for transaction purposes, as a precautionary measure and for speculative opportunities. The management's attitude towards these i.e., transaction motive, precautionary motive and speculative motive (taking advantage of lower prices of raw materials etc., in the market) is an important determinant of a company's liquidity position.

Liquidity is assessed through the use of ratio analysis. Liquidity ratios provide an insight into the present cash solvency of a firm and its ability to remain solvent in the event of calamities.

Current Ratio which is the ratio of current assets to current liabilities, is widely used by corporate units to judge the ability to discharge short-term liabilities covering the period upto one year. The interpretation of the current ratio is that 'higher the ratio, greater is the ability of the firm to pay off its bills'.

Nevertheless, it is a crude ratio and does not take into account the difference amongst different categories of assets. For example, inventory may not be turned into cash as quickly as Account Receivables. The main difficulty that arises in treating inventory as a quick item is that unless one has ensured about the quality, condition and marketability of the inventory it may be impossible to turn it into cash immediately at the estimated value. Therefore, to assess quick liquidity position, inventory is excluded while calculating Quick Ratio. The ingredients of current assets while computing the Quick Ratio are cash, marketable securities and receivables. Besides cash, the other two items are near cash and at very short notice can easily be converted into cash. Therefore, for taking financial decisions particularly for assessing cash position of the company and its ability to discharge current obligations, Quick Ratio is frequently relied upon. Nevertheless, the main shortcoming of the Quick Ratio is that it ignores inventories and concentrates on cash, marketable securities and receivables in relation to current obligations although inventory is also a basic input in current ratio without which company's decision process cannot be complete.

Liquidity ratio enables a company to assess its Net Working Capital. Working Capital is denoted by the combination of current assets or current liabilities of a company, and for calculation of net working capital we deduct current liabilities from current assets. Having done so we are left with the ready money in our hands to meet day to day

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needs of the business. If we still want to know as to how much is available with the company per rupee of sales then Net Working Capital is divided by sales.

Tailor-made measurement can be devised for calculating liquidity ratio in different situations. For example, the principle of liquidity can be extended to study liquidity of receivables (or inventories) separately to enable the executives to take decisions about the collection period of bills.

Liquidity of receivables is assessed through Average Collection Period (ACP). ACP tells us the average number of days receivables are outstanding i.e., the average time a bill takes to convert into cash. The inverse to this ratio is Receivables Turnover Ratio (RTR). Either of the two ratios can be used as both depict the slowness of recovery, but the readings are different. For financial decisions and to use liquidity as criterion the average collection period ratio, and receivables turnover ratio is used to help in taking corrective steps for maintaining the optimum liquid position for the company at any given time to avoid risk of losing goodwill and chances of bankruptcy. The ratio, in short, reveals the following results:

- (1) Too low an average collection period may suggest excessively restricted credit policy of a company.
- (2) Too high an average collection period (ACP) may indicate too liberal a credit policy. A large number of receivables may remain due and outstanding, resulting in less profits and more chances of bad debts.

Average collection period and receivables turnover ratio should be compared to the average age of accounts payable or accounts payable turnover ratio. Though adequate liquidity could be maintained by accelerating collections and deferring payments, yet this has its own limitations and drawbacks. It affects the credit standing of the company in business and banking circles.

In the same spirit, decisions are made to maintain a proper inventory level in the company. For the purpose, it becomes essential to assess the liquidity of inventory. Inventory Turnover Ratio i.e., cost of goods sold divided by average annual inventory, shows the rapidity with which inventory is turned into receivables through sales. The higher the ratio, the more efficient is the inventory management system of the company.

To conclude, liquidity, as a decision criterion is an important tool in financial management. Financial decisions are affected by liquidity analysis of a company in the following areas:

1. Management of cash and marketable securities;
2. Credit policy of a firm and procedures for realisation;
3. Management and control of inventories;
4. Administration of fixed assets;
5. Taking decisions for efficient use of current assets at minimum cost; and
6. Decisions to keep the company's position on sound basis to avoid eventualities.

The above analysis of liquidity suggests evaluation of current assets of a company. On liabilities side also, liquidity position is analysed and managed through assessment of long and medium term debts of the company, and the arrangements for their repayments. This is done purely from the precautionary point of view so that the company could be saved from the risk of bankruptcy for non-payment of its debt to the lenders.

PROFITABILITY

Profitability as a decision criterion is another important tool in financial management for taking decisions from different angles after evaluating the performance of the company in different spheres. For example, if it becomes essential for the company to examine profit per unit of sale then it is done by estimating profitability per rupee of sales. It is used as a measure of comparison and standard of performance. Similarly, there could be other ratios.

Because different users look at the profitability of a company from different angles, they use different ratios. Short-

term creditors, long-term lenders, equity shareholders, investors, etc. all are interested in profitable operations of a concern. They use the ratios which best suit their requirements. Profitability can be related to sales or to total capital employed or to net worth of the company. But then different figures for profits are taken into account.

Profitability to sales ratio, reflects the company's ability to generate profits per unit of sales. If sales lack sufficient margin of profit, it is difficult for the business enterprise to cover its fixed cost, including fixed charges on debt, and to earn profit for shareholders. From investors point of view profits are compared by the investors as percentage to the capital employed in the business enterprise. Absence of adequate profitability ratio on sales reflects the company's inability to utilise assets effectively. This is analysed through the asset turnover ratio.

One of the important profitability ratios is profits on equity – profit figure after interest, before dividend and taxes, drawn from the profit and loss account is related to the equity of the shareholders as shown in balance sheet. This is an indicator of profits earned on funds invested by the owners. It is an indicator of actual returns received by them. This ratio may assume two forms:

$$(1) \frac{\text{Earning available to common shareholders}}{\text{Total Equity}}$$

$$(2) \frac{\text{Net income after tax}}{\text{Total Equity}}$$

[The ratio at (2) is used where the company has no preference shareholders].

Profit margin is another measure of viewing profitability. The revenue bearing property of sales can be easily assessed from the profit margin. It is derived by dividing operating income from business by sales. This ratio indicates the efficiency of operations as well as how products are priced. Inadequacy of profit margin is an evidence of company's inability to achieve satisfactory results. Pricing decisions are made by financial executives in consultation with the marketing departments of the company. Policy decisions relating to increase or decrease in price are taken in respect of different products keeping in view the competitiveness of the market. Profit margin ratio is constantly used by business executives for this purpose. To look into the cash generating capacity of sales, gross profit margin is used by deducting the cost of goods sold from sales and dividing by sales.

The gross profit margin ratio indicates the profits relative to sales after deduction of direct production cost. It indicates efficiency of production operations and the relationship between production costs and selling price.

The difference between the above two ratios i.e. gross profit margin and net profit margin ratios is that general and administrative expenses are excluded while computing gross margin. Thus, net profit margin ratio is calculated as under:

$$\text{Net Profit Margin (NPM)} = \frac{\text{Net Profit after Taxes}}{\text{Sales}}$$

NPM ratio is an indicator of company's ability to generate profits after paying all taxes and expenses. Decline in this ratio reflects the presence of either higher expenses relative to sales or higher tax burden on the company, affecting its profitability adversely. For assessment of profitability as a decision criterion return on investment (ROI) is a frequently used ratio.

Return on Investment: This is an important profitability ratio from the angle of shareholders and reflects on the ability of management to earn a return on resources put in by the shareholders. The beauty of the ROI ratio is that earning of the company can be viewed from different angles so as to take decisions on different causes responsible, to reduce or to enhance the profitability of the company. One way of finding out rate of return on assets employed in the company is to find the ratio of earnings before interest and taxes (EBIT) to capital employed. This ratio indicates operating income to the assets used to produce income.

Another way of computing the ratio of return is through the assets turnover ratio and margin of profit which gives the same results, as EBIT to capital employed. It may be seen from the following:

$$\frac{\text{EBIT}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} = \frac{\text{EBIT}}{\text{Assets}}$$

A high ratio indicates efficient use of assets and low ratio reflects inefficient use of assets by a company.

Another off-shoot of profitability ratio is the times interest earned ratio, which gives a clue to the interest bearing capacity of the income character of business operations. This ratio relates operating profits to fixed charges created by the company's borrowings, and provides an indication of margin of safety between financial obligations and Net income after tax. A company may earn profits but may find it difficult to make payments of excess interest charges or may face inability to meet such obligations. EBIT should be 5 to 6 times interest charges as a satisfactory guideline for this ratio. Lenders, particularly banks and financial institutions, greatly rely on this ratio particularly in profitability assessment through projections of income of the borrower in the coming years after investment of borrowed funds.

In this way, we find that profitability as decision making criterion in financial management, is crucial for business managers. Business works as a system comprised of sub-systems. Different criteria assess different aspects and assist in viewing different situations which have an aggregate impact on business activity, and therefore form the basis of financial management.

There is an inverse relationship between liquidity and profitability. While the immediate survival of a business depends on its liquidity, its long term survival and growth depend on profitability. Thus, liquidity ensures short term survival and profitability ensures long term survival. Both are, therefore important for any firm to survive. A firm should maintain a trade-off situation where the firm maintains its optimum liquidity for greater profitability and the finance executive has to strike a balance between the two conflicting objectives. Therefore we can say that Liquidity and Profitability are competing goals for the finance manager.

COSTING AND RISK

In financial management, costing relates to the system adopted for assessing cost of capital from various sources viz., equity and preference shares, debentures/bonds, long-term borrowings from financial institutions, etc. Equity capital is owner's money employed in the business whereas borrowed funds are creditors' funds carrying an interest obligation and repayment schedule. There are thus, risks involved if interest is not paid or on account of default in repayment of principal. It is ordinarily expected that every rupee obtained on loan enhances the chances of increasing the returns on owners' capital and the net worth. The rate of interest on borrowed funds is usually lower than the returns expected by the investors or risk-takers in the business. Moreover, interest paid is deductible for tax purposes. The following illustration gives an idea of the phenomenon stated above:

Company A	Company B	
Total Capital	₹ 100	₹ 100
Owners' capital	₹ 100	₹ 50
Borrowed capital	NIL	₹ 50
Rate of earnings	20%	20%
Rate of interest	–	15%
Earnings before interest and taxes	₹ 20	₹ 20
Interest paid	–	₹ 7.50
Earnings before taxes	₹ 20	₹ 12.50
Taxes at 50%	₹ 10	₹ 6.25
Earnings after taxes	₹ 10	₹ 6.25
Percentage of earnings on owners' funds	10%	12.5%

But if the company is not able to earn sufficient returns, the returns on owners' funds are reduced and risk increases. Using borrowed funds or fixed cost funds in the capital structure of a company is called financial gearing. High financial gearing will increase the earnings per share of a company if earnings before interest and taxes are rising, as compared to the earnings per share of a company with low or no financial gearing. It may be understood that leverage and gearing are used interchangeably. (The former is used in the USA and the latter in U.K.). So at times when the economy is doing well, the shareholders of a highly geared company will do better than the shareholders of a low geared company. However, if the company is not doing well, when its profits before interest and taxes are falling, the earnings per share of highly geared company will fall faster than those of the low geared company. The higher this level of financial gearing, the greater the risk. Those who take risk should appreciate that in difficult times their reward will be below average but in good times they will receive above average rewards. The lower the levels of financial gearing, the more conservative are the financial policies of the company and the less will be deviations over time to earnings per share.

Risk is associated with fixed charges in the shape of interest on debt capital. Higher the fixed charges, the greater the chance that it will not be covered by earnings and so greater the risk. Large companies financed by heavy borrowings, need to continue to produce and search for new markets for their output. Any internal disturbance or external constraint that may hamper the company's production and sales will reduce inflow of funds but fixed interest charges have to be paid. A study of the effects of capital gearing on cost of capital is quite important for financial decisions. Given that a company has to minimise the cost of capital, it should fix up a level of gearing where its costs of capital is minimum.

As against the traditional theory of capital structure suggesting that the average cost of capital does depend on the level of gearing, the alternative theory on cost of capital as propounded by Modigliani and Miller argues that the cost of capital is independent of the capital structure. The essence of the Modigliani and Miller argument is the arbitrage process. Should the value of two firms with identical incomes and the same risk class ratios vary (which would be possible under the traditional theory) the investors would arbitrage so as to make the market value of the two firms equal. A key assumption of the model is that the investors can arbitrage between companies, and between loan and equity capital, without increasing the risk of their individual investment portfolios. The above theories would be discussed in detail in lesson 3.

Despite all the above theoretical explanations the fact remains that debt is associated with risk which enhances with increase in the leverage. There are two major reasons for this increased risk viz., (1) interest is a fixed charge and is required to be paid by the company whether or not it earns profits; and (2) a substantial decrease in liquidity or increased demands from creditors for payment if the company has higher proportion of debt capital in its capital structure. For these reasons, the risk of a company not being able to meet its obligations is greater than in the case of a company in which the proportion of borrowed sum is substantially smaller.

Distinction may be made between different types of risk to which an enterprise is exposed in the business environment.

The risk which we have discussed is financial risk that arises in relation to owners' return created by the utilization of funds in the enterprise particularly fixed cost securities i.e. debt and preference shares. Financial risk is distinguished from "business risks" which is associated with the chance of loss due to variability of return, in general, created by the enterprise and as such it is known as operating risk. The concepts of operating and financial risk will be discussed with practical examples in Lesson 3. Operating risk is concerned with EBIT (earning before interest and taxes) whereas financial risk is concerned with EAIT (earning after interest and taxes). If there is preference capital then the financial risk is concerned with earnings available to ordinary (equity) shareholders after dividends have been paid to preference shareholders. Financial risk encompasses the risk of possible insolvency and the variability in the earnings on equity. In case the enterprise does not employ debt or preference capital there will be no financial risk and overall risk for the firm will be low. It is only because of application of debt financing, that overall risk increases and originates into financial risk to equity holders.

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Besides, there are other types of risk which are related to investment decisions and not cost of financial sources viz., purchasing power risk, market risk, interest rate risk, social or regulatory risk and other risks. Purchasing power risk affects all investors. The risk is associated with changes in the price level on account of inflation. Under inflationary conditions, the purchasing power of money decreases over time, and the investor is faced with the possibility of loss on account of investments made to the extent of inflation. Under inflationary conditions, therefore, the real rate of return would vary from the nominal rate of return (viz., the percent return on the face value of investment made). Interest rate risk is concerned with holders of the bonds due to changes in interest rates. These bonds are high quality bonds not subject to business or financial risk but their prices are determined by there prevailing level of interest rates in the market. As a result, if interest rate falls, the price of these bonds will rise and vice versa. The risk is more in case of long-term bonds because the rate of interest may fluctuate, over a wider range as compared to a short-term bond. As regards social and regulatory risks, they arise due to harsh regulatory measures like licensing, nationalisation, price controls limiting profits, etc. Other types of risks may depend upon the nature of investment.

OBJECTIVES OF A FIRM

Financial management of any business firm has to set goals for itself and to interpret them in relation to the objective of the firm. Broadly, there are only two alternative objectives a business firm can pursue viz.

- (a) Profit maximisation;
- (b) Shareholder Wealth maximisation.

(a) Profit Maximisation

According to Solomon, Price system directs managerial efforts towards more profitable goods or services. Prices are determined by the demand and supply conditions as well as the competitive forces, and they guide the allocation of resources for various productive activities.

In economic theory, the behavior of the firm is analysed in terms of profit maximization. The classical economic view of the firm, as put forward by Hayek (1950) and Fredman (1970), is that it should be operated in a manner that maximizes its profit. This occurs, in economic terms, when marginal revenue equals marginal cost. Profit maximization means that a firm either produces maximum output for a given amount of input, or uses minimum input for producing a given output. The underlying rationale of profit maximization is efficiency. It is assumed that profit maximisation causes the efficient allocation of resources under the competitive market condition, and profit is considered as the most appropriate measure of a firm's performance.

Thus, profit maximisation is considered as an important goal in financial decision-making in an organisation. It ensures that firm utilizes its available resources most efficiently under conditions of competitive markets.

But in recent years, under the changed corporate environment, profit maximisation is regarded as unrealistic, difficult, inappropriate and socially not much preferred goal for business organisation. It is argued that profit maximisation assumes perfect competition, and in the face of imperfect modern markets, it cannot be a legitimate objective of the firm. It is also argued that the objective of profit maximisation as a business objective developed in the 19th century when the business activity was self financing and based on assumption of private property and single entrepreneurship. The only aim of the entrepreneur then was to maximize his profit and enhance his own wealth, this objective could be easily satisfied by profit maximisation objective. The modern business environment is characterised by limited liability and a distinction between management and ownership. The various stakeholders of the firm are shareholder, lenders, customers, employees, government and society. In practice the objectives of all these stakeholders may differ and may even conflict with each other. The manager has a difficult task of reconciling and balancing these conflicting objectives. The goal of profit maximization overlooks the interest of other parties than the shareholders and is therefore criticised and considered as unrealistic, inappropriate and immoral.

Profit maximisation as corporate goal is criticised by scholars mainly on the following grounds:

- (i) It is vague conceptually.
- (ii) It ignores timing of returns.
- (iii) It ignores the risk factor.
- (iv) It may tempt to make such decisions which may in the long run prove disastrous.
- (v) Its emphasis is generally on short run projects.
- (vi) It may cause decreasing share prices.
- (vii) The profit is only one of the many objectives and variables that a firm considers.

(b) Shareholder Wealth Maximisation

According to Solomon, shareholder wealth maximization means maximizing the net present value of a course of action to shareholders. Net present value (NPV) or wealth of a course of action is the difference between the present value of its benefit and the present value of its costs.

Presently, maximisation of present value (or wealth) of a course of action is considered appropriate operationally flexible goal for financial decision-making in an organisation. The net present value or wealth can be defined more explicitly in the following way:

$$NPV = W = \frac{A_1}{(1 + K_1)} + \frac{A_2}{(1 + K_2)} + \frac{A_3}{(1 + K_3)} + \frac{A_4}{(1 + K_4)} + \dots + \frac{A_n}{(1 + K_n)} - C_0 = \frac{\sum_{t=1}^n A_t}{\sum (1 + K)^t} - C_0$$

Where A_1, \dots, A_n represent the stream of benefits expected to occur in form of future cashflows if a course of action is adopted. C_0 is the immediate cashflow for that action and K is the appropriate discount rate, and W is the Net present worth or wealth which is the difference between the present worth or wealth of the stream of cash inflows and the initial cash outflow.

The management of an organisation tries to maximise the present value not only for shareholders but for all including employees, customers, suppliers and community at large. This goal for the maximum present value is generally justified on the following grounds:

- (i) It is consistent with the object of maximising owners economic welfare.
- (ii) It focuses on the long run picture.
- (iii) It considers risk.
- (iv) It recognises the value of regular dividend payments.
- (v) It takes into account time value of money.
- (vi) It maintains market price of its shares.
- (vii) It seeks growth in sales and earnings.

However, profit maximisation can be part of a wealth maximisation strategy. Quite often two objectives can be pursued simultaneously but the maximisation of profit should never be permitted to overshadow the objectives of wealth maximisation.

The objective of the firm provides a framework for optimal decision making in the area of business management. The term 'objective' should be used in the sense of 'decision criteria' for taking decisions involved in financial management. It means that what is relevant is not the overall objective of the business but operationally useful criterion against which the investment, financing and dividend policy decisions are to be judged. The objective of shareholder wealth maximisation is an appropriate and operationally feasible criterion to choose among the alternative financial actions.

It provides an unambiguous measure of what financial management should seek to maximise in making investment and financing decisions on behalf of shareholders. Another point to note in this context is that objective provide a 'normative' framework. In other words, it implies that the focus is on what a firm should try to achieve and on policies that it should follow if the objectives are to be achieved.

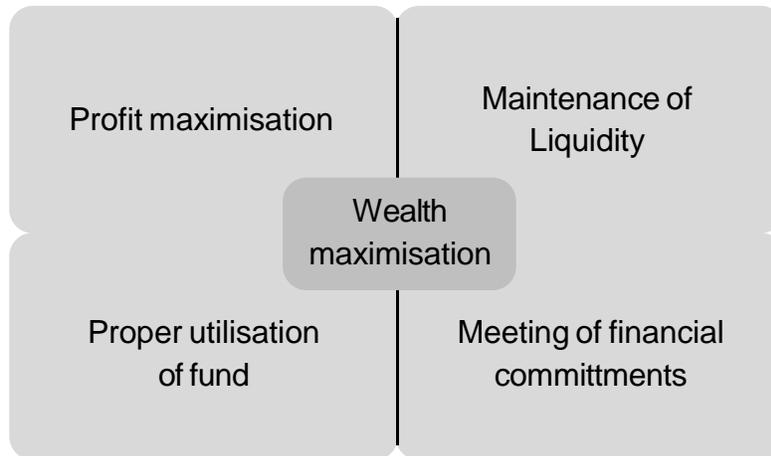
PROFIT MAXIMISATION VERSUS SHAREHOLDER WEALTH MAXIMISATION

Profit maximisation is basically a single-period or, at the most, a short-term goal. It is usually interpreted to mean the maximisation of profits within a given period of time. A firm may maximise its short-term profits at the expense of its long-term profitability and still realise this goal. In contrast, shareholder wealth maximisation is a long-term goal and shareholders are interested in future as well as present profits. Wealth maximisation is generally preferred because it considers (1) wealth for the long-term, (2) risk or uncertainty, (3) the timing of returns, and (4) the shareholders' return. The following table provides a summary of the advantages and disadvantages of these two often conflicting goals.

Profit Maximisation Vs. Shareholder Wealth Maximisation

<i>Goal</i>	<i>Objective</i>	<i>Advantages</i>	<i>Disadvantages</i>
Profit maximisation	Large amount of profits	<ol style="list-style-type: none"> 1. Easy to calculate profits 2. Easy to determine the link between financial decisions and profits 	<ol style="list-style-type: none"> 1. Emphasizes the short term 2. Ignores risk or uncertainty 3. Ignores the timing of returns 4. Requires immediate resources
Shareholder wealth maximisation	Highest market value of common stock	<ol style="list-style-type: none"> 1. Emphasizes the long term 2. Recognizes risk or uncertainty 3. Recognizes the timing of returns 4. Considers return 	<ol style="list-style-type: none"> 1. Offers no clear relationship between financial decisions and stock price 2. Can lead to management anxiety and frustration

In other words, the conflict may emerge in the area of profit maximisation and wealth maximisation as an objective of financial management. Profit maximisation would be a measure of attaining profit in a firm and wealth maximisation would consider the effect of earning per share and dividend to shareholders. The objective of wealth maximisation would be fulfilled by increasing the market price of shares through decisions on future cashflow, dividends and earnings per shares but to maximise profit the financial manager may have to consider issues like – retained earnings, non-payment of dividends, investing funds in profitable outlets. The finance manager has to try and maximise profit without in any way affecting the shareholders wealth because primary goal of financial decision making is to achieve wealth maximisation. Profit maximisation is the narrow objective of financial management because profit is a test of economic efficiency but wealth maximisation is comprehensive objective of financial management, it goes beyond the quantitative aspects as it also considers qualitative benefits in a firm. Wealth maximisation objective is therefore, superior to the profit maximisation concept.



Economic Value-Added (EVA) – Means to Measure Shareholders Value Criteria

The conventional approach to measure profit will deduct cost of loan capital in arriving at profit; but there is no similar deduction for the cost of shareholders. Critics of the conventional approach point out that a business will not make a profit, in an economic sense, unless it covers the cost of all capital invested, including shareholders' funds. Earnings per share tells nothing about the cost of generating those profits. If the cost of capital (loans, bonds, equity) as say, 15 per cent, then a 14 per cent earning is actually a reduction, not a gain, in economic value. Profits also increase taxes, thereby reducing cash flow.

Return on assets is a more realistic measure of economic performance, but it ignores the cost of capital. Leading firms can obtain capital at low costs, via favourable interest rates and high stock prices, which they can then invest in their operations at decent rates of return on assets. This tempts them to expand without paying attention to the real return, economic value-added.

Economic value added (EVA) is the after tax cash flow generated by a business minus the cost of the capital it has deployed to generate that cash flow. Representing real profit versus paper profit, EVA underlines shareholder value, increasingly the main target of leading companies strategies. Shareholders are the players who provide the firm with its capital; they invest to gain a return on that capital.

The concept of EVA is well established in financial theory, but only recently has the term moved into the mainstream of corporate finance, as more and more firms adopt it as the base for business planning and performance monitoring. There is growing evidence that EVA, not earnings, determines the value of a firm. There is difference between EVA, earnings per share, return on assets, and discounted cash flow, as a measure of performance.

Discounted cash flow is very close to economic value-added, with the discount rate being the cost of capital.

There are two key components to EVA. The net operating profit after tax (NOPAT) and the capital charge, which is the cost of capital times the amount of capital. In other words, it is the total pool of profits available to provide cash return to those who provided capital to the firm. The capital charge is the product of the cost of capital times the capital tied up in the investment. In other words, the capital charge is the cash flow required to compensate investors for the riskiness of the business given the amount of capital invested. On the one hand, the cost of capital is the minimum rate of return on capital required to compensate debt and equity investors for bearing risk—a cut-off rate to create value and capital is the amount of cash invested in the business, net of depreciation (Dierks and Patel, 1997). In formula form,

$$\text{EVA} = (\text{Operating Profit}) - (\text{A Capital Charge})$$

$$\text{EVA} = \text{NOPAT} - (\text{Cost of Capital} \times \text{Capital})$$

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Problem: XYZ Ltd. has capital investment of Rs. 150 crores. After tax operating income is Rs. 20 crores and company has a cost of capital of 12%. Estimate the Economic Value Added of the firm.

Solution: Capital employed 150 crores

NOPAT= 20 crores

WACC= 12 %

$$\begin{aligned} \text{EVA} &= \text{NOPAT} - (\text{WACC} \times \text{CE}) \\ &= 20 - (12\% \times 150) \\ &= 2 \text{ crores} \end{aligned}$$

Example

Say you made a ₹ 20,000 capital investment in your company. Your operating profit, after taxes, is ₹ 10,000. The opportunity cost of that investment is 10%.

In this case EVA would be Net Operating Profit after taxes – Cost of Capital

i.e. ₹ 10,000- 10% of ₹ 20,000 = ₹ 8,000.

The goal of EVA is to take into account the cost of capital invested in the company.

Thus, EVA represents the value added to the shareholders by generating operating profits in excess of the cost of capital employed in the business. EVA will increase if:

- i. Operating profits grow without employing additional capital i.e., through greater efficiency.
- ii. Additional capital is invested in the projects that give higher returns than the cost of procuring new capital, and
- iii. Unproductive capital is liquidated i.e., curtailing the unproductive uses of capital.

Implementing EVA in a company is more than just adding one additional row in the income statement. It is of course some kind of change process which should be given some management effort. However, if right actions are taken straight from the beginning then implementing EVA should be one of the easiest change processes that a company goes through. The actions might include e.g.:

- Gaining the understanding and commitment of all the members of the management group through training and discussing and using this support prominently during the process.
- Training of the other employees, especially all the key persons.
- Adopting EVA in all levels of organization.

However, there are a few common mistakes that are often made in implementing or using EVA. Most of them are bound up with either misunderstanding and thus misusing the concept at upper levels or not training all the employees to use EVA and thus not using the full capacity of the concept. These common mistakes include defining capital costs intentionally wrongly (usually too high for some reason), using EVA only in the upper management level and investing too little in training of employees.

Although EVA is a value based measure, and it gives in valuations exactly the same answer as discounted cash flow, the periodic EVA values still have some accounting distortions.

That is because EVA is after all an accounting-based concept and suffers from the same problems of accounting rate of returns. In other words, the historical asset values that distort ROI also distort EVA values.

In EVA valuations, the historical asset values (book value) are irrelevant and only the cash flows are left to give the end result.

The financial manager as a measure of performance also function to find out return on equity, market captialisation and earning per share by adding the concept of Market Value Added (MVA). This works in close nexus to the economic value added concept. This concept shows the management the increase or decrease in the value of capital. Through this principle, the finance manager will be able to make the conflicting areas of conflict of the shareholders, debt investors and manager complementary.

FINANCIAL DISTRESS AND INSOLVENCY

Generally the affairs of a firm should be managed in such a way that the total risk – business as well as financial – borne by equity holders is minimised and is manageable, otherwise, the firm would obviously face difficulties. In managing business risk, the firm has to cope with the variability of the demand for its products, their prices, input prices, etc. It has also to keep a tab on fixed costs. As regards financial risk, high proportion of debt in the capital structure entails a high level of interest payments. If cash inflow is inadequate, the firm will face difficulties in payment of interest and repayment of principal. If the situation continues long enough, a time will come when the firm would face pressure from creditors. Failure of sales can also cause difficulties in carrying out production operations. The firm would find itself in a tight spot. Investors would not invest further. Creditors would recall their loans. Capital market would heavily discount its securities. Thus, the firm would find itself in a situation called distress. It may have to sell its assets to discharge its obligations to outsiders at prices below their economic values i.e. resort to distress sale. So when the sale proceeds is inadequate to meet outside liabilities, the firm is said to have failed or become bankrupt or (after due processes of law are gone through) insolvent.

Failure of a firm is technical if it is unable to meet its current obligations. The failure could be temporary and might be remediable. When liabilities exceed assets i.e. the net worth becomes negative, bankruptcy, as commonly understood, arises. Technical bankruptcy can be ascertained by comparing current assets and current liabilities i.e. working out current ratio or quick ratio. On the other hand, solvency ratios indicate long term liquidity i.e. the ability of the firm to discharge its term-liabilities. Examples of solvency ratios are Debt to Equity ratio, Debt to total Funds Ratios, and Interest coverage ratio. Trend analysis should be made for the past three to five years to pick up signals of bankruptcy, if any.

FINANCIAL MANAGEMENT AS A SCIENCE OR AN ART

Financial Management is a subject within the compass of social science as it deals with people. Its nature is nearer to applied sciences as it envisages use of classified and tested knowledge as a help in practical affairs and solving business.

Theory of financial management is based on certain systematic principles, some of which can be tested in mathematical equations like the law of physics and chemistry. Financial management contains a much larger body of rules or tendencies that hold true in general and on the average. The use of computers, operations research, statistical techniques and econometric models find wide application in financial management as tools for solving corporate financial problems like budgeting, choice of investments, acquisition or mergers etc. This takes the financial management nearer to treatment as a subject of science. Nevertheless, there remains a wide scope for application of value judgement in financial decision making. Most practical problems of finance have no hard and fast answers that can be worked out mathematically or programmed on a computer. They must be solved by value judgement, intuition and the “feel” of experience. Thus, despite its frequent acceptance as an applied science, finance remains largely an art. Because, according to George A. Christy and Peyton Foster Roden (Finance: Environment and Decisions) knowledge of facts, principles and concepts is necessary for making decisions but personal involvement of the manager through his intuitive capacities and power of judgement becomes essential. This makes financial management and managing a company’s finance both an art and a science. It requires a feel for the situation and analytical skills alongwith a thorough knowledge of the techniques and tools of financial analysis and the know-how to apply them and interpret the results.

A very interesting presentation has been made by Weston in his book “Methodology in Finance”. The finance

functions are mainly three viz., planning, organisation and financial control. In each of these finance functions elements of science and art can be observed. Wherever methodology is to be applied in decision making in all these areas, the subject matter becomes a science confronted with the framework of techniques and tools. On the other hand, when the question of choice to make selection out of the alternative results arises the subject matter becomes an art requiring human skills for value judgement. For example, in planning function, there are certain goals, which may be short-term goals or long-term goals. Each falls within the area of art. Another parameter of planning is estimating funds, which may again be short-term or long-term involving techniques and skills. When involvement to techniques is there the subject matter remains science and when the skills are required to be interpreted, the subject matter becomes an art. It so happens in all aspects of planning, organisation and control.

Thus, in the entire study of financial management whether it is related to investment decision, financing decisions i.e. deciding about the sources of financing, or dividend decision, there is a mixture of science as well as art. When techniques for analytical purposes are used it is science and when choice in appreciation of the results is made it is an art. Thus, people will like to call financial management as science as well as art. But it is better if we say that the discipline of financial management has both the aspects of science as well as art; where there is theory of systematic knowledge it is science and where there is application it is art.

EMERGING ROLES OF FINANCIAL MANAGER

With the evolution of finance from being mere a descriptive study to the one that is highly developed discipline, the role of financial managers has also undergone a sea change. His areas of responsibilities now extend far beyond keeping records, reports, the firm's cash position, paying bills and obtaining funds, and he is now concerned with and is fully involved in the decision making processes to decide investment of funds in assets, determining the best mix of financing and dividends in relation to overall valuation of the firm. The responsibilities of the financial manager are linked to the goal of ensuring liquidity, profitability or both and is also related to the management of assets and funds of any business enterprise. When the Financial Manager is involved in management of asset, he is performing the role of the decision-maker and when he is managing funds, he is performing the staff function. In the light of different responsibilities of the financial manager, he performs mainly the following duties:

- 1. Forecasting of Cash Flow:** This is necessary for the successful day to day operations of the business so that it can discharge its obligations as and when they arise. In fact, it involves matching of cash inflows against outflows and the manager must forecast the sources and timing of inflows from customers and use them to pay the liability.
- 2. Raising Funds:** The Financial Manager has to plan for mobilising funds from different sources so that the requisite amount of funds are made available to the business enterprise to meet its requirements for short term, medium term and long term.
- 3. Managing the Flow of Internal Funds:** Here the Manager has to keep a track of the surplus in various bank accounts of the organisation and ensure that they are properly utilised to meet the requirements of the business. This will ensure that liquidity position of the company is maintained intact with the minimum amount of external borrowings.
- 4. To Facilitate Cost Control:** The Financial Manager is generally the first person to recognise when the costs for the supplies or production processes are exceeding the standard costs/budgeted figures. Consequently, he can make recommendations to the top management for controlling the costs.
- 5. To Facilitate Pricing of Product, Product Lines and Services:** The Financial Manager can supply important information about cost changes and cost at varying levels of production and the profit margins needed to carry on the business successfully. In fact, financial manager provides tools of analysis of information in pricing decisions and contribute to the formulation of pricing policies jointly with the marketing manager.
- 6. Forecasting Profits:** The Financial manager is usually responsible for collecting the relevant data to make forecasts of profit levels in future.

7. Measuring Required Return: The acceptance or rejection of an investment proposal depends on whether the expected return from the proposed investment is equal to or more than the required rate of return. An investment project is accepted if the expected return is equal or more than the required rate of return. Determination of required rate of return is the responsibility of the financial manager and is a part of the financing decision.

8. Managing Assets: The function of asset management focuses on the decision-making role of the financial manager. Finance personnel meet with other officers of the firm and participate in making decisions affecting the current and future utilisation of the firm's resources. As an example, managers may discuss the total amount of assets needed by the firm to carry out its operations. They will determine the composition or a mix of assets that will help the firm best achieve its goals. They will identify ways to use existing assets more effectively and reduce waste and unwarranted expenses.

The decision-making role crosses liquidity and profitability lines. Converting the idle equipment into cash improves liquidity. Reducing costs improves profitability.

9. Managing Funds: Funds may be viewed as the liquid assets of the firm. In the management of funds, the financial manager acts as a specialised staff officer to the Chief Executive of the company. The manager is responsible for having sufficient funds for the firm to conduct its business and to pay its bills. Money must be located to finance receivables and inventories, to make arrangements for the purchase of assets, and to identify the sources of long-term financing. Cash must be available to pay dividends declared by the board of directors. The management of funds has therefore, both liquidity and profitability aspects. If the firm's funds are inadequate, the firm may default on the payment of liabilities and may have to pay higher interest. If the firm does not carefully choose its financing methods, it may pay excessive interest costs with a subsequent decline in profits.

LESSON ROUND-UP

- Financial Management deals with procurement of funds and their effective utilizations in the business and concerned with investment, financing and dividend decisions in relation to objectives of the company.
- Investment decisions are essentially made after evaluating the different project proposals with reference to growth and profitability projections of the company.
- Financing decisions are concerned with the determination of how much funds to procure from amongst the various avenues available i.e. the financing mix or capital structure.
- Dividend decision is to decide whether the firm should distribute all profits or retain them or distribute a portion and retain the balance.
- Profit maximization ensures that firm utilizes its available resources most efficiently under conditions of competitive markets.
- Wealth maximization means the management of an organization maximizes the present value not only for shareholders but for all including employees, customers, suppliers and community at large.
- Economic value added is the after cash flow generated by a business minus the cost of capital it has deployed to generate that cash flow.
- Liquidity means ability of the business to meet short-term obligations. It shows the quickness with which a business/company can convert its assets into cash to pay what it owes in the near future.
- Profitability ratio reflects on the ability of management to earn a return on resources put in by the shareholders evaluating the performance of the company in different spheres
- Affairs of the firm should be managed in such a way that the total risk – business as well as financial borne by equity shareholders is minimised and is manageable.

Lesson 2

Capital Budgeting

LESSON OUTLINE

- Time Value of Money
- Planning and Control of Capital Expenditure
- Capital Budgeting Process
- Techniques of Capital Budgeting- Discounted and Non- Discounted Cash Flow Methods, Modified NPV (MNPV), Modified IRR (MIRR), Unequal lives of projects
- Choice of Methods
- Capital Rationing;
- Risk Evaluation and Sensitivity Analysis,
- Simulation for Risk Evaluation
- Inflation, Uncertainty and Evaluation using Statistical Decision Theory
- Analysis of Capital Budgeting, Decisions- Some Case Studies
- LESSON ROUND UP
- TEST YOURSELF

LEARNING OBJECTIVES

Capital Budgeting is one of the core and most difficult task of a finance manager. In capital budgeting cum investment appraisal decision, a finance manager is to co-ordinate with project managers, bankers and promoters to get different data for his analysis. Capital budgeting requires use of various methods including statistical techniques.

The object of the study lesson is to enable the students to understand:

- Time value of money
- Need and importance of Capital Budgeting
- Factors influencing investment decisions
- Kinds of Capital Budgeting Decisions
- Planning of Capital Expenditure
- Capital Expenditure Control
- Capital Rationing
- Capital Budgeting Process
- Various methods of Capital Budgeting
- Risk Evaluation and Sensitivity Analysis
- Simulation for Risk Evaluation

“Capital Budgeting is long term planning for making and financing proposed capital outlays”

– Charles T. Horngreen

TIME VALUE OF MONEY

Introduction

One of the most fundamental concept in finance is that money has a “time value.” That is to say that money in hand today is worth more than money that is expected to be received in the future. The reason is straightforward, a rupee that you receive today can be invested in such a way that you will have more than a rupee at some future time.

Suppose “A” win a Prize in a contest and he has got two options.

A. Receive ₹10,000 now

OR

B. Receive ₹10,000 in three years

Which option should “A” choose?

If A is a rational person he would choose to receive ₹10,000 now. After all, three years is a long time to wait. Why would any rational person defer payment into the future when he or she could have the same amount of money now? For most of us, taking the money in the present is just natural. So at the most basic level, the time value of money demonstrates the concept of time value:

“A rupee today is worth more than a rupee tomorrow.”

The time value of money serves as the foundation for all other notions in finance. It impacts business finance, consumer finance, and government finance. Time value of money results from the concept of interest.

Why ₹ 1 received today is worth more than ₹ 1 received after a time period

There are four primary reasons why a rupees to be received in the future is worth less than a rupees to be received immediately.

1. Presence of positive rates of inflation which reduce the purchasing power of rupees through time. Suppose rate of petrol about one year back was ₹ 65 per litre and now it is ₹ 72 per litre. This may be observed that in this example purchase power of rupee in terms of petrol purchased has decreased from $1/65$ to $1/72$.
2. A rupee today is worth more today than in the future because of the opportunity cost of lost earnings — that is, it could have been invested and earned a return between today and a point in time in the future.
3. Thirdly, all future values are in some sense only **promises**, and contain some uncertainty about their occurrence. As a result of the risk of default or non-performance of an investment, a rupee in hand today is worth more than an expected rupee in the future.
4. Finally, human preferences typically involve impatience, or the preference to consume goods and services now rather than in the future.

Use of Time Value of Money

Some standard calculations based on the time value of money are:

Present Value: Present value refers to the current worth of a future sum of money or stream of cash flows given a specified rate of return. Present Value of a cash flow is calculated on the basis of formula as given below

$$PV = \text{Cash Flow} / (1+r)^t$$

Here 'r' refers to required rate of return and 't' refers to the time period.

Example

Find Present Value of ₹ 80,000 to be received after five years when required rate of return is 10%

$$\begin{aligned}\text{Present Value} &= 80000 / (1+0.10)^5 \\ &= ₹ 49,674\end{aligned}$$

Assume in the same example, the rate of return is 15%,

$$\begin{aligned}\text{Present Value will be} &= 80000 / (1+0.15)^5 \\ &= ₹ 39,774\end{aligned}$$

The above calculation shows, higher the discount rate, the lower the present value of the future cash flows.

Future Value of a lump sum

Future value of a lump sum refers to the value after a certain period of time at the given rate of interest.

It may be calculated by using the following formula

$$FV_t = CF_0 * (1+r)^t \text{ OR } FV_t = PV * (1+r)^t$$

Where FV_t = Future Value after a period t

r = Rate of return

PV= Present Value

Example. Find present value of maturity value of ₹ 10,000 which has been given on 15% interest for five years while required rate of return is 10%.

$$FV \text{ of ₹ } 10,000 @ 15\% \text{ after five years} = ₹ 10,000 (1+0.15)^5 = ₹ 20,113.57$$

$$\text{Present Value of ₹ } 20,113.57 \text{ which is to be received after 5 years} = ₹ 20,113.57 / (1+0.10)^5 = ₹ 12,488.94$$

Present Value of a Lump Sum

Present value of a future cash flow (inflow or outflow) is the amount of current cash that is of equivalent value to the decision maker. Discounting is used to determine the present values of series of future cash flows. The compound interest rate used for discounting cash flows is also called the discount rate.

The present values can be worked out for any combination of number of years and interest rate. The following formula can be used to calculate the present value of a lump sum to be received after some future periods:

$$PV = \frac{F_n}{(1+i)^n} = F_n [(1+i)^{-n}]$$

The term in parenthesis i.e. $(1+i)^{-n}$ is the discount factor or present value factor (PVF), and it is always less than 1 for positive i, indicating that a future amount has a smaller present value. We can rewrite the above equation as under :

Present value = Future value × Present value factor of Rs. 1

$$PV = F_n \times PVF_{n,i}$$

$PVF_{n,i}$ is the present value factor for n periods at i rate of interest and the value can be easily found from the present value tables.

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Example 1: From the following information compute balance in an account at the end of 10 years if INR 2500 is deposited today and the account earns 4% interest, compounded annually and quarterly.

a. Annual Compounding:

$$FV = \text{INR } 2500 (1+0.04)^{10} = \text{INR } 2500 (1.4802) = \text{INR } 3,700.61$$

b. Quarterly Compounding:

$$FV = 2500 (1+0.01)^{40} = \text{INR } 2,500 (1.4889) = \text{INR } 3,722.16$$

Example 2: A person deposit \$10 in an account that pays 5% interest, compounded annually, how much he will obtain at the end of 10 years, 50 years and 100 years?

Note: *Interest on interest is the difference between the future value calculated using compound interest and the future value calculated using simple interest, because simple interest includes only interest on the principal amount, not the interest on interest.*

Continuously compounded:

$$10 \text{ Years: } FV = \$10 (1+0.05)^{10} = \$10 (1.6289) = \$16.29$$

$$50 \text{ Years: } FV = \$10 (1 + 0.05)^{50} = \$10 (11.4674) = \$114.67$$

$$100 \text{ Years: } FV = \$10 (1+0.05)^{100} = \$10 (131.50) = \$1,315.01$$

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.

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 is the length of the annuity and the formula for FVA_n is:-

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

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 work out problems.

The value of expression $\frac{(1+i)^n - 1}{i}$ or $FVIFA_{i,n}$ can easily be found through financial tables.

Example: Find the amount of an annuity if payment of ₹ 5,000 is made annually for 7 years at interest rate of 14% compounded annually.

Solution

Here $R = ₹ 5,000$, $n = 7$, $i = 0.14$

$$FVA = ₹ 5000 \times FVIFA (7, 0.14) = 5000 \times 10.7304915 = ₹ 53,650.25$$

Example: A person is required to pay four equal annual payments of Rs.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

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

$$= ₹ 5,000 (4.507) = ₹ 22,535$$

Example: ₹ 2,000 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

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

'i' being the interest rate (in decimal) per payment period over n payment period.

Here, $i = .06/12 = .005$, $n = 10$.

$$\text{Required amount is given by } A \left[\frac{(1+0.005)^{10} - 1}{0.005} \right] 2000 = 2000 \times 10.22 = ₹ 20,440.$$

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:

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

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

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

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

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.

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

Solution

PVA = Amount of annuity × Present value (r, n) Now, $i = 10\%$, $N = 4$ years

$$= ₹ 20,000 \left[\frac{(1+0.1)^4 - 1}{0.1(1+0.1)^4} \right]$$

$$= ₹ 20,000 \times 3.170$$

$$= ₹ 63,400$$

Example: 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 ₹ 7000 has to be computed. The present value factor of an annuity of Re. 1 at 8 per cent for 6 years is 4.623. Therefore, the present value of an annuity of ₹ 7000 will be: $4.623 \times 7,000 = ₹ 32,361$

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:

- 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).
- 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.

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

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

Where

R = the payment or receipt each period

i = the interest rate per payment or receipt period

Example: Uday wants to retire and receive Rs. 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

$$R = ₹ 3,000$$

$$i = 0.08/12 \text{ or } 0.00667$$

Substituting these values in the above formula, we get

$$\begin{aligned} PVA &= \frac{\text{₹ } 3,000}{0.00667} \\ &= \text{₹ } 4,49,775 \end{aligned}$$

If he wants the payment to start today, he must increase the size of the funds to handle the first payment. This will be 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.

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:

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

Example: Assuming that the discount rate is 7% per annum, how much would you pay to receive ₹ 500, growing at 5%, annually, forever?

Solution

$$\begin{aligned} PVA &= \frac{R}{i-g} \\ &= \frac{\text{₹ } 500}{.07 - .05} = \text{₹ } 25,000 \end{aligned}$$

Sinking Fund

It is the fund which is created for a specified purpose to be fulfilled at future date, by way of sequence of periodic payments over a time period at a specified interest rate.

Size of the sinking fund deposit is computed by using the formula i.e. $FVA = R[FVIFA_{(i,n)}]$, where FVA is the amount to be saved, R, the periodic payment, n, the payment period.

Example: 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 per annum in order to be able to repay debentures?

Solution

$$A (CVFA_{r,n}) = 50,00,000$$

$$A (CVFA_{0.12,7}) = 50,00,000$$

$$A = \frac{50,00,000}{CVFA_{0.12,7}}$$

$$A = \frac{50,00,000}{10.089} = \text{₹ } 4.96 \text{ lakh}$$

Net Present Value

Net Present Value is the difference between the sum total of present values of all the future cash inflows and outflows:

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Algebraically:

$$NPV = \frac{R_1}{(1+k)^1} + \frac{R_2}{(1+k)^2} + \frac{R_n}{(1+k)^n} + \frac{W_n}{(1+k)^n} + \frac{S_n}{(1+k)^n} - C$$

If cash outflow is also expected to occur at some time other than initial investment (non-conventional cash flows) then formula would be

$$NPV = \left[\frac{R_1}{(1+k)^1} + \dots + \frac{R_n}{(1+k)^n} + \frac{S_n}{(1+k)^n} + \frac{W_n}{(1+k)^n} \right] - \left[C_0 + \frac{C_1}{(1+k)^t} + \dots + \frac{C_n}{(1+k)^n} \right]$$

NPV = Net Present Value

R = Cash inflow at different time period

k = Rate of discount or cost capital

t = 1 = first period in the sum

n = The last period in the sum

S_n = Salvage value in period n

W_n = Working capital in period n

C = Cost of investment plus Working Capital

Example

A Company has invested ₹ 8,00,000 in a business and expects a series of cash flow as per given details

Year	Cash Inflow (₹)	Additional Cash Outflow (₹)
1	2,50,000	Nil
2	4,20,000	1,05,000
3	3,50,000	Nil
4	2,50,000	10,000

At the end of fourth year company made a sale of scrap for ₹ 2,40,000 and realized ₹ 30,000 from working capital. Find Net Present Value (NPV) if required rate of return is 10%

Present Value of Cash Inflows = ₹ {(2,50,000/(1+0.10)¹ + 4,20,000/(1+0.10)² + 3,50,000/(1+0.10)³ + 2,50,000/(1+0.10)⁴ + 2,40,000(1+0.10)⁻⁴ + 30,000(1+0.10)⁻⁴} = ₹ 11,92,507

Present Value of Cash Outflows = ₹ {(8,00,000 + 1,05,000 / (1+0.10)² + 10,000(1+0.10)⁻⁴} = ₹ 8,93,607

Net Present Value = Present Value of Cash Inflows - Present value of Cash Outflows

$$= ₹ 11,92,507 - ₹ 8,93,507 = ₹ 2,98,900$$

CAPITAL BUDGETING

DEFINITIONS

According to the definition of **Charles T. Horngreen**, "Capital budgeting is a long-term planning for making and financing proposed capital outlays".

According to the definition of **G. C. Philippatos**, "Capital budgeting is concerned with the allocation of the firms source financial resources among the available opportunities".

The consideration of investment opportunities involves the comparison of the expected future, streams of earnings from a project with the immediate and subsequent streams of earning from a project, with the immediate and subsequent streams of expenditure”.

According to the definition of **Richard and Green law**, “Capital budgeting is acquiring inputs with long-term return”.

According to the definition of **Lyrich**, “Capital budgeting consists of planning development of available capital for the purpose of maximizing the long-term profitability of the concern”.

INTRODUCTION

Capital Budgeting is the process of determining which capital expenditure project should be accepted amongst various projects and given an allocation of funds from the firm. To evaluate capital budgeting processes, their consistency with the goal of shareholder wealth maximization is of utmost importance.

The examples of capital expenditure includes :

1. Purchase of fixed assets such as land and building, plant and machinery, good will, etc.
2. The expenditure relating to addition, expansion, improvement and alteration to the fixed assets.
3. The replacement of fixed assets.
Research and development project.

CAPITAL BUDGETING- PLANNING AND CONTROL OF CAPITAL EXPENSES

In modern times, the efficient allocation of capital resources is a most crucial function of financial management. This function involves organisation’s decision to invest its resources in long-term assets like land, building facilities, equipment, vehicles, etc. All these assets are extremely important to the firm because, in general, all the organisational profits are derived from the use of its capital in investment in assets which represent a very large commitment of financial resources, and these funds usually remain invested over a long period of time.

The future development of a firm hinges on the capital investment projects, the replacement of existing capital assets, and/or the decision to abandon previously accepted undertakings which turns out to be less attractive to the organisation than was originally thought, and divesting the resources to the contemplation of new ideas and planning. For new projects such as investment decisions of a firm fall within the definition of capital budgeting or capital expenditure decisions.

Capital budgeting refers to long-term planning for proposed capital outlays and their financing. Thus, Capital Budgeting includes both raising of long-term funds as well as its utilisation. It may, thus, be defined as the “firm’s formal process for acquisition and investment of capital.” To be more precise, capital budgeting decision may be defined as “the firms’ decision to invest its current fund more efficiently in long-term activities in anticipation of an expected flow of future benefit over a series of years.” The long-term activities are those activities which affect firms operation beyond the one year period. Capital budgeting is a many sided activity. It contains searching for new and more profitable investment proposals, investigating, engineering and marketing considerations to predict the consequences of accepting the investment and making economic analysis to determine the profit potential of investment proposal. The basic feature of capital budgeting decisions are:

- (1) current funds are exchanged for future benefits;
- (2) there is an investment in long-term activities; and
- (3) the future benefits will occur to the firm over series of years.

NEED FOR CAPITAL INVESTMENT

This is the logical question and the answer to that is rather easy. The following factors give rise to the need for capital investments:

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- (a) Wear and tear of old equipments.
- (b) Obsolescence.
- (c) Variation in product demand necessitating change in volume of production.
- (d) Product improvement requiring capital additions.
- (e) Learning-curve effect.
- (f) Expansion.
- (g) Change of plant site.
- (h) Diversification.
- (i) Productivity improvement.

Some of these factors are self-explanatory. However, we add a few explanatory lines on some of abovementioned factors. Obsolescence occurs when alternative methods of equipments for performing a function become available which are significantly better either in terms of quality or newness of the product or plant safety. In a high consumption economy like U.S.A. this problem is acute. In an economy like India, the problem of obsolescence is still rare. Only in certain investments for manufacturing export products (e.g. garments, jute goods, cotton textiles), this problem exists. Product improvements require changes in equipments and this problem is also not an important factor in influencing capital investment decisions in India, expecting changes special product qualities like radios, transistors, televisions etc. Learning curve consideration influences capital decisions in the sense that new equipments might be such as to cut down learning time and effect considerable saving on training expenses. For reasons such as expansion, new sources of raw materials, new markets, labour conditions, transportation or termination of a lease, an entire plant may have to be relocated. The cost of removing a plant is enormous and management may decide to undertake modernisation through a complete new layout and equipment purchases. Many progressive companies seek out new markets and new products. They may even like to acquire another company for purpose of diversification. All these require major capital investments. In some industries, wage escalation may force management to acquire labour-saving equipment machinery to effect saving on wages and at the same time improve productivity.

INVESTMENT DECISIONS – MANAGEMENT PERSPECTIVE

Usually, in investment problems, much attention is focussed on how to choose among alternative projects, so that one is tempted to believe that this constitutes the only problem in capital decisions. However, if we examine carefully, it is easy to realise that choice among alternatives is only one facet *albeit* the important facet of the problem from the top management perspective. The other facets are implementation and control as applied to all phases of capital investment, and these are important aspects because in the ultimate analysis, the top management is accountable to Board of directors and owners for the success or failure of investment plans.

Let us examine in brief how investment decisions are influenced by management perspective. Obviously, we have to start with the company objectives which provide the broad guidelines to policies, plans and operations. A possible objective might be to maximise return on investment in which case the management might seek to minimise investment by selecting only a few capital projects that yield the highest returns. On the other hand, the objective may be to maximise sales volume and in that case all capital investment that yield a net profit (may be small) would be made without undue concern. If the management is guided by a growth objective, expansionary investment involving high capital cost would be undertaken.

Within the board company objectives, top management also reviews the competitive position of the company and if the competition is sharper, the management looks out continuously to evaluate and upgrade the equipments to achieve greater efficiency at least cost. In big companies, the management sets out policies to guide lower levels of management in the search for evaluation of and initiation of capital projects.

Top management has also to keep watch on company funds which finance investments. It cannot allow funds to

lie idle just because suitable project is not at hand. The cost of idle funds is substantial and hence the need for looking out for suitable investment opportunities. If such opportunities exist then the management must spare funds and if existing funds are inadequate it should raise funds externally. It should be remembered that if there is no profitable investment opportunity within the company, the dividend policy of the company should be liberal. Funds for capital investment must be arranged on a long-term basis otherwise borrowings short and investing long can lead to lack of liquidity and consequent troubles. The major sources of long-term funds are long-term borrowing, new equity capital (sale of stock) and retained earnings. Sometimes, a change in the inventory system also releases funds by effecting reduction in inventory to be carried. The selection of the right source of funds is again influenced by management's own belief and value judgement and such other factors like outsider control, dilution of equity, price earnings ratio, cost of funds etc.

And finally, the top management is usually concerned with implementation and control aspects of investment projects. Specific responsibilities are to be assigned to specific individuals or cells and progress reports have to be carefully studied. In big projects, improved methods like programme evaluation review technique (PERT) or critical path method (CPM) may be used.

IMPORTANCE OF CAPITAL BUDGETING

Capital budgeting decisions are of paramount importance in financial decision. So it needs special care on account of the following reasons:

- (1) **Long-term Implications:** A capital budgeting decision has its effect over a long time span and inevitably affects the company's future cost structure and growth. A wrong decision can prove disastrous for the long-term survival of firm. It leads unwanted expansion of assets, which results in heavy operating cost to the firm. On the other hand, lack of investment in asset would influence the competitive position of the firm. So the capital budgeting decisions determine the future destiny of the company.
- (2) **Involvement of large amount of funds:** Capital budgeting decisions need substantial amount of capital outlay. This underlines the need for thoughtful, wise and correct decisions as an incorrect decision would not only result in losses but also prevent the firm from earning profit from other investments which could not be undertaken.
- (3) **Irreversible decisions:** Capital budgeting decisions in most of the cases are irreversible because it is difficult to find a market for such assets. The only way out will be to scrap the capital assets so acquired and incur heavy losses.
- (4) **Risk and uncertainty:** Capital budgeting decision is surrounded by great number of uncertainties. Investment is present and investment is future. The future is uncertain and full of risks. Longer the period of project, greater may be the risk and uncertainty. The estimates about cost, revenues and profits may not come true.
- (5) **Difficult to make:** Capital budgeting decision making is a difficult and complicated exercise for the management. These decisions require an over all assessment of future events which are uncertain. It is really a marathon job to estimate the future benefits and cost correctly in quantitative terms subject to the uncertainties caused by economic-political social and technological factors.

FACTORS INFLUENCING INVESTMENT DECISION

We shall now study the factors, which have specific or general relevance to capital investment decisions. We have realised already that capital investment decisions are not governed by one or two factors, because the investment problem is not simply one of replacing an old equipment by a new one, but is concerned with replacing an existing process in a system with another process which makes the entire system more effective. We discuss below some of the relevant factors that affects investment decisions:

- (i) **Management outlook:** If the management is progressive and has an aggressive marketing and growth outlook, it will encourage innovation and favour capital proposals which ensure better productivity or quality or both. In some industries where the product being manufactured is a simple standardised one, innovation is difficult and management would be extremely cost conscious. In contrast, in industries such as chemicals and electronics, a firm cannot survive, if it follows a policy of 'make-do' with its existing equipment. The management has to be progressive and innovation must be encouraged in such cases.
- (ii) **Competitor's Strategy:** The competitors' strategy regarding capital investment exerts significant influence on the investment decision of a company. If competitors continue to install more equipment and succeed in turning out better products, the existence of the company not following suit would be seriously threatened. This reaction to a rival's policy regarding capital investment often forces decision on a company.
- (iii) **Opportunities created by technological change:** Technological changes create new equipment which may represent a major change in process, so that there emerges the need for re-evaluation of existing capital equipment in a company. Such changes may justify new investments. Sometimes the old equipment which has to be replaced by new equipment as a result of technical innovation may be downgraded to some other applications. A proper evaluation of this aspect is necessary, but is often not given due consideration. In this connection, we may note that the cost of new equipment is a major factor in investment decisions. However, the management should think in terms of incremental cost, not the full accounting cost of the new equipment because cost of new equipment is partly offset by the salvage value of the replaced equipment. In such analysis an index called the disposal ratio becomes relevant.
- $$\text{Disposal ratio} = \frac{\text{Salvage value} / \text{Alternative use value}}{\text{Installed cost}}$$
- (iv) **Market forecast:** Both short and long run market forecasts are influential factors in capital investment decisions. In order to participate in long-run forecast for market potential critical decisions on capital investment have to be taken.
- (v) **Fiscal incentives:** Tax concessions either on new investment incomes or investment allowance allowed on new investment decisions, the method for allowing depreciation deduction allowance also influence new investment decisions.
- (vi) **Cash flow Budget:** The analysis of cash-flow budget which shows the flow of funds into and out of the company, may affect capital investment decision in two ways. First, the analysis may indicate that a company may acquire necessary cash to purchase the equipment not immediately but after say, one year, or it may show that the purchase of capital assets now may generate the demand for major capital additions after two years and such expenditure might clash with anticipated other expenditures which cannot be postponed. Secondly, the cash flow budget shows the timing of cash flows for alternative investments and thus help management in selecting the desired investment project.
- (vii) **Non-economic factors:** A new equipment may make the workshop a pleasant place and permit more socialising on the job. The effect would be reduced absenteeism and increased productivity. It may be difficult to evaluate the benefits in monetary terms and as such we call this as non-economic factor. Let us take one more example. Suppose the installation of a new machine ensures greater safety in operation. It is difficult to measure the resulting monetary saving through avoidance of an unknown number of injuries. Even then, these factors give tangible results and do influence investment decisions.

RATIONALE OF CAPITAL BUDGETING DECISIONS

The rationale behind the capital budgeting decisions is efficiency. A firm has to continuously invest in new plant

or machinery for expansion of its operations or replace worn out machinery for maintaining and improving efficiency. The main objective of the firm is to maximise profit either by way of increased revenue or by cost reduction. Broadly, there are two types of capital budgeting decisions which expand revenue or reduce cost.

1. **Investment decisions affecting revenue:** It includes all those investment decisions which are expected to bring an additional revenue by raising the size of firm's total revenue. It is possible either by expansion of present operations or the development of new product in line. In both the cases fixed assets are required.
2. **Investment decisions reducing costs:** It includes all those decisions of the firms which reduces the total costs and leads to increase in its total earnings i.e. when an asset is worn out or becomes outdated, the firm has to decide whether to continue with it or replace it by new machine. For this, the firm evaluates the benefit in the form of reduction in operating costs and outlays that would be needed to replace old machine by new one. A firm will replace an asset only when it finds it beneficial to do so. The above decision could be followed decisions following alternative courses: i.e. Tactical investment decisions to strategic investment decisions, as briefly defined below.
3. **Tactical investment decisions:** It includes those investment decisions which generally involves a relatively small amount of funds and does not constitute a major departure from what the firm has been doing in the past.
4. **Strategic investment decisions:** Such decisions involve large sum of money and envisage major departure from what the company has been doing in the past. Acceptance of strategic investment will involve significant change in the company's expected profits and the risk to which these profits will be subject. These changes are likely to lead stock-holders and creditors to revise their evaluation of the company.

KINDS OF CAPITAL BUDGETING DECISIONS

Generally the business firms are confronted with three types of capital budgeting decisions (i) the accept-reject decisions; (ii) mutually exclusive decisions; and (iii) capital rationing decisions.

(i) Accept-reject decisions: Business firm is confronted with alternative investment proposals. If the proposal is accepted, the firm incur the investment and not otherwise. Broadly, all those investment proposals which yield a rate of return greater than cost of capital are accepted and the others are rejected. Under this criterion, all the independent prospects are accepted.

(ii) Mutually exclusive decisions: It includes all those projects which compete with each other in a way that acceptance of one precludes the acceptance of other or others. Thus, some technique has to be used for selecting the best among all and eliminates other alternatives.

(iii) Capital rationing decisions: Capital budgeting decision is a simple process in those firms where fund is not the constraint, but in majority of the cases, firms have fixed capital budget. So large number of projects compete for these limited budget. So the firm ration them in a manner so as to maximise the long run returns. Thus, capital rationing refers to the situations where the firm have more acceptable investments requiring greater amount of finance than is available with the firm. It is concerned with the selection of a group of investment out of many investment proposals ranked in the descending order of the rate of return.

PLANNING OF CAPITAL EXPENDITURE

From the above discussion, it is evident that capital budgeting is concerned with activities ranging from planning the availability, allocation and control of expenditure of long-term as well as short-term investment funds.

Planning of capital expenditure could be done to finance the capital expenditure plans of the company for short-term or long-term periods and hence the long-term plan budget and short-term plan budget.

A. As regards long-term plan budget, the period covered under the planning is three to five or more years. The planning for such expenditure assumes a composite form involving all aspects of economic forecasts for the outlook of entire industry in which the company performs with its unit and forecast for the company with probable or expected coverage of market share. On the basis of this forecast, plant managers estimate their prospective capital expenditure, the marketing managers plan their market shares, the personnel managers assess the requirements for manpower and technical hands to achieve targeted production results, and the finance managers plans, for the funds to be made available for investment taking into consideration the above requirements. The long-range capital budget is continually revised with changing economic conditions, the marketing environment, structure of wages and the inflationary pressures in the economy. It is flexible in nature and oriented towards a long-range growth planning for the company.

B. As regards short-period Capital budgeting, involving short-range planning for funds, it covers expenditure for a short duration involving the period covered within one or two years. It does not involve large capital expenditure but covers temporary need for funds for different departments within the company depending upon the degree of urgency, profitability and savings to be achieved with reference to the capital costs to be incurred. Short run capital expenditure plans get converted into long-term plans of capital expenditure. Short-term capital expenditure plan is known as operating budget and is concerned with revenues and expenses related to firms daily operations.

Significance of planning for capital expenditure is derived only with major investment proposals and the use of funds over a long period. The most important factor affecting the planning horizon is the rate of change in technology in the industry. The advancement in technology may warrant capital investment for short as well as long period depending upon the changing pace of technology and technological obsolescence: long-term plan, however, helps the company to analyse its need and directions into the distant future involving a technological change.

CAPITAL EXPENDITURE CONTROL

Planning and control are inter-linked and consecutive steps for the successful implementation of any programme. Planning done for incurring capital expenditure is followed by control devices to assess the divergencies between the expected and achieved results. Control for capital expenditure is expressed keeping in view the above objective.

It may be recalled that capital expenditure is classified into three main forms viz.:

- (1) expenditure made to reduce costs;
- (2) expenditure made to increase revenue;
- (3) expenditure which is justified on non-economic grounds.

With exercise control over capital expenditure in any of the above categories, the capital expenditure analysis should concentrate on three types of outlays viz.: (1) Major projects, (2) Routine expenditure, and (3) Replacement.

As regards major projects, strategic investment may be made for expansion of productive capacity or achieving product innovation or preparing barriers against capital fluctuations. In the second type of outlay, routine expenditure may be working condition improvement, maintenance expenditure, competition oriented expenditure etc. Thirdly, replacement need may arise to avoid capital wastage for existing equipment to check its disposal value or it may be obsolescence replacement. In all circumstances, proper attention is to be devoted in analysing the need for the capital expenditure so that it would be curtailed to the minimum required.

CAPITAL BUDGETING PROCESS

It is a complex process which may be divided in the following phases:



I. Identification of Investment Opportunities: Mere identification or possible alternatives is not all that is required in any search for investment proposals. The best proposal needs to be discovered and considered. Capital expenditure proposals should come from different segments of the enterprise. Personnel working at different levels in the organisation should be encouraged to participate in the discovery of best available proposals for capital outlays within the limits of their authority, knowledge and experience. It is better if management establishes well-defined guidelines for searching investment proposals so that no useful idea remains uncommunicated and no redundant proposal pass through the processing stage.

Proposals regarding capital expenditure do not originate at the level of the controller or the budget committee. The requirements for fixed-assets expenditure are forwarded by the managers of different operating units or departments. It is, however, better if such proposals are accompanied by commercial and technical assumptions on which these are based and duly supported with details relating to the following matters;

- (a) Market potential for the product and yearly sales forecasts for different years.
- (b) Raw material requirements and their supply position.
- (c) Technical details relating to physical facilities and flow diagrams.
- (d) Financial implications.

Capital expenditure proposals may also originate at the top management level of the company. The Chief Executive may carry out survey relating to physical facilities, new market, development of new products, stage of technology and the like. Such efforts may lead to discovery of certain useful alternatives which should be screened and evaluated in the same way as originating at lower levels.

II. Assembling Investment Proposal: Economic performance like return on investment as calculated in a number of ways under different methods furnishes the most important criterion used for evaluating fixed assets investment

proposals. But here also the technique to be used for evaluating economic performance should be clearly defined and communicated. There are also occasions when non-economic criteria like competition, risk, legal requirements, and social responsibilities become the over-riding considerations in evaluating different investment proposals. But it does not mean that criteria once established holds good under all circumstances and for all times to come. Relevance and reliability of criteria should be continuously reviewed.

All those proposals which are conflicting and do not deserve further consideration are rejected so that only useful alternatives are analysed in detail. Economic evaluation generally plays an important role in the screening process. Along with screening, there is also the need for blending together and unifying different capital projects under the total capital expenditure programme. In this way, conflicting and duplicate proposals would be eliminated and taken together all of them contribute to the accomplishment of some higher objectives. Co-ordination will be greatly facilitated in different proposals for capital outlays are related to each other.

II. Decision Making: It would be useful if different proposals are properly classified and diagnosed before their evaluation. Investment proposals may be classified on the basis of the degree of risk involved or the extent to which they are postponable. In terms of reasons for the expenditure, the proposals may be classified whether they result in replacements, betterments or additions to assets. In the process, certain mutually exclusive and conflicting proposals will be eliminated. If the firm enjoys sufficient resources to finance all the remaining projects which are profitable, ranking them in order of preference is not a serious problem. But in reality, the number of proposals are generally larger than the amount of funds available with the firm, and the controller wants to recommend only the most desirable of them. As a matter of fact, some of the good proposals are also rejected even when they are profitable.

IV. Budgeting Capital Expenditure: Capital budgeting refers to the process of planning the investment of funds in long-term assets of the enterprise. Its purpose is to help management control capital expenditure. With the help of capital budgeting, management is able not only to reject poor investment decisions but also to select, in order of priority the projects which are most profitable and consistent with the objectives and targets set.

Additions, replacement and betterments require additional funds to be committed to long-term assets, and are thus included in the capital budget which is typically prepared for a year. Capital budget is a snapshot of the plan and projects for the coming year for which approval is sought. Capital budget should be flexible so as to eliminate some of the projects already included but allow addition of new projects that deserve consideration. Inclusion of certain projects in the capital budget and its approval by the management does not mean that actual expenditure has been authorised. Rather, it offers an opportunity to look at each project even from the view point of the total organisation. There is also the need of reconcile capital budget with other budgeting activities of the enterprise for example, cash revenue and expense budgets.

V. Implementation and Controlling of Projects: Another important aspect of planning and control of capital outlay is to devise a procedure to exercise control over projects while in process. Controlling of projects in process generally falls within the purview of the financial manager. He is concerned with laying down the procedure to ensure that completion satisfies the norms with respect to cost, time and purpose of expenditure. Variations from approved plans together with reasons should promptly be reported to responsible authorities for deviations. The observations and up-to-date progress report provide sufficient information to the management about the exact stage and status of all major projects.

VI. Follow-up and Performance Report: The project manager or the manager originating the investment proposal, is responsible for submitting its completion report on the basis of which management normally proceeds to carry out the post completion audit. Follow up implies comparing and reporting actual results with the projected result of investment proposal so as to evaluate the performance and outcome in proper perspective. It is required, however, that procedures and format of follow-up should be clearly defined and communicated. Frequency and duration of audit should also be clearly indicated. Audit personnel should also be provided with broad guidelines as to the extent of economic and non-economic evaluation they are expected to carry out.

A project below a certain size may be audited locally by the staff of the departmental manager. But projects involving a number of departments or above a certain size should be audited by a certain group. The latter approach claims uniformity, efficiency and detailed review of the project as its main advantages. The post-completion audit helps management in a number of ways:

- (a) to validate the existing capital expenditure, planning and control procedures and methods;
- (b) to evaluate results;
- (c) to highlight reasons for projects failure; and
- (d) to judge soundness of proposals originating at different levels in the organisation.

INVESTMENT CRITERIA

A sound and systematic investment criteria is absolutely necessary to appraise the economic worth of an investment proposal. It is because of the fact that huge sums of scarce financial and other resources are to be sunk almost irrevocably within a limited span of time for which returns and rewards are uncertain and expected to accrue over a long period of time in the future. A sound investment criteria at least should provide the following:

1. a means of distinguishing between acceptable and non-acceptable projects;
2. ranking of projects in order of their desirability;
3. choice among several alternatives;
4. a criteria which is applicable to any conceivable investment project independent of others;
5. recognising the fact that the bigger benefits are preferable to smaller one and early benefits are preferable to later benefits;
6. helping to choose among mutually exclusive projects, one which maximises the shareholders wealth.

CAPITAL BUDGETING TECHNIQUES

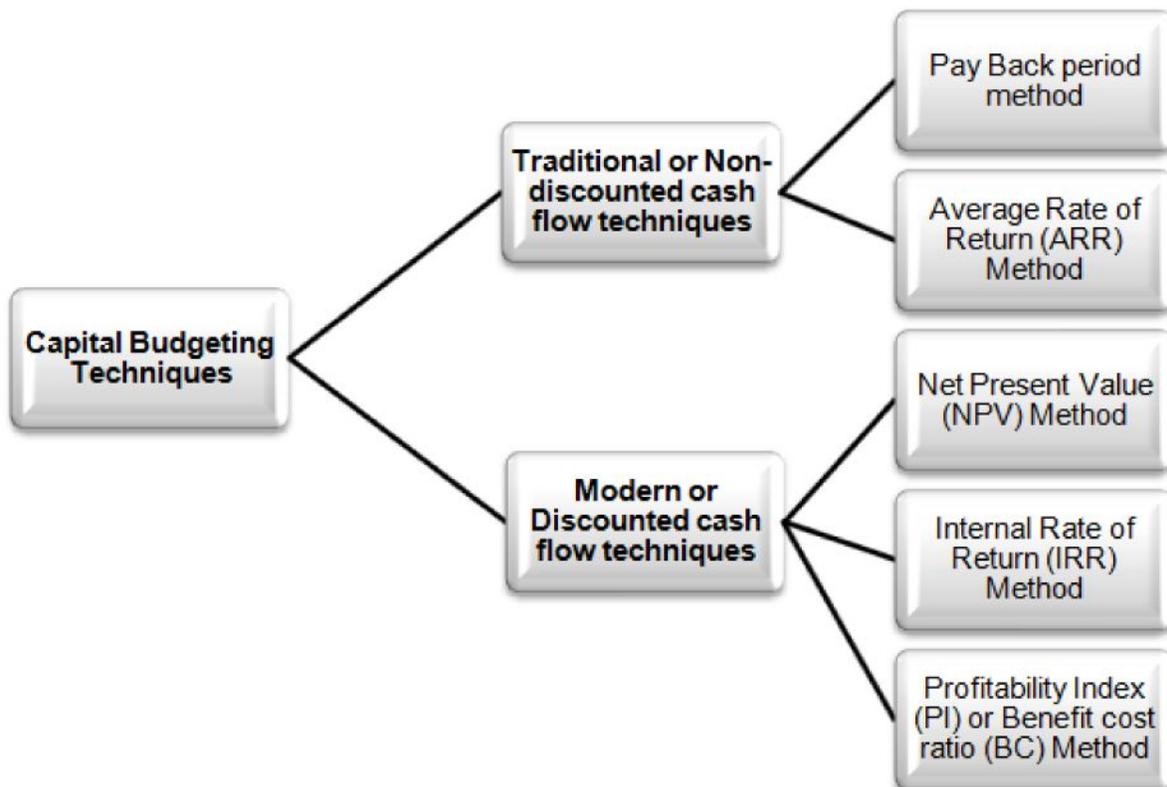
A wide variety of techniques are used for evaluating investment proposals. The most commonly used techniques are as follows:

Traditional or Non- discounted cash flow techniques

- Pay Back Method
- Average Rate of Return (ARR) Method

Modern or Discounted cash flow techniques

- Net Present Value (NPV) Method (including Equivalent NPV and Modified NPV)
- Internal Rate of Return (IRR) Method (including Modified IRR)
- Profitability Index (PI) or Benefit cost ratio (BC) Method



Every method is designated with some purpose in view and as such different methods are not equally useful to every firm and under all circumstances. However, proper understanding of these techniques will help the management to determine the most suitable technique to be used and thus make better investment decisions keeping in view the business situation, particular requirements of the firm and nature of investment proposals.

Traditional or Non- Discounted Cash Flow Techniques

As the name suggested, these techniques do not discount the cash flows to find out their present worth. There are two such techniques available i.e. (i) the Payback period method, and (ii) the Accounting rate of Return method. These are essentially rules of thumb that intuitively grapple with the trade-off between net investment and operating cash inflows. Both these traditional evaluation methods have been discussed on next page:

1. The Payback Period Method

This technique estimates the time required by the project to recover, through cash inflows, the firms initial outlay. Beginning with the project with the shortest payout period, different projects are arranged in order of time required to recapture their respective estimated initial outlays. The payback period for each investment proposal is compared with the maximum period acceptable to management and proposals are then ranked and selected in order of those having minimum payout period.

While estimating net cash inflows for each investment proposal, the following considerations should be borne in mind:

- (i) Cash inflows should be estimated on incremental basis so that only the difference between cash inflows of the firm with and without the proposed investment project is considered.
- (ii) Cash inflows for a project should be estimated on an after-tax basis.
- (iii) Since non-cash expenses like depreciation do not involve any cash outflows, estimated cash inflows from a project should be adjusted for such items.

Let us consider an example. Say, a project requires ₹ 25,000 as initial investment, and it will generate an annual cash inflow of ₹ 5,000 for ten years then pay back period will be five years, calculated as follows:

$$\begin{aligned} \text{Pay back period} &= \frac{\text{Initial Investment}}{\text{Annual cash inflows}} \\ &= \frac{\text{Rs. } 25,000}{\text{Rs. } 5,000} = 5 \text{ years} \end{aligned}$$

The annual cash inflow is calculated by taking into account the amount of net income on account of the asset (or project) before depreciation but after taxation.

Sometimes there are projects where the cash inflows are not uniform. In such a case cumulative cash inflows will be calculated and by interpolation exact payback period can be calculated.

Example: If the project needs an initial investment of ₹ 25,000 and the annual cash inflow for five years are ₹ 6,000, ₹ 9,000, ₹ 7,000, ₹ 6,000 and ₹ 4,000 respectively. The pay back period will be calculated as follows:

Year	Cash inflow ₹	Cumulative cash-inflow ₹
1.	6,000	6,000
2.	9,000	15,000
3.	7,000	22,000
4.	6,000	28,000
5.	4,000	32,000

It is evident from the above table that in 3 years ₹ 22,000 has been recovered and ₹ 3,000 is left of initial investment of ₹ 25,000. It indicates that payback period is between 3 to 4 years calculated as follows:

$$\begin{aligned} \text{Pay back period} &= 3 \text{ years} + \frac{3,000}{6,000} \\ &= 3.5 \text{ years.} \end{aligned}$$

Example 2: Excellent Limited is planning to undertake a project requiring initial investment of \$100 million. The project is expected to generate \$25 million per year in net cash flows for 7 years. Calculate the payback period of the project.

Solution

Payback Period

= Initial Investment ÷ Annual Cash Flow

= \$100M ÷ \$25M

= 4 years

Example 3: Best Limited is planning to undertake another project requiring initial investment of \$50 million and is expected to generate \$10 million net cash flow in Year 1, \$13 million in Year 2, \$16 million in year 3, \$19 million in Year 4 and \$22 million in Year 5. Calculate the payback value of the project.

Solution

Year	<i>(cash flows in millions)</i>	
	Annual Cash Flow	Cumulative Cash Flow
0	(50)	(50)
1	10	(40)
2	13	(27)
3	16	(11)
4	19	8
5	22	30

Payback Period = $3 + 11/19 = 3 + 0.58 = 3.6$ years

Decision Rule for Payback Method:

Accept the project if the payback period calculated for it is less than the maximum set by the management. Reject the project if it is otherwise. In case of multiple projects, the project with shorter payback period will be selected. In essence, payback period shows break-even point where cash inflows are equal to cash out flows. Any inflows beyond this period are surplus inflows.

Advantages of Payback Period Method:

1. It is easy to understand and calculate, thus, investment proposals can be ranked quickly.
2. For a firm experiencing shortage of cash, the payback technique may be used with advantage to select investments involving minimum time to recapture the original investment.
3. The payback period method permits the firm to determine the length of time required to recapture through cash flows, the capital expenditure incurred on a given project and thus helps it to determine the degree of risk involved in each investment proposal.
4. This is ideal in deciding cash investment in a foreign country with volatile dynamic political position where a long-term projection of political stability is difficult.
5. This is, likewise, more preferred in case of industries where technological obsolescence comes within short period; say electronic industries.
6. This method is a good indicator of liquidity. If an entrepreneur is interested to have greater liquidity for the firm, he can choose the proposal, which will provide early cash inflows.

Disadvantages of Payback Method:

1. The payback method ignores the time value of money and treats all cash flows at par. Thus, projects A and B with the following cash flows are treated equally:

Years	Cash Flows	
	Project A ₹	Project B ₹
1.	5,000	2,000
2.	4,000	3,000
3.	3,000	4,000
4.	2,000	5,000
Investment	14,000	14,000

Although Pay Back period is 4 years for both the projects, project A is preferable since it recovers larger amount of money during the initial years.

The pay back method, therefore, ignores the fact that amount of cash received today is more important than the same amount received after say, 2 years.

2. The payback method does not consider cash flows and income that may be earned beyond the payout period so it is not good measure of profitability. It gives misleading results.
3. Moreover, it does not take into account the salvage or residual value, if any, of the long-term asset.
4. The payback technique ignores the cost of capital as the cut-off factor affecting selection of investment proposals.

Suitability of using Payback Period of Method :

Payback period method may be successfully applied in the following circumstances:

- (i) where the firms suffers from liquidity problem and is interested in quick recovery of fund than profitability;
- (ii) high external financing cost of the project;
- (iii) for projects involving very uncertain return; and
- (iv) political and economic pressures.

It may, therefore, be said that payback period is defined as the measure of project's liquidity and capital recovery rather than its profitability.

2. The Average Rate of Return (ARR) OR Accounting Rate of Return Method

This method is designated to consider the relative profitability of different capital investment proposals as the basis for ranking them – the fact neglected by the payout period technique. Since this method uses accounting rate of return, it is sometimes described as the financial statement method. Rate of return is calculated by dividing earnings by capital invested. The numerator, i.e., earnings can be interpreted in a number of ways. It might mean income after taxes and depreciation, income before taxes and depreciation, or income after taxes but before depreciation. Since both numerator and denominator carry different meanings. It is not surprising if one comes across a number of variations of the average rate of return method. However, the two common variations are:

(a) Average Rate of Return in Original Investment:

$$= \left(\frac{\text{Net earnings after Depreciation and Taxes}}{\text{No. of years project will last}} \right) \div \text{Original Investment}$$

(b) Average Rate of Return on Average Investment:

$$= \left(\frac{\text{Net earnings after Depreciation and Taxes}}{\text{No. of years project will last}} \right) \div \text{Average Investment}$$

Average investment is estimated by dividing the total of original investment and investment in the project at the end of its economic life by 2. The approach of dividing average annual after-tax earnings of the project by its original investment makes no attempt to incorporate the fact of gradual recovery of investment over time, hence tends to undertake the average rate of return. The average investment approach on the other hand, gives best result when original investment is evenly recovered over the economic life of the project which may not always be the case.

Decision Rule for Average of Rate of Return Method:

Normally, business firm determine rate of return. So accept the proposal if $ARR > \text{Minimum rate of return (cut off rate)}$

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and Reject the project if $ARR < \text{Minimum rate of return (cut off rate)}$

In case of more than one project, where a choice has to be made, the different projects may be ranked in descending or ascending order of their rate of return. Project below the minimum rate will be dropped. In case of project yielding rate of return higher than minimum rate, it is obvious that project yielding a higher rate of return will be preferred to all.

Advantages of Average Rate of Return Method:

- (i) Earnings over the entire life of the project are considered.
- (ii) This method is easy to understand, simple to follow. Accounting concept of income after taxes is known to every student of accountancy.

Disadvantages of Average Rate of Return Method:

- (i) Like the payback technique, the average return on investment method also ignores the time value of money. Consideration to distribution of earnings over time is important. It is to be accepted that current income is more valuable than income received at a later date.
- (ii) The method ignores the shrinkage of original investment through the process of charging depreciation allowances against earnings. Even the assumption of regular recovery of capital over time as implied in average investment approach is not well founded.
- (iii) The average rate of return on original investment approach cannot be applied to a situation where part of the investment is to be made after the beginning of the project.
- (iv) Since ARR can be calculated by using different methods, so results are not the same. Thus, the identification of right method to compare with cut of rate is difficult to apply.
- (v) Its major limitation is that ARR is based on accounting principle and not on cash flow analysis.

Suitability of using ARR Method:

If the project life is not long, then the method can be used to have a rough assessment of the internal rate of return. The present method is generally used as supplementary tool only.

Comparison between Average Rate of Return and Payback Method:

The average rate of return method and its comparison with payback method may be illustrated as follows:

Suppose there are two investment proposals A and B each with capital investment of ₹ 20,000 and depreciable life of 4 years. Assume that following are the estimated profit and cash inflows when annual straight line depreciation charged is ₹ 5,000.

Period	Project A		Project B	
	Book Profits ₹	Net Cash Inflows ₹	Book Profits ₹	Net Cash Inflows ₹
1.	4,000	9,000	1,000	6,000
2.	3,000	8,000	2,000	7,000
3.	2,000	7,000	3,000	8,000
4.	1,000	6,000	4,000	9,000
Total	10,000	30,000	10,000	30,000
Average rate of return on original investment	12.5%		12.5%	

If evaluated in terms of average rate of return method, the two projects are equally favourable. However, project A is more favourable than project B since it provides larger cash inflows in the initial period (i.e. Quicker Payback).

Discounted Cash Flow (DCF) Method

The traditional techniques like the Payback period or Accounting rate of return takes no account of the time value of the money. But money received today is much more valuable than the some money received later. Present inflationary conditions magnify the difference. This is the principal fact that modern analysis technique like Discounted Cash flow have incorporated to improve on the past procedures. Under this method, the cash flow discounted at the projects discount rate to the present time, is a present value. Analysis concentrate on the incremental cash flow of a project. Discounted cash flow method involves following steps:

1. Computation of cash flows i.e. both inflows and out flows (preferably after tax) over the life of the project.
2. Applying the discount factor to the cash flows.
3. Totalling discounted cash-inflows and comparing it with discounted cash outflows.

Broadly, there are three discounted cash flow methods for evaluating capital investment proposals i.e.

- A. Net Present Value Method
- B. Internal Rate of Return Method
- C. Profitability Index or Benefit Cost (B/C) Ratio Method.

A. Net Present Value Method (NPV)

The net present value method is understood to be the best available method for evaluating the capital investment proposals. Under this method, the cash outflows and inflows associated with each project are ascertained first. Cash inflows are worked out by adding depreciation to profit after tax arising to each project. Since the cash outflows and inflows arise at different point of time and cannot be compared, so both are reduced to the present values at the rate of return acceptable to the management. The rate of return is either cost of capital of the firm or the opportunity cost of capital to be invested in the project. The assumption under this method remain that cash inflows are reinvested at the same discount rate.

In essence, Net Present Value is the difference between the sum total of present values of all the future cash inflows and outflows:

Algebraically:

$$NPV = \frac{R_1}{(1+k)^1} + \frac{R_2}{(1+k)^2} + \dots + \frac{R_n}{(1+k)^n} + \frac{W_n}{(1+k)^n} + \frac{S_n}{(1+k)^n} - C$$

$$NPV = \sum_{t=1}^n \frac{R_t}{(1+k)^t} + \frac{S_n + W_n}{(1+k)^n} - C$$

If cash outflow is also expected to occur at some time other than initial investment (non-conventional cash flows) then formula would be

$$NPV = \left[\frac{R_1}{(1+k)^1} + \dots + \frac{R_n}{(1+k)^n} + \frac{S_n}{(1+k)^n} + \frac{W_n}{(1+k)^n} \right] - \left[C_0 + \frac{C_1}{(1+k)^t} + \dots + \frac{C_n}{(1+k)^n} \right]$$

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$$NPV = \sum_{t=1}^N \frac{R_t}{(1+k)^t} + \frac{S_n + W_n}{(1+k)^n} - \sum_{t=1}^N \frac{C_t}{(1+k)^t} - C_0$$

NPV = Net Present Value

R=Cash inflow at different time period

k=Rate of discount or cost capital

t=1 = first period in the sum

n=The last period in the sum

S_n = Salvage value

W_n = Working capital

C=Cost of investment plus Working Capital

For Example: The cash flows of a project are provided below with the discounting factors to analyse the Net Present Value:

Year	CF	Disc. Factor	PV
0	-100000	1	-100000
1	26000	.9091	23637
2	28000	.8264	23139
3	31000	.7573	23290
4	33000	.6830	22539
5	36000	.6209	22352
6	18000	.5645	<u>10161</u>
	NPV =		<u>25121</u>

Decision Rule of using NPV Method:

If NPV > Zero : Accept the project

NPV < Zero : Reject the project

NPV = Zero : Firm is indifferent to accept or reject the project.

In the above example, since NPV is more than zero, it is advisable to accept the project.

Example: Compute the NPV for Project A and accept or reject the project cash flows shown below if the appropriate cost of capital is 10%

Time	Cash Flow
0	-75
1	-75
2	0
3	100
4	75
5	50

$$NPV = CF_1/(1+r)^1 + CF_2/(1+r)^2 + CF_3/(1+r)^3 + CF_4/(1+r)^4 + CF_5/(1+r)^5 - CF_0$$

Where:

CF_n Cash flow at time n

r Interest rate/Cost of capital

CF₀ Cash outflow at time 0

Given Project A's cash flows and a cost of capital of 10%, the NPV for this project is:

$$NPV = -75/(1+0.1)^0 + 100/(1+0.1)^1 + 75/(1+0.1)^2 + 100/(1+0.1)^3 + 75/(1+0.1)^4 + 50/(1+0.1)^5$$

$$NPV = -68.18 + 0 + 75.13 + 51.23 + 31.04 - 75$$

NPV = 14.22

Given a positive NPV of \$14.22 we should accept Project X based on these cash flows.

Example: Calculate the net present value of a project which requires an initial investment of \$243,000 and it is expected to generate a net cash flow of \$50,000 each month for 12 months. Assume that the salvage value of the project is zero. The target rate of return is 12% per annum.

Solution: We have,

$$\text{Initial Investment} = \$243,000$$

$$\text{Net Cash Inflow per Period} = \$50,000$$

$$\text{Number of Periods} = 12$$

$$\text{Discount Rate per Period} = 12\% \div 12 = 1\%$$

Net Present Value

$$= \$50,000 \times (1 - (1 + 1\%)^{-12}) \div 1\% - \$243,000$$

$$= \$50,000 \times (1 - 1.01^{-12}) \div 0.01 - \$243,000$$

$$= \$50,000 \times (1 - 0.887449) \div 0.01 - \$243,000$$

$$= \$50,000 \times 0.112551 \div 0.01 - \$243,000$$

$$= \$50,000 \times 11.2551 - \$243,000$$

$$= \$562,754 - \$243,000$$

$$= \$319,754$$

Example: An initial investment of \$8,320 thousand on plant and machinery is expected to generate net cash flows of \$3,411 thousand, \$4,070 thousand, \$5,824 thousand and \$2,065 thousand at the end of first, second, third and fourth year respectively. At the end of the fourth year, the machinery will be sold for \$900 thousand. Calculate the net present value of the investment if the discount rate is 18%. Round your answer to nearest thousand dollars.

Solution

PV Factors:

$$\text{Year 1} = 1 \div (1 + 18\%)^1 = 0.8475$$

$$\text{Year 2} = 1 \div (1 + 18\%)^2 = 0.7182$$

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Year 3 = $1 \div (1 + 18\%)^3$ H" 0.6086

Year 4 = $1 \div (1 + 18\%)^4$ H" 0.5158

The rest of the calculation is summarized below:

Year	1	2	3	4
Net Cash Inflow	\$3,411	\$4,070	\$5,824	\$2,065
Salvage Value				900
Total Cash Inflow	\$3,411	\$4,070	\$5,824	\$2,965
× Present Value Factor	0.8475	0.7182	0.6086	0.5158
Present Value of Cash Flows	\$2,890.68	\$2,923.01	\$3,544.67	\$1,529.31
Total PV of Cash Inflows	\$10,888			
“ Initial Investment	“ 8,320			
Net Present Value	\$2,568	thousand		

Advantages of NPV Method:

- (i) Income over the entire life of the project is considered.
- (ii) The method takes into account time value of money.
- (iii) The method provides clear acceptance so interpretation is easy.
- (iv) When projects involves different amount of investment, the method may not provide satisfactory answers.
- (v) This method considers the firm objective of wealth maximisation concept for the shareholders.

Disadvantages of NPV Method:

- (i) As compared with the first two methods, the present value approach is certainly more difficult to understand and apply. It requires special skill for calculation.
- (ii) An additional difficulty in this approach is encountered when projects with unequal lives are to be evaluated.
- (iii) It is difficult to determine the firm cost of capital or appropriate rate of discount.

Suitability of NPV Method:

Net present value is the most suitable method in those circumstances where availability of resources is not a constraint. The management authority can accept all those projects having Net Present Value either Zero or positive. This method shall maximise shareholders wealth and market value of share which is the sole aim of any business enterprise.

The Modified Net Present Value Method

One of the limitations of NPV method is that reinvestment rate in case of NPV is Cost of Capital (k). However, in case of MNPV, different reinvestment rates for the cash inflows over the life of the project may be used. Under this modified approach, terminal value of the cash inflows is calculated using such expected reinvestment rate (s). Thereafter, MNPV is determined with present value of such terminal value of the cash inflows and present value of the cash outflows using cost of capital (k) as the discounting factor.

Terminal value is the sum of the compounded value of cash inflows of different years at the end of the life of the project. If the life of the project is 'n' years, cash inflow of period 't' is CF_t and reinvestment rate is 'r', the terminal value will be $\sum (CF_t)^{n-t}$

B. Internal Rate of Return (IRR)

The internal rate of return refers to the rate which equates the present value of cash inflows and present value of cash outflows. In other words, it is the rate at which net present value of the investment is zero. If the Net Present Value is positive, a higher discount rate may be used to bring it down to equalise the discount cash inflows and vice versa. That is why Internal Rate of Return is defined as the break even financing rate for the project.

The necessary steps to be followed in applying this method are:

- (i) Project the net cash benefit of an investment during the whole of its economic life. Future cash flows should be estimated after taxes, but before depreciation and interest.
- (ii) Determine the rate of discount that equates the present value of its future cash benefits to its present investment. The rate of discount is determined by the method of trial and error.
- (iii) Compare the rate of discount as determined above with the cost of capital or any other cut-off rate, and select proposals with the highest rate of return as long as the rate is higher than the cost of capital or cut off rate.

Assuming conventional cash flows, mathematically the Internal Rate of Return is represented by that rate of, such that

$$C = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \dots + \frac{CF_n}{(1+r)^n} + \frac{S_n}{(1+r)^n} + \frac{W_n}{(1+r)^n}$$

$$C = \sum_{t=1}^n \frac{CF_t}{(1+r)^t} + \frac{S_n}{(1+r)^n} + \frac{W_n}{(1+r)^n}$$

$$C = \sum_{t=1}^n \frac{CF_t}{(1+r)^t} + \frac{S_n + W_n}{(1+r)^n}$$

$$0 = \sum_{t=1}^n \frac{CF_t}{(1+r)^t} + \frac{S_n + W_n}{(1+r)^n} - C$$

For non-conventional cash flows the equation would be

$$0 = \sum_{t=1}^n \frac{CF_t}{(1+r)^t} + \frac{S_n + W_n}{(1+r)^n} - \sum_{t=1}^n \frac{C_1}{(1+k)^t}$$

r = the internal rate of return

CF_t = cash inflows at different time periods

S_n = salvage value in period n

W_n = working capital adjustment in period n

C = cash outlays at different time periods

k = cut off rate, the rate below which a project will not be accepted, which is normally the cost of capital

n = life of the project

Computation of Internal Rate of Return:

The computation of Internal Rate of Return is relatively complicated and difficult compared to Net Present Value. One has

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to follow trial and error exercise to ascertain Internal Rate of Return (r) which equates the cash inflows and outflows of the investment proposals. Under net present value, k is known, but under this method it is worked out.

Initially the Internal rate of return (r) may give

$NPV > 0$ $r > k$ (higher rate will be tried)

$NPV = 0$ $r = k$

$NPV < 0$ $r < k$ (lower rate will be tried)

To calculate the exact figure, we use the method of interpolation i.e.

$$IRR(r) = r_L + \left[\frac{PV_{CFAT} - PV_C}{DPV} \right] \times Dr$$

or

$$= r_H - \left[\frac{PV_C - PV_{CFAT}}{DPV} \right] \times Dr$$

r_L = The lower rate of discount.

PV_{CFAT} = Calculated present value of cash inflow.

PV_C = Present value of cash outlay.

DPV = Difference in calculated present value.

Dr = Difference in rate of interest.

r_H = The higher rate of discount.

Decision Rule:

If Internal Rate of Return i.e.

$r > k$ (cut off rate) Accept the investment proposal

$r < k$ Reject the investment proposal

$r = k$ Indifferent

In case of several investment proposals the projects may be ranked according to their Internal Rate of Return, the project with highest Internal Rate of Return, is ranked first and so on. Acceptance of more than one project may follow in order of priority

Let us illustrate the method in two different situations:

(i) Uniform cash inflows

(ii) Non-uniform cash inflows.

Example

Let us consider a project where initial investment is ₹ 18,000. The annual cash flow will be ₹ 5,600 for a period of 5 years. The internal rate of return can be computed by computing the factor as under

$$F = I/C$$

where,

F = Factor to be located

I = Initial investment

C = Average cash inflow

$$= \frac{18,000}{5600} = 3.214$$

After the factor is calculated as above, it is located in the different Annuity table on the line representing the number of years corresponding to the economic life of the project.

In above example, according to annuity table, factor closest to 3.21 for five years are 3.2 (16% discount rate) and 3.199 (17% discount rate). Net Present Value for both the rates are as follows:

Rate of Discount	16%	17%
Total Present Value	₹ 5,600 x 3.274 = ₹ 18,334.40	₹ 5,600 x 3.199 = ₹ 17,914.40
Less: initial outlay	₹ 18,000.00	₹ 18,000.00
NPV	+ ₹ 334.40	(-) ₹ 85.60

Since Net Present Value is greater than zero i.e. ₹ 334.40 at 16% rate of discount, we need a higher rate of discount to equalise Net Present Value with total outlay. On other hand, Net Present Value is less than zero i.e. (-) ₹ 85.60 at 17% rate of discount we need lower rate. So the above exercise shows that internal Rate of Return lies between 16% and 17%. To find out the exact figure, the interpolation can be used i.e.

$$IRR = r_L + \frac{PV_{CFAT} - PV_C}{\Delta PV} \times \Delta r$$

$$r_L = 16$$

$$PV_{CFAT} = + ₹ 18,334.40$$

$$PV_C = ₹ 18,000$$

$$\Delta PV = ₹ 420$$

$$\Delta r = 1$$

$$IRR = 16 + \frac{₹334}{₹420} \times 1 = 16+.8$$

$$= 16.8\%$$

Alternatively it can be worked out by using higher rate of return also.

Under uneven cash inflow, the calculation of internal rate of return is a tedious job. The process of Internal Rate of Return can be understood with the help of following illustration i.e. Company A is proposed to instal a new machine costing ₹ 16,200 having an economic life of 3 years. The annual Cash inflow shall be ₹ 8,000, 7,000 and 6,000 in the respective 3 years. Calculate Internal Rate of Return.

To compute internal rate of return, the trial and error method has been followed.

$$\text{Average cash inflow} = \frac{\text{Rs. } 8,000 + 7,000 + 6,000}{3} = ₹ 7,000$$

$$F = \frac{I}{C} = \frac{₹16,200}{₹7,000} = 2.314$$

According to annuity table factor closest to 2.314 for 3 years are 2.322 (14%) and 2.246 (16%). Broad results are given in the following table:

Year	Cash in flow (₹)	Rate of Discount (14%)	PV (₹)	Rate of Discount (16%)	PV (₹)	Rate of Discount	PV (₹) (15%)
1.	8,000	0.877	7,016	.862	6,896	.870	6,960
2.	7,000	0.769	5,383	.743	5,201	.756	5,292
3.	6,000	0.675	4,050	.641	3,846	.658	3,948
			16,449		15,943		16,200
Less: Cash outlay			16,200		16,200		16,200
NPV			+249		-257		0

From the above table, it is quite clear that net present value is zero with 15% rate of discount, so it is the true internal rate of return.

Advantages of IRR Method:

- (i) The discounted cash flow (IRR) takes into account the time value of money.
- (ii) It considers cash benefits, i.e. profitability of the project for the whole of its economic life.
- (iii) The rate of discount at which the present value of cash flows is equated to capital outlay on a project is shown as a percentage figure. Evidently, this method provides for uniform ranking and quick comparison of relative efficiency of different projects.
- (iv) This method is considered to be a sophisticated and more reliable technique of evaluating capital investment proposals.
- (v) The objective of maximising of owner's wealth is met.

Disadvantages of IRR Method:

- (i) The discounted cash flow is the most difficult of all the methods of project evaluation discussed above.
- (ii) An important assumption implied in this method is that incomes are reinvested (compounding) over the project's economic life at the rate earned by the investment. This assumption is correct and justified only when the internal rate of return is very close to the average rate of return earned by the company on its total investments. To the extent internal rate of return departs from the typical rate of earnings of the company, results of this method, will be misleading. Thus, when the internal rate of return on a project is computed to be 30% while company's average rate of return is 15%, the assumption of earning income on income at the rate of 30% is highly unrealistic. From this point of view the assumption of the net present value method that incomes are reinvested at the rate of discount (cost of capital) seems to be more reasonable.
- (iii) The rate may be negative or one or may be multiple rate as per calculations. When a project has a sequence of changes in sign of cash flow, there may be more than one internal rate of return.

Modified IRR

The limitation of IRR is that reinvestment rate in case of IRR is IRR itself. This can be overcome changing the reinvestment rate incorporating the expected reinvestment rate for future periods over the life of the projects

and using such expected reinvestment rate for calculating the terminal value of the cash inflows for different years of the life of the project. Thereafter, MIRR is determined with present value of such terminal value of the cash inflows and present value of the cash outflows. In other words, the MIRR is the discount rate which will make present /discounted value of terminal value of cash inflows equal to present/discouted value of cash outflow.

The procedure for calculating MIRR is as follows:

Step 1: Calculated the present Value of the costs (PVC) associated with the project, using the cost of capital (r) as the discount rate:

PVC =

$$PVC = \sum_{t=0}^n \frac{\text{Cash outflow}_t}{(1+r)^t}$$

Step 2: Calculate the terminal Value (TV) of the cash inflow expected from the project:

$$TV = \sum_{t=0}^n \text{Cash Inflow}_t (1+r)^{n-t}$$

Step 3: Obtain MIRR by solving the following equation:

$$PVC = \frac{TV}{(1 + \text{MIRR})^n}$$

To illustrate the calculation of MIRR let us consider an example. Srivastava Limited is evaluating a project that has the following cash flow stream associated with it:

Year	0	1	2	3	4	5	6
Cash Flow	-120	-80	20	60	80	100	120

The cost of capital is 15 percent. The present value of costs will be :

$$120 + \frac{80}{1.15} = 189.6$$

The terminal value of cash inflow is:

$$20(1.15)^4 + 60(1.15)^3 + 80(1.15)^2 + 100(1.15) + 120$$

$$= 34.98 + 91.26 + 105.76 + 115 + 120 = 467$$

The MIRR is obtained as follows:

$$189.6 = \frac{467}{(1 + \text{MIRR})^6}$$

$$(1 + \text{MIRR})^6 = 2.463$$

$$1 + \text{MIRR} = 2.463^{1/6} = 1.162$$

MIRR = 1.162 or 16.2 percent

Modified NPV or Modified IRR may be used to resolve the conflict in ranking of the alternative projects under NPV and IRR methods arising out of differences in timing of cash flows, i.e., in one project, the cash inflows in the initial years may be more than the other or vice versa.

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In case of mutually exclusive projects, financial appraisal using NPV & IRR methods may provide conflicting results. The reasons for such conflicts may be attributed to (i) Difference in timing / pattern of cash inflows of the alternative proposals (Time Disparity), (ii) difference in their amount of investment (Size Disparity) and (iii) difference in the life of the alternative proposals (Life Disparity).

TIME DISPARITY: Main source of conflict is the different re-investment rate assumption. Such conflicts may be resolved using modified version of NPV and IRR using expected / defined reinvestment rate applicable to the firm.

For modified NPV and IRR, at first Terminal Value (TV) is calculated using the specified reinvestment rate.

$$TV = \sum_{t=1}^n CF_t(1+r)^{n-t} \quad MNPV = \{TV \div (1+K)^n\} - I \quad MIRR = (TV \div I)^{1/n} - 1$$

Where, r^* = reinvestment rate

Example:

	Project I	Project II
Investment	220000	220000
Year 1	62000	142000
Year 2	80000	80000
Year 3	100000	82000
Year 4	140000	40000

Cost of capital: 10%

Solution:

	I	II
NPV()	73226	62628
IRR (appx.)	22%	25%

According to NPV, Project I is better but according to IRR, Project II is better. So, there is conflicting results. The primary reason for such conflict is the difference in timing of cash inflows. In case of Project II, more cash inflows occur in the initial years while in case of Project I more cash flows occur towards the end of the project. Such conflict may be resolved using Modified version of NPV or IRR (MNPV or MIRR) as follows.

Using reinvestment rate of 14%,

$$TV_1 = 62000(1 + .14)^3 + 80000(1 + .14)^2 + 100000(1 + .14)^1 + 140000(1 + .14)^0 = 449822$$

$$TV_2 = 142000(1 + .14)^3 + 80000(1 + .14)^2 + 82000(1 + .14)^1 + 40000(1 + .14)^0 = 447822$$

$$MNPV_I = \{449822 \div (1 + .10)^4\} - 220000 = 87228$$

$$MNPV_{II} = \{447822 \div (1 + .10)^4\} - 220000 = 85862$$

$$MIRR_I = (449822 \div 220000)^{1/4} - 1 = 19.57\%$$

$$MIRR_{II} = (447822 \div 220000)^{1/4} - 1 = 19.32\%$$

Both the MIRR and MNPV show that Project I should be accepted.

SIZE DISPARITY:

Conflict may arise due to disparity in the size of initial investment /outlays. Such conflict may be resolved using **incremental approach**.

Steps :

- Find out the differential cash flows between the two proposals
- Calculate the IRR of the incremental cash flows
- If the IRR of the differential cash flows exceeds the required rate of return (usually cost of capital), the project having greater non-discounted net cash flows should be selected.

Example:

	Project A (₹)	Project B (₹)
Investment	5000000	7500000
Net Cash Inflow	6250000	9150000

$K = 10\%$

Solution: At first, NPV and IRR of the projects are calculated and it has been found that,

$$NPV_A < NPV_B$$

$$IRR_A > IRR_B$$

The above results indicate that there is a conflict in ranking of the projects under NPV and IRR. Such conflict is mainly due to the difference in the initial investment of the projects and it can be resolved using incremental approach as follows.

Differential Cash Outflows = ₹ 2500000, Differential Net Cash Inflows = ₹2900000

We know that IRR is the discount rate at which Present Value of Cash Inflows are equal to the Present Value of Cash Outflows.

$$\text{So, } 25,00,000 = 29,00,000 / (1+r)^1$$

$$\text{Or, } 1+r = 29,00,000 / 25,00,000 \text{ Or, } r = 1.16 - 1 = 0.16$$

IRR (r) of the differential cash flows = 16%, which is greater than Cost of Capital (k). Therefore, Project with higher non-discounted cash inflows, i.e., Project B would be selected.

Advantages and Disadvantages of the MIRR Method

The modified internal rate of return resolves two problems inherent to the IRR.

- All cash inflows are reinvested at the reinvestment rate, which is more realistic than reinvesting at the IRR.
- The method of calculation eliminates the problem of multiple IRR for projects with abnormal cash flows.

The main disadvantage of the MIRR method is the potential conflict with the NPV method. The reason may be due to a difference in project scale or in the timing of cash flows (the problem was discussed in "NPV vs IRR method"). Furthermore, if the reinvestment rate is lower than the cost of capital, there is a conflict with the basic assumption of the NPV method, which is that all expected cash inflows are reinvested at the cost of capital (discount rate). Thus, the project can simultaneously have positive NPV and MIRR lower than the cost of capital. That is the reason why some academic studies recommend using the reinvestment rate equal to the cost of capital raised for a project.

Unequal lives of the Projects or LIFE DISPARITY

In some cases, the mutually exclusive alternatives with different/ unequal lives may lead to conflict in ranking. To resolve such conflict, one approach is to compare the alternatives on the basis of their Equivalent Annual Benefit (EAB) or Equivalent Annual Cost (EAC) and select the alternative with the higher EAB or lower EAC.

$$\text{EAB} = \text{NPV} \times \text{Capital Recovery Factor or } \text{NPV} \div \text{PVIFA}_{k,n}$$

$$\text{Capital Recovery Factor} = \text{the inverse of } \text{PVIFA}_{k,n} = k(1+k)^n \div (1+k)^n - 1$$

$$\text{EAC} = \text{PV of Cost} \div \text{PVIFA}_{k,n}$$

Another approach is to evaluate the alternatives over an equal time frame using the lowest common multiple (LCM) of the lives of the alternatives under consideration. This method is referred to as **LCM** method. For example, life of Proposal A is 3 Years and that of B is 5 years. Lowest common multiple period is 15 years, during which period, it may be assumed that Machine A will be replaced 5 times and Machine B will be replaced 3 times. Cash Flows are extended to this period and computations made. The final results would then be on equal platform i.e. equal years, and hence would be comparable.

Example:

	P	Q
Investment (Rs.):	5000000	5000000
Cash Inflows (Rs.):		
Year 1	7500000	2000000
Year 2		2000000
Year 3		7000000
K = 12%		

Solution.

	P	Q
NPV (Rs.)	1696400	3362800
IRR	50%	40%

From the above, it is found that there is conflict in ranking of the projects under NPV and IRR. The reason may be attributed primarily to the unequal lives, i.e., life disparity. In such situation, EAB approach may be followed as follows.

	P	Q
Capital Rec. Factor	1.12	416*
		*1 ÷ (.893+.797+.712)
EAB (Rs.)	1900000	1398900

Based on EAB, Project P is better.

Example 2:

Cost of Machine I – ₹75000, Life 5 years, annual operating cost ₹12000.

Cost of Machine II – ₹50000, Life 3 years, annual operating cost ₹20000.

Cost of Capital 12%. Present Value of all costs:

Machine I: ₹118260; Machine II: ₹86030.

EAC (Equivalent Annual Cost): $PV \text{ of Cost} \div PVIFA_{k,n}$

Machine I: $118260 / 3.605 = ₹32804$ Machine II: $86030 / 2.402 = ₹35816$

So, the machine I is preferable to machine II

If a firm is evaluating two mutually exclusive proposals, then the decision may be taken in normal course on the basis of NPV of the two proposals. The proposal with the higher NPV will be selected as it will give greater rise in the wealth of the shareholders. The difference in economic lives may not be of much consequence, unless there is a shortage of funds, the situation known as capital rationing. However, the different economic lives may give rise to the following considerations.

1. The earlier receipts of cash inflow from a shorter project may be advantageous.
2. If the project can be repeated, then the length of the project will be an important factor since the NPV of a shorter period project is recovered more frequently than the NPV of a longer period project.

For example, a firm is evaluating the following two proposals @ 15% discount rate:

Year	Project X (₹)	Project Y (₹)
0	-24,000	-44,000
1	14,000	16,000
2	14,000	16,000
3	14,000	16,000
4	—	16,000
5	—	16,000

In this case, the NPVs of the proposals are 7,962 (Project X) and 9,632 (Project Y). Hence, if these are one off investment, the firm should select the proposal Y as it is having higher NPV. However, in making this decision on the basis of the NPV of two proposals, an important consideration has been overlooked i.e., the NPV of the project X is realized within the three year while NPV of project Y is realized in five years. The early recovery of NPV of project X can possibly be reinvested elsewhere to get some return. But this aspect has not been considered in the above analysis. Thus, the above procedure is not correct because it introduces, impliedly, a bias in favour of the proposal with a longer life.

Equivalent Annual Annuity Approach (EAA)

The EAA approach uses a three-step process to compare projects. The present value of the constant annual cash flows is exactly equal to the project's net present value. The three steps include:

1. Calculate each project's NPV over its lifetime
2. Compute each project's EAA so that the present value of the annuities is exactly equal to the project's NPV
3. Compare each project's EAA and select the one with the highest EAA.

For example, assume a company with a weighted average cost of capital of 10% is comparing two projects, A and B. Project A has an NPV of 3 million and an estimated life of five years, while Project B has an NPV of 2 million and an estimated life of three years. Using a financial calculator, Project A has an EAA of 791,392.44, and Project B

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has an EAA of 804,229.61. Under the EAA approach, the company would choose Project B since it has the higher equivalent annual annuity value.

Formula for Equivalent Annual Annuity Approach

An analyst can use the following formula in a spreadsheet or with a normal non-financial calculator with exactly the same results.

$$C = (r \times \text{NPV}) / (1 - (1 + r)^{-n})$$

Where:

C = equivalent annuity cash flow

NPV = net present value

r = interest rate per period

n = number of periods

For example, consider two projects. One has a seven-year term and an NPV of 100,000. The other has a nine-year term and an NPV of 120,000. Both projects are discounted at a 6 percent rate. The EAA of each project is:

$$\text{EAA Project one} = (0.06 \times 100,000) / (1 - (1 + 0.06)^{-7}) = 17,914$$

$$\text{EAA Project two} = (0.06 \times 120,000) / (1 - (1 + 0.06)^{-9}) = 17,643$$

Project one is the better option.

C. Profitability Index (PI) Method

Profitability Index is defined as the rate of present value of the future cash benefits at the required rate of return to the initial cash outflow of the investment. symbolically, Profitability Index is expressed as :

$$\text{Profitability index} = \frac{\text{PV of Future cash flows}}{\text{Initial cash investment}}$$

$$\text{PI} = \frac{\sum_{t=1}^n \frac{A_t}{(1+k)^t}}{C}$$

A_t = Present value of cash inflows.

k = rate of return

C = initial cash outlay

t = time period.

The above ratio is an indicator of the profitability of the project. If the ratio is equal to or greater than one, it shows that project has an expected yield equal to or greater than the discount rate. If the index is less than one, it indicates that project has an expected yield less than the discount rate.

Decision Rule:

If $\text{PI} > 1$ Accept the Project, $\text{PI} = 1$ indifferent, $\text{PI} < 1$ Reject the project.

In the event of more than one alternatives, projects may be ranked according to their ratio – the project with the highest ratio should be ranked first and *vice versa*.

Advantages of PI Method:

- (1) Profitability Index method gives due consideration to the time value of money.
- (2) Profitability Index method satisfies almost all the requirements of a sound investment criterion.
- (3) This method can be successfully employed to rank projects of varying cash and benefits in order of their profitability.
- (4) This method is consistent with the principle of shareholders wealth maximisation.

Disadvantages of PI Method:

- (1) This method is more difficult to understand and compute.
- (2) This method does not take into account the size of investment.
- (3) When cash outflows occur beyond the cement period Profitability Index Ratio criterion is unsuitable as a selection criterion.

COMPARISON OF NET PRESENT VALUE AND INTERNAL RATE OF RETURN METHODS

The net present value and internal rate of return, two widely used methods are the species of the same genus i.e. Discount cash flow method, yet they are different from each other on various points.

The broad points of difference between the two are as follows:

Points of Differences

1. Interest Rate: Under the net present value method rate of interest is assumed as the known factor whereas it is unknown in case of internal rate of return method.

2. Reinvestment Axiom: Under both the methods, it is assumed that cash inflows can be re-invested at the discount rate in the new projects. However, reinvestment of funds, at cut-off rate is more possible than internal rate of return. So the net present value method is more reliable than internal rate of return method for ranking two or more projects.

3. Objective: The net present value method took to ascertain the amount which can be invested in a project so that its expected yields will exactly match to repay this amount with interest at the market rate. On the other hand, internal rate of return method attempts to find out the rate of interest which is maximum to repay the invested fund out of the cash inflows.

Points of Similarities

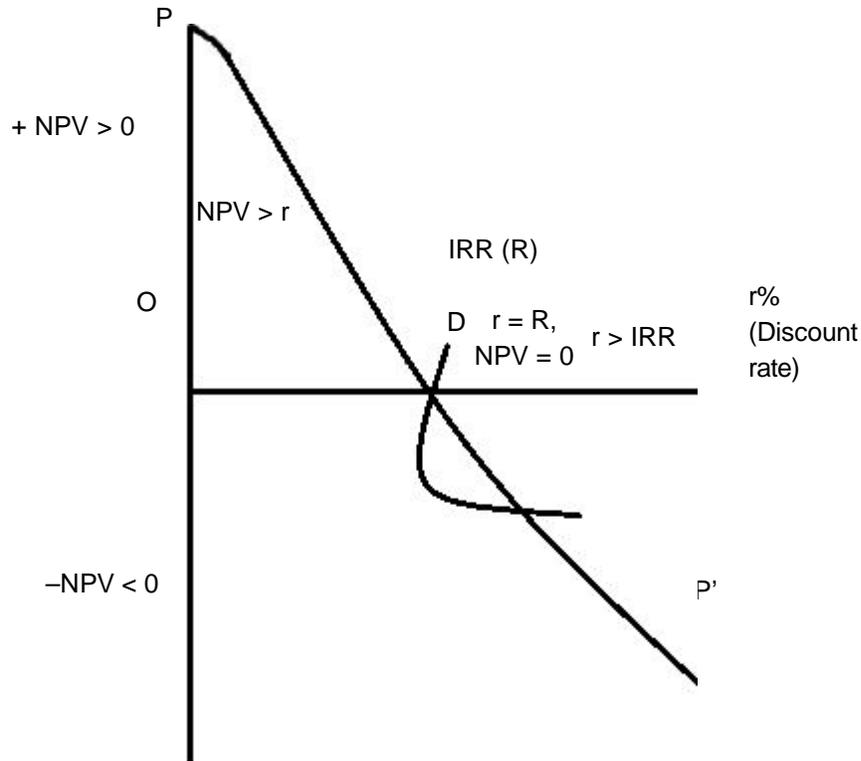
IRR will give the same results as NPV in terms of acceptance or rejection of investment proposals in the following circumstances:

1. Projects having conventional cash flows i.e. a situation where initial investment (outlay or cash outflow) is followed by series of cash inflows.
2. Independent Investment Proposals: Such proposal, the acceptance of which does not exclude the acceptance of others.

The reasons for the consistent results under net present value and internal rate of return method in above two cases are simple and logical. According to the net present value method the rule is that an investment proposal will be accepted if it has positive net present value ($NPV > 0$) which is possible only when actual rate of return is more than cut off rate. It is supported by internal rate of return method. In those case internal rate of return is more than required rate of return ($R > r$). When the net present value is = 0 or internal rate of return $R = r$ the project may be

accepted or rejected. So the proposal which have positive net present value will also have a higher than required rate of return.

The following diagram depict NPV as $\begin{matrix} > \\ = \\ < \end{matrix} 0$ corresponding to IRR (R) $\begin{matrix} > \\ = \\ < \end{matrix} r$



The above figure helps us to understand the close relationship between the Net Present Value (NPV) and internal rate of return methods along with reasons for their identical decisions. In the figure, vertical line upward and downward indicates $NPV > 0$, $= 0$ and less than 0. Whereas base horizontal line indicates rate of return from 0 to > 0 . In the figure, OP is the highest NPV at the zero rate of discount or cost of capital. At 0 discount rate $R > r$, $NPV > 0$ because at this point NPV is the difference between total cash inflow and total cash outflow and is both case inflows and case outflows are greater than zero. As the rate of discount increases from 0 towards $IRR(R)$, the NPV decrease. At a point D, where rate of discount i.e. $r = R$, the NPV is zero. Further, if rate of discount increases beyond $IRR(R)$ then NPV turn out to be negative. Thus, we may say, that when the required rate of return of a project is some what less than R (Internal Rate of Return), then we would accept the project under both the method because $NPV > 0$ and IRR is higher than cut-of rate. On the other hand, if required rate (cut of rate) is greater then IRR, than we would reject the project under both the methods. Hence, we see that IRR & NPV methods give us identical answers with respect to the acceptance or rejection of an investment project.

Points of conflict between net present value and internal rate of return cannot be avoid under certain situations where the results given by both the methods are in conflict to each other. This is so in the case of mutually exclusive investment proposals which result in non-acceptance of others. There are two types of mutually exclusive proposals:

1. **Technical:** It refers to proposals having different profitabilities and their selection is most profitable.
2. **Financial:** It is the exclusiveness due to limited fund. A firm will select only those proposal which is most profitable rather than accepting all proposals yielding more than minimum acceptable level. The conflict of results under two methods may be due to following reasons:

1. Size-disparity problem
2. Time-disparity problem
3. Unequal expected lives.

Comparative Study of results under alternative Discounted Cash Flow Method

We can summarise the relationship among net present value, internal rate of return and profitability index methods regarding decision rules as follows:

Proposal	Net Present Value	Internal rate of return (R)	Profitable Index(PI)
Accept	(1) Positive	$> r$	> 1
Indifferent	(2) Zero	$= r$	$= 1$
Reject	(3) Negative	$< r$	< 1

Given the above relationship, any discounted cash flow criterion may be employed where investment proposals are independent and there is no capital budget constraints. In such a situation, the set of projects selected by all the criterion would be the same though there may be differences in internal ranking. In the real world, however, firms are faced with mutually exclusive proposals and limited availability of funds. On account of the imperfections, all the projects with $(NPV) > 0$, $(IRR) > r$, and $(PI > 1)$ can be accepted.

CHOICE OF METHODS

The business enterprise is confronted with large number of investment criteria for selection of investment proposals. It should like to choose the best among all. Specially, it is the choice between Net Present Value and Internal Rate of Return Method because these are the two methods which are widely used by the firms. If a choice must be made, the Net Present Value Method generally is considered to be superior theoretically because:

- (i) It is simple to operate as compared to internal rate of return method;
- (ii) It does not suffer from the limitations of multiple rates;
- (iii) The reinvestment assumption of the Net Present Value Method is more realistic than internal rate of return method.

On the other hand, some scholars have advocated for internal rate of return method on the following grounds:

1. It is easier to visualise and to interpret as compared to Net Present Value Method.
2. It suggests the maximum rate of return and even in the absence of cost of capital, it gives fairly good idea of the projects profitability. On the other hand, Net Present Value Method may yield incorrect results if the firm's cost of capital is not calculated with accuracy.
3. The internal rate of return method is preferable over Net Present Value Method in the evaluation of risky projects.

Limits on Investment

The evaluation techniques discussed above help management to appraise and rank different capital investment proposals in terms of their economic benefits. But does it mean that management will accept all projects promising some economic benefit? The most probable answer seems to be in negative. For one thing, no firm enjoys infinite capital supply at a point of time when investment decisions have to be made. Ability to generate funds internally and to raise them externally is not without limits. Next, there are also occasions when quantitative factors of economic evaluation need to be supplemented with a number of qualitative

considerations like employee relations, competitive position, environmental and social responsibility and public relations. Moreover, there are some valid reasons for establishing some minimum acceptable rate of return below which management will not accept any investment proposal even if resources would remain unutilised for sometime. The rate of return below which no investment should ordinarily be accepted is known as the cut off rate or the hurdle rate. Establishing the levels of hurdle rate enables the organisation to make investment decisions and maintain consistency in the actions of different people in the organisation. Further, by indicating the hurdle rate management communicates throughout the organisation its expectation as to the minimum rate of return.

The cut off rate may be established by any of the following methods:

1. By the method of intuition;
2. By the historical rate of return;
3. By the weighted average cost of capital;
4. By the cost of funds to be used to finance a given project.

The method used to establish a hurdle rate should be carefully selected keeping in view the overall objectives of the enterprise, its environment and opportunity cost of funds required to be invested in a given project.

CAPITAL RATIONING

One important aspect of control device is to match the demand schedule for the capital for the company and the supply of capital from different sources. Demand comes for capital from all departments and it is at this level control could be exercised to keep the demand at the bare minimum required for the objective inherent in capital investment decisions. Supply of capital, on the other hand, is a scarce commodity and the company has to incur expenditure for availing it. This necessitates for the finance manager to exercise economy in capital expenditure so that optimum benefit could be obtained with the use of scarce capital sources. This establishes the need for capital rationing to impose constraints on capital expenditure under prevailing market conditions and place self-imposed constraints to check the funds being raised from outside agencies like borrowings. Thus, the device of capital rationing is adopted to control capital expenditure.

The firm may put a limit to the maximum amount that can be invested during a given period of time, such as a year. Such a firm is then said to be resorting to capital rationing. A firm with capital rationing constraint attempts to select the combination of investment projects that will be within the specified limits of investments to be made during a given period of time and at the same time provide greatest profitability.

Capital rationing may be effected through budget ceiling. A firm may resort to capital rationing when it follows the policy of financing investment proposals only by ploughing back its retained earnings. In that case, capital expenditure in a given period cannot exceed the amount of retained earnings available for reinvestment. Management may also introduce capital rationing when a department is authorised to make investments upto a limit beyond which investment decisions will be made by higher level management.

Capital rationing may result in accepting several small investment proposals then accepting a few large investment proposals so that there may be full utilisation of budget ceiling. This may result in accepting relatively less profitable investment proposals if full utilization of budget is a primary consideration. Similarly, capital rationing also means that the firm foregoes the next most profitable investment falling after the budget ceiling even though it is estimated to yield a rate of return much higher than the required rate of return. Thus, capital rationing does not lead optimum results.

Types of capital rationing

1. "hard" or external

2. "soft" or internal

Hard capital rationing occurs when external factors force a company to cut expenses, including capital expenditures. For example, creditors may include provisions in an agreement limiting borrowers' spending to reduce the risk of default. Many companies are also forced to reduce spending when they are going to raise additional capital by issuing new debt or equity. The objective of such a strategy is to increase the free cash flow and therefore make a company more attractive to investors. As we can see, external factors may cause severe constraints on the capital budget.

Soft capital rationing is caused by internal factors. For example, to reduce overall risk, the board of directors may set a minimum internal rate (IRR) of return for capital projects. All projects having a lower IRR will be rejected even though they have a positive net present value. Dividend policy can also cause soft rationing. For example, if a company declares paying a fixed dividend per share, any failure will be negatively perceived by the market and will most likely result in a decrease in the stock price. That is why company management would prefer to cut capital expenditures than dividends.

A company has a budget constraint of 3 lakh for Capital expenditure and is considering five projects using the net present value method. The particulars are:

Project	Project cost (₹)	Net Present value (₹)
A	1,80,000	75,000
B	1,50,000	60,000
C	1,20,000	50,000
D	75,000	36,000
E	60,000	30,000

Assuming that project *B* and *C* are mutually exclusive and all other project are independent, select the combination which all maximise the net present value.

SOLUTION

Under condition of Capital Rationing, raking of the project is done under the profitability index as follow:

Profitability Project for under PI					
Project	Project Cost (₹)	NVP (₹)	Total PV (₹)	PI(PV÷PC)	Rank
A	1,80,000	75,000	2,55,000	1.42	3
B	1,50,000	60,000	2,10,000	1.40	4
C	1,20,000	50,000	1,70,000	1.42	3
D	75,000	36,000	1,11,000	1.48	2
E	60,000	30,000	90,000	1.50	1

On the basis raking for other factors, three possible combinations along with their net present value are arrived at as follow:

Profitability of Combined Project								
Combination I			Combination II			Combination III		
Project	Project Cost (₹)	NVP (₹)	Project	Project Cost (₹)	NVP (₹)	Project	Project Cost (₹)	NVP (₹)
E	60,000	30,000	E	60,000	30,000	C	1,20,000	50,000
D	75,000	36,000	D	75,000	36,000	A	1,80,000	75,000

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C	1,20,000	50,000	B	1,50,000	60,000		
	2,55,000	1,16,000		2,85,000	1,26,000	3,00,000	125,000
Rank		3			1		2

Combination II, which produces the maximum possible net present value within the overall budget limit of 3, 00,000 of the project cost is recommended.

Note: Since B and C are mutually project, they cannot be considered simultaneously.

Risk and Uncertainty

Uncertainty refers to the outcomes of a given event which are too unsure to be assigned probabilities, while Risk refers to a set of unique outcomes for a given event which can be assigned probabilities. In investment decisions, cash outflows and cash inflows over the life of the project are estimated and on the basis of such estimates, decisions are taken following some appraisal criteria (NPV, IRR, etc.). Risk and uncertainties are involved in the estimation of such future cash flows as it is very difficult to predict with certainty what exactly will happen in future. Therefore, the risk with reference to capital budgeting is referred to as the variability in actual returns of a project over its working life in relation to the estimated return as forecast at the time of the initial capital budgeting decision. The difference between the risk and uncertainty, therefore, lies in the fact that variability is less in risk than in uncertainty. So, the risk exists when the decision maker is in a position to assign probabilities to various outcomes. This happens when the decision maker has some historical data on the basis of which he assigns probabilities to other projects of the same type.

Risk Evaluation and Sensitivity analysis

Risk analysis gives management better information about the possible outcomes that may occur so that management can use their judgement and experience to accept or reject an investment. Since risk analysis is costly, it should be used relatively in costly and important projects.

Risk and uncertainty are quite inherent in capital budgeting decisions. This is so because investment decisions and capital budgeting are actions of today which bear fruits in future which is unforeseen. Future is uncertain and involve risk. The projection of probability of cash inflows made today are not certain to be achieved in the course of future. Seasonal fluctuations and business cycles both deliver heavy impact upon the cash inflows and outflows projected for different project proposals. The cost of capital which offers cut-off rates may also be inflated or deflated under business cycle conditions. Inflation and deflation are bound to effect the investment decision in future period rendering the degree of uncertainty more severe and enhancing the scope of risk. Technological developments are other factors that enhance the degree of risk and uncertainty by rendering the plants or equipments obsolete and the product out of date. Tie up in the procurement in quantity and/or the marketing of products may at times fail and frustrate a business unless possible alternative strategies are kept in view.

Standard Deviation and Coefficient of Variation

Standard Deviation is considered as the best measures of dispersion or variability. Higher value of standard deviation indicates higher variability and vice versa. Higher variability means higher risk. As future cash flows cannot be estimated with certainty, it involves risk. Therefore, risk in investment analysis can be measured by using standard deviation. Investment proposal with lower standard deviation will indicate lower variability in cash flow estimates, hence such investment proposal may be preferred to the proposal having higher standard deviation. For comparing different alternative investment proposals, coefficient of variation is preferred to standard deviation because coefficient of variation is a relative measure (which is derived through dividing standard deviation by expected NPV while standard deviation is an absolute measure).

$$\text{Standard Deviation} = \sqrt{\frac{\sum f(x - \bar{x})^2}{\sum f}}$$

$$\text{Co-efficient of Variation} = \frac{\text{Standard Deviation}}{\text{Mean}} \times 100$$

Both standard deviation and co-efficient of variation require to be adjusted with the discount rate with which the project investments are evaluated. According to the degree of standard deviation or co-efficient of variation, the investment proposals shall be termed as highly risky or less risky investments. Less risky projects shall be afforded highest priority in investment or capital budgeting decisions.

Risk Adjusted Discount Rate (RADR) Method

Risk adjusted discount rates method is used in investment and budgeting decisions to cover time value of money and the risk. The use of risk adjusted discount rate is based on the concept that investors demands higher returns from the risky projects. The required return of return on any investment should include compensation for delaying consumption equal to risk free rate of return, plus compensation for any kind of risk taken on.

The case, risk associated with any investment project is higher than risk involved in a similar kind of project, discount rate is adjusted upward in order to compensate this additional risk borne.

After determining the appropriate required rate of return (Discount rate) for a project with a given level of risk cash flows are discounted at this rate in usual manner.

Adjusting discount rate to reflect project risk- If risk of project is greater than, equal to, less than risk of existing investments of firm, discount rate used is higher than, equal to or less than average cost of capital as the, case may be. Risk Adjusted Discount Rate for Project 'k' is given by:

$$\text{NPV} = \sum_{t=0}^n \frac{\text{NCF}_t}{(1+k)^t}$$

Where, NCF_t is the forecasts not cash flow in time period t, k is a risk-adjusted discount rate (RADR). That is:

$\text{RADR} = \text{Risk free rate} + \text{Risk premium}$

$$k = k_f + k_r$$

Certainty Equivalent Approach (CE Approach)

This is another method of dealing with risk in capital budgeting in order to reduce the forecasts of cash flows to some conservative levels. The certainty equivalent approach may be expressed as:

$$\text{NPV} = \sum_{t=0}^n \frac{\alpha_t \text{NCF}_t}{(1+k_f)^t}$$

where NCF_t = the forecasts of net cash flow without risk adjustment

α_t = the risk adjustment factor or the certainty equivalent coefficient

k_f = risk- free rate of return assumed to be constant for all periods

The certainty equivalent coefficient α_t assumes value between 0 and 1, and varies inversely with risk. A lower α_t will be used if greater risk is perceived and a higher α_t will be used if lower risk is anticipated. The decision maker subjectively or objectively establishes the coefficients. These coefficients reflect the decision maker's confidence in obtaining a particular cash flow in period t. Thus, to obtain certain cash flows, we multiply estimated cash flows by the certainty-equivalent coefficients.

The certainty-equivalent coefficient can be determined as a relationship between the certain cash flows and the risky cash flows, i.e.

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$$\alpha_t = \frac{NCF_t}{NCF_t} = \frac{\text{Certain net cash flow}}{\text{Risky net cash flow}}$$

Decision Tree Analysis

Decision tree technique is another method which many corporate units use to evaluate risky proposals. A decision tree shows the sequential outcome of a risky decision. A capital budgeting decision tree shows the cash flows and net present value of the project under differing possible circumstances.

For example, a company 'X' has an opportunity to invest in equivalent schemes that will last for two years and will cost ₹ 1,00,000 initially. Cost of capital is 15%. It has the following estimated possible cash flow after tax (CFAT)

Year

- One: 30% chance that (CFAT) will be ₹ 40,000/-
 40% chance that (CFAT) will be ₹ 60,000/-
 30% chance that (CFAT) will be ₹ 80,000

Two: CFAT are conditional to those of year one.

The estimated conditional CFAT's and probabilities are as under:

If 1st year CFAT = ₹ 40,000		If 1st year CFAT = ₹ 60,000		If 1st year CFAT = ₹ 80,000	
2nd year CFAT	Probability	2nd year CFAT	Probability	2nd year CFAT	Probability
20,000	0.2	70,000	0.3	80,000	0.1
50,000	0.6	80,000	0.4	1,00,000	0.8
80,000	0.2	90,000	0.3	1,20,000	0.1

From the above data we may plan the decision as under:

	Prob-ability	CFAT Year 1 (₹)	Decision Tree				Expected NPV a x b (₹)	
			Probability	CFAT Year 2 (₹)	PV of CFAT at 15% (PV of CFAT at yr1 + PV of CFAT at yr2)	(a) NPV at 15% ₹		(b) Joint Probability
	0.3	40,000	0.2	20,000	49,920	- 50,080	0.06	- 3,005
			0.6	50,000	72,600	- 27,400	0.18	- 4,932
			0.2	80,000	95,280	- 4,720	0.06	- 283
Cash outlay 1,00,000	0.4	60,000	0.3	70,000	1,05,120	5,120	0.12	614
			0.4	80,000	1,12,680	12,680	0.16	2,029
			0.3	90,000	1,20,240	20,240	0.12	2,428
	0.3	80,000	0.1	80,000	1,30,080	30,080	0.03	902
			0.8	1,00,000	1,45,200	45,200	0.24	10,848
			0.1	1,20,000	1,60,320	60,320	0.03	1,810
							1.00	10,411

Note: Present value of cash inflows are worked out on the basis of three decimal points.

The above decision tree shows possible CFAT outcomes in each year and the probabilities associated with these outcomes. The decision tree shows nine distinct paths, or combinations of outcomes that the project would take if accepted. One possibility is that one year's CFAT is ₹ 40,000 and the second year's CFAT is ₹ 20,000. This is worst combination of outcomes that could occur. The company X would have paid ₹ 1,00,000 for a CFAT stream of ₹ 40,000 and ₹ 20,000 in years one and two respectively. If the company X determined that an appropriate discount rate for this project is 15%, the NPV of the worst path is –₹ 50,080. By looking at the decision tree figure, the best path for the firm is $CFAT_1 = ₹ 80,000$ and $CFAT_2 = ₹ 1,20,000$. The NPV at 15% of that path is ₹ 60,320. The decision tree shows NPV of each of the nine possible CFAT paths in the tree at discount rate of 15%. The expected net present value (\overline{NPV}) of the problem depicted by the decision tree is the weighted average of net present values of all the paths:

$$\overline{NPV} = \sum_{j=0}^N (\text{Prob}_j) (NPV_j)$$

Where NPV_j = net present value of the jth path

Prob_j = the probability of the jth path occurring

N = number of possible paths

The probability of a path occurring is called its joint probability. It is equal to the product of the probabilities along with the path.

In the decision tree calculations the last column shows the calculation of expected \overline{NPV} which is the weighted average of individual path NPVs where the weights are the path probabilities. \overline{NPV} for example is ₹ 10,411 and project should be accepted.

For short period projects the above technique is good but for long period projects it becomes more complicated with the multiplication of paths, for the number of possibilities. In the above case, there had been 9 paths for 2 years, but for the 3 years these could be $(3 \times 3 \times 3) = 27$ paths and like wise the increase of path complicates the diagram and calculations.

Sensitivity Analysis in Capital Budgeting

Sensitivity analysis is used in Capital budgeting for more precisely measuring the risk. It helps in assessing information as to how sensitive are the estimated parameters of the project such as cash flows, discount rate, and the project life to the estimation errors. Future being always uncertain and estimations are always subject to error, sensitivity analysis takes care of estimation errors by using a number of possible outcomes in evaluating a project. The methodology adopted in sensitivity analysis is to evaluate a project by using a number of estimated cash flows so as to provide to the decision maker an insight into the variability of outcome. Thus, it is a technique of risk analysis which studies the responsiveness of a criterion of merit like NPV or IRR to variation in underlying factors like selling price, quantity sold, returns from an investment etc. Sensitivity analysis answers questions like,

- (i) What happens to the present value (or some other criterion of merit) if flows are, say Rs. 50,000 than the expected Rs. 80,000?
- (ii) What will happen to NPV if the economic life of the project is only 3 years rather than expected 5 years?

Therefore, wherever there is an uncertainty, of whatever type, the sensitivity analysis plays a crucial role. However, it should not be viewed as the method to remove the risk or uncertainty, it is only a tool to analyse and measure the risk and uncertainty. In terms of capital budgeting the possible cash flows are based on three assumptions:

- (a) Cash flows may be worst (pessimistic)
- (b) Cash flows may be most likely.

(c) Cash flows may be most optimistic.

Sensitivity analysis has been evolved to treat risk and uncertainty in capital budgeting decisions. The analysis is compromised of the following steps:

- (1) Identification of variables;
- (2) Evaluation of possibilities for these variables;
- (3) Selection and combination of variables to calculate NPV or rate of return of the project;
- (4) Substituting different values for each variables in turn while holding all other constant to discover the effect on the rate of return;
- (5) Comparison of original rate of return with this adjusted rate to indicate the degree of sensitivity of the rate to change in variables;
- (6) Subjective evaluation of the risk involved in the project.

The purpose of sensitivity analysis is to determine how varying assumptions will affect the measures of investment worth. Ordinarily, the assumptions are varied one at a time i.e. cash flows may be held constant with rate of discount used to vary; or discount rate is assumed constant and cash flow may vary with assumed outlay; or the level of initial outlay may change with discount rate and annual proceeds remaining the same. In the context of NPV, sensitivity analysis provides information regarding the sensitivity of the calculated NPV to possible estimation errors in expected cash flows, the required rate of return and project life.

SIMULATION FOR RISK EVALUATION

Simulation is known as simulated sampling or more fully Monte-Carlo simulation is as much an art as a technique. It has been described as “what to do when all else fails”. Some investment projects may depend on so many stochastic variables that analytical results are unobtainable. In simulation a mathematical model is constructed and artificial data is fed. The desired parameters of the system are then determined from the output of the mode. Simulation like sensitivity analysis is not an optimising technique. It merely provides a convenient representation of reality in some more advanced work than can be used to improve NPV by adjusting certain variables under the decision makers control (like advertising expenditure). There are two important things in simulation viz. the construction of the model and the judgement of changes to be made to controllable variables. This method involves use of computers to determine the distribution of the internal rate of return or net present value. Suppose the company has estimated project probability distribution for initial investment, annual sales and operating costs, life and salvage value, the simulation proceeds as follows:

1. Randomly select a value of each variable from its distribution;
2. Take these values and other given information (tax rates, type of depreciation used and so on) and calculate the projects IRR or NPV;
3. Repeat steps one and two many times; and
4. Prepare the IRR or NPV distribution.

This is the result of the simulation. From the information used to prepare the distribution the analyst can determine the standard deviation of the projects IRR which is used in determining the project risk.

Simulation is an expensive device and suits only to those projects involving heavy capital expenditure. Simulation is advantageous to corporate project proposal selections for the reason that it shows all possible outcomes associated with the project including identification of possible extremely bad outcomes which might happen if the project is accepted.

Capital budgeting Techniques under uncertainty

Risk can be defined as the chance that the actual outcome will differ from the expected outcome. Uncertainty relates to the situation where a range of differing outcome is possible, but it is not possible to assign probabilities to this range of outcomes. The two terms are generally used interchangeably in finance literature. In investment appraisal, managers are concerned with evaluating the riskiness of a project's future cash flows. Here, they evaluate the chance that the cash flows will differ from expected cash flows, NPV will be negative or the IRR will be less than the cost of capital. In the context of risk assessment, the decision-maker does not know exactly what the outcome will be but it is possible to assign probability weightage to the various potential outcomes. The most common measures of risk are standard deviation and coefficient of variations. There are three different types of project risk to be considered:

1. **Stand-alone risk:** This is the risk of the project itself as measured in isolation from any effect it may have on the firm's overall corporate risk.
2. **Corporate or within-firm risk:** This is the total or overall risk of the firm when it is viewed as a collection or portfolio of investment projects.
3. **Market or systematic risk:** This defines the view taken from a well-diversified shareholders and investors. Market risk is essentially the stock market's assessment of a firm's risk, its beta, and this will affect its share price.

Due to practical difficulties of measuring corporate and market risk, the stand-alone risk has been accepted as a suitable substitute for corporate and market risk. There are following techniques one can use to deal with risk in investment appraisal.

Statistical Techniques for Risk Analysis:

- (a) Probability Assignment
- (b) Expected Net Present Value
- (c) Standard Deviation
- (d) Coefficient of Variation
- (e) Probability Distribution Approach
- (f) Normal Probability Distribution

(a) Probability Assignment:

The concept of probability is fundamental to the use of the risk analysis techniques. It may be defined as the likelihood of occurrence of an event. If an event is certain to occur, the probability of its occurrence is one but if an event is certain not to occur, the probability of its occurrence is zero. Thus, probability of all events to occur lies between zero and one.

The classical view of probability holds that one can talk about probability in a very large number of times under independent identical conditions. Thus, the probability estimate, which is based on a large number of observations, is known as an objective probability. But this is of little use in analyzing investment decisions because these decisions are non-repetitive in nature and hardly made under independent identical conditions over time. The another view of probability holds that it makes a great deal of sense to talk about the probability of a single event without reference to the repeatability long run frequency concept. Therefore, it is perfectly valid to talk about the probability of sales growth will reach to 4%, the probability of rain tomorrow or fifteen days hence. Such probability assignments that reflect the state of belief of a person rather than the objective evidence of a large number of trials are called personal or subjective probabilities.

(b) Expected Net Present Value:

Once the probability assignments have been made to the future cash flows, the next step is to find out the expected net present value. It can be found out by multiplying the monetary values of the possible events by their probabilities. The following equation describes the expected net present value.

$$ENPV = \sum_{t=0}^n \frac{ENCF_t}{(1+k)^t}$$

Where ENPV is the expected net present value, ENCF_t expected net cash flows in period t and k is the discount rate. The expected net cash flow can be calculated as follows:

$$ENCF_t = NCF_{jt} \times P_{jt}$$

Where NCF_{jt} is net cash flow for jth event in period t and P_{jt} probability of net cash flow for jth event in period t.

For example, A company is considering an investment proposal costing ₹ 7,000 and has an estimated life of three years. The possible cash flows are given below:

Expected net present value*All amount in ₹*

Cash flow In Year 1	Prob.	Expected Value	Cash flow in Year 2	Prob.	Expected Value	Cash flow in Year 3	Prob.	Expected Value
2000	0.2	400	3000	0.4	1200	4000	0.3	1200
3000	0.5	1500	4000	0.3	1200	5000	0.5	2500
4000	0.3	1200	5000	0.3	1500	6000	0.2	1200
		3100			3900			4900

If we assume a risk free discount rate of 10%, the expected NPV for the project will be as follows:

Year	ENCF in ₹	PV@10%	PV in ₹
1	3100	0.909	2817.9
2	3900	0.826	3221.4
3	4900	0.751	3679.9
		Σ PV	9719.2
		Less : NCO	7000
		ENPV	2719.2

(c) Standard Deviation:

The assignment of probabilities and the calculation of the expected net present value include risk into the investment decision, but a better insight into the risk analysis of capital budgeting decision is possible by calculating standard deviation and coefficient of variation.

Standard deviation(s) is an absolute measure of risk analysis and it can be used when projects under consideration are having same cash outlay. Statically, standard deviation is the square root of variance and variance measures the deviation about expected cash flow of each of the possible cash flows. The formula for calculating standard deviation will be as follows:

$$= \sqrt{\sum_{i=1}^n (CF_t - \overline{CF})^2 \times P_i}$$

Thus, it is the square root of the mean of the squared deviation, where deviation is the difference between an outcome and the expected mean value of all outcomes and the weights to the square of each deviation is provided by its probability of occurrence. For example, the standard deviation of following project X and Y is as follows :

Table 2.8

PROJECT-X (Standard deviation)

All Amount in in ₹

CF	\overline{CF}	$(CF_t - \overline{CF})$	$(CF_t - \overline{CF})^2$	P _i	$(CF_t - \overline{CF})^2 P_i$	$= \sqrt{(CF_t - \overline{CF})^2 P_i}$
4000	6000	-2000	4000000	0.1	400000	
5000	6000	-1000	1000000	0.2	200000	
6000	6000	0	0	0.4	0	
7000	6000	1000	1000000	0.2	200000	
8000	6000	2000	4000000	0.1	400000	
					1200000	1095

PROJECT Y (Standard deviation)

All Amount in ₹

CF	\overline{CF}	$(CF_t - \overline{CF})$	$(CF_t - \overline{CF})^2$	P _i	$(CF_t - \overline{CF})^2 P_i$	$= \sqrt{(CF_t - \overline{CF})^2 P_i}$
12000	8000	4000	16000000	0.1	1600000	
10000	8000	2000	4000000	0.15	600000	
8000	8000	0	0	0.5	0	
6000	8000	-2000	4000000	0.15	600000	
4000	8000	-4000	16000000	0.1	1600000	
					4400000	2098

In the above example, Project Y is riskier as standard deviation of project Y is higher than the standard deviation of project X. However, the project Y has higher expected value also so the decision-maker is in a dilemma for selecting project X or project Y.

(d) Coefficient of Variation:

If the projects to be compared involve different outlays/different expected value, the coefficient of variation is the correct choice, being a relative measure. It can be calculated using following formula:

$$CV = \frac{\text{Standard deviation or } \sigma}{\text{Expected Value CF}}$$

For example, the coefficient of variation for the above project X and project Y can be calculated as follows:

$$CV (X) = \frac{1095}{6000} = 0.1825$$

$$CV (Y) = \frac{2098}{8000} = 0.2623$$

The higher the coefficient of variation, the riskier is the project. Project Y is having higher coefficient so it is riskier than the project X. It is a better measure of the uncertainty of cash flow returns than the standard deviation because it adjusts for the size of the cash flow.

(e) Probability Distribution Approach:

The researcher has discussed the concept of probability for incorporating risk in capital budgeting proposals. The probability distribution of cash flows over time provides valuable information about the expected value of return and the dispersion of the probability distribution of possible returns which helps in taking accept-reject decision of the investment decision.

The application of this theory in analyzing risk in capital budgeting depends upon the behaviour of the cash flows, being (i) independent, or (ii) dependent. The assumption that cash flows are independent over time signifies that future cash flows are not affected by the cash flows in the preceding or following years. When the cash flows in one period depend upon the cash flows in previous periods, they are referred to as dependent cash flows.

(i) Independent Cash Flows over Time: The mathematical formulation to determine the expected values of the probability distribution of NPV for any project is as follows:

$$PV = \sum_{t=1}^n \frac{\overline{CF}_t}{(1+i)^t} - C_0$$

where CF_t is the expected value of net CFAT in period t and i is the risk free rate of interest.

The standard deviation of the probability distribution of net present values is equal to ;

$$\sigma(NPV) = \sqrt{\sum_{t=1}^n \frac{\sigma_t^2}{(1+i)^{2t}}}$$

where σ_t is the standard deviation of the probability distribution of expected cash flows for period t, σ_t would be calculated as follows:

$$\sigma_t = \sqrt{\sum_{j=1}^n (CF_{jt} - \overline{CF}_t)^2 P_{jt}}$$

Thus, the above calculation of the standard deviation and the NPV will produce significant volume of information for evaluating the risk of the investment proposal. For example, The standard deviation of the probability distribution of net present values under the assumption of the independence of cash flows over time for the above mentioned example of expected net present values can be calculated as follows:

Probability distribution approach

Year 1

CF (in ₹)	\overline{CF} (in ₹)	$(CF_t - \overline{CF})^2$ (in ₹)	$(CF_t - \overline{CF})^2$ (in ₹)	Pi	$(CF_t - \overline{CF})^2 Pi$ (in ₹)	σ
2000	3000	-1000	10,00,000	0.2	2,00,000	
3000	3000	0	0	0.5	0	
4000	3000	1000	10,00,000	0.3	3,00,000	
					5,00,000	707
Year 2						
3000	4000	-1000	10,00,000	0.4	4,00,000	
4000	4000	0	0	0.3	0	
5000	4000	1000	10,00,000	0.3	3,00,000	
					7,00,000	836
Year 3						
4000	5000	-1000	10,00,000	0.3	3,00,000	
5000	5000	0	0	0.5	0	
6000	5000	1000	10,00,000	0.2	200,000	
					5,00,000	707

$$\sigma = \sqrt{\sum_{t=1}^n \frac{\sigma t^2}{(1+i)^{2t}}} = \sqrt{\frac{(707)^2}{(1.10)^2} + \frac{(836)^2}{(1.10)^4} + \frac{(707)^2}{(1.10)^6}}$$

= ₹ 1083

where σ is the standard deviation of the probability distribution of possible net cash flows and σ^2 is the variance of each period.

(ii) Dependent Cash Flows: If cash flows are perfectly correlated, the behavior of cash flows in all periods is alike. This means that if the actual cash flow in one year is a standard deviations to the left of its expected value, cash flows in other years will also be a standard deviations to the left of their respective expected values. In other words, cash flows of all years are linearly related to one another. The expected value and the standard deviation of the net present value, when cash flows are perfectly correlated, are as follows:

$$\overline{NPV} = \sum_{t=1}^n \frac{\overline{CF}_t}{(1+i)^t} - CO$$

$$\sigma(NPV) = \sum_{t=1}^n \frac{\sigma t}{(1+i)^t}$$

Where,

NPV = Expected Net Present Value

\overline{CF}_t = Expected Cash Flow for year "t"

i = Risk-free interest rate

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σ NPV = Standard deviation of Net Present Value

σt = Standard deviation of the cash flow for year "t"

For example, if we calculate NPV and σ NPV for an investment project requiring a current outlay of Rs 10,000, assuming a risk free interest rate of 6 per cent. The mean and standard deviation of cash flows, which are perfectly correlated, are as follows:

Year	CFt (₹)	σt
1	5,000	1,500
2	4,000	1,000
3	5,000	2,000
4	3,000	1,200

$$\overline{NPV} = \frac{5000}{(1.06)^1} + \frac{4000}{(1.06)^2} + \frac{5000}{(1.06)^3} + \frac{3000}{(1.06)^4} - 10,000 = ₹4,851$$

$$\sigma(\overline{NPV}) = \frac{1,500}{(1.06)^1} + \frac{1,000}{(1.06)^2} + \frac{2,000}{(1.06)^3} + \frac{1,200}{(1.06)^4} = ₹4,934$$

(f) Normal Probability Distribution:

The normal probability distribution can be used to further analyze the risk in investment decision. It enable the decision maker to have an idea of the probability of different expected values of NPV, that is, the probability of NPV having the value of zero or less, greater than zero and within the range of two values for example, within the range of ₹ 2,000 and ₹ 3,000 etc. If the probability of having NPV is low or zero or less, eg. .01, it means that the risk in the project is negligible. Thus, the normal probability distribution is an important statistical technique in the hands of decision makers for evaluating the riskiness of a project.

The area under the normal curve, representing the normal probability distribution, is equal to 1 (0.5 on either side of the mean). The curve has its maximum height at its expected value i.e. its mean. The distribution theoretically runs from minus infinity to plus infinity. The probability of occurrence beyond 3 s is very near to zero (0.26 per cent).

For any normal distribution, the probability of an outcome falling within plus or minus.

- 1 σ from the mean is 0.6826 or 68.26 per cent,
- 2 σ from the mean is 95.46 per cent,
3. σ from the mean is 99.74 per cent.

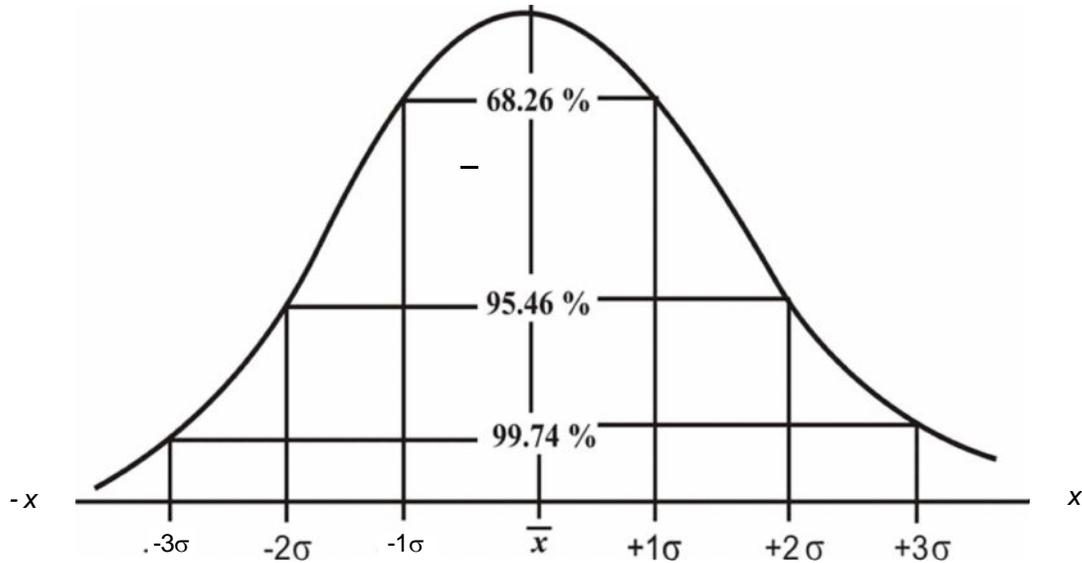


Figure 2.4

For example, If one needs to calculate for the above mentioned example the probability of the NPV being zero or less, the probability of the NPV being greater than zero and the probability of NPV between the range of ₹ 1500 and ₹ 3000, it can be calculated as follows using normal distribution.

Probability of the NPV being zero or less:

$$Z = \frac{X - \bar{X}}{s} = \frac{0 - 2719.2}{1073.7} = -2.533$$

According to Table Z, the probability of the NPV being zero is = 0.4943, therefore, the probability of the NPV being zero or less would be 0.5-0.4943=0.0057 i.e. 0.57 per cent.

Probability of the NPV being greater than zero:

As the probability of the NPV being less than zero is 0.57 per cent, the probability of the NPV being greater than zero would be 1-0.0057=0.9943 or 99.43 per cent.

Probability of NPV between the range of ₹ 1,500 and ₹ 3,000:

$$Z_1 = \frac{1,500 - 2,719.2}{1,073.7} = -1.13$$

$$Z_2 = \frac{3000 - 2719.2}{1073.7} = 0.26$$

The area as per Table Z for the respective values of -1.13 and 0.26 is 0.3708 and

0.4803 respectively. Summing up, we have 0.8511 i.e., there is 85.11 per cent probability of NPV being within the range of ₹ 1500 and ₹ 3000.

SOME CASE STUDIES

Question No. 1 : An Entrepreneur has approached you with an opportunity to lend ₹25,000 for his newly established home healthcare business. Funds would be used to lease a delivery vehicle, purchase supplies, and provide

working capital. Terms of the proposal are that you would receive ₹5,000 at the end of each year in interest with the full ₹25,000 to be repaid at the end of a ten-year period.

- A. Assuming a 10% required rate of return, calculate the present value of cash flows and the net present value of the proposed investment.
- B. Based on this same interest rate assumption, calculate the cumulative cash flow of the proposed investment for each period in both nominal and present-value terms.
- C. What is the payback period in both nominal and present-value terms?
- D. What is the difference between the nominal and present-value payback period? Can the present-value payback period ever be shorter than the nominal payback period??

Solution

A : The present value of cash flows and the net present value of the proposed investment can be calculated as given below:

Year	Cash Flow in ₹	Present Value Interest Factor (10%)	Present Value Cash Flow ₹
0	(25,000)	1.0000	(25,000)
1	5,000	0.9091	4,545
2	5,000	0.8264	4,132
3	5,000	0.7513	3,757
4	5,000	0.6830	3,415
5	5,000	0.6209	3,105
6	5,000	0.5645	2,822
7	5,000	0.5132	2,566
8	5,000	0.4665	2,333
9	5,000	0.4241	2,120
10	5,000	0.3855	1,928
Cost of Capital	10.0%		
Present Value of Benefits	₹ 30,723		
Present Value of Cost	₹ 25,000		
Net Present Value	₹ 5,723		

B. The cumulative cash flow of the proposed investment for each period in both nominal and present-value terms is:

Year Flow	Cash Interest Factor	Present Value Factor @ (10%)	Present Value Cash Flow	Cumulative PV Cash Flow	Cumulative
0	(₹ 25,000)	1.0000	(₹25,000)	(₹25,000)	(₹25,000)
1	5,000	0.9091	4,545	(20,000)	(20,455)
2	5,000	0.8264	4,132	(15,000)	(16,322)
3	5,000	0.7513	3,757	(10,000)	(12,566)
4	5,000	0.6830	3,415	(5,000)	(9,151)
5	5,000	0.6209	3,105	0	(6,046)
6	5,000	0.5645	2,822	5,000	(3,224)
7	5,000	0.5132	2,566	10,000	(658)
8	5,000	0.4665	2,333	15,000	1,675
9	5,000	0.4241	2,120	20,000	3,795
10	5,000	0.3855	1,928	25,000	5,723
Payback Period			5 years		
Present Value Payback Period			8.28 years (= 8 + ₹ 658/₹2,333).		

C. Based on the information provided in part B, it is clear that the cumulative cash flow in nominal rupees reached ₹0 at the end of Year 5. This means that the nominal payback period is 5 years. The cumulative cash flow in present-value rupees exceeds ₹0 when the Year 8 interest payment is received. This means that the present-value payback period is roughly 8 years. If cash flows were received on a continuous basis, the present-value payback period would be 8.28 years (= ₹ 658/₹ 2,333).

D. Assuming a positive rate of interest, the present-value payback period is always longer than the nominal payback period. This stems from the fact that present-value dollars are always less than nominal dollars, and it therefore takes longer to receive a fixed dollar amount back in terms of present-value dollars rather than in nominal terms.

Question No. 2: Decision Rule Conflict : Balwinder has been retained as a management consultant by Square Pants, Inc., a local specialty retailer, to analyze two proposed capital investment projects, projects X and Y. Project X is a sophisticated working capital and inventory control system based upon a powerful personal computer, called a system server, and PC software specifically designed for inventory processing and control in the retailing business. Project Y is a similarly sophisticated working capital and inventory control system based upon a powerful personal computer and general-purpose PC software. Each project has a cost of ₹ 10,000, and the cost of capital for both projects is 12%. The projects = expected net cash flows are as follows

Solution:

Years	Expected Net Cash Flows in ₹	
	Project X	Project Y
0	(10,000)	(10,000)
1	6,500	3,500
2	3,000	3,500
3	3,000	3,500
4	1,000	3,500

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- A. Calculate each project = s nominal payback period, net present value (NPV), internal rate of return (IRR), and profitability index (PI).
- B. Should both projects be accepted if they are interdependent?
- C. Which project should be accepted if they are mutually exclusive?
- D. How might a change in the cost of capital produce a conflict between the NPV and IRR rankings of these two projects? At what values of k would this conflict exist?
- E. Why does a conflict exist between NPV and IRR rankings?

Solution

A. Payback:

To determine the nominal payback period, construct the cumulative cash flows for each project:

Cumulative Cash Flow in ₹		
Year	Project X	Project Y
0	(10,000)	(10,000)
1	(3,500)	(6,500)
2	(500)	(3,000)
3	2,500	500
4	3,500	4,000

Payback period project X = $2 + \frac{\text{Rs.500}}{\text{Rs.3,000}} = 2.17$ years

Payback period project Y = $2 + \frac{\text{Rs.3,000}}{\text{Rs.3,500}} = 2.86$ years

Net Present Value

All amount in INR

Years	Expected Net Cash Flows in ₹		Present Value Factor @ 12%	Cash Flow in ₹	
	Project X	Project Y		Project X	Project Y
0	(10,000)	(10,000)	1.0000	(10,000)	(10,000)
1	6,500	3,500	0.8929	5,803.57	3,125.00
2	3,000	3,500	0.7972	2,391.58	2,790.18
3	3,000	3,500	0.7118	2,135.34	2,491.23
4	1,000	3,500	0.6355	635.52	2,224.31
<i>Net Cash Flow</i>				966.01	630.72

Internal Rate of Return (IRR):

To solve for each project’s IRR, find the discount rates that set NPV to zero:

$$IRR_x = 18.0\%$$

$$IRR_y = 15.0\%$$

Profitability Index (PI):

$$\text{Profitability Index} = \frac{\text{Present Value}}{\text{Initial Investment}}$$

$$\text{Profitability Index (X)} = \frac{\text{Rs. } 10,966.01}{\text{Rs. } 10,000} = 1.10$$

$$\text{Profitability Index (Y)} = \frac{\text{Rs. } 10,630.72}{\text{Rs. } 10,000} = 1.06$$

B. Using all methods, project X is preferred over project Y. Because both projects are acceptable under the NPV, IRR, and PI criteria, both projects should be accepted if they are interdependent.

C. Choose the project with the higher NPV at $k = 12\%$, or project X.

D. To determine the effects of changing the cost of capital, plot the NPV profiles of each project. The crossover rate occurs at about 6% to 7%. To find this rate exactly, create a project, which is the difference in cash flows between projects X and Y:

Years	Differential Cash flow between Project X and Y (in ₹)
0	0
1	3,000
2	(500)
3	(500)
4	(2,500)

Then find the IRR of Project :

$$IRR = \text{Crossover Rate} = 6.2\%$$

Thus, if the firms cost of capital is less than 6.2%, a conflict exists, because

$$NPV_y > NPV_x \text{ but } IRR_x > IRR_y$$

E. The basic cause of conflict is the differing reinvestment rate assumptions between PV and IRR. The conflict occurs in this situation because the projects differ in their cash flow timing.

Qns No 3: Decision Rule Criteria. The net present value (NPV), profitability index (PI), and internal rate of return (IRR) methods are often employed in project valuation. Identify each of the following statements as true or false, and explain your answers.

- A. The IRR method can tend to understate the relative attractiveness of superior investment projects when the opportunity cost of cash flows is below the IRR.
- B. A PI = 1 describes a project with an NPV = 0.
- C. Selection solely according to the NPV criterion will tend to favor larger rather than smaller investment projects.
- D. When NPV = 0, the IRR exceeds the cost of capital.
- E. Use of the PI criterion is especially appropriate for larger firms with easy access to capital markets.

Solution

- A. False. The *IRR* method implicitly assumes reinvestment of net cash flows during the life of the project at the *IRR* and will overstate the relative attractiveness of superior investment projects when the opportunity cost of cash flows is below the *IRR*. If, for example, a project has a projected *IRR* = 22%, but cash flows thrown off during the life of the project can only be reinvested at, say, 15%, then the true *IRR* for the project will be less than 22% and its relative attractiveness will be overstated using the *IRR* method.
- B. True. The $PI = PV \text{ Cash Flows} / \text{Cost}$, and $NPV = PV \text{ Cash Flows} - \text{Cost}$. Therefore, when $PV \text{ Cash Flows} = \text{Cost}$, $PI = 1$ and $NPV = 0$.
- C. True. Selection according to the *NPV* criterion will tend to favour larger as opposed to smaller investment projects.
- D. False. The *IRR* is the interest rate that equates the *PV* cash flows with the investment cost of a project. $NPV = PV \text{ Cash Flows} - \text{Cost}$, when cash flows are discounted at an appropriate risk-adjusted cost of capital, k . Therefore, when $IRR = k$, $NPV = 0$.
- E. False. Larger firms with easy access to capital markets maximize the value of the firm through the process by selecting projects according to the *NPV* criterion. Smaller firms, which face capital budget constraints forcing rejection of some $NPV > 0$ projects, can best employ scarce capital through use of the *PI* criterion.

Question No 4:

Mr. Jagdish owns a Drug Store, **located** in Maliwara Ghaziabad. The drug store sells pharmaceuticals, cosmetics, toiletries, magazines, and various novelties. The most recent annual net income statement of drug store is as follows:

	<i>Amount in ₹</i>
Sales revenue (i)	1,800,000
Costs	
Cost of goods sold	1,260,000
Wages and salaries	200,000
Rent	120,000
Depreciation	60,000
Utilities	40,000
Miscellaneous	30,000
Total costs (ii)	1,710,000
Net profit before tax (i) – (ii)	90,000

Drug Store's sales and expenses have remained relatively constant over the past few years and are expected to continue unchanged in the near future. To increase sales, Drug Store is considering using some floor space for a small soda fountain. Drug Store would operate the soda fountain for an initial three-year period and then would reevaluate its profitability. The soda fountain would require an incremental investment of ₹20,000 to lease furniture, equipment, utensils, and so on. This is the only capital investment required during the three-year period. At the end of that time, additional capital would be required to continue operating the soda fountain, and no capital would be recovered if it were shut down. The soda fountain is expected to have annual sales of ₹100,000 and food

and materials expenses of ₹20,000 per year. The soda fountain is also expected to increase wage and salary expenses by 8% and utility expenses by 5%. Because the soda fountain will reduce the floor space available for display of other merchandise, sales of non-soda fountain items are expected to decline by 10%.

- A. Calculate net incremental cash flows for the soda fountain.
- B. Assume that Drug Store has the capital necessary to install the soda fountain and that he places a 12% opportunity cost on those funds. Should the soda fountain be installed? Why or why not?

Solution

- A. The relevant annual cash flows from the proposed soda fountain are:

	Amount in ₹
Incremental revenue (A)	100,000
Increment Cost	
Food and materials	20,000
Wages and salaries (₹200,000 x 0.08)	16,000
Utilities (₹40,000 x 0.05)	2,000
Opportunity Cost: Profit contribution lost on regular sales	
= 0.1(₹ 18,00,000 - ₹12,60,000)	54,000
Total incremental cost (B)	92,000
Net incremental annual cash flow (A – B)	8,000
Incremental investment	20,000

- B. No, the NPV for the proposed soda fountain should be calculated to determine the economic viability of the project.

$$\begin{aligned}
 \text{NPV} &= (\text{Incremental annual cash flow})(\text{PVIFA}, N = 3, i = 12\%) - ₹20,000 \\
 &= ₹8,000(2.4018) - ₹20,000 \\
 &= -₹785.60 \text{ (A loss)}
 \end{aligned}$$

Because $\text{NPV} < 0$, Drug Store should not undertake the soda fountain investment project.

Question No 5: Cash Flow Analysis. The Future India Press is analyzing the potential profitability of three printing jobs put up for bid by the Department of Revenue:

	Job A	Job B	Job C
Projected winning bid (per unit)	₹ 5.00	₹ 8.00	₹ 7.50
Direct cost per unit	₹ 2.00	₹ 4.30	₹ 3.00
Annual unit sales volume	₹ 8,00,000	₹ 6,50,000	₹ 4,50,000
Annual distribution costs	₹ 90,000	₹ 75,000	₹ 55,000
Investment required to produce annual volume	₹ 50,00,000	₹ 52,00,000	₹ 40,00,000

Assume that

- (1) The company's marginal city-plus-state-plus-Corporate tax rate is 50%;

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(2) Each job is expected to have a six-year life; (3) the firm uses straight-line depreciation; (4) the average cost of capital is 14%; (5) the jobs have the same risk as the firm's other business; and (6) the company has already spent ₹60,000 on developing the preceding data. This ₹60,000 has been capitalized and will be amortized over the life of the project.

- A. What is the expected net cash flow each year? (Hint: Cash flow equals net profit after taxes plus depreciation and amortization charges.)
- B. What is the net present value of each project? On which project, if any, should Future India Press (FIP) bid?
- C. Suppose that FIP's primary business is quite cyclical, improving and declining with the economy, but that job A is expected to be countercyclical. Might this have any bearing on your decision?

Solution

- A. The ₹60,000 spent on job cost development is a sunk cost. This cost must, however, be accounted for in the tax calculation as a ₹10,000 per year non-cash expense. The annual net cash flow calculations are:

Amount in ₹

	Job A	Job B	Job C
Projected winning bid (per unit)	5.00	8.00	7.50
Deduct direct cost per unit	(2.00)	(4.30)	(3.00)
Profit contribution per unit	3.00	3.70	4.50
Annual unit sales volume (in unit)	8,00,000	6,50,000	4,50,000
Profit contribution per year	24,00,000	24,05,000	20,25,000
Deduct annual distribution costs	90,000	75,000	55,000
Cash flow before amortization, depreciation and taxes	23,10,000	23,30,000	19,70,000
Deduct amortization charges	(10,000)	(10,000)	(10,000)
Cash flow before depreciation and taxes	23,00,000	23,20,000	19,60,000
Deduct depreciation	(8,33,333)	(8,66,667)	(6,66,667)
Cash flow before taxes	14,66,667	14,53,333	12,93,333
Deduct taxes	(7,33,334)	(7,26,666)	(6,46,666)
Cash flow	7,33,333	7,26,667	6,46,667
Add back depreciation plus amortization	8,43,333	8,76,667	6,76,667
Net annual cash flow	15,76,667	16,03,333	13,23,333
Investment required to produce annual volume	50,00,000	52,00,000	40,00,000
Job cost development	60,000		
Job life (years)	6		
Tax rate	50%		

B. The NPV calculations are:

Amount in ₹

	Job A	Job B	Job C
Net annual cash flow	15,76,667	16,03,333	13,23,333
PVIFA (14%, 6 years)	3.8887	3.8887	3.8887
Present value of annual net cash flows	61,31,185	62,34,881	51,46,045
Deduct initial investment cost	(50,00,000)	(52,00,000)	(40,00,000)
Net present value (NPV)	11,31,185	10,34,881	11,46,045
Relevant discount rate		14%	
Job life (years)		6	

Job C is the most profitable, and therefore is the most attractive because $NPV_C > NPV_A > NPV_B$. However, $NPV > 0$ for each job and each project is attractive.

C. Risk for the firm is reduced through diversification. If job A is counter-cyclical, then it is least risky, other things being equal, and could be attractive on the basis of both its risk and return characteristics.

Question No. 6

Following data in respect of two machines namely 'A' and 'B' are detailed below Depreciation has been charged on straight line basis and estimated life of both machines is five years.

(In ₹)

Item	Machine 'A'	Machine 'B'
Cost	56,125	56,125
Net income after depreciation and taxes:		
1st Year	3,375	11,375
2nd Year	5,375	9,375
3rd Year	7,375	7,375
4th Year	9,375	5,375
5th Year	11,375	3,375
	<u>36,875</u>	<u>36,875</u>

Find out –

- Average rate of return on 'A' and 'B' machines
- Which machine is better from the point of view of pay-back period and why?
- Calculate average rate of return when salvage value of machine 'A' turns out to be Rs. 3,000 and when 'B' machine has zero salvage value.

Answer

- Average Rate of Return (ARR)

$$\text{ARR} = \frac{\text{Average net income after taxes}}{\text{Average investment}}$$

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$$\text{Average income of machine 'A'} = \frac{36,875}{5} = 7,375$$

$$\text{Average income of machine 'B'} = \frac{36,875}{5} = 7,375$$

$$\begin{aligned} \text{Average investment} &= \frac{1 \times 56,125}{2} \\ &= \text{Rs.}28,062.50 \end{aligned}$$

(Average investment of Machine A and Machine B is the same as the cost is same)

$$\begin{aligned} \text{ARR for Machine A} &= \frac{7,375 \times 100}{28,062.50} \\ &= 26.28\% \end{aligned}$$

$$\begin{aligned} \text{ARR for Machine B} &= \frac{7,375 \times 100}{28,062.50} \\ &= 26.28\% \end{aligned}$$

(b) From the Point of View of Pay-back Period

From this point of view, Machine B is better as the initial inflow is much higher compared to Machine A and hence Machine B provides large liquidity of funds.

(c) Average Rate of Return when Salvage Value of Machine A is Rs. 3,000

$$\begin{aligned} \text{Average Investment} &= ₹ 3,000 + 1/2 (₹ 56,125 - ₹ 3,000) \\ &= ₹ 3,000 + ₹ 26,563 \text{ (approximately)} \\ &= ₹ 29,563 \text{ (approximately)} \end{aligned}$$

$$\begin{aligned} \text{ARR} &= \frac{\text{Average income}}{\text{Average investment}} \\ &= \frac{7,375 \times 100}{29,563} \\ &= 24.95\% \end{aligned}$$

$$\text{ARR of Machine A} = 24.95\%$$

As Machine B does not have any salvage value, the ARR for Machine B will remain the same, i.e. 26.28% (as calculated in (a) above).

Question No. 7

Nimex Ltd. has just installed Machine-R at a cost of Rs. 2,00,000. The machine has a five year life with no residual value. The annual volume of production is estimated at 1,50,000 units, which can be sold at Rs. 6 per unit. Annual operating costs are estimated at Rs. 2,00,000 (excluding depreciation) at this output level. Fixed costs are estimated at Rs. 3 per unit for the same level of production.

Nimex Ltd. has just come across another model called Machine-S capable of giving the same output at an annual operating cost of Rs. 1,80,000 (exclusive of depreciation). There will be no change in fixed costs. Capital cost of this machine is Rs. 2,50,000 and the estimated life is for five years with nil residual value.

The company has an offer for sale of Machine-R at Rs.1,00,000. But the cost of dismantling and removal will amount to Rs. 30,000. As the company has not yet commenced operations, it wants to sell Machine –R and purchase Machine-S.

Nimex Ltd. will be a zero-tax company for seven years in view of several incentives and allowances available.

The cost of capital may be assumed at 14%. P.V. factors for five years are as follows:

Year	P.V. Factors @ 14%
1	0.877
2	0.769
3	0.675
4	0.592
5	0.519

- (i) Advise whether the company should opt for the replacement.
- (ii) Will there be any change in your view if Machine-R has not been installed but the company is in the process of selecting one or the other machine?

Support your view with necessary workings.

Answer

(i) **Replacement of Machine –R**

Incremental cash out flow

Cash out flow on Machine –S ₹ 2,50,000

Less: Sale Value of Machine –R after Cost of dismantling and removal (Rs. 1,00,000-Rs. 30,000) ₹ 70,000

Net outflow ₹ 1,80,000

Incremental cash flow from Machine-S

Annual cash flow from Machine –S ₹ 2,70,000

Annual cash flow from Machine –R ₹ 2,50,000

Net incremental Cash in flow ₹ 20,000

Present value of incremental cash in flows

$$= ₹ 20,000 \times (0.877 + 0.769 + 0.675 + 0.592 + 0.519)$$

$$= 20,000 \times 3.432 = ₹ 68,640$$

NPV of Machine -S = ₹ 68,640 – ₹ 1,80,000

$$= (-) ₹ 1,11,360$$

Rs. 2,00,000 spent on Machine –R is a sunk cost and hence it is not relevant for deciding the replacement.

Decision: Since Net present value of Machine –S is in the negative, replacement is not advised.

If the company is in the process of selecting one of the two machines, the decision is to be made on the basis of independent evaluation of two machines by comparing their Net-present values.

(ii) Independent evaluation of Machine –R and Machine –S:

	<i>Machine –R</i>	<i>Machine –S</i>
Units produced	1,50,000	1,50,000
Selling price per unit (₹)	<u>6</u>	<u>6</u>
Sale value (₹)	9,00,000	9,00,000
Less: Operating Cost (₹) (exclusive of depreciation)	<u>2,00,000</u>	<u>1,80,000</u>
Contribution (₹)	7,00,000	7,20,000
Less: Fixed Cost (₹)	<u>4,50,000</u>	<u>4,50,000</u>
Annual cash flow (₹)	2,50,000	2,70,000
Present value of cash flows for five years (₹)	8,58,000	9,26,640
Cash Outflow (₹)	<u>(2,00,000)</u>	<u>(2,50,000)</u>
Net Present Value (₹)	<u>6,58,000</u>	<u>6,76,640</u>

As the NPV of cash inflow of Machine –S is higher than that of Machine –R, the choice should fall on machine –S.

Note: As the company is a zero tax company for seven years (Machine life in both cases is only for five years), depreciation and the tax effect on the same are not relevant for consideration.

Question No. 8

A large profit making company is considering the installation of a machine to process the waste produced by one of its existing manufacturing process to be converted into a marketable product. At present, the waste is removed by a contractor for disposal on payment by the company of ₹ 50 lacs per annum for the next four years. The contract can be terminated upon installation of the aforesaid machine on payment of a compensation of ₹ 30 lacs before the processing operation starts. This compensation is not allowed as deduction for tax purposes.

The machine required for carrying out the processing will cost ₹ 200 lacs to be financed by a loan repayable in 4 equal installments commencing from the end of year 1. The interest rate is 16% per annum. At the end of the 4th year, the machine can be sold for ₹ 20 lacs and the cost of dismantling and removal will be ₹ 15 lacs.

Sales and direct costs of the product emerging from waste processing for 4 years are estimated as under:

	(₹ In lacs)			
Year	1	2	3	4
Sales	322	322	418	418
Material consumption	30	40	85	85
Wages	75	75	85	100
Other expenses	40	45	54	70
Factory overheads	55	60	110	145
Depreciation (as per income tax rules)	50	38	28	21

Initial stock of materials required before commencement of the processing operations is ₹ 20 lacs at the start of year 1. The stock levels of materials to be maintained at the end of year 1, 2 and 3 will be ₹ 55 lacs and the

stocks at the end of year 4 will be nil. The storage of materials will utilise space which would otherwise have been rented out for ₹ 10 lacs per annum. Labour costs include wages of 40 workers, whose transfer to this process will reduce idle time payments of ₹ 15 lacs in the year 1 and ₹ 10 lacs in the year 2. Factory overheads include apportionment of general factory overheads except to the extent of insurance charges of ₹ 30 lacs per annum payable on this venture. The company's tax rate is 50%.

Present value factors for four years are as under:

Year	1	2	3	4
Present value factors	0.870	0.756	0.658	0.572

Advise the management on the desirability of installing the machine for processing the waste. All calculations should form part of the answer.

Answer

Statement of Incremental Profit (₹ in lacs)

Years	1	2	3	4
Sales :(A)	<u>322</u>	<u>322</u>	<u>418</u>	<u>418</u>
Material consumption	30	40	85	85
Wages	60	65	85	100
Other expenses	40	45	54	70
Factory overheads (insurance)	30	30	30	30
Loss of rent	10	10	10	10
Interest	32	24	16	8
Depreciation (as per income tax rules)	<u>50</u>	<u>38</u>	<u>28</u>	<u>21</u>
Total cost: (B)	<u>252</u>	<u>252</u>	<u>308</u>	<u>324</u>
Incremental profit (C)=(A)-(B)	70	70	110	94
Tax (50% of (C))	35	35	55	47

Statement of Incremental Cash Flows (₹ in lacs)

Years	0	1	2	3	4
Material stocks	(20)	(35)	-	-	-
Compensation for contract	(30)	-	-	-	-
Contract payment saved	-	50	50	50	50
Tax on contract payment	-	(25)	(25)	(25)	(25)
Incremental profit	-	70	70	110	94
Depreciation added back	-	50	38	28	21
Tax on profits	-	(35)	(35)	(55)	(47)
Loan repayment	-	(50)	(50)	(50)	(50)

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Profit on sale of machinery (net)	-	-	-	-	5
Total incremental cash flows	(50)	25	48	58	48
Present value factor	1.00	0.870	0.756	0.658	0.572
Net present value of cash flows	(50)	21.75	36.288	38.164	27.456
Net present value	= ₹ 123.658 – ₹ 50				
	= ₹ 73.658 lacs.				

Advice: Since the net present value of cash flows is ₹ 73.658 lacs which is positive the management should install the machine for processing the waste.

Notes:

1. Increase in material stock is taken in cash flows.
2. Idle time wages have also been considered
3. Apportioned factory overheads are not relevant, only insurance charges of this project are relevant.
4. Interest calculated at 16% based on 4 equal instalments of loan repayment.
5. Sale of machinery- Net income after deducting removal expenses taken. Tax on Capital gains ignored.
6. Saving in contract payment and income tax there on considered in the cash flows.

Question No. 9

A company is considering two mutually exclusive projects X and Y. Project X costs ₹ 3,00,000 and Project Y ₹ 3,60,000. You have been given below the net present value, probability distribution for each project:

Project X		Project Y	
NPV Estimate	Probability	NPV Estimate	Probability
(₹)		(₹)	
30,000	0.1	30,000	0.2
60,000	0.4	60,000	0.3
1,20,000	0.4	1,20,000	0.3
1,50,000	0.1	1,50,000	0.2

- (i) Compute the expected net present value of Projects X and Y.
- (ii) Compute the risk attached to each project i.e., Standard Deviation of each probability distribution.
- (iii) Which project do you consider more risky and why?

Answer

Project-X

(Amount in ₹)

NPV Estimates	Probability	Expected NPV	Deviation 90,000- (1)	Square of Deviation	Square of Deviation x Probability
(1)	(2)	(3)=(1) x (2)	(4)	(5)=(4) ²	(6)=(5) x (2)

30,000	0.1	3,000	-60,000	36,00,000,000	36,00,00,000
60,000	0.4	24,000	-30,000	9,00,000,000	9,00,00,000
1,20,000	0.4	48,000	30,000	9,00,000,000	9,00,00,000
1,50,000	0.1	15,000	60,000	36,00,000,000	36,00,00,000
Expected NPV	90,000			14,40,000,000	

Project-Y

(Amount in ₹)

NPV Estimates	Probability	Expected NPV	Deviation 90,000- (1)	Square of Deviation	Square of Deviation x Probability
(1)	(2)	(3) =(1) x (2)	(4)	(5) =(4) ²	(6)=(5) x (2)
30,000	0.2	6,000	-60,000	36,00,000,000	72,00,00,000
60,000	0.3	18,000	-30,000	9,00,000,000	27,00,00,000
1,20,000	0.3	36,000	30,000	9,00,000,000	27,00,00,000
1,50,000	0.2	30,000	60,000	36,00,000,000	72,00,00,000
Expected NPV	90,000			19,80,000,000	

(i) The expected net present value of Projects X and Y is ₹ 90,000 each.

(ii) Standard Deviation = $\sum \sqrt{\text{Square of the deviation} \times \text{probability}}$

In case of Project X: Standard Deviation = $\sqrt{14,40,000,000}$
= 37,947

In case of Project Y: Standard Deviation = $\sqrt{19,80,000,000}$
= 44,497

(iii) Coefficient of variation = $\frac{\text{standard deviation}}{\text{Expected net present value}}$

In case of Project X : Coefficient of variation = $\frac{37,947}{90,000}$
= 0.42

In case of Project Y : Coefficient of variation = $\frac{44,497}{90,000}$
= 0.4944 or 0.50

Project Y is riskier since it has a higher coefficient of variation.

Question No. 9

The Textile Manufacturing Company Ltd., is considering one of two mutually exclusive proposals, Projects M and N, which require cash outlays of ₹ 8,50,000 and ₹ 8,25,000 respectively. The certainty-equivalent (C.E) approach is used in incorporating risk in capital budgeting decisions. The current yield on government bonds is 6% and this is used as the risk free rate. The expected net cash flows and their certainty equivalents are as follows:

Year-end	Project M		Project N	
	Cash Flow (₹)	C.E.	Cash Flow (₹)	C.E.
1	4,50,000	0.8	4,50,000	0.9
2	5,00,000	0.7	4,50,000	0.8
3	5,00,000	0.5	5,00,000	0.7

Present value factors of ₹ 1 discounted at 6% at the end of year 1, 2 and 3 are 0.943, 0.890 and 0.840 respectively. Which one of the project should be accepted?

Answer

(i) Statement Showing the Net Present Value of Project M

Year	Cash Flow(a) (₹)	C. E.(b)	Adjusted Cashflow (₹)(c) = (a) × (b)	Present Value Factor at 6%(d)	Total Present Value (₹) (c) × (d)
1	4,50,000	0.8	3,60,000	0.943	3,39,480
2	5,00,000	0.7	3,50,000	0.890	3,11,500
3	5,00,000	0.5	2,50,000	0.840	2,10,000
Total					<u>8,60,980</u>
Less: Initial Investment					<u>8,50,000</u>
Net Present Value					<u>10,980</u>

Statement Showing the Net Present Value of Project N

Year	Cash Flow(a) (₹)	C. E.(b)	Adjusted Cashflow (₹)(c) = (a) × (b)	Present Value Factor at 6%(d)	Total Present Value (₹) (c) × (d)
1	4,50,000	0.9	4,05,000	0.943	3,81,915
2	4,50,000	0.8	3,60,000	0.890	3,20,400
3	5,00,000	0.7	3,50,000	0.840	2,94,000
Total					<u>9,96,315</u>
Less: Initial Investment					<u>8,25,000</u>
Net Present Value					<u>1,71,315</u>

Decision : Since the net present value of Project N is higher, so the project N should be accepted.

Question No. 10

From the following details relating to a project, analyse the sensitivity of the project to changes in initial project cost, annual cash inflow and cost of capital:

Initial Project Cost (₹)	1,20,000
Annual Cash Inflow (₹)	45,000
Project Life (Years)	4
Cost of Capital	10%

To which of the three factors, the project is most sensitive? (Use annuity factors: for 10% 3.169 and 11% ... 3.109).

Answer**CALCULATION OF NPV**

	₹
PV of cash inflows (₹ 45,000 x 3.169)	1,42,605
Initial Project Cost	<u>1,20,000</u>
NPV	22,605
If initial project cost is varied adversely by 10%	
NPV (Revised) (₹ 1,42,605 - 1,32,000)	₹ 10,605
Change in NPV $\frac{₹ 22,605 - ₹ 10,605}{₹ 22,605}$	₹ 22,605
= 53.08 %	

If annual cash inflow is varied adversely by 10%*

Revised annual inflow (₹ 45,000 - 10% of ₹ 45,000) = ₹ 40,500

NPV (Revised) (₹ 40,500 x 3.169) – (1,20,000) = (+) ₹ 8,345

Change in NPV (₹ 22,605 – ₹ 8,345) / ₹ 22,605

=63.08 %

If cost of capital is varied adversely by 11%*

NPV (Revised) (₹ 45,000 x 3.109) – ₹ 1,20,000 = (+) ₹ 19,905

Change in NPV (₹ 22,605 – ₹ 19,905) / ₹ 22,605

=11.94 %

Conclusion: Project is most sensitive to 'annual cash inflow'.

*Note: Students may please note that they may assume any other percentage rate other than 10% say 15%, 20%, 25% etc.

LESSON ROUND-UP

- Capital Budgeting refers to long-term planning for proposed capital outlays and their financing. Capital Budgeting may also be defined as “the firms’ decision to invest its current fund more efficiently in long-term activities in anticipation of an expected flow of future benefit over a series of years.
- Capital Rationing helps the firm to select the combination of investment projects that will be within the specified limits of investments to be made during a given period of time and at the same time provide greatest profitability.
- Pay Back technique estimates the time required by the project to recover, through cash inflows, the firms initial outlay.

$$\text{Pay back period} = \frac{\text{Initial Investment}}{\text{Annual cash inflows}}$$

- Average Rate of Return method is designated to consider the relative profitability of different capital investment proposals as the basis for ranking them – the fact neglected by the payout period technique.

- Average Rate of Return

$$= \left(\frac{\text{Net earnings after Depreciation and Taxes}}{\text{No. of years project will last Investment}} \right) \div \text{Original Investment or Average Investment}$$

- Net Present Value: The cash outflows and inflows associated with each project are ascertained first and both are reduced to the present values at the rate of return acceptable to the management. The rate of return is either cost of capital of the firm or the opportunity cost of capital to be invested in the project.

$$\text{NPV} = \sum_{t=1}^N \frac{R_t}{(1+k)^t} + \frac{S_n + W_n}{(1+k)^n} - \sum_{t=1}^N \frac{C_t}{(1+k)^t} - C_0$$

- Internal Rate of Return: The internal rate of return refers to the rate which equates the present value of cash inflows and present value of cash outflows.

$$\mathring{a}_{t=1}^n \frac{CF_t}{(1+r)^t} + \frac{S_n + W_n}{(1+r)^n} = \mathring{a}_{t=1}^n \frac{C_t}{(1+k)^t}$$

- Profitability Index (PI): Profitability Index is defined as the ratio of present value of the future cash benefits at the required rate of return to the initial cash outflow of the investment.

$$\text{PI} = \frac{\sum_{t=1}^n \frac{A_t}{(1+k)^t}}{C}$$

- Sensitivity Analysis treats risk and uncertainty in capital budgeting decisions.
- Cost of equity capital is the minimum return that the investors would like to get on their investments in Company's Shares.
- Composite cost of Capital is calculated as combined weighted average of the cost of all different sources of capital

TEST YOURSELF

(These are meant for re-capitulation only. Answers to these questions are not to be submitted for evaluation)

1. Define capital budgeting and examine the need for capital budgeting.
2. Explain different methods of appraising project profitability. Which method is considered to be the best?
3. Distinguish between Internal Rate of Return and Net Present Value techniques. Which method would you recommend for evaluating investment? Explain.
4. (a) Capital Budgeting models are used to evaluate a wide variety of capital expenditure decisions. Comment on this statement and enunciate some of the important expenditure decisions to which capital budgeting technique can be applied.

(b) The Susan Co. is contemplating either of two mutually exclusive projects. The data with respect to each are given below. The initial investment for both is equal to their depreciable value. Both will be depreciated straight line over a five-year life.

	<i>Project A (₹)</i>	<i>Project B (₹)</i>
Initial Investment	1,00,000	1,40,000
Year	Profits after taxes	
1	10,000	25,000
2	15,000	25,000
3	20,000	25,000
4	25,000	25,000
5	35,000	25,000

- (i) Calculate the 'net present value' and 'benefit-cost ratio' for each project.
- (ii) Evaluate the acceptability of each project on the basis of above mentioned two techniques.
- (iii) Select the best project, using NPV and benefit-cost ratios and comment on the resulting rankings.
- (iv) Assume that the Susan Co. has an 11% cost of capital.
- (v) The following data relates to discounting factor:

Year	Discounting factor at 11%
1	.901
2	.812
3	.731
4	.659
5	.593

and discounting factor for present value of an annuity discounted at 11% for five years is 3.696.

5. Define the concept of cost of capital. State how you would determine the weighted average cost of capital of firm.
6. Write short notes on:
 - (1) Profitability Index
 - (2) Sensitivity Analysis
 - (3) Decision tree analysis
 - (4) Capital Rationing.
7. Explain the various steps of capital budgeting process.

Lesson 3

Capital Structure and Leverage Analysis

LESSON OUTLINE

- Meaning and Significance of Capital Structure
- Capital Structure vis-à-vis Financial Structure
- Planning and Designing
- Optimal Capital Structure
- Factors affecting Capital Structure of a Company
- Determinants of Capital Structure
- Capital Structure and Valuation
- Theories of Capital Structure
- EBIT - EPS Analysis
- EBITDA Analysis (Earnings before Interest, Tax, Depreciation and Amortization)
- Measures of Operating and Financial Leverage
- Effects of Leverage on Shareholders' Returns
- Risk and Leverage
- LESSON ROUND UP
- TEST YOURSELF

LEARNING OBJECTIVES

Capital Structure of a company is very important for company's survival. If the capital structure of a company is not optimized, then it becomes difficult for a company to sustain i.e. sometimes it has to face shortage of capital, sometimes it has to bear high interest. So in view of above, it becomes very important for a finance manager to ensure that the firm's capital structure is as per the market and organisation condition. The object of the lesson is to enable the students to understand:

- Nature, scope and significance of capital structure
- Factors affecting Capital Structure
- Capital structure vis a vis Financial structure
- Planning and designing of capital structure
- Optimal Capital Structure
- Capital Structure & Valuation
- Theories of Capital Structure
- Leverage – Operating leverage, financial leverage, combined leverage
- EBIT-EPS Analysis
- Effect of leverages on return on equity

The optimal capital structure indicates the best debt-to-equity ratio for a firm that maximizes its value. Putting it simple, the optimal capital structure for a company is the one which offers a balance between the ideal debt-to-equity ranges thus minimizing the firm's cost of capital

INTRODUCTION, DEFINITION AND SIGNIFICANCE OF CAPITAL STRUCTURE

Introduction

Given the Capital Budgeting decision of a firm, it has to decide the way in which the capital projects will be financed. Every time the firm makes an Investment decision, it has to undertake a financing decision also. For example, a decision to purchase a new machinery or plant implies specific ways of financing that project. Should the firm employ equity or debt or both? What may be its implications/ What is the appropriate mix of debt and equity? These are some questions that a firm needs to answer before taking up any Financing decision.

Capital structure means the structure or constitution or break-up of the capital employed by a firm. The capital employed consists of both the owners' capital and the debt capital provided by the lenders. Debt capital is understood here to mean the long term debt which has been deployed to build long term assets. Apart from the elements of equity and debt in the capital structure, a firm could have quasi equity in the form of convertible debt.

The Financing or Capital Structure decision is a significant managerial decision as it influences the shareholder's return and risk. Consequently, the market value of the share may be affected by the capital structure decision.

Definition of Capital Structure

The following definitions clearly initiate, the meaning and objective of the capital structure.

According to the definitions of **Gerstenberg**, "Capital Structure of a company refers to the composition or make up of its capitalization and it includes all long-term capital resources".

According to the definition of **James C. Van Horne**, Capital Structure is "The mix of a firm's permanent long-term financing represented by debt, preferred stock and common stock equity".

Type of Capital Structure

Capital Structure of a firm is a reflection of the overall investment and financing strategy of the firm. It shows how much reliance is being placed by the firm on external sources of finance and how much internal accruals are being used to finance expansions etc. Capital structure can be of various kinds as described below:

1. Horizontal Capital Structure

In a Horizontal capital structure, the firm has zero debt components in the structure mix. The structure is quite stable. Expansion of the firm takes in a lateral manner, i.e. through equity or retained earning only. The absence of debt results in the lack of financial leverage. Probability of disturbance of the structure is remote.

2. Vertical Capital Structure

In a vertical capital structure, the base of the structure is formed by a small amount of equity share capital. This base serves as the foundation on which the super structure of preference share capital and debt is built. The incremental addition in the capital structure is almost entirely in the form of debt. Quantum of retained earnings is low and the dividend pay-out ratio is quite high. In such a structure, the cost of equity capital is usually higher than the cost of debt. The high component of debt in the capital structure increases the financial risk of the firm and renders the structure unstable. The firm, because of the relatively lesser component of equity capital, is vulnerable to hostile takeovers.

3. Pyramid shaped Capital structure

A pyramid shaped capital structure has a large proportion consisting of equity capital and retained earnings which have been ploughed back into the firm over a considerably large period of time. The cost of share capital and the retained earnings of the firm is usually lower than the cost of debt. This structure is indicative of risk averse conservative firms.

4. Inverted Pyramid shaped Capital Structure

Such a capital structure has a small component of equity capital, reasonable level of retained earnings but an ever increasing component of debt. All the increases in the capital structure in the recent past have been made through debt only. Chances are that the retained earnings of the firm are shrinking due to accumulating losses. Such a capital structure is highly vulnerable to collapse.

Significance of Capital Structure

Capital structure is significant for a firm because the long term profitability and solvency of the firm is sustained by an optimal capital structure consisting of an appropriate mix of debt and equity. The capital structure also is significant for the overall ranking of the firm in the industry group. The significance of the capital structure is discussed below:

1. It reflects the firm's strategy

The capital structure reflects the overall strategy of the firm. The strategy includes the pace of growth of the firm. In case the firm wants to grow at a faster pace, it would be required to incorporate debt in its capital structure to a greater extent. Further, in case of growth through acquisitions or the inorganic mode of growth as it is called, the firm would find that financial leverage is an important tool in funding the acquisitions.

2. It is an indicator of the risk profile of the firm

One can get a reasonably accurate broad idea about the risk profile of the firm from its capital structure. If the debt component in the capital structure is predominant, the fixed interest cost of the firm increases thereby increasing its risk. If the firm has no long term debt in its capital structure, it means that either it is risk averse or it has cost of equity capital or cost of retained earnings less than the cost of debt.

3. It acts as a tax management tool

The capital structure acts as a tax management tool also. Since the interest on borrowings is tax deductible, a firm having healthy growth in operating profits would find it worthwhile to incorporate debt in the capital structure in a greater measure.

4. It helps to brighten the image of the firm

A firm can build on the retained earnings component of the capital structure by issuing equity capital at a premium to a spread out base of small investors. Such an act has two benefits. On the one hand, it helps the firm to improve its image in the eyes of the investors. At the same time, it reduces chances of hostile take-over of the firm.

CAPITAL STRUCTURE VIS-A-VIS FINANCIAL STRUCTURE

In engineering, structure refers to different parts of a building and thus in financial terms, financial structure refers to all the components of finance in an organization. In simple terms, financial structure consists of all assets, all liabilities and the capital. The manner in which an organization's assets are financed is referred to as its financial structure. There are some similarities between capital structure and financial structure. However, there are many differences also.

If you take a look at the balance sheet of a company, the entire left hand side which includes liabilities plus equity is called the financial structure of the company. It contains all the long term and short term sources of capital. On the other hand, capital structure is the sum total of all long term sources of capital and thus is a part of the financial structure. It includes debentures, long term debt, preference share capital, equity share capital and retained earnings. In the simplest of terms, capital structure of a company is that part of financial structure that reflects long term sources of capital.

Consider the balance sheet of a company :

(Amt. in ₹)

Particulars	Note	Amount as at 31 st March, 2019
1	2	3
I EQUITY AND LIABILITIES		
(1) Shareholders' funds		
(a) Share Capital		2,00,000
(b) Reserve and Surplus	1	72,000
(2) Current liabilities		
(a) Trade payable		1,28,000
(b) Provision for income Tax		60,000
TOTAL		4,60,000
II. ASSETS		
(1) Non current-assets		
(a) Fixed Assets		2,64,000
(b) Preliminary expenses	2	8,000
(2) Current Assets		
(a) inventories		48,000
(b) Trade receivable		88,000
(c) Cash at bank		52,000
TOTAL		4,60,000

In the above illustration, the total liabilities size of ₹ 4,60,000 is the financial structure of the firm while the long term block of ₹ 2,72,000 is the capital structure. We can also say that that the total financial structure minus the current liabilities structure gives us the capital structure. (Financial Structure - Current Liabilities = Capital Structure)

We can enunciate the following differences between financial structure and capital structure:

- Capital structure relates to long term capital deployment for creation of long term assets. Financial structure involves creation of both long term and short term assets.
- Capital structure is the core element of the financial structure. Capital structure can exist without the current liabilities and in such cases. Capital structure shall be equal to the financial structure. But we cannot have a situation where the firm has only current liabilities and no long term capital.
- Components of the capital structure may be used to build up the level of current assets but the current liabilities should not be used to finance acquisition of fixed assets. This would result in an asset liability mismatch.

PLANNING AND DESIGNING OF CAPITAL STRUCTURE

Just as planning and design of a physical structure is important, the same holds true for capital structure as well. A well thought out plan for the capital structure supplemented by a careful design ensures that prime goal of the firm, i.e. maximisation of the shareholder wealth is easily achieved.

Planning of the capital structure is a preliminary activity and it might commence as early at the time of incorporation of the firm. Once the firm is established, the next logical step is to move in the direction of implementation of the project. For meeting the cost of the project, the means of finance are to be arranged. Hence the need for timely and early planning of the capital structure.

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

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

Attributes of a Well Planned Capital Structure

A sound or appropriate capital structure should have the following features:

Return: The capital structure of the company should be most advantageous. Subject to other considerations, it should generate maximum returns to the shareholders without adding additional cost to them.

Risk: The use of excessive debt threatens the solvency of the company. To the point debt does not add significant risk. It should be used, otherwise its use should be avoided.

Flexibility: The capital structure should be flexible. It should be possible for a company to adapt its capital structure with a minimum cost and delay if warranted by a changed situation. It should also be possible for the company to provide funds whenever needed to finance its profitable activities.

Capacity: The capital structure should be determined within the debt capacity of the company and this capacity should not be exceeded. The debt capacity of a company depends on its ability to generate future cash flows. It should have enough cash to pay creditors' fixed charges and principal sum.

Control: The capital structure should involve minimum risk of loss of control of the company. The owners of closely-held companies are particularly concerned about dilution of control.

Designing a Capital Structure

After planning the capital structure, we are faced with the issue of its design. Design takes off from where the plan ends. Planning establishes the broad parameters of the structure. It is left for the design to fill in the minor details. While designing a capital structure, following points need to be kept in view:

1. **Design should be functional:** The design should create synergy with the long term strategy of the firm and should not be dysfunctional. It should facilitate the day to day working of the firm rather than create systematic bottlenecks.
2. **Design should be flexible:** The capital structure should be designed to incorporate a reasonable amount of flexibility in order to allow for temporary expansion or contraction of the share of each component.

- 3. Design should be conforming statutory guidelines:** The design should conform to the statutory guidelines, if any, regarding the proportion and amount of each component. The limits imposed by lenders regarding the minimum level of owners' equity required in the firm should be complied with.

OPTIMAL CAPITAL STRUCTURE

Is there an optimal capital structure for a firm? By the term optimal capital structure we mean a particular arrangement of various components of the structure which is just in tune with the both the long term and short term objectives of the firm. An optimal capital structure is the best debt to equity ratio for a firm that maximises its value. The optimal capital structure for a company is one that offers a balance between the ideal debt to equity range and minimises the firm's cost of capital. A combination less or more than the optimal combination would be less than satisfying. Hence, a sub-optimal combination would affect the achievement of the goal of maximisation of the shareholders' wealth.

But can we plan and design an optimal capital structure? For designing such a structure, one would need the following information:

- The requirement of capital of the firm
- Availability of different components
- Cost of these components
- Rate of return from investment

It has to be further kept in mind that the above information should be exact information. In reality it is not possible to have the exact information on all the above four parameters. Secondly whatever information is available is for a particular period. Thus, we have to design the structure in a static set-up which makes the design devoid of all flexibility.

The real world of business, however, is a dynamic world with ever changing demand and supply of various components of the capital structure. Hence, we can not formulate the optimal capital structure in a static framework. The process has to be carried out in a dynamic framework of interdependent investment and financing decisions that yield optimal values within the constraints at the time and place when the decisions were made. We can, therefore, say that the optimal capital structure is an ideal situation which can function as the benchmark of performance for a firm. But this benchmark is invincible and the firm can expect to achieve moderated or toned down versions of this benchmark depending upon dynamics of each project.

FACTORS INFLUENCING CAPITAL STRUCTURE

Under the capital structure, decision regarding the proportion of long-term sources of capital is determined. Most favourable proportion determines the optimum capital structure. That happens to be the need of the company because EPS happens to be the maximum on it. Some of the chief factors affecting the choice of the capital structure are the following:

(1) Cash Flow Position

While making a choice of the capital structure the future cash flow position should be kept in mind. Debt capital should be used only if the cash flow position is really good because a lot of cash is needed in order to make payment of interest and refund of capital.

(2) Interest Coverage Ratio-ICR

With the help of this ratio an effort is made to find out how many times the EBIT is available to the payment of interest. The capacity of the company to use debt capital will be in direct proportion to this ratio.

It is possible that inspite of better ICR the cash flow position of the company may be weak. Therefore, this ratio is not a proper or appropriate measure of the capacity of the company to pay interest. It is equally important to take into consideration the cash flow position.

(3) Debt Service Coverage Ratio-DSCR

This ratio removes the weakness of ICR. This shows the cash flow position of the company.

This ratio tells us about the cash payments to be made (e.g., preference dividend, interest and debt capital repayment) and the amount of cash available. Better ratio means the better capacity of the company for debt payment. Consequently, more debt can be utilised in the capital structure.

(4) Return on Investment-ROI

The greater return on investment of a company increases its capacity to utilise more debt capital.

(5) Cost of Debt

The capacity of a company to take debt depends on the cost of debt. In case the rate of interest on the debt capital is less, more debt capital can be utilised and vice versa.

(6) Tax Rate

The rate of tax affects the cost of debt. If the rate of tax is high, the cost of debt decreases. The reason is the deduction of interest on the debt capital from the profits considering it a part of expenses and a saving in taxes.

For example, suppose a company takes a loan of 0ppp 100 and the rate of interest on this debt is 10% and the rate of tax is 30%. By deducting 10/- from the EBIT a saving of in tax will take place (If 10% on account of interest are not deducted, a tax of @ 30% shall have to be paid).

(7) Cost of Equity Capital

Cost of equity capital (it means the expectations of the equity shareholders from the company) is affected by the use of debt capital. If the debt capital is utilised more, it will increase the cost of the equity capital. The simple reason for this is that the greater use of debt capital increases the risk of the equity shareholders.

Therefore, the use of the debt capital can be made only to a limited level. If even after this level the debt capital is used further, the cost of equity capital starts increasing rapidly. It adversely affects the market value of the shares. This is not a good situation. Efforts should be made to avoid it.

(8) Floatation Costs

Floatation costs are those expenses which are incurred while issuing securities (e.g., equity shares, preference shares, debentures, etc.). These include commission of underwriters, brokerage, stationery expenses, etc. Generally, the cost of issuing debt capital is less than the share capital. This attracts the company towards debt capital.

(9) Risk Consideration: There are two types of risks in business –

(i) Operating Risk or Business Risk

This refers to the risk of inability to discharge permanent operating costs (e.g., rent of the building, payment of salary, insurance installment, etc.).

(ii) Financial Risk

This refers to the risk of inability to pay fixed financial payments (e.g., payment of interest, preference dividend, return of the debt capital, etc.) as promised by the company.

The total risk of business depends on both these types of risks. If the operating risk in business is less, the financial risk can be faced which means that more debt capital can be utilised. On the contrary, if the operating risk is high, the financial risk likely occurring after the greater use of debt capital should be avoided.

(10) Flexibility

According to this principle, capital structure should be fairly flexible. Flexibility means that, if need be, amount of capital in the business could be increased or decreased easily. Reducing the amount of capital in business is possible only in case of debt capital or preference share capital.

If at any given time company has more capital than as necessary then both the above-mentioned capitals can be repaid. On the other hand, repayment of equity share capital is not possible by the company during its lifetime. Thus, from the viewpoint of flexibility to issue debt capital and preference share capital is the best.

(11) Control

According to this factor, at the time of preparing capital structure, it should be ensured that the control of the existing shareholders (owners) over the affairs of the company is not adversely affected.

If funds are raised by issuing equity shares, then the number of company's shareholders will increase and it directly affects the control of existing shareholders. In other words, now the number of owners (shareholders) controlling the company increases.

This situation will not be acceptable to the existing shareholders. On the contrary, when funds are raised through debt capital, there is no effect on the control of the company because the debenture holders have no control over the affairs of the company. Thus, for those who support this principle debt capital is the best.

(12) Regulatory Framework

Capital structure is also influenced by government regulations. For instance, banking companies can raise funds by issuing share capital alone, not any other kind of security. Similarly, it is compulsory for other companies to maintain a given debt-equity ratio while raising funds.

Different ideal debt-equity ratios such as 2:1; 4:1; 6:1 have been determined for different industries. Also, the public issue of shares and debentures has to be made under SEBI guidelines.

(13) Stock Market Conditions

Stock market conditions refer to upward or downward trends in capital market. Both these conditions have their influence on the selection of sources of finance. When the market is dull, investors are mostly afraid of investing in the share capital due to high risk.

On the contrary, when conditions in the capital market are cheerful, they treat investment in the share capital as the best choice to reap profits. Companies should, therefore, make selection of capital sources keeping in view the conditions prevailing in the capital market.

(14) Capital Structure of Other Companies

Capital structure is influenced by the industry to which a company is related. All companies related to a given industry produce almost similar products, their costs of production are similar, they depend on identical technology, they have similar profitability, and hence the pattern of their capital structure is almost similar.

Because of this fact, there are different debt- equity ratios prevalent in different industries. Hence, at the time of raising funds a company must take into consideration debt-equity ratio prevalent in the related industry.

CAPITAL STRUCTURE AND VALUATION

There is a theme that the capital structure should be conducive to increase in valuation of the firm. By valuation, we mean that the market value or the realisable value of the owners' equity should increase. This can happen in case value of both components of the shareholders' equity, i.e. share capital and retained earnings increases.

Value of the share capital is reflected in the market value of the firm in case the shares are traded on the stock exchange. This market value, under ideal conditions, is indicative of the inherent value and is different from both the face value and the book value. The capital structure should be such as maximises the inherent value of the firm.

Retained earnings also have a book value, i.e. the value at which these earnings are carried in the books of the firm. The inherent value of the retained earnings depends upon the future returns which these earnings can generate for the owners. As earnings of the firm increase, its valuation also increases. Earnings can increase either directly through increased level of operations of the firm or indirectly through decrease in cost of capital of the firm. The direct increase in earnings is dependent upon the investment decisions and the changes in capital structure have no explicit bearing upon these earnings. Capital structure plays an important part in increase in earnings brought about by change in cost of different components of the structure.

CAPITAL STRUCTURE THEORIES

There are basically four approaches to capital structure decision:

1. Net Income Approach
2. Net Operating Income Approach
3. Traditional Approach
4. Modigliani Miller (MM) Approach

1. Net Income Approach

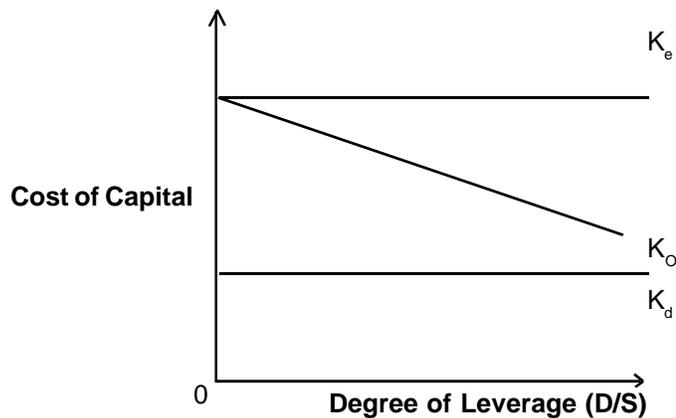
According to this approach there is a relationship between capital structure and the value of the firm and therefore, the firm can affect its value by increasing or decreasing the debt proportion in the overall financial mix. The Net Income Approach makes the following assumptions:

1. Cost of debt (K_d) is less than cost of equity (K_e) ($K_d < K_e$)
2. Both K_d and K_e remain constant and increase in financial leverage i.e., use of more and more debt financing in the capital structure does not affect the risk perception of the investors.
3. There are no taxes.

Under this approach, the cost of debt capital, K_d and the cost of equity capital K_e remains unchanged when D/S , the degree of leverage, varies. Here S stands for total capital employed ($S = D + E$). The constancy of K_d and K_e with respect to the degree of leverage means that K_0 , the average cost of capital, measured by the following formula declines as the degree of leverage increases.

$$K_0 = K_d \times \frac{D}{(D+E)} + K_e \times \frac{E}{(D+E)}$$

This happens because when the degree of leverage increases, K_d which is lower than K_e receives a higher weight in the calculation of K_0 . This can also be illustrated by a graph as shown below:



As our assumption is that the cost of debt and equity capital would not change with the change in the level of leverage, K is seen to go down with the increasing proportion of debt in the capital.

Let us take a company that has an investment of ₹ 2,00,000 and a net operating income of ₹ 50,000. It is considering two scenarios: (1) no debt and (2) equal levels of debt and equity of ₹ 1,00,000 each. Let us say that the company finds out that the cost of equity is 12% and the cost of debt is 8%.

Calculations show that equity earnings would be ₹ 50,000 and ₹ 42,000 respectively in the two scenarios and shown below. As the return expected on equity is 12%, we can say that this profit is 12% and therefore the market value of equity would be such that this return becomes 12% on the same. This means that the market value of equity would be ₹ 4,16,667 and ₹ 4,50,000 respectively in the two scenarios. Adding the market value of debt and the market value of equity gives us the total value of the firm in the market.

	Scenario A	Scenario B
Equity	2,00,000	1,00,000
Debt	0	1,00,000
Total Capital	2,00,000	2,00,000
Cost of Equity	12%	12%
Cost of Debt	8%	8%

Now the Calculation will be as under

	Scenario A	Scenario B
EBIT	50,000	50,000
Less Interest	0	(8,000)
Earnings available for Equity Shareholders	50,000	42,000
Value of Equity (Earnings Available/ K_e)	4,16,667	3,50,000
Add - Market Value of Debt	0	1,00,000
Total Value of Firm	4,16,667	4,50,000

Average cost of capital Scenario A: $8\% \times (0/2,00,000) + 12\% \times (2,00,000/2,00,000) = 12\%$

Scenario B: $8\% \times (1,00,000/4,50,000) + 12\% \times (3,50,000/4,50,000) = 11.10\%$

There are two points to be noted here

1. As the cost of capital decreases the value of the firm would go up. Inverse relationship exists between the value of the firm and cost of capital for any given level of return.
2. As we increase the level of debt in the company, the value of the firm would go up even further. This would mean that the companies would like to employ as much debt as possible.

Example: Super manufacturing company expects to earn net operating income of INR 1,50,000 annually. The company has INR 6,00,000, 8% debentures. The cost of equity capital of the company is 10%. What would be the value of the company? Also calculate overall cost of capital.

Solution:

Calculation of Value of Super Manufacturing Company

Particulars	Amount (INR)
Net Operating Income	1,50,000
Less: Interest on 8% debentures (I)	48,000
Earnings available to equity shareholders (NI)	1,02,000
Equity capitalisation rate (Ke)	0.10
Market value of equity (S) = NI / Ke	10,20,000
Market value of debt (B)	6,00,000
Total value of firms (S+B)= V	16,20,000

Overall cost of capital = $K_0 = \text{EBIT} / V = \text{INR } 1,50,000 / 16,20,000$

= 0.093

= 9.3% approximately

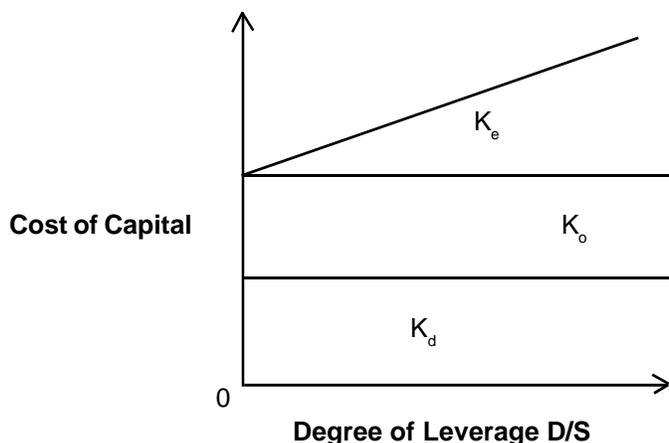
2. Net Operating Income Approach

Net operating income approach is opposite to the Net income approach. According to NOI Approach, the market value of the firm depends upon the net operating profit or EBIT and the overall cost of capital. The financing mix or the capital structure is irrelevant and does not affect the value of the firm. The NOI Approach makes the following assumptions:

1. The investors see the firm as a whole and thus capitalize the total earnings of the firm to find the value of the firm as a whole.
2. The overall cost of capital K_0 of the firm is constant and depends upon the business risk which also is assumed to be unchanged.
3. The cost of debt, K_d is also taken as constant.
4. The use of more and more debt in the capital structure increases the risk of the shareholders and thus results in the increase in the cost of equity capital i.e, K_e . The increase in K_e is such as to completely offset the benefits of employing cheaper debt, and

5. There is no taxes.

Under NOI Approach the relationship between the leverage and cost of capital has been represented in the Figure below:



Let us repeat the example we discussed earlier in net income approach. Let us take a company that has an investment of ₹ 2,00,000 and net operating income of ₹ 50,000. It is considering two scenarios: 1) no debt and 2) equal levels of debt and equity of ₹ 100,000 each. Let us assume that the company finds out that the overall cost of capital is 10% and the cost of debt is 8%.

As the return expected on total capital is 10 per cent, therefore the market value of total capital would be such that this return becomes 10 per cent on the same. This means that the market value of capital would be ₹ 5,00,000 in both the scenarios as our assumption in this case is that the total market value remains constant. Also the value of debt would also remain constant as the cost of debt remains constant. This means that the equity capitalization can be calculated by subtracting the market value of debt from the total market value of the firm. Then the return on equity divided by the market capitalization of equity would give us the cost of equity.

Equity	Scenario 'A'	Scenario 'B'
Equity	₹ 2,00,000	₹ 1,00,000
Debt	0	₹ 1,00,000
Cost of Debt	8%	8%
Net operating income	₹ 50,000	₹ 50,000
Overall Capitalization rate	10%	10%
Total market value	₹ 5,00,000	₹ 5,00,000
Interest on debt	0	₹ 8,000
Debt capitalization rate	0.08	0.08
Market value of debt	0	₹ 1,00,000
Market value of equity	₹ 5,00,000	₹ 4,00,000

There are two points to be noted here:

- As the cost of total capital and debt is constant, the cost of equity would go up or down with increasing or decreasing leverage, i.e., the amount of debt in the capital structure.
- This means that as we increase the level of debt in the company, the value of the firm doesn't change and

the company does not benefit by taking on debt. This would mean that the companies would like to employ as much equity as possible so as to reduce the risk of the company.

3. Traditional Approach

The NI Approach and NOI Approach hold extreme views on the relationship between the leverage, cost of capital and the value of the firm. In practical situations, both these approaches seem to be unrealistic. The traditional view takes a compromising view between the two and incorporates the basic philosophy of both. The traditional approach to capital structure suggests that there exist an optimal debt to equity ratio where the overall cost of capital is the minimum and market value of the firm is the maximum. On either side of this point, changes in the financing mix can bring positive change to the value of the firm. Before this point, the marginal cost of debt is less than a cost of equity and after this point vice-versa.

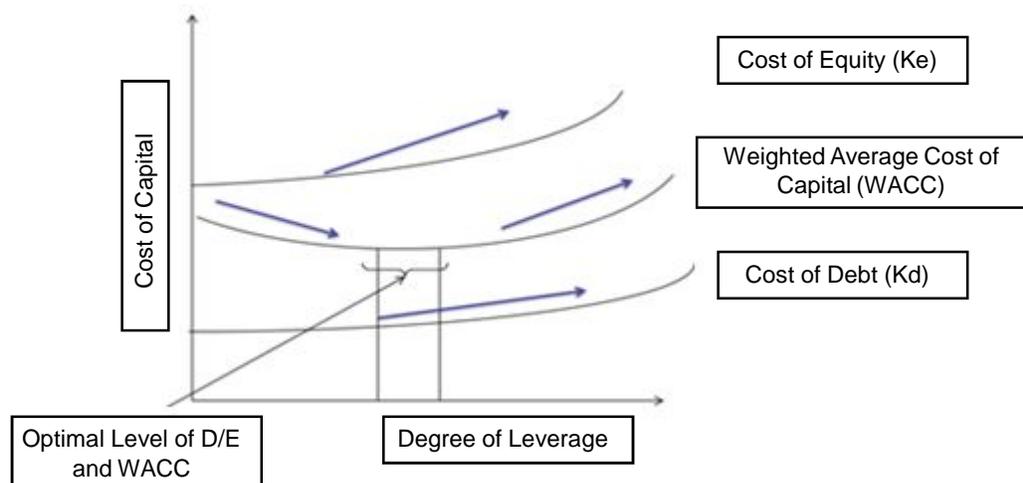
The traditional approach to capital structure advocates that there is a right combination of equity and debt in the capital structure, at which the market value of a firm is maximum. As per this approach, debt should exist in the capital structure only up to a specific point, beyond which, any increase in leverage would result in the reduction in value of the firm.

It means that there exists an optimum value of debt to equity ratio at which the Weighted Average Cost of Capital (WACC) is the lowest and the market value of the firm is the highest. Once the firm crosses that optimum value of debt to equity ratio, the cost of equity rises to give a detrimental effect to the WACC. Above the threshold, the WACC increases and market value of the firm starts a downward movement.

Assumptions under traditional approach:

1. The rate of interest on debt remains constant for a certain period and thereafter with an increase in leverage, it increases.
2. The expected rate by equity shareholders remains constant or increase gradually. After that, the equity shareholders starts perceiving a financial risk and then from the optimal point and the expected rate increases speedily.
3. As a result of the activity of rate of interest and expected rate of return, the WACC first decreases and then increases. The lowest point on the curve is optimal capital structure.

Traditional viewpoint on the relationship between leverage, cost of capital and the value of the firm is displayed in the figure below:



The following estimates of the cost of debt and cost of equity capital have been made at various level of the debt-equity mix of PQR Ltd:

% of Debt (1)	Cost of Debt (2)	(3) = (1) * (2)	% of Equity (4)	Cost of Equity (5)	(6) = (4) * (5)	Cost of Capital {(3) + (6)} in %
0	5	0	1	12	12	12
0.10	5	0.5	0.90	12	10.8	11.3
0.20	5	1	0.80	12.5	10	11
0.30	5.5	1.65	0.70	13	9.1	10.75
0.40	6	2.4	0.60	14	8.4	10.8
0.50	6.5	3.25	0.50	16	8	11.25
0.60	7	4.2	0.40	20	8	12.20

4. Modigliani - Miller Theory

In 1958, Franco Modigliani and Merton Miller (MM) published a theory of modern financial management – they concluded that the value of a firm depends solely on its future earnings stream, and hence its value is unaffected by its debt/equity mix. In short, they concluded that a firm's value stems from its assets, regardless of how those assets are financed.

In their paper, MM began with a very restrictive set of assumptions, including perfect capital markets (which implies zero taxes). And then they used an arbitrage proof to demonstrate that capital structure is irrelevant. Under their assumptions, if debt financing resulted in a higher value for the firm than equity financing, then investors who owned shares in a leveraged (debt-financed) firm could increase their income by selling those shares and using the proceeds, plus borrowed funds, to buy shares in an unleveraged (all equity-financed) firm. The simultaneous selling of shares in the leveraged firm and buying of shares in the unleveraged firm would drive the prices of the stocks to the point where the values of the two firms would be identical. Thus, according to MM Hypothesis, a firm's stock price is not related to its mix of debt and equity financing.

Modigliani and Miller have restated and amplified the net operating income position in terms of three basic propositions. These are as follows:

Proposition – I

The total value of a firm is equal to its expected operating income (PBIT when tax = 0) divided by the discount rate appropriate to its risk class. It is independent of the degree of leverage.

$$V_l = V_u = \frac{\text{EBIT}}{K_{ol}} = \frac{\text{EBIT}}{K_{ou}}$$

Here the subscript l is used to denote leveraged firm and subscript u is used to denote unleveraged firm.

Since the V (Value of the firm) as established by the above equation is a constant, then under the MM model, when there are no taxes, the value of the firm is independent of its leverage. This implies that the weighted average cost of capital to any firm is completely independent of its capital structure and the WACC for any firm, regardless of the amount of debt it uses, is equal to the cost of equity of unleveraged firm employing no debt.

Proposition – II

The expected yield on equity, K_e is equal to K_o plus a premium. This premium is equal to the debt – equity ratio times the difference between K_o and the yield on debt, K_d . This means that as the firm's use of debt increases its cost of equity also rises, and in a mathematically precise manner.

Proposition – III

The cut-off rate for investment decision making for a firm in a given risk class is not affected by the manner in which

the investment is financed. It emphasizes the point that investment and financing decisions are independent because the average cost of capital is not affected by the financing decision.

Example

Let us take the case of two firms X and Y, similar in all respects except in their capital structure. Firm X is financed by equity only; firm Y is financed by a mixture of equity and debt. The financial parameters of the two firms are as follows:

Financial Particulars of Firms X and Y

(Amount in ₹)

Particulars	Firm X	Firm Y
Total Capital Employed	10,00,000	10,00,000
Equity Capital	10,00,000	6,00,000
Debt	Nil	4,00,000
Net operating Income	1,00,000	1,00,000
Debt Interest	0	20,000
Market value of debt	0	4,00,000
Equity earnings	1,00,000	80,000
Equity capitalization rate	10%	12%
Market value of equity	10,00,000	6,66,667
Total market value of the firm	10,00,000	10,66,667
Average cost of capital	10%	9.37%
Debt-Equity ratio	0	0.6

From the above particulars, it can be seen that the value of leveraged firm Y is higher than that of the unleveraged firm. According to Modigliani Miller approach, such a situation cannot persist because equity investors would do well to sell their equity investment in firm Y and invest in the equity of firm X with personal leverage. For example, an equity investor who owns 1% equity in firm Y would do well to:

- Sell his equity in Firm Y for ₹ 6,667
- Borrow ₹ 4,000 at 5% interest on personal account and
- Buy 1.0667% of the equity of firm X with the amount of ₹ 10,667 that he has.

Such an action will result in the following income:

Particular	(₹)
Income on investment in firm X	1066.70
Less: Interest (4000 x 5%)	<u>200.00</u>
Net Income	<u>866.70</u>

This net income of ₹ 866.7 is higher than a net income of ₹ 800 foregone by selling 1 percent equity of firm Y and the leverage ratio is the same in both the cases.

When investors sell their equity in firm Y and buy the equity in firm X with personal leverage, the market value of equity of firm Y tends to decline and the market value of equity of firm X tends to rise. This process continues until the net market values of both the firms become equal because only then the possibility of earning a higher income for a given level of investment and leverage by arbitraging is eliminated. As a result of this the cost of capital for both

the firms is the same.

The above example explains that due to the arbitrage mechanism the value of a leveraged firm cannot be higher than that of an unleveraged firm, other things being equal. It can also be proved that the value of an unleveraged firm cannot be higher than that of leveraged firm, other things being equal.

Let us assume the valuation of the two firms X and Y is the other way around and is as follows:

(Amount in INR)

Particulars	Firm X	Firm Y
Debt Interest	0	20,000
Market Value of debt (Debt capitalisation rate is 5%)	0	4,00,000
Equity earnings	1,00,000	80,000
Equity Capitalisation rate	8%	12%
Market value of equity	12,50,000	6,66,667
Total Market value	12,50,000	10,66,667

If a situation like this arises, equity investors in firm X would do well to sell the equity in firm X and use the proceeds partly for investment in the equity of firm Y and partly for investment in the debt of firm Y. For example, an equity investor who owns 1 percent equity in firm X would do well to:

- Sell his 1% equity in firm X for ₹ 12,500
- Buy 1.01% of the equity and debt in firm Y involving an outlay of INR 10,773

Such an action will result in an increase of income by INR 1727 without changing the risk shouldered by the investor. When investors resort to such a change, the market value of the equity of firm X tends to decline and the market value of the equity of firm Y tends to rise. This process continues until the total market value of both the firms becomes equal.

CRITICISM OF MM HYPOTHESIS

If the MM theory was correct, managers would not need to concern themselves with capital structure decisions, because such decisions would have no impact on stock prices. However, like most theories, MM's results would hold true only under a particular set of assumptions. Still, by showing the conditions under which capital structure is irrelevant, MM provided important insights into when and how debt financing can affect the value of a firm.

MM Hypothesis with Corporate Taxes

In 1963, MM added corporate taxes to their model. With corporate taxes considered, a firm's stock price was shown to be directly related to its use to debt financing – higher the percentage of debt financing, the higher the stock price. Under the MM with tax theory, firms should use virtually 100% debt financing. The reason for this result is the corporate tax structure – returns to stockholders come from after-tax earnings, but returns to creditors are paid before tax. The effect of this tax treatment is that more of a company's operating income is left for investors when more debt financing is used.

Empirical evidence against MM Hypothesis

In spite of the MM arguments, firms do not usually use anywhere close to 100% debt financing. In an attempt to modify MM's model to make it more consistent with actual behaviour, many of their assumptions were relaxed in papers by other authors. In particular, the possibility of financial distress drastically changed the MM results. In the modified model, tax savings cause the value of a firm to rise as more and more debt is used, but at some point (the optimal structure), the value of the firm begins to fall with additional debt because the tax benefits are more than

offset by the increasing costs of potential financial distress.

The MM model as modified to include financial distress suggests to managers .

- that a certain amount of debt is good
- that too much debt is bad, and
- that there is an optimal amount of debt for every firm.

Thus, the modified MM theory, which is called the trade-off theory of capital structure, provides useful insights into the factors that affect a firm's optimal capital structure. Here the marginal costs and benefits of debt financing are balanced against one another, and the result is an optimal capital structure that falls somewhere between zero and 100% debt.

Pecking Order Theory

One of the most influential theory of corporate leverage is Pecking Order Theory. It assumes that there is no target capital structure and due to adverse selection, firms prefer internal finance to external finance. Even when outside funds are necessary, debt is preferred to equity since issue of debt involves lower information costs. The debt is preferred because issuing equity would bring external ownership into the company.

EBIT - EPS Analysis

One widely used means of examining the effect of leverage is to analyse the relationship between earnings before interest and taxes (EBIT) and earnings per share (EPS). The use of EBIT – EPS analysis indicates to management the projected EPS for different financial plans. Generally, management wants to maximise EPS if doing so also satisfies the primary goal of financial management - maximisation of the owner's wealth as represented by the value of business, i.e. the value of firm's equity. If the firm attempts to use excessive amounts of debt, shareholders (who are risk - averters) may sell their shares, and thus its price will fall. While the use of large amount of debt may result in higher EPS, it may also result in a reduction in the price of the firm's equity. The optimum financial structure for a firm (that is, the use of debt in relationship of equity and retained earnings as sources of financing) should be the one which maximises the price of the equity.

Given the importance of earnings per share (EPS) as a measure of a firm's performance, analysis of the impact of financing alternatives on EPS is an important first step. Essentially, the method involves the comparison of alternative methods of financing under various assumptions as to EBIT.

Let us assume that a firm has a capital structure of INR 1,00,000. The equity capital is of ₹ 100 each and debt carries rate of interest of 10% p.a. We further assume that the firm has the following combination of components of this structure:

Case No.	Equity (%)	Debt (%)
1.	100	0
2.	75	25
3.	50	50
4.	25	75

For calculating the impact on EPS of various levels of EBIT, we take five values of ₹ 5000, ₹ 7,500, ₹ 12,500 and ₹ 15,000. The tax rate is assumed to be 40 %.

(a) If EBIT is INR 5,000*(Amount in INR)*

Debt Level (%)	0%	25%	50%	75%
EBIT	5,000	5,000	5,000	5,000
Less: Interest	0	(2,500)	(5,000)	(7,500)
PBT	5,000	2,500	0	2,500
Less: Tax @ 40%	2,000	1,000	0	0
PAT	(3,000)	(1,500)	0	(2,500)
No. of Equity Shares	1,000	750	500	250
EPS (PAT/No. of Equity Shares)	3.0	2.0	0	(1.0)

We find that with increasing level of debt in the capital structure, the EPS decreases.

(b) If EBIT is INR 7,500*(Amount in INR)*

Debt Level (%)	0%	25%	50%	75%
EBIT	7,500	7,500	7,500	7,500
Less: Interest	0	(2,500)	(5,000)	(7,500)
PBT	7,500	5,000	2,500	0
Less: Tax @ 40%	(3,000)	(2,000)	(1,000)	0
PAT	4,500	3,000	1,500	0
No. of Equity Shares	1,000	750	500	250
EPS (PAT/No. of Equity Shares)	4.5	4.0	3.0	0

In this case also, the EPS decreases with increasing level of debt.

(c) If EBIT is INR 10,000*(Amount in INR)*

Debt Level (%)	0%	25%	50%	75%
EBIT	10,000	10,000	10,000	10,000
Less: Interest	0	(2,500)	(5,000)	(7,500)
PBT	10,000	7,500	5,000	2,500
Less: Tax @ 40%	(4,000)	(3,000)	(2,000)	(1,000)
PAT	6,000	4,500	3,000	1,500
No. of Equity Shares	1,000	750	500	250
EPS (PAT/No. of Equity Shares)	6.0	6.0	6.0	6.0

At this level of EBIT, the EPS remains unchanged irrespective of any change in the capital structure.

(d) If EBIT is INR 12,500*(Amount in INR)*

Debt Level (%)	0%	25%	50%	75%
EBIT	12,500	12,500	12,500	12,500
Less: Interest	0	(2,500)	(5,000)	(7,500)
PBT	12,500	10,000	7,500	5,000
Less: Tax @ 40%	(5,000)	(4,000)	(3,000)	(2,000)
PAT	7,500	6,000	4,500	3,000
No. of Equity Shares	1,000	750	500	250
EPS (PAT/No. of Equity Shares)	7.5	8.0	9.0	12.0

Now we see that EPS increases with increasing level of debt.

(e) If EBIT is INR 15,000*(Amount in INR)*

Debt Level (%)	0%	25%	50%	75%
EBIT	15,000	15,000	15,000	15,000
Less: Interest	0	(2,500)	(5,000)	(7,500)
PBT	15,000	12,500	10,000	7,500
Less: Tax @ 40%	(6,000)	(5,000)	(4,000)	(3,000)
PAT	9,000	7,500	6,000	4,500
No. of Equity Shares	1,000	750	500	250
EPS (PAT/No. of Equity Shares)	9.0	10.0	12.0	18.0

If we increase the EBIT further, the impact on EPS is better still.

We can conclude from the above illustration that the firm should resort to financing its operations through debt only beyond a threshold or indifference level in order to benefit from tax breaks provided by interest on borrowings. In other words, debt is suitable if the EBIT is expanding rapidly. If the operations are shrinking, it should change its capital structure immediately in favour of equity capital.

The EBIT-EPS analysis of the above illustration can be summarised in the form of following table :

	Debt Levels (%)			
	0%	25%	50%	75%
EBIT	EPS at above levels			
₹ 5,000	3.0	2.0	0	(1.0)
₹ 7,500	4.5	4.0	3.0	0
₹ 10,000	6.0	6.0	6.0	6.0
₹ 12,500	7.5	8.0	9.0	12.0
₹ 15,000	9.0	10.0	12.0	18.0

The indifference point of a firm (EBIT of ₹ 10000 in this case) varies from firm to firm but normally it approximates the breakeven point.

EBITDA ANALYSIS (EARNINGS BEFORE INTEREST, TAX, DEPRECIATION AND AMORTIZATION),

EBITDA, an acronym for “earnings before interest, taxes, depreciation and amortization,” is an often-used measure of the value of a business. EBITDA is calculated by taking net income and adding interest, taxes, depreciation and amortization expenses back to it. EBITDA is used to analyze a company’s operating profitability before non-operating expenses (such as interest and “other” non-core expenses) and non-cash charges (depreciation and amortization).

Analysis with EBITDA

EBITDA enables analysts to exclude the impacts of non-operating activities and focus on the outcome of operating decisions. Non-operating activities include interest expenses, tax rates, and large non-cash items such as depreciation and amortization.

By removing the non-operating effects, EBITDA gives investors the ability to focus on the profitability of their operations. This type of analysis is particularly important when comparing similar companies across a single industry.

Limitations of EBITDA

Factoring out interest, taxes, depreciation and amortization can make even completely unprofitable firms appear to be fiscally healthy. The use of EBITDA as measure of financial health made these firms look attractive. EBITDA numbers are easy to manipulate. If fraudulent accounting techniques are used to inflate revenues and interest, taxes, depreciation and amortization are factored out of the equation, almost any company may appear to be profitable and great.

Operating cash flow is a better measure of how much cash a company is generating because it adds non-cash charges (depreciation and amortization) back to net income and includes the changes in working capital that also use or provide cash (such as changes in receivables, payables and inventories). These working capital factors are the key to determining how much cash a company is generating. If investors do not include changes in working capital in their analysis and rely solely on EBITDA, they will miss clues that indicate whether a company is losing money because it isn’t making any sales.

Despite various shortcomings, there are some good reasons for using EBITDA.

1. The first factor to consider is that EBITDA can be used as a shortcut to estimate the cash flow available to pay debt on long-term assets, such as equipment and other items with a lifespan measured in decades rather than years. Dividing EBITDA by the amount of required debt payments yields a debt coverage ratio. Factoring out the “ITDA” of EBITDA was designed to account for the cost of the long-term assets and provide a look at the profits that would be left after the cost of these tools was taken into consideration
2. Another factor is that EBITDA estimate to be reasonably accurate, the company under evaluation must have legitimate profitability. Using EBITDA to evaluate old-line industrial firms is likely to produce useful results. This idea was lost during the 1980s, when leveraged buyouts were fashionable, and EBITDA began to be used as a proxy for cash flow. This evolved into the more recent practice of using EBITDA to evaluate unprofitable dotcoms as well as firms such as telecoms, where technology upgrades are a constant expense.
3. EBITDA can also be used to compare companies against each other and against industry averages. In

addition, EBITDA is a good measure of core profit trends because it eliminates some of the extraneous factors and allows a more “apples-to-apples” comparison.

Ultimately, EBITDA should not replace the measure of cash flow, which includes the significant factor of changes in working capital. Remember “cash is king” because it shows “true” profitability and a company’s ability to continue operations.

MEASURES OF OPERATING AND FINANCIAL LEVERAGE

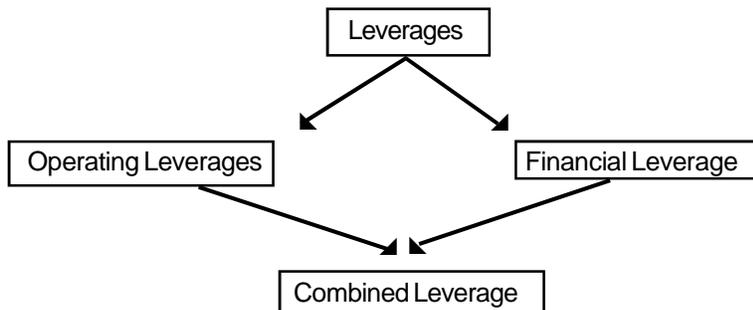
The term leverage refers to an increased means of accomplishing some purpose. Leverage is used to lifting heavy objects, which may not be otherwise possible. In the financial point of view, leverage refers to furnish the ability to use fixed cost assets or funds to increase the return to its shareholders.

Definition of Leverage

James Horne has defined leverage as, “the employment of an asset or fund for which the firm pays a fixed cost or fixed return.

Types of Leverage

Leverage can be classified into three major headings according to the nature of the finance mix of the company.



The company may use financial or leverage or operating leverage, to increase the EBIT and EPS.

The leverage associated with investment activities is called as operating leverage. It is caused due to fixed operating expenses in the company. Operating leverage may be defined as the company’s ability to use fixed operating costs to magnify the effects of changes in sales on its earnings before interest and taxes. Operating leverage consists of two important costs viz., fixed cost and variable cost. When the company is said to have a high degree of operating leverage if it employs a great amount of fixed cost and smaller amount of variable cost. Thus, the degree of operating leverage depends upon the amount of various cost structure. Operating leverage can be determined with the help of a break even analysis.

Operating leverage can be calculated with the help of the following formula:

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{Operating Profit (EBIT)}}$$

Degree of Operating Leverage

The degree of operating leverage may be defined as percentage change in the operating income (EBIT) resulting from a percentage change in the sales. It can be calculated with the help of the following formula:

$$\text{DOL} = \frac{\text{Percentage change in EBIT}}{\text{Percentage change in sale}}$$

Example 1:

From the following selected operating data, determine the degree of operating leverage. Which company has the greater amount of business risk? Why?

Amount in ₹

	Company A (₹)	Company B (₹)
Sales	25,00,000	30,00,000
Fixed costs	7,50,000	15,00,000

Variable expenses as a percentage of sales are 50% for company A and 25% for company B.

Solution

Statement of Profit

Amount in ₹

	Company A	Company B
Sales	25,00,000	30,00,000
Less : Variable cost	12,50,000	7,50,000
Contribution	12,50,000	22,50,000
Less : Fixed cost	7,50,000	15,00,000
Operating Profit (EBIT)	5,00,000	7,50,000

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{Operating Profit}}$$

$$\text{Company 'A' Operating Leverage} = \frac{12,50,000}{5,00,000}$$

= 2.5 times

$$\text{Similarly for Company B Operating Leverage would be} = \frac{22,50,000}{7,50,000} = 3$$

Comments

Operating leverage for Company B is higher than that of Company A; Company B has a higher degree of operating risk. The tendency of operating profit may vary proportionately with sales, is higher for Company B as compared to Company A.

Uses of Operating Leverage

Operating leverage is one of the techniques to measure the impact of changes in sales which lead for change in the profits of the company. If any change in the sales, it will lead to corresponding changes in profit. Operating leverage helps to identify the position of fixed cost and variable cost.

Operating leverage measures the relationship between the sales and revenue of the company during a particular period. Operating leverage helps to understand the level of fixed cost which is invested in the operating expenses of business activities. It describes the overall position of the fixed operating cost.

FINANCIAL LEVERAGE

A leverage activity with financing activities is called financial leverage. Financial leverage represents the relationship between the company's earnings before interest and taxes (EBIT) or operating profit and the earning available to equity shareholders.

Financial leverage is defined as "the ability of a firm to use fixed financial charges to magnify the effects of changes in EBIT on the earnings per share". It involves the use of funds obtained at a fixed cost in the hope of increasing the return to the shareholders. "The use of long-term fixed interest bearing debt and preference share capital along with share capital is called financial leverage or trading on equity".

Financial leverage may be favourable or unfavourable depends upon the use of fixed cost funds.

Favourable financial leverage occurs when the company earns more on the assets purchased with the funds, then the fixed cost of their use. Hence, it is also called as positive financial leverage.

Unfavourable financial leverage occurs when the company does not earn as much as the funds cost. Hence, it is also called as negative financial leverage.

Financial leverage can be calculated with the help of the following formula:

$$\text{Financial Leverage} = \frac{\text{Operating Profit (EBIT)}}{\text{Profit Before Tax}}$$

Degree of Financial Leverage

Degree of financial leverage may be defined as the percentage change in taxable profit as a result of percentage change in earnings before interest and tax (EBIT). This can be calculated by the following formula :-

$$\text{DFL} = \frac{\text{Percentage change in taxable Income}}{\text{Percentage change in operating income}}$$

Alternative Definition of Financial Leverage

According to **Gitmar**, "financial leverage is the ability of a firm to use fixed financial changes to magnify the effects of change in EBIT on its EPS".

$$\text{DFL} = \frac{\text{Percentage change in EPS}}{\text{Percentage change in EBIT}}$$

Example

A Company has the following capital structure :

Particulars	₹
Equity share capital	1,00,000
10% Preference share capital	1,00,000
8% Debentures	1,25,000

The present EBIT is ₹ 50,000. Calculate the financial leverage assuming that the company is in 50% tax bracket.

Solution

<i>Statement of Profit</i>	<i>₹</i>
Earnings before Interest and Tax (EBIT) or operating profit	50,000
Less: Interest on Debenture $(1,25,000 \times \frac{8}{100})$	<u>(10,000)</u>
Earnings before Tax (EBT)	40,000
Income Tax	<u>(20,000)</u>
Profit	20,000

$$\begin{aligned}
 \text{Financial leverage} &= \frac{\text{Operating Profit (OP)}}{\text{Profit before Tax (PBT)}} \\
 &= \frac{50,000}{40,000} \\
 &= 1.25
 \end{aligned}$$

Uses of Financial Leverage

Financial leverage helps to examine the relationship between EBIT and EPS.

Financial leverage measures the percentage of change in taxable income to the percentage change in EBIT. It locates the correct profitable financial decision regarding capital structure of the company. It is one of the important devices which is used to measure the fixed cost proportion with the total capital of the company. If the firm acquires fixed cost funds at a higher cost, then the earnings from those assets, the earning per share and return on equity capital will decrease. The impact of financial leverage can be understood with the help of the following exercise.

Example

XYZ Ltd. decides to use two financial plans and they need ₹ 50,000 for total investment.

Particulars	Plan A	Plan B
Debenture (interest at 10%)	₹ 40,000	₹10,000
Equity share (₹ 10 each)	₹ 10,000	₹40,000
Total investment needed	₹ 50,000	₹ 50,000
Number of equity shares	1,000	4,000

The earnings before interest and tax are assumed at ₹ 5,000, and 12,500. The tax rate is 50%. Calculate the EPS.

Solution

When EBIT is ₹ 5,000

Particulars	Plan A	Plan B
Earnings before interest and tax (EBIT)	₹ 5,000	₹ 5,000
Less : Interest on debt (10%)	₹ 4,000	₹ 1,000
Earnings before tax (EBT)	₹ 1,000	₹ 4,000
Less : Tax at 50%	₹ 500	₹ 2,000
Earnings available to equity shareholders.	₹ 500	₹ 2,000
No. of equity shares	1,000	4,000
Earnings per share (EPS) Earnings/No. of equity shares	₹ 0.5	₹ 0.5

When EBIT is ₹ 12,500

Particulars	Plan A	Plan B
Earnings before interest and tax (EBIT)	₹ 12,500	₹ 12,500
Less : Interest on debt (10%)	₹ 4,000	₹ 1,000
Earnings before tax (EBT)	₹ 8,500	₹ 11,500
Less : Tax at 50%	₹ 4,250	₹ 5,750
Earnings available to equity shareholders.	₹ 4,250	₹ 5,750
No. of equity shares	1,000	4,000
Earnings per share (EPS) Earnings/No. of equity shares	₹ 4.25	₹ 1.44

DIFFERENCE BETWEEN OPERATING LEVERAGE AND FINANCIAL LEVERAGE

Sl. No	Operating Leverage	Financial Leverage
1	Operating leverage is associated with investment activities of the company.	Financial leverage is associated with financing activities of the company.
2	Operating leverage consists of fixed operating expenses of the company.	Financial leverage consists of Fixed Financial Expenses of the company.
3	It represents the ability to use fixed operating cost.	It represents the ability to use fixed financial cost.
4	Operating leverage can be calculated by= Contribution/EBIT	Financial leverage can be calculated by= EBIT/EBT
5	A percentage change in the profits resulting from a percentage change in the sales is called as degree of operating leverage.	A percentage change in taxable profit is the result of percentage change in EBIT.
6	Trading on equity is not possible by using operating leverage	Trading on equity is possible only when the company uses financial leverage.

7	Operating leverage depends upon fixed cost and variable cost.	Financial leverage depends upon the operating profits & fixed financial costs.
8	Tax rate and interest rate will not affect the operating leverage.	Financial leverage will change due to tax rate and interest rate.

Financial Break Even Point

It is the level of EBIT which covers all fixed financing costs of the company. It is the level of EBIT at which EPS is zero.

$$\text{FBP} = \text{Interest} + \frac{\text{Preference Dividend}}{1 - t}$$

Example

ABC Limited has the following capital structure and want to know its Financial Break Even Point

Equity shares (FV = ₹ 100)	₹ 5,00,000
12% Preference Shares (FV = ₹ 100)	₹ 5,00,000
10% Debentures (FV = ₹ 100)	₹ 10,00,000
Tax Rate	40%

$$\begin{aligned} \text{FBP} &= \text{Interest} + \frac{\text{Pref Dividend}}{(1-t)} \\ &= 1,00,000 + \frac{6,00,000}{(1-0.40)} \\ &= ₹ 11,00,000 \end{aligned}$$

In other words, the EPS of the firm will be zero at Rs 11,00,000 level of EBIT.

	<i>Amount in ₹</i>
EBIT	11,00,000
Less : Interest	(1,00,000)
EBT	10,00,000
Less : Taxes @ 40%	(4,00,000)
EAT	6,00,000
Less : Preference Dividend	(6,00,000)
Earnings Available for Equity Shareholders	Nil
No. of Equity Shares	5,000
EPS	Nil

Indifference Point

It is the point at which different sets of debt ratios (percentage of debt to total capital employed in the company) gives the same EPS. Indifference level is the level of EBIT beyond which the benefits of financial leverage began to operate with respect to EPS.

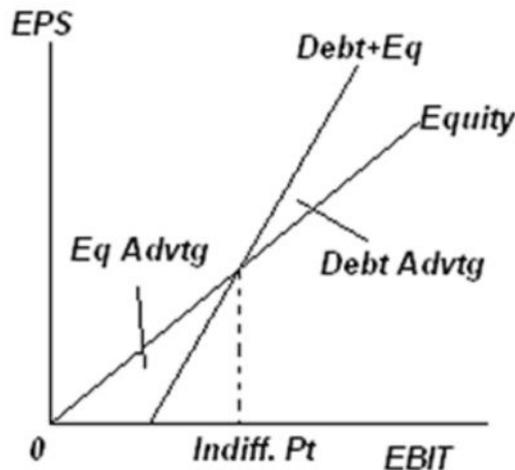
In other words, if the expected levels of EBIT exceed the indifference level of EBIT, the use of fixed charge sources

(debt) would be favorable from the point of view of EPS. In nutshell, financial leverage is favorable & leads to an increase in the EPS.

On the other hand, if the expected level of EBIT is less than the indifference point, the advantage of EPS would be available from the use of equity capital.

The indifference point between two financial plans can be calculated by using the following formula:

$$\frac{(EBIT - \text{Interest})(1-t) - PD(1+t)}{\text{No of equity shares in Plan A}} = \frac{(EBIT - \text{Interest})(1-t) - PD(1+t)}{\text{No of equity shares in Plan B}}$$



Example:

A new project requires a capital outlay of ₹ 400 lakhs. The required amount to be raised either fully by equity shares of ₹ 100 each or by equity shares of the value of ₹ 200 lakhs and by loan of ₹ 200 lakhs at 15% interest. Assuming a tax rate of 40%, calculate the figure of EBIT that would keep the equity investors indifferent to the two options.

	Option A (Full Equity)	Option B (Debt + Equity)
Equity (FV 100)	₹ 400 Lakhs	₹ 200 Lakhs
15% Debt	Nil	₹ 200 Lakhs
Total Capital	₹ 400 Lakhs	₹ 400 Lakhs
No of Equity Shares	4,00,000	2,00,000

Let us assume Indifference Level of EBIT is ₹ X. Thus

$$\frac{\{(X-0)(1-0.4) - 0\}}{4,00,000} = \frac{(X-30,00,000)(1-0.4) - 0}{2,00,000}$$

$$\frac{0.6X}{4,00,000} = \frac{0.6X - 18,00,000}{2,00,000}$$

$$0.6X = \frac{(4,00,000)\{0.6X - 18,00,000\}}{2,00,000}$$

$$0.6X = 1.2X - 36,00,000$$

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$$36,00,000 = 1.2X - 0.6X$$

$$0.6X = 36,00,000$$

$$X = ₹ 60,00,000$$

Thus the EPS under two different financial options will be equal at ₹ 60 lakhs EBIT Level. This can be verified as follows:

	Option A (in ₹)	Option B (in ₹)
EBIT	60,00,000	60,00,000
Less : Interest	Nil	(30,00,000)
EBT	60,00,000	30,00,000
Less : Taxes @ 40%	(24,00,000)	(12,00,000)
Earnings available for equity shares	36,00,000	18,00,000
No. of Equity Shares	4,00,000	2,00,000
EPS (Earnings available for Equity Shares / No. of Shares)	9	9

COMBINED LEVERAGE

When the company uses both financial and operating leverage to magnification of any change in sales into a larger relative changes in earning per share. Combined leverage is also called as composite leverage or total leverage.

Combined leverage expresses the relationship between the revenue in the account of sales and the taxable income.

Combined leverage can be calculated with the help of the following formulas:

$$DCL = DOL \times DFL = \frac{\text{Contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{PBT}} = \frac{\text{Contribution}}{\text{PBT}}$$

Degree of Combined Leverage

The percentage change in a firm's earning per share (EPS) results from one percent change in sales. This is also equal to the firm's degree of operating leverage (DOL) times its degree of financial leverage (DFL) at a particular level of sales.

$$\text{Degree of combined leverage} = \frac{\text{Percentage change in EPS}}{\text{Percentage change in sales}}$$

Example

Kumar Company has sales of ₹ 25,00,000. Variable cost of ₹ 15,00,000 and fixed cost of ₹ 5,00,000 and debt of ₹ 12,50,000 at 8% rate of interest. Calculate combined leverage.

Solution

Statement of Profit

		Amount in ₹
Sales		25,00,000
Less: Variable cost		(15,00,000)
	Contribution	10,00,000
Less: Fixed cost		(5,00,000)
	Operating Profit	5,00,000

Combined leverage = Operating leverage x Financial leverage

Calculation of operating leverage

$$\frac{\text{Contribution}}{\text{Operating Profit}} = \frac{10,00,000}{5,00,000} = 2 \text{ times}$$

Calculation of financial leverage

Earning before Interest and Tax (EBIT)	₹ 5,00,000
Less: Interest on Debenture (8% of 12,50,000)	<u>(₹ 1,00,000)</u>
Earnings before Tax	₹ 4,00,000

$$\text{Financial Leverage} = \frac{EBIT}{EBT}$$

$$\text{Financial Leverage} = \frac{5,00,000}{4,00,000}$$

$$= 1.25 \text{ times}$$

Combined leverage = 2 x 1.25 = 2.5 times OR $= \frac{10,00,000}{4,00,000} = 2.5 \text{ times}$

WORKING CAPITAL LEVERAGE

One of the new models of leverage is working capital leverage which is used to locate the investment in working capital or current assets in the company.

Working capital leverage measures the sensitivity of return in investment of charges in the level of current assets.

$$\text{Working Capital Leverage} = \frac{\text{Percentage Change in ROI}}{\text{Percentage Change in Working Capital}}$$

If the earnings are not affected by the changes in current assets, the working capital leverage can be calculated with the help of the following formula.

$$\text{Working Capital Leverage} = \frac{CA}{(TA + \Delta CA)}$$

where,

CA = Current Assets

TA = Total Assets

Δ CA = Changes in the level of Current Assets

Example

The following information is available for two companies.

You are required to compare the sensitivity earnings of the two companies for 30% change in the level of their current assets.

Solution

$$\text{Working Capital Leverage} = \frac{CA}{TA + \Delta CA}$$

	X Ltd.	Y Ltd.
Fixed Assets	₹ 4,00,000	₹ 1,00,000
Current Assets	₹ 10,00,000	₹ 4,00,000
Total Assets	₹ 14,00,000	₹ 14,00,000
Earnings before interest and taxes	₹ 1,50,000	₹ 1,50,000

$$\begin{aligned} \text{Working Capital Leverage for Company X} &= \frac{10,00,000}{14,00,000 - 3,00,000} \\ &= \frac{10,00,000}{11,00,000} \\ &= 0.90 \end{aligned}$$

$$\begin{aligned} \text{Working Capital Leverage for Company Y} &= \frac{4,00,000}{14,00,000 - 1,20,000} \\ &= \frac{4,00,000}{12,80,000} \\ &= 0.3125 \end{aligned}$$

EFFECTS OF LEVERAGE ON SHAREHOLDERS' RETURNS

Financial plan is one of the vital decisions of a firm because a financial plan affects the market value, cost of capital and shareholders return of a firm. The Proportion of Debt to Equity in the financial plan of a firm is called leverage. Since optimal debt ratio influences a firm's market value and shareholder's return, different firms use different debt ratio at different levels to maximize market value and shareholders return. Leverage has statistically significant effect on the shareholders' return and proper management of leverage can maximize the value of EPS.

1. Operating Leverage Effect : % Change in EBIT is more than % Change in Sale

If % change of earning before interest and tax is more than % change in sale, this operating leverage will effect ROE positively because at this level, per unit fixed cost will decrease and small increase in sale will boost EBIT.

If EBIT will increase, ROE will also increase. Operating Leverage indicates, how will EBIT change if sales changes. 2:1 ratio of operating leverage means 100% increase in sales will increase EBIT by 200%. As interest is fixed cost, so ROE will increase.

A. Situation: High Operating Leverage:

Too high operating leverage is not good, it may be highly risky.

B. Situation: Low Operating Leverage:

Low operating leverage may be useful when sale market is fluctuating.

2. Effect of Financial Leverage on ROE

If we have to check real effect of leverage on ROE, we have to study financial leverage. Financial leverage refers to the use of debt to acquire additional assets. Financial leverage may decrease or increase return on equity in different conditions.

A. Situation: High Financial Leverage:

Financial over-leveraging means incurring a huge debt by borrowing funds at a lower rate of interest and utilizing the excess funds in high risk investments in order to maximize returns.

B. Situation: Low Financial Leverage:

Financial low-leveraging means incurring a low debt by borrowing funds. It may affect positively, if decrease the value of bought asset with this low debt.

3. Effect of High Operating leverage and High Financial Leverage

It will increase ROE but it is highly risky also.

4. Effect of Low Operating leverage and High Financial Leverage

It is optimum combination for bringing optimum return on equity.

RISK AND LEVERAGE

Risk is the probability that the future revenue streams of a firm shall show a variation from the expected figures. The variation is normally on the negative or the lower side because a positive variation reduces the investment risk and a reduction of risk is always welcome.

For linkage with leverage, we can divide risk into two broad categories, i.e. business risk and financial risk. Business risk pertains to risks associated with day to day operations of the firm. For example, decisions made regarding purchase of raw materials, manufacturing expenses and administrative expenses, etc. change the business risk profile of the firm. These decisions have an impact upon the operational profitability of the firm, i.e. the profits before interest and taxes. Financial risk, on the other hand, is associated with introduction of fixed interest bearing debt obligations in the capital structure of the firm. These obligations create a prior charge on EBIT before distribution of post tax profits among the owners.

The distinction between business risk and financial risk can be clarified through the following illustration:

ABC Company Limited
Profit and Loss Statement for the year ended 31.03.2012

(Amount in ₹ Lacs)

(a) Net Sales	8,500	
(b) Cost of goods Sold	5,000	(1)
(c) Gross Profit	3,500	
(d) Selling Expenses	1,500	(2)
(e) EBIT	2,000	(3)

Business risk is associated with the impact of item no. (3) above of changes in item nos. (1) and (2). The “Cost of goods sold” item consists of cost of raw materials, labour cost, factory rent and other manufacturing expenses. Out of these elements, labour cost and factory rent are fixed costs while the rest are variable depending upon the level of sales. Now if the fixed costs are increased the expectation would be that the sales would rise in anticipated proportion. However, if the sales do not rise as anticipated, business risk of the firm increases.

Till now we have assumed that the firm has no debt and as such, no interest cost. Let us assume that the firm raises debt with yearly interest payment of ₹ 500 lacs. The Profit & loss account would now be extended as shown below:

Sr. No.	Particulars	Amount (₹ in lakh)	
(a)	EBIT	2,000	
(b)	Less : Interest	500	(4)
(c)	Profit before tax	1,500	
(d)	Less : Tax @ 40%	600	
(e)	Profit after Tax	900	(5)

Now item no. (5) i.e. profit after tax is dependent on interest payments which are fixed. If EBIT decreases as a result of changes in items (1) and (2) and item no. (4) remains the same, the venture would become riskier as an additional element of financial risk has been built in. The change in risk profile of the firm has been caused by change in its leverage. The changes in fixed labour costs and factory rent are referred to as changes in operating leverage while the changes in fixed interest costs are described as changes in financial leverage.

A firm has operating leverage when it can expand output and sales without a proportionate increase in fixed costs. Let us assume that in our earlier illustration, cost of sales has the following break-up:

Cost of raw materials	₹ 2,500
Labour Cost	₹ 500
Factory rent	₹ 500
Other manufacturing costs	₹ 1,500

Labour cost and factory rent are fixed costs for running the factory for manufacturing, say, 1,00,000 units of the product. The firm now plans to expand the capacity to 2,00,000 units in the same factory by increasing the number of factory labour and installation of new machinery. The profit and loss account under the two levels of capacity would now read as under:

Amount in ₹

Sr. No.	Particulars	Capacity (100000 units)	Capacity (200000 units)
1.	Net Sales	8,500	17,000
2.	Cost of raw material	2,500	5,000
3.	Labour cost	500	1,000
4.	Factory rent	500	500
5.	Other mfg. Costs	1,500	2,500
6.	Gross profit	3,500	8,000
7.	Selling Expenses	1,500	2,500
8.	EBIT	2,000	5,500
9.	Tax @ 40%	800	2,200
10.	Profit after tax	1,200	3,300

We see that while net sales have increased by 100%, the EBIT has increased by 175%, thanks to the operating leverage provided by the fixed factory rent and the fixed component of manufacturing expenses and selling expenses, which we assume to be ₹ 500 lacs each.

Now, if due to recessionary conditions, capacity utilisation of the factory is reduced to 50% and 40% in two subsequent years respectively, profitability of the firm would change as under:

Amount in ₹

Sr. No	Particulars	Capacity 50%	Capacity 40%
1.	Net Sales	8,500	6,800
2.	Cost of raw material	2,500	2,000
3.	Labour cost	1,000	1,000
4.	Factory rent	500	500
5.	Other mfg. Costs	1,500	1,300
6.	Gross profit	3,000	2,000
7.	Selling Expenses	1,500	1,300
8.	EBIT	1,500	700
9.	Tax @ 40%	600	280
10.	Profit after tax	900	420

We see that the fall in EBIT is much sharper than the decline in sales. This has happened due to operating leverage.

Let us assume that the firm decides to move from rented factory premises to own premises. This is achieved by borrowing a sum of ₹ 15 crores from the bank carrying fixed interest of 12% p.a. The capacity is also simultaneously doubled. The comparative profit & loss figures shall now read as under:

Amount in ₹

Sr. No.	Particulars	Original Capacity	Double Capacity
1.	Net Sales	8,500	17,000
2.	Cost of raw material	2,500	5,000
3.	Labour cost	500	1,000
4.	Other mfg. Costs	1,500	2,500
5.	Gross profit	4,000	8,500
6.	Selling Expenses	1,500	2,500
7.	EBIT	2,500	6,000
8.	Interest	180	180
9.	Profit before tax	2,320	5,820
10.	Tax @ 40%	928	2,328
11.	Profit after tax	1,392	3,492

By creating financial leverage, the firm has not only ensured rise in EBIT but in PAT as well. But at the same time, it has increased its financial risk, i.e. the risk of default on repayment of loan amount and the interest on loan.

Now let us see how financial leverage impacts the performance of the firm in recessionary conditions:

Amount in ₹

Sr. No.	Particulars	Original Capacity	Double Capacity
1.	Net Sales	8,500	6,800
2.	Cost of raw material	2,500	2,000
3.	Labour cost	1,000	1,000
4.	Other mfg. Costs	1,500	1,300
5.	Gross profit	3,500	2,500
6.	Selling Expenses	1,500	1,300
7.	EBIT	2,000	1,200
8.	Interest	180	180
9.	Profit before tax	1,820	1,020
10.	Tax @ 40%	728	408
11.	Profit after tax	1,092	612

We can see that in case of financial leverage, the impact on PAT upon reduction in capacity utilisation is much severe. The degree of financial leverage can be calculated by the rate of change of PAT for a one percent change in sales.

Relationship between Financial Risk and Financial Leverage

As the financial leverage increases, the breakeven point of the company increases and the company now has to sell more of its product (or service) in order to break even. High financial leverage increases the risk to banks and other lenders because of the higher probability of bankruptcy and the risk to stockholders because greater losses may be incurred if the company goes bankrupt. Increase in financial leverage, increases the risk to stockholders because the higher leverage will cause greater volatility in earnings and greater volatility in the stock price.

SOME CASE STUDIES

Example No. 1: Calculate the operating, financial and combined leverage under situations 1 and 2 and the financial plans for X and Y respectively from the following information relating to the operating and capital structure of a company, and also find out which gives the highest and the least value ? Installed capacity is 5000 units. Annual Production and sales at 60% of installed capacity.

Selling price per unit ₹ 25

Variable cost per unit ₹ 15

Fixed cost:

Situation 1 : ₹ 10,000

Situation 2 : ₹ 12,000

Example No. 2. XYZ' company has a choice of the following three financial plans. You are required to calculate the financial leverage in each case

	Plan I	Plan II	Plan III
Equity capital	₹ 2,000	₹ 1,000	₹ 3,000
Debt	₹ 2,000	₹ 3,000	₹ 1,000
EBIT	₹ 400	₹ 400	₹ 400

Interest @10% per annum on debts in all cases.

Solution

Amount in ₹

	Plan I	Plan II	Plan III
EBIT	400	400	400
Less Interest-(I)	200	300	100
EBT	200	100	300
FL (EBIT/EBT)	2	4	1.33

Example No. 3. Calculate operating leverage and financial leverage under situations A, B and C and financial plans 1, 2 and 3 respectively from the following information relating to the operating and financial leverage which give the highest value and the least value.

Installed capacity (units)	1,200
Actual production and sales (units)	800
Selling price per unit (₹)	15
Variable cost per unit (₹)	10
Fixed costs (₹) Situation A	1,000
Situation B	2,000
Situation C	3,000

Sources of Fund	Financial Plan		
	1	2	3
Equity	₹ 5,000	₹ 7,500	₹ 2,500
Debt	₹ 5,000	₹ 2,500	₹ 7,500
Cost of debt	12 per cent per annum		

Solution

Amount in ₹

	A	B	C
S – VC	4,000	4,000	4,000
EBIT	3,000	2,000	1,000
Degree of Operative Leverage = (S – VC)/EBIT	1.33	2	4

FINANCIAL LEVERAGE

Situation A	1	2	3
EBIT	3,000	3,000	3,000
Less : Interest	600	300	900
EBT	2,400	2,700	2,100
Financial Leverage	1.25	1.11	1.43

Situation B

EBIT	2,000	2,000	2,000
Less : Interest	600	300	900
EBT	1,400	1,700	1,100
Financial Leverage	1.43	1.18	1.82

Situation C

EBIT	1,000	1,000	1,000
Less : Interest	600	300	900
EBT	400	700	100
Financial Leverage	2.5	1.43	10

LESSON ROUND-UP

- Capital Structure of a firm is a reflection of the overall investment and financing strategy of the firm. It shows how much reliance is being placed by the firm on external sources of finance and how much internal accruals are being used to finance expansions.
- Optimal capital structure means arrangement of various components of the structure in tune with both the long-term and short term objectives of the firm.
- The four Capital Structure Theories are—Net Income Approach, Net Operating Income Approach, Traditional Approach and Modigliani Miller Approach.
- Net income approach provides that the cost of debt capital, K_d and the cost of equity capital K_e remains unchanged when the degree of leverage, varies.
- Net Operating Income approach states that cost of the capital for the whole firm remains constant, irrespective of the leverage employed in the firm.
- Traditional Approach to capital structure advocates that there is a right combination of equity and debt in capital structure, at which market value of the firms is maximum.
- Modigliani and Miller have restated the net operating income position in terms of three basic propositions:
 - Proposition I – The total value of a firm is equal to its expected operating income divided by the discount rate appropriate to its risk class.
 - Proposition II – The expected yield on equity, K_e is equal to K_o plus a premium.

Lesson 4

Sources of Long Term Finance and Cost of Capital

LESSON OUTLINE

- Meaning and Purpose of Long Term Finance
- Sources of Long Term Finance
- Meaning of Cost of Capital
- Factors affecting Cost of Capital
- Measurement of Cost of Capital
 - (a) Cost of redeemable debt
 - (b) Cost of irredeemable debt
 - (c) Cost of irredeemable preference shares
 - (d) Cost of redeemable Preference Share
 - (e) Cost of Equity
- Weighted Average Cost of Capital
- Marginal Cost of Capital
- LESSON ROUND UP
- TEST YOURSELF

LEARNING OBJECTIVES

Cost of capital is very important aspect of corporate finance which decides the fate of various investment decisions. Cost of capital is an integral part of investment decision as it is used to measure the worth of investment proposal provided by the business concern. It is used as a discount rate in determining the present value of future cash flows associated with capital projects. Cost of capital is also called as cut-off rate, target rate, hurdle rate and required rate of return. When the firms are using different sources of finance, the finance manager must take careful decision with regard to the cost of capital; because it is closely associated with the value of the firm and the earning capacity of the firm.

The objective of this lesson is to enable the students to learn about

- Sources of Long Term Finance
- Factors affecting the cost of capital of a company
- Calculation of cost of capital for different sources of finance
- Calculation of Weighted Cost of Capital
- Calculation of Marginal cost of Capital

Cost of a capital of a company is not only important financing decision but it very important in deciding the capital structure of a company and various important financial decisions.

INTRODUCTION

Finance is the life blood of business. It is of vital significance for modern business which requires huge capital. Funds required for a business may be classified as long term and short term. In this chapter we will discuss about long term sources of finance. Finance for a long period is required for purchasing fixed assets like land and building, machinery etc. Even a portion of working capital, which is required to meet day to day expenses, is of a permanent nature. To finance it we require long term capital. The amount of long term capital depends upon the scale of business and nature of business.

Features of Long-term finance

- It involves financing for fixed capital required for investment in fixed assets
- it is obtained from Capital Market
- Long term sources of finance have a long term impact on the business
- Generally used for financing big projects, expansion plans, increasing production, funding operations.

LONG TERM FINANCE – ITS MEANING AND PURPOSE

A business requires funds to purchase fixed assets like land and building, plant and machinery, furniture etc. These assets may be regarded as the foundation of a business. The capital required for these assets is called fixed capital. A part of the working capital is also of a permanent nature. Funds required for this part of the working capital and for fixed capital is called long term finance.

Purpose of long term finance:

Long term finance is required for the following purposes:

1. To finance fixed assets :

Business requires fixed assets like machines, building, furniture etc. Finance required to buy these assets is for a long period, because such assets can be used for a long period and are not for resale.

2. To finance the permanent part of working capital:

Business is a continuing activity. It must have a certain amount of working capital which would be needed again and again. This part of working capital is of a fixed or permanent nature. This requirement is also met from long term funds.

3. To finance growth and expansion of business:

Expansion of business requires investment of a huge amount of capital permanently or for a long period.

FACTORS DETERMINING LONG-TERM FINANCIAL REQUIREMENTS

The amount required to meet the long term capital needs of a company depend upon many factors. These are:

- (a) **Nature of Business:** The nature and character of a business determines the amount of fixed capital. A manufacturing company requires land, building, machines etc. So it has to invest a large amount of capital for a long period. But a trading concern dealing in, say, washing machines will require a smaller amount of long term fund because it does not have to buy building or machines.
- (b) **Nature of goods produced:** If a business is engaged in manufacturing small and simple articles it will require a smaller amount of fixed capital as compared to one manufacturing heavy machines or heavy consumer items like cars, refrigerators etc. which will require more fixed capital.
- (c) **Use of Technology:** In heavy industries like steel the fixed capital investment is larger than in the case of a business producing plastic jars using simple technology or producing goods using labour intensive technique.

SOURCES OF LONG TERM FINANCE

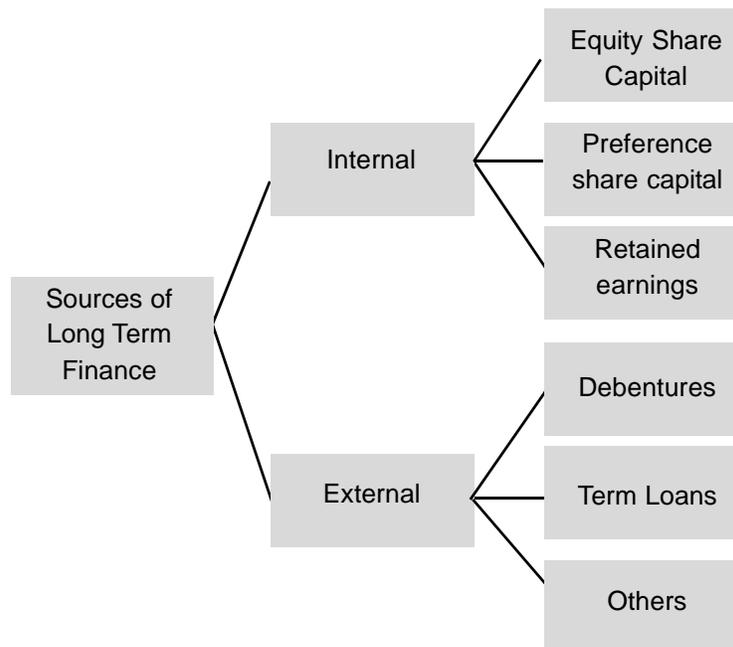
The two main sources of long term finance are as follows:

(A) Ownership Capital

- Equity share capital
- Preference share capital
- Retained earnings

(B) Borrowed capital

- Debentures
- Term loans
- Others



Owner's capital

1. Equity share capital

It represents the investment made by the owners of the business. They enjoy the rewards and bear the risks of the ownership. They are paid dividend only after paying dividend to preference shareholders and after meeting the future investment needs of the organisation.

2. Preference share capital

It represents the investment made by preference shareholders. Preference share holders as the name suggests enjoy preference over payment of dividend. The dividend paid on these shares is generally at a fixed rate.

3. Retained earnings

It represents the earnings not distributed to shareholders. A firm may retain a portion or whole of its profits and utilize it for financing its projects.

Borrowed Capital

1. Debentures

Debenture capital is a financial instrument for raising long term debt capital. A debenture holder is a

creditor of the company. A fixed rate of interest is paid on debentures. It may be convertible or Non-convertible.

Non-convertible debentures - these are straight debt instrument carrying a fixed rate and have a maturity period of 5-9 years. If interest is accumulated it has to be paid by the company by liquidation of its assets. It is an economical method of raising funds. Debenture holders do not have any voting rights and there is no dilution of ownership. They cannot be converted into equity shares.

Convertible debentures - convertible debentures are debentures which are convertible wholly or partly into equity shares after a fixed period of time.

2. **Term loans from banks:** Many industrial development banks, cooperative banks and commercial banks grant medium term loans for a period of three to five years. Commercial banks usually provide short-term finance to business firms in the form of loans and advances, cash credit, overdraft etc. But now-a-days, most of the commercial banks have also started term lending (long and medium term) and providing need based finance of different time periods to firms of all sizes.
3. **Loan from financial institutions:** There are many specialised financial institutions established by the Central and State governments which give long term loans at reasonable rate of interest. Some of these institutions are: Industrial Finance Corporation of India (IFCI), Industrial Development Bank of India (IDBI), Industrial Investment Bank of India (IIBI), Infrastructure Development Finance Company Ltd. (IDFC), Small Industries Development Bank of India (SIDBI), State Industrial Development Corporations (SIDCs), Industrial Credit and Investment Corporation of India (ICICI), Unit Trust of India (UTI), State Finance Corporations (SFCs) etc. The main functions of these institutions are:
 - (i) to grant loans for a longer period to industrial establishment;
 - (ii) to help the establishment of business units that require large amount of funds and have long gestation period;
 - (iii) to provide support for the speedy development of the economy in general and backward regions in particular;
 - (iv) to offer specialized services operating in the areas of promotion, project assistance, technical assistance services and training and development of entrepreneurs;
 - (v) to provide technical and professional management services and help in identification, evaluation and execution of new projects.
4. **Foreign Sources:** Foreign Sources also play an important part in meeting the long-term financial needs of the business in India. These usually take the form of (1) external borrowings; (2) foreign investments and; (3) deposits from NRIs.

COST OF CAPITAL

The cost of capital is the required rate of return that a firm must achieve in order to cover the cost of generating funds in the marketplace. It is used to evaluate new projects of a company as it is the minimum return that investors expect for providing capital to the company, thus setting a benchmark that a new project has to meet.

Meaning of Cost of Capital

Cost of capital is the rate of return that a firm must earn on its project investments to maintain its market value and attract funds.

Cost of capital is the required rate of return on its investments which belongs to equity, debt and retained earnings. If a firm fails to earn return at the expected rate, the market value of the shares will fall and it will result in the reduction of overall wealth of the shareholders.

Definitions of the Term 'Cost of Capital'

The following important definitions are commonly used to understand the meaning and concept of the cost of capital.

According to the definition of **John J. Hampton** "Cost of capital is the rate of return the firm required from investment in order to increase the value of the firm in the market place"

According to the definition of **Solomon Ezra**, "Cost of capital is the minimum required rate of earnings or the cut-off rate of capital expenditure".

According to the definition of **James C. Van Horne**, Cost of capital is "A cut-off rate for the allocation of capital to investment of projects. It is the rate of return on a project that will leave unchanged the market price of the stock".

According to the definition of **William and Donaldson**, "Cost of capital may be defined as the rate that must be earned on the net proceeds to provide the cost elements of the burden at the time they are due".

Assumption of Cost of Capital

Cost of capital is based on certain assumptions which are closely associated while calculating and measuring the cost of capital. It is to be considered that there are three basic concepts:

- A. It is not a cost as such. It is merely a hurdle rate.
- B. It is the minimum rate of return.
- C. It consists of three important risks such as zero risk level, business risk and financial risk. Cost of capital can be measured with the help of the following equation.

$$K = r_j + b + f.$$

Where,

K = Cost of capital.

r_j = The riskless cost of the particular type of finance, b = The business risk premium.

f = The financial risk premium.

IMPORTANCE OF COST OF CAPITAL

Computation of cost of capital is a very important part of the financial management to decide the capital structure of the business concern.

- 1. Importance to Capital Budgeting Decision:** Capital budgeting decision largely depends on the cost of capital of each source. According to net present value method, present value of cash inflow must be more than the present value of cash outflow. Hence, cost of capital is used to make capital budgeting decision.
- 2. Importance to Capital Structure Decision:** Capital structure is the mix or proportion of the different kinds of long term securities. A firm uses particular type of sources if the cost of capital is suitable. Hence, cost of capital helps to take decision regarding structure.
- 3. Importance to Evolution of Financial Performance:** Cost of capital is one of the important factor in determining claim which affects the capital budgeting, capital structure and value of the firm. Hence, it helps to evaluate the financial performance of the firm.
- 4. Importance to Other Financial Decisions:** Apart from the above points, cost of capital is also used in some other areas such as, market value of share, earning capacity of securities etc. hence; it plays a major part in the financial management.

FACTORS DETERMINING THE FIRM'S COST OF CAPITAL

Cost of capital, like all other costs, is a variable term, subject to changes in a number of factors. The various factors that play a part in determination of cost of capital are described below. There are four main factors which mainly determine the cost of Capital of a firm.

1. General Economic Conditions

General economic conditions determine the demand for and supply of capital within the economy, as well as the level of expected inflation. This economic variable is reflected in the risk less rate of return. This rate represents the rate of return on risk-free investments, such as the interest rate on short-term government securities. In principle, as the demand for money in the economy changes relative to the supply, investors alter their required rate of return. For example, if the demand for money increases without an equivalent increase in the supply, lenders will raise their required interest rate. At the same time, if inflation is expected to deteriorate the purchasing power of money, investors require a higher rate of return to compensate for this anticipated loss.

2. Market Conditions

When an investor purchases a security with significant risk, an opportunity for additional returns is necessary to make the investment attractive. Essentially, as risk increases, the investor requires a higher rate of return. This increase is called a risk premium. When investors increase their required rate of return, the cost of capital rises simultaneously. If the security is not readily marketable when the investor wants to sell, or even if a continuous demand for the security exists but the price varies significantly, an investor will require a relatively high rate of return. Conversely, if a security is readily marketable and its price is reasonably stable, the investor will require a lower rate of return and the company's cost of capital will be lower.

3. Operating and Financing Decisions

Risk, or the variability of returns, also results from decisions made within the company. Risk resulting from these decisions is generally divided into two types: business risk and financial risk. Business risk is the variability in returns on assets and is affected by the company's investment decisions. Financial risk is the increased variability in returns to common stockholders as a result of financing with debt or preferred stock. As business risk and financial risk increase or decrease, the investor's required rate of return (and the cost of capital) will move in the same direction.

4. Amount of Financing

The last factor determining the corporation's cost of funds is the level of financing that the firm requires. As the financing requirements of the firm become larger, the weighted cost of capital increases for several reasons. For instance, as more securities are issued, additional flotation costs, or the cost incurred by the firm from issuing securities, will affect the percentage cost of the funds to the firm. Also, as management approaches the market for large amounts of capital relative to the firm's size, the investors' required rate of return may rise. Suppliers of capital become hesitant to grant relatively large sums without evidence of management's capability to absorb this capital into the business. This is typically "too much too soon". Also, as the size of the issue increases, there is greater difficulty in placing it in the market without reducing the price of the security, which also increases the firm's cost of capital.

Controllable Factors affecting Cost of Capital

These are the factors affecting cost of capital that the company has control over :

(1) Capital Structure Policy

A firm has control over its capital structure, and it targets an optimal capital structure. As more debt is issued, the cost of debt increases, and as more equity is issued, the cost of equity increases.

(2) Dividend Policy

Given that the firm has control over its payout ratio, the breakpoint of the marginal cost of capital schedule can be changed. For example, as the payout ratio of the company increases, the breakpoint between lower-cost internally generated equity and newly issued equity is lowered.

(3) Investment Policy

It is assumed that, when making investment decisions, the company is making investments with similar degrees of risk. If a company changes its investment policy relative to its risk, both the cost of debt and cost of equity change.

Uncontrollable Factors affecting the Cost of Capital

These are the factors affecting cost of capital that the company has no control over:

(1) Level of Interest Rates

The level of interest rates will affect the cost of debt and, potentially, the cost of equity. For example, when interest rates increase the cost of debt increases, which increases the cost of capital.

(2) Tax Rates

Tax rates affect the after-tax cost of debt. As tax rates increase, the cost of debt decreases, decreasing the cost of capital.

MEASUREMENT OF COST OF CAPITAL**Cost of Debt (Kd)**

Cost of Debt refers to the cost of long term debentures/bond. Short term debts are ignored in calculating the cost of debt assuming that either short term debt plays insignificant part in determining the cost of debt or that the interest on short term debt is balanced by interest on short term receivables

Cost of Debt is calculated after tax because interest payments are tax deductible for the firm. Cost of capital is denoted by the term Kd

$K_d \text{ after taxes} = K_d (1 - \text{tax rate})$

Example 1

If the cost of debt for Cowboy Energy Services is 10% (effective rate) and its tax rate is 40% then:

$$\begin{aligned} K_d \text{ after taxes} &= K_d (1 - \text{tax rate}) \\ &= 10 (1 - 0.4) = 6.0 \% \end{aligned}$$

Example 2

Jain & Co sells a new issue of 6% irredeemable debentures to raise ₹ 100,000 and realizes the full face value of ₹ 100. The company falls in 40% tax bracket. Debts are issued at par. Find Cost of Capital

Solution

Before tax cost of debt = Interest / Sale value or Interest /Principal being issued at par

$$(6,000 / 1,00,000) * 100 = 6\%$$

Cost of debt after tax = $(1 - T) * \text{before tax cost of debt}$

$$= (1 - 0.40) * 6\%$$

$$= 0.036 \text{ or } 3.6\%$$

Cost of debt which are issued at premium

Example 3

Jain & Co sells a new issue of 6%, 1000 irredeemable debentures of ₹ 100 each @ 10 % premium. The company falls in 40% tax bracket. Find Cost of Capital?

Solution

Sale value or net proceeds from sale of Debentures (SV) = ₹ (1,000*100+ 1,000*100*10%)
= ₹ 1, 10,000

$$K_d = I (1 - T) / SV$$

Where:

K_d = cost of debt after tax

SV = Sale value of debentures

T = Tax rate

I = Annual interest payment

Cost of debt = 6,000 * (1 - 0.40) / 1,10,000= 3.27%

Cost of debt which are issued at Discount

Example 4

Jain & Co sells a new issue of 6%, 1000 irredeemable debentures of ₹ 100 each @ 10% discount. The company falls in 40% tax bracket. Find Cost of Capital?

Solution

Sale value or net proceeds from sale of Debentures (SV) = ₹ (1,000*100- 1,000*100*10%)
= ₹ 90,000

$$K_d = I (1 - T) / SV$$

Cost of debt = 6,000 * (1 - 0.40) / 90,000= 4%

Cost of Bond/Debentures redeemable after certain period

Cost of Redeemable debt:

In case of debentures redeemable after a certain period of time, cost of debt is calculated taking the average of sale value and redemption value. It is calculated by using under given formula :-

$$K_d (\text{before tax}) = (I + [RV - SV] / n) / (RV + SV) / 2$$

Where:

I = Annual fixed interest

RV = Redeemable Value of debenture net of commission and floatation costs, if any.

SV= Sale Value of debentures net of discount or premium.

n = Term of debt till maturity

After tax cost of Redeemable debt :-

$$K_d (\text{after tax}) = K_d (\text{before tax}) * (1 - T)$$

Example 5

A firm issues debentures worth ₹ 1,00,000 and realizes ₹ 98,000 after allowing 2% commission to brokers. They carry an interest rate of 10% and are due for maturity at the end of 10th year. The company has 40% tax bracket.

Solution

Redeemable value = ₹1,00,000; Sale value = ₹ 98,000. Annual interest (I) = ₹ 10,000

Cost of debt = $\frac{(10,000 + [1,00,000 - 98,000] / 10)}{[(1,00,000 + 98,000) / 2]}$

Cost of debt (before tax) = 10.30%

Cost of debt (after tax) = $10.30\% \times (1 - 0.40) = 6.18\%$

Example 6

X Limited issues its Bond at par @ ₹1,000 per bond. These bonds will mature after 20 years at par and bears coupon rate of 10%. Coupons are annual. The bond will sell for par but flotation costs amount to ₹ 50 per bond.

What is the pre-tax and after-tax cost of debt for X Limited?

Solution

Present realization from sale of 1 Bond = ₹ 950

Annual Interest = ₹ 100

Maturity value after 20 Years = ₹ 1000

Let Pre tax cost of debt is Kd

Present Value of realization from Bond= P. V. of interest for 20 Years @ kd + P.V of Redemption Value @ Kd

$$950 = 100 (PVIFA)_{(20,Kd)} + 1000 (PVIF)_{(20,Kd)}$$

Using a financial calculator:

$$Kd = 10.61\%$$

After-tax cost of debt:

$$Kd = Kd (1 - T)$$

$$Kd = 0.1061 (1 - 0.34)$$

$$Kd = .07 = 7\%$$

B. COST OF PREFERENCE SHARE CAPITAL

Preference shares represent a special type of ownership interest in the firm. They are entitled to a fixed dividend, but subject to availability of profit for distribution. The preference share holders have to be paid their fixed dividends before any distribution of dividends to the equity shareholders. Their dividends are not allowed as an expense for the purpose of taxation. In fact, the preference dividend is a distribution of profits of the business. Dividends are paid out of profits after taxes so the cost of preference shareholder is after tax only.

Preference shares can be divided into:

1. Irredeemable preference shares
2. Redeemable preference shares

(1) Cost of Irredeemable preference shares

Irredeemable preference shares are those shares issuing by which the company has no obligation to pay back the principal amount of the shares during its lifetime. The only liability of the company is to pay the annual dividends. The cost of irredeemable preference shares is:

$$K_p (\text{cost of pref. share}) = \frac{\text{Annual dividend of preference shares}}{\text{Market price of the preference stock}}$$

Example 7

Calculate the cost of 10% preference capital of 10,000 preference shares whose face value is ₹100. The market price of the share is currently ₹ 115.

Solution

Annual dividend = 10% of ₹ 100 = ₹10 per share

$$K_p = \frac{₹ 10}{₹ 115} = 8.7\%$$

Cumulative preference shares:

Cumulative preference shares are those shares whose dividends will get accumulated if they are not paid periodically. All the arrears of cumulative preference shares must be paid before paying anything to the equity share holders. In case of cumulative preference shares, the market price of the preference stock will be increased by such amount of dividend in arrears.

Non-cumulative preference shares:

These are preference shares whose dividends do not get carried forward to the next year if they are not paid during a year.

If the company issues new preference shares,

The cost of preference capital would be:

$K_p = \text{Annual dividend} / \text{Net proceeds after floatation costs, if any.}$

Example 8: A limited company issues 8% preference shares which are irredeemable. The face value of share is ₹100 but they are issued at ₹105. The floatation cost is ₹3 per share, calculate case of capital.

Solution

Net proceed = ₹(105-3) = ₹ 102

$$K_p = (8/102) * 100 = 7.84\%$$

(2) Cost of Redeemable preference shares

Redeemable preference shares are those shares which have a fixed maturity date at which they would be redeemed.

$$\text{Cost of Redeemable preference shares} = K_p = \frac{D + (RV - SV) / N}{(RV + SV) / 2}$$

Where K_p = Cost of preference Shares

RV- Redemption value

SV= Sale value

N= No of years to Maturity

D= Annual Dividend

Example 9: A company issues 10,000, 8% preference shares of ₹100 each redeemable after 20 years at face value. The floatation costs are ₹3 per share find case of capital.

Solution

Redeemable value = ₹100;

Sale value = ₹100 - ₹3 = ₹97

Annual dividend = ₹8 per share.

$$K_p = \frac{8 + (100 - 97) / 20}{(100 + 97) / 2} = 8.27\%$$

COST OF EQUITY CAPITAL

The measurement of cost of capital of equity share capital is the most typical and conceptually a difficult exercise. The reason being there is no coupon rate in case of equity shares. Further, there is no commitment to pay equity dividends and it is the sole discretion of the Board of directors to pay or not to pay dividends or to decide at what rate the dividend be paid to the equity share holders. Moreover equity shareholders are the last claimant on the profits of the company. Therefore, it is often said that equity shares have no cost of capital as such. But the same is not true.

The equity share capital, like any other source, also has a cost. Just as in the case of debt and preference shares, the investor will invest the funds in the form of equity share capital of a firm only if they expect a return from the firm, which will compensate them for surrendering the funds as the risk undertaken. The return which equity share holders get is of two kinds:

- Periodic Payments in the form of dividends. This is an explicit return.
- The capital appreciation which they might get by selling the shares at the increase in the market value of the shares. This return is an implicit return. The market value is an indicative measure of the return to the investors when they wish to redeem their investment

The cost of equity capital is the minimum rate of return that a company must earn on the equity financed portion of its investments in order to maintain the market price of the equity share at the current level. The cost of equity capital is rather difficult to estimate because there is no definite commitment on the part of the company to pay dividends. However, there are various approaches for computing the cost of equity capital. They are:

1. CAPM model

This is a popular approach to estimate the cost of equity. According to the CAPM, the cost of equity capital is:

$$K_e = R_f + (R_m - R_f) \beta$$

Where:

K_e = Cost of equity

R_f = Risk-free rate

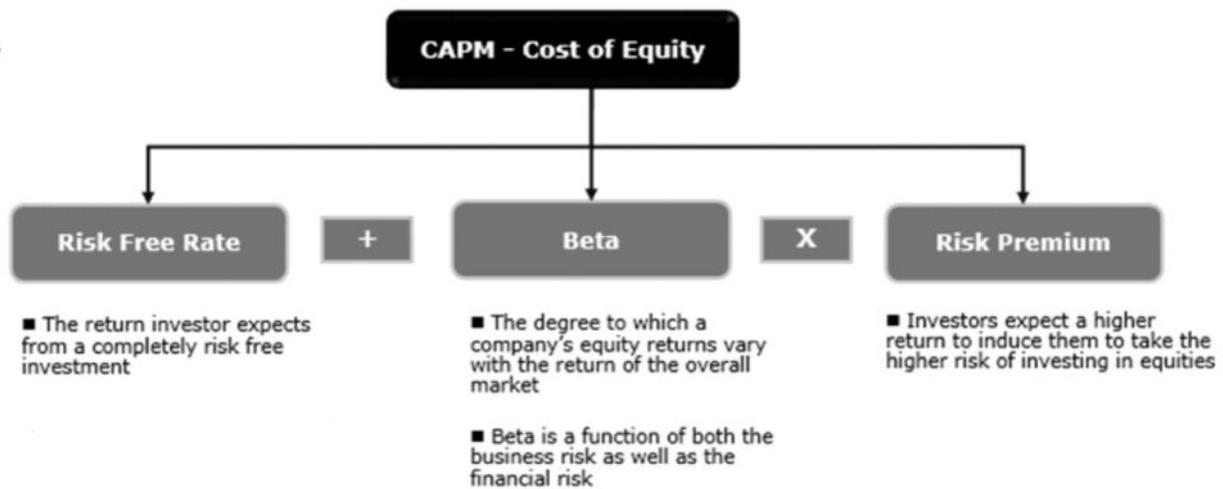
R_m = Equity market required return (expected return on the market portfolio)

β = beta is Systematic Risk Coefficient.

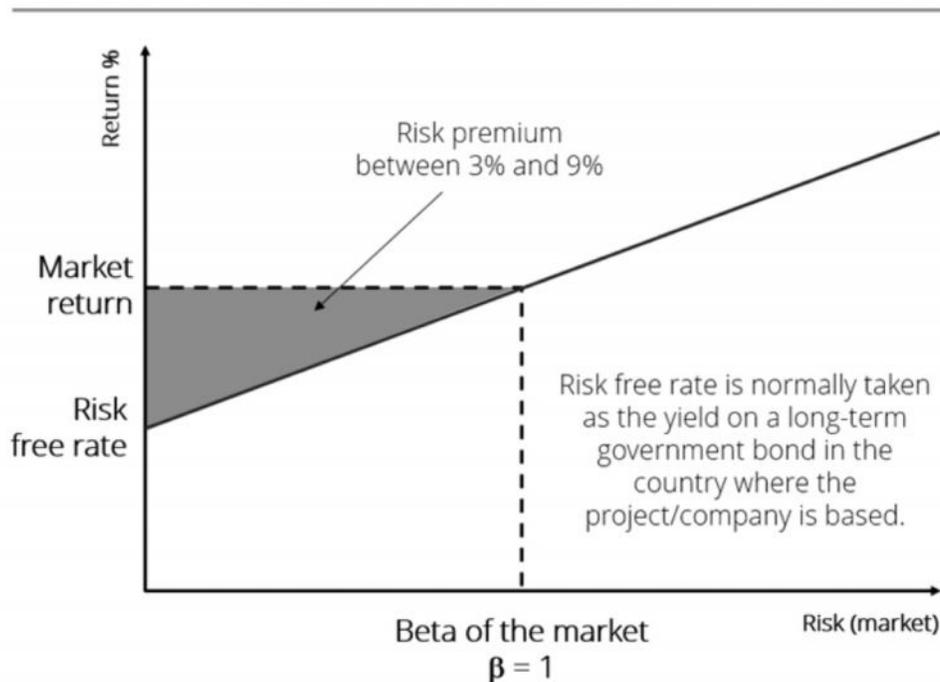
Beta is the measure of market risk. Market risk is the risk that cannot be diversified away.

CAPM can be understood through the following diagrams:

Components of Capital Asset Pricing Model (CAPM)



Capital Asset Pricing Model



Example 10:

Calculate the cost of equity capital for a company whose Risk-free rate =10%, equity market required return =18% with a beta of 0.5.

Solution

$$\begin{aligned}
 K_e &= 0.10 + 0.5(0.18 - 0.10) \\
 &= 0.14 \text{ or } 14\%.
 \end{aligned}$$

2. Bond Yield Plus Risk Premium Approach

This approach is a subjective procedure to estimate the cost of equity. In this approach, a judgmental risk premium to the observed yield on the long-term bonds of the firm is added to get the cost of equity.

Cost of equity = Yield on long-term bonds + Risk Premium.

Example 11

Given, the yield on debt is 10% and the risk premium as 5%, calculate the cost of equity.

Solution

Cost of equity = 0.10 + 0.05 = 0.15 or 15%.

Firms that have risky and consequently, high cost of debt will also have risky and consequently high cost equity. Thus, it makes sense to base the cost of equity on a readily observable cost of debt. The disadvantage or a challenge to this approach is the determination of the risk premium. There is no objective way to determine it and hence many financial analysts look at the operating and financial risks of the business and arrive at a subjectively determined risk premium that ranges between 2 percent and 6 percent.

3. Dividend Growth Model Approach

The price of an equity stock depends ultimately on the dividends expected from it. It can be represented as follows:

$$P_0 = D_1 / (1+r)^1 + D_2 / (1+r)^2 + D_3 / (1+r)^3 + \dots$$

Where:

P_0 = Current price of the stock

D_1 = Expected dividend at the end of year 1

D_2 = Expected dividend at the end of year 2 and so on..

t = Year t

r = Equity shareholders' required rate of return

If the dividends are expected to grow at a constant rate of g% per year, then the equation becomes:

$$P_0 = D_1(1+g) / (1+r)^1 + D_2(1+g) / (1+r)^2 + D_3(1+g) / (1+r)^3 + \dots$$

Simplifying this equation, we get: $P_0 = D_1 / (r-g)$

and solving for r, we get $r = D_1 / P_0 + g$

Example 12

A company has issued 5,000 equity shares of ₹ 100 each. Its current market price is ₹ 95 per share and the current dividend is ₹ 4.5 per share. The dividends are expected to grow at the rate of 6%. Compute the cost of equity capital.

Solution

Here, $D_1 = ₹4.5 + \text{growth rate } 6\% = ₹ 4.77 \text{ per share}$

$P_0 = ₹95$

$Ke = \frac{₹4.77}{₹ 95} + 6\% = 0.11 \text{ or } 11\%$

4. Earnings-Price Ratio approach

According to this approach, the cost of equity capital is:

$$K_e = \frac{E_1}{P_0}$$

Where:

E_1 = Expected earnings per share for the next year

P_0 = Current market price per share

E_1 = (Current EPS) * (1 + growth rate of EPS)

Example 13

A company has currently 10,000 equity shares of ₹100 each and its' earnings are ₹ 150,000. Its' current market price is ₹112 and the growth rate of EPS is expected to be 5%. Calculate the cost of equity.

Solution

$$\begin{aligned} \text{Current EPS} &= \frac{\text{Earnings available for equity shareholders}}{\text{Number of equity shares}} \\ &= ₹150,000 / 10,000 \text{ shares} = ₹15 \text{ per share.} \end{aligned}$$

$$E_1 = ₹15 + 5\% \text{ of } ₹15 = ₹15.75 \text{ per share}$$

$$K_e = ₹15.75 / ₹112 = 0.14 \text{ or } 14\%.$$

Cost of Retained Earnings

Earnings generated by a firm are distributed among the equity shareholders. However, if the entire earnings are not distributed and a part of it is retained by the firm, then these retained earnings are available for reinvestment within the firm. The firm is not required to pay dividends on retained earnings, so it may be argued that the retained earnings have no cost as such. But this is not true. The cost of retained earnings must be considered as the opportunity cost of the foregone dividends. From the point of view of equity shareholder, any earnings could have been profitably invested by them, had these been distributed to them. Thus, there is an opportunity cost involved in the firm's retaining the earnings and an estimation of this cost may be taken up as a measure of cost of capital of retained earnings.

The cost of retained earnings are often taken as equal to the cost of equity. Therefore we can say, $k_e = k_r$. It may be noted that the cost of retained earnings is not to be adjusted for tax, for floatation cost and for the under pricing. While retaining the earnings, the firm does not in any way incur any such cost and the earnings to be retained are already after tax.

Weighted Average Cost of Capital

The weighted average cost of capital (WACC), as the name implies, is the weighted average of the costs of different components of the capital structure of a firm. WACC is calculated after assigning different weights to the components according to the proportion of that component in the capital structure.

Example No 14

$K_0 = K_1W_1 + K_2W_2 + K_3W_3 + \dots$ where K_1, K_2, \dots are components of cost and W_1, W_2 are weights of various kind of capital employed by the company.

Kritika Limited is currently financed with ₹1, 000,000 of 7% bonds, and ₹2, 000,000 of common stock. The stock has a beta of 1.5, and the risk free rate is 4%, and the market risk premium is 3.5%. The marginal tax rate for a corporation of AKL's size is 35%. What is Kritika Limited WACC?

Solution

$$\begin{aligned} \text{Ratio of Debt to Total Capital} &= 10,00,000 / (10,00,000 + 20,00,000) \\ &= 1/3 \end{aligned}$$

$$\begin{aligned} \text{Ratio of Common stock to total capital} &= 20,00,000 / (10,00,000 + 20,00,000) \\ &= 2/3 \end{aligned}$$

Cost of Equity:

$$E(R_e) = R_f + \beta_{im} [(E(R_m) - R_f)] = 4\% + 1.5 \times 3.5 = 9.25\%$$

$$\text{Cost of debt} = 0.07(1 - 0.35) = 0.455 \text{ or } 4.55\%$$

$$\begin{aligned} \text{WACC} &= (4.55\% \times 1/3) + (9.25\% \times 2/3) \\ &= 0.076833 \text{ or } 7.68\% \end{aligned}$$

Example No 15

A firm is considering a new project which would be similar in terms of risk to its existing projects. The firm needs a discount rate for evaluation purposes. The firm has enough cash on hand to provide the necessary equity financing for the project.

Also, the firm has 10,00,000 common shares outstanding with current price ₹ 11.25 per share. Next year's dividend expected to be ₹1 per share, firm estimates that dividend will grow at 5% per year.

It has 1,50,000 preference shares outstanding. The current price of preference share is ₹9.50 per share and dividend is ₹0.95 per share. If new preference shares are issued, they must be sold at 5% less than the current market price (to ensure they sell) and involve direct flotation costs of ₹0.25 per share

It has a total of ₹100,00,000 (par value) in debt outstanding. The debt is in the form of bonds with 10 years left to maturity. They pay annual coupons at a coupon rate of 11.3%. Currently, the bonds sell at 106% of par value. Flotation costs for new bonds would equal 6% of par value.

The firm's tax rate is 40%. What is the appropriate discount rate for the new project?

Solution:

Market value of common = 11.25(1000000)	=	₹ 1,12,50,000
Market value of preferred = 9.50(150000)	=	₹ 14,25,000
Market value of debt = 10000000(106%)	=	₹ 1,06,00,000
Total value of firm	=	<u>₹ 2,32,75,000</u>

Cost of Equity:

$$\begin{aligned} K_e &= \frac{D_1}{P_0} + g \\ &= \frac{1}{11.25} + 0.05 \\ K_e &= 0.1389 \end{aligned}$$

Cost of Preference Share Capital

$$\begin{aligned} KP &= \frac{\text{Dividend}}{\text{Net Proceed}} \\ &= \frac{0.95}{9.50(1 - 0.05) - 0.25} \\ &= 0.1083 \end{aligned}$$

Cost of debt:

Net price = 106% - 6% = 100% of par value

Net price = par

Therefore, cost of debt = coupon rate

$K_d = 11.3\%$; cost of debt after tax = $11.3\% (1 - 0.4) = 6.78\%$

Therefore:

$$\begin{aligned} WACC &= \left(\frac{11250000}{23275000} \right) (0.1389) + \left(\frac{1425000}{23275000} \right) (0.1083) + \left(\frac{10600000}{23275000} \right) (0.113)(1 - 0.4) \\ &= 0.1046 \\ &= 10.46\% \end{aligned}$$

Book Value vs. Market Value weights

The weights to be used for calculation of WACC can either be based on the book value or the market value of the funds raised from different sources.

(a) Book value weights

The weights are said to be book value weights if the proportion of different sources are ascertained on the basis of the face values. The book value can be easily calculated by taking the relevant information from the capital structure as given in the balance sheet of the firm.

(b) Market value weights

The weights may also be calculated on the basis of the market value of different sources i.e., the proportion of each source at its market value. In order to calculate the market value weights, the firm has to find out the current market price of the securities in each category.

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

Marginal Cost of Capital (MCC)

MCC can be defined as the cost of additional capital introduced in the capital structure since we have assumed that the capital structure can vary according to changing requirements of the firm.

The following illustration shows how marginal cost of capital can be calculated:

Let us assume that the capital structure of the firm has been expanded by addition to various components. The

addition has been ₹ 2,000 lacs for debt, ₹ 1,000 lacs for preference capital, ₹ 2,000 lacs for equity capital and ₹ 6,000 lacs for retained earnings. The cost of each component of the capital structure after addition would be the weighted average of the old and new values of the component:

(₹ in lakhs)

Component	Existing Value	Cost (%)	Additional Value	Cost (%)	Weighted Average Cost (%)
Debt	4,000	14	2,000	16	14.6
Pref. Capital	1,000	9	1,000	12	10.5
Equity Capital	1,000	15	2,000	20	18.34
Ret. Earnings	4,000	18	6,000	18	18.00

Having calculated the weighted cost of each component, we calculate the weighted average cost of the entire capital structure now:

Component	Weight (%)	Cost (%)	Weighted Cost
Debt	28.57	14.6	14.6 x 0.29 = 4.23
Preference capital	9.52	10.5	10.5 x 0.0952 = 1.00
Equity capital	14.28	18.34	18.34 x 0.1428 = 2.62
Retained earnings	47.62	18	18 x 0.4762 = 8.57
Total	WACC = 4.23 + 1.00 + 2.62 + 8.57 = 16.42 %		

Marginal cost of addition is $16.42 - 15.2 = 1.22\%$. The return on investment has to be more than the revised weighted average cost of capital in order to ensure that the investors stay invested.

COST OF CAPITAL AND ITS IMPLICATIONS IN BUDGETING DECISIONS

Investment decisions are directly related to financial decisions influenced by cost of capital. Management of a company is always anxious to maximise return on investments with a view to ensure that cost of capital is covered although management may alternatively decide to minimise investment which may yield highest returns for reasons of high risk involved or it may decide to maximise investments for obtaining highest growth through expansion of the productive processes. Management is guided by such considerations as:

- (1) Opportunities created by technological change requiring replacements, necessitating expansion or taking up new activities.
- (2) Competition strategies to avail of economic opportunities, investment being planned by them and the threat which may arise to the existing or proposed market shares of the firm;
- (3) Short-term and long-term market forecasts with reference to sales, revenue proceeds, net profits etc.;
- (4) Incentives offered by the state to promote investment in particular areas of production required for meeting urgent local needs of the nation or for exporting to earn foreign exchange etc. Nevertheless, the management of a corporate enterprise while preparing capital outlays prepares the particulars of the expected receipts (cash inflows) generated from the activity through such investment. Both are compared over-time and for optimum decision, receipts should cover cost of financing the capital outlays. As such investment or capital budgeting decisions are directly linked with the cost of capital.

Before dealing with the application of cost of capital budgeting decisions, it is considered necessary to apprise the

readers of the sources of capital and the cost of capital and its significance in investment decisions in the following paragraphs:

IMPLICATIONS IN BUDGETING DECISIONS

Despite the above objections, cost of capital is used as the basis to evaluate investments whose cash flows are perfectly correlated with the cash flows from the company's present assets. With perfect co-relation between the two sets of cash flows risk is the same. But if the timing of the cash flows is not also the same, the same discount rate cannot be used for both investments. But weighted average cost of capital represents an averaging of all risks of the company and can be used to evaluate investments in much the same manner that the pay-back method. It gives some insight and guidance and to that extent it is good to be used. Present value of an investment can be computed using a weighted average cost of capital and this can be compared with present values calculated using the other discount rates. It may be that an investment with a positive present value should be rejected because of its risk characteristics or that an investment with a negative present value using the weighted average cost of capital should be accepted. All this will differ from situation to situation and case to case. Nevertheless, evaluation of capital investment projects requires some basis which could serve as the minimum rate of return which a project should generate. In such cases, weighted cost of capital could serve as an accepted discounting rate for evaluating investment decisions as no project will be acceptable which does not generate funds equal or greater to the cut-off rate represented by weighted cost.

Some Case Study

Exercise 1: Identify each of the following statements as true or false, and explain your answers.

- A. Information costs both increase the marginal cost of capital and reduce the internal rate of return on investment projects.
- B. Depreciation expenses involve no direct cash outlay and can be safely ignored in investment-project evaluation.
- C. The marginal cost of capital will be less elastic for larger firms than for smaller firms.
- D. In practice, the component costs of debt and equity are jointly rather than independently determined.
- E. Investments necessary to replace worn-out or damaged equipment tend to have low levels of risk.

SOLUTION

- A. True:** The need to gather information concerning the creditworthiness of borrowers increases the interest rates charged by creditors. Similarly, the task of information gathering in the investment project evaluation process reduces the IRR from those projects.
- B. False:** Even though depreciation expenses involve no direct cash outlay, they must be explicitly considered in investment project evaluation because they affect corporate cash outlays for income tax payments.
- C. False:** The marginal cost of capital will tend to be more elastic for larger as opposed to smaller firms. Large firms tend to have easy access to capital markets given their relatively long operating history, and substantial resources. On the other hand, the marginal cost of capital can increase rapidly (be quite inelastic) for smaller firms which, for example, face capital constraints due to scarce managerial talent.
- D. True:** The component costs of debt and equity tend to be jointly as opposed to independently determined. Higher levels of debt, for example, will usually increase the perceived level of risk for debt holders and equity holders alike, and, therefore, raise the interest rate charged by creditors and the rate of return requirement of stockholders.
- E. True:** Investments necessary to replace worn out or damaged equipment have highly predictable returns and low levels of risk.

Exercise 2

ABC Ltd. has the following capital structure.

	₹
Equity (expected dividend 12%)	10,00,000
10% preference	5,00,000
8% loan	15,00,000

You are required to calculate the weighted average cost of capital, assuming 50% as the rate of income-tax, before and after tax.

Solution

Sources of Funds	Amount in ₹	After Tax Cost of Capital	Weights	Cost (₹)
Equity	10,00,000	12%	33.33%	3.99
Preference	5,00,000	10%	16.67	1.67
8% Loan	15,00,000	4%	50.00	2.00
				7.66%

Weighted average cost of capital = 7.66%

Exercise 3

A company has on its books the following amounts and specific costs of each type of capital.

Type of Capital	Book Value	Market Value	Specific Costs (%)
	₹	₹	
Debt	4,00,000	3,80,000	5
Preference	1,00,000	1,10,000	8
Equity	6,00,000	9,00,000	15
Retained Earnings	2,00,000	3,00,000	13
	13,00,000	16,90,000	

Determine the weighted average cost of capital using:

- (a) Book value weights, and
- (b) Market value weights.

How are they different? Can you think of a situation where the weighted average cost of capital would be the same using either of the weights?

Solution**A. Computation of Weighted Average Cost of Capital using book value**

Source of Funds	Amount (₹)	Cost % (X)	Weighted Cost (W) (₹)
Debt	4,00,000	5	20,000
Preference Shares	1,00,000	8	8,000
Equity Shares	6,00,000	15	90,000
Retained Earnings	2,00,000	13	26,000
	$\Sigma W = 13,00,000$		$\Sigma XW = 1,44,000$

$$K_w = \frac{\Sigma XW}{\Sigma W}$$

$$K_w = \frac{1,44,000 \times 100}{13,00,000}$$

$$= 11.1\%$$

B. Computation Weighted Average Cost of Capital using Market Value

Source of Funds	Amount (₹)	Cost % (X)	Weighted Cost (W) (₹)
Debt	3,80,000	5	19,000
Preference Shares	1,10,000	8	8,800
Equity Shares	9,00,000	15	13,500
Retained Earnings	3,00,000	13	39,000
	$\Sigma W = 16,90,000$		$\Sigma XW = 2,01,800$

$$K_w = \frac{\Sigma XW}{\Sigma W}$$

$$K_w = \frac{2,01,800}{16,90,000} \times 100 = 11.9\%$$

Exercise 4

KPL Manufacturing is in the process of analyzing its investment decision-making procedures. The two projects evaluated by the firm during the past month were projects 123 and 124. The basic variables surrounding each project analysis and the resulting decision actions are summarized in the following table.

Basic variables	Project 123	Project 124
Cost	₹ 60,000	₹ 52,000
Life	10 years	10 years
Expected return	8%	15%
Cost of financing		
Source	Debt	Equity
Cost (after-tax)	7%	16%

Decision

Action	Invest	Don't invest
Reason	8% > 7% cost	15% < 16% cost

- Evaluate the firm's decision-making procedures, and explain why the acceptance of project 123 and rejection of project 124 may not be in the owners' best interest.
- If the firm maintains a capital structure containing 40% debt and 60% equity, find its weighted average cost using the data in the table.
- If the firm had used the weighted average cost calculated in part (b), what actions would have been indicated relative to projects 123 and 124?
- Compare and contrast the firm's actions with your findings in part (c). Which decision method seems more appropriate? Explain why.

Answer

- The firm is basing its decision on the cost to finance a particular project rather than the firm's combined cost of capital. This decision-making method may lead to erroneous accept/reject decisions.
- Weighted average cost of capital, $K_a = w_d * K_d + w_e * K_e$
 $= 0.40 (7\%) + 0.60 (16\%)$
 $= 2.8\% + 9.6\%$
 $= 12.4\%$
- Reject project 123. Accept project 124.
- Opposite conclusions were drawn using the two decision criteria. The overall cost of capital as a criterion provides better decisions because it takes into consideration the long-run interrelationship of financing decisions.

Exercise 5

ABC Ltd. has expected earnings at ₹ 30 per share which is growing at 8% annually. Company follows fixed payout ratio of 50%. The market price of its share is ₹ 300. Find the following:

- Current cost of equity
- Cost of new equity if the firm issues fresh shares at current market price but with floatation cost of 5%.

Answer

- Cost of equity can be calculated by using constant growth valuation model. The formula is as under:

$$K_e = \frac{D_1}{P_0} + g$$

Here, the EPS is given as ₹ 30. Since the payout is 50%, therefore, the dividend per share (DPS) = $30 * 0.5 = ₹ 15$.

$$\text{So, } K_e = \frac{15}{300} + 0.08$$

$$= 0.13 = 13\%$$

b) Cost of new equity with 5% floatation cost: $K_{ex} = \frac{K_e}{(1 - f)}$

Where;

f- Floatation cost

K_e - Cost of internal equity

So,

$$K_{ex} = \frac{0.13}{(1 - 0.05)}$$

$$= 0.1368 = 13.68\%$$

Exercise 6

Oxford Company has compiled the information shown in the following table.

Source of capital	Book Value	Market value	After tax cost
Equity	1080000	3000000	17%
Preference stock	50000	60000	13%
Long term debt	4500000	3840000	6%
<i>Total</i>	<i>5630000</i>	<i>6900000</i>	

- Calculate the weighted average cost of capital using book value weights.
- Calculate the weighted average cost of capital using market value weights.
- Compare the answers obtained in parts a and b. Explain the differences.

Answer

- a) Weighted average cost of capital (WACC) using book value weights can be calculated as follows:

Source of capital	Book Value (₹Crore)	Weight	Cost (%)	WACC = $K_e * W_e + K_p * W_p + K_d * W_d$
Equity	1080000	0.19	17	3.23
Preference stock	50000	0.01	13	0.13
Long term debt	4500000	0.80	6	4.80
Total	<u>5630000</u>	<u>1</u>		<u>8.16</u>

So, the weighted average cost of capital is 8.16%

- b) Weighted average cost of capital (WACC) using market value weights can be calculated as follows:

Source of capital	Market Value (₹Crore)	Weight	Cost (%)	WACC = $K_e * W_e + K_p * W_p + K_d * W_d$
Equity	3000000	0.43	17	7.31
Preference stock	60000	0.01	13	0.13
Long term debt	3840000	0.56	6	3.36
Total	<u>6900000</u>	<u>1</u>		<u>10.80</u>

So, the weighted average cost of capital is 10.80%

- c) The difference lies in the two different value bases. The market value approach yields the better value because the costs of the components of the capital structure are calculated using the prevailing market prices. Since the common stock is selling at a higher value than its book value, the cost of capital is much higher when using the market value weights. Notice that the book value weights give the firm a much greater leverage position than when the market value weights are used.

Exercise 7

Optimum Limited company uses only debt and internal equity to finance its capital budget and uses CAPM to compute its cost of equity. Company estimates that its WACC is 12%. The capital structure is 75% debt and 25% internal equity. Before tax cost of debt is 12.5 % and tax rate is 20%. Risk free rate is $r_{RF} = 6\%$ and market risk premium ($r_m - r_{RF}$) = 8%: What is the beta of the company?

Solution

$$WACC = w_d r_d (1 - T) + w_e r_e$$

$$0.12 = 0.75(0.125)(1 - 0.20) + 0.25r_e$$

$$0.12 = 0.075 + 0.25r_e$$

$$r_e = 18\%$$

$$r_e = 18\% = r_{RF} + \beta(r_m - r_{RF})$$

$$18\% = 6\% + \beta(8\%)$$

$$\beta = 1.5$$

Exercise 8

A company issue 10% irredeemable debentures of Rs. 10,000. The company is in 50% tax bracket. Calculate cost of debt capital at par, at 10% discount and at 10% premium

Solution

$$\begin{aligned} \text{Cost of debt at par} &= \text{Rs.}1000 / \text{Rs.}10000 * (1 - 0.50) \\ &= 5\% \end{aligned}$$

$$\begin{aligned} \text{Cost of debt issued at 10\% discount} &= \text{Rs.}1000 / \text{Rs.}9000 * (1 - 0.50) \\ &= 5.55\% \end{aligned}$$

$$\begin{aligned} \text{Cost of debt issued at 10\% premium} &= \text{Rs.}1000 / \text{Rs.}11000 * (1 - 0.50) \\ &= 4.55\% \end{aligned}$$

Example 9

A firm issued 100 10% debentures, each of Rs. 100 at 5% discount. The debentures are to be redeemed at the end of 10th year. The tax rate is 50%. Calculate cost of debt capital.

Solution

Cost of Debt Capital

$$= \frac{\frac{1000 + 500 / 10}{10,000 + 9,500} + \frac{1050}{9750}}{2} * 0.50$$

$$= 5.385\%$$

($r_{m} r_{RF}$) $18\% = 6\% + (8\%)$

LESSON ROUND-UP

- Funds required for a business may be classified as long term and short term.
- Long term finance is required to Finance fixed assets, finance the permanent part of working capital, finance growth and expansion of business.
- The two main sources of long term finance are Ownership Capital and Borrowed capital.
- The cost of capital is a term used in the field of financial investment to refer to the cost of a company's funds (both debt and equity), or, from an investor's point of view "the shareholder's required return on a portfolio company's existing securities"
- Cost of capital is used to evaluate new projects of a company and it is the minimum return that investors expect for providing capital to the company.
- For an investment to be worthwhile, the expected return on capital must be greater than the cost of capital. The cost of capital is the rate of return that capital could be expected to earn in an alternative investment of equivalent risk.
- There are four main factors which mainly determine the cost of Capital of a firm. General economic conditions, the marketability of the firm's securities (market conditions), operating and financing conditions within the company, and the amount of financing needed for new investments.
- There are factors affecting cost of capital that the company has control over and includes Capital Structure Policy, Dividend Policy, Investment Policy etc.
- There are some factors affecting cost of capital that the company has not control over and these factors includes Level of Interest Rates, Tax Rates.
- Cost of Debt is calculated after tax because interest payments are tax deductible for the firm. Cost of capital is denoted by the term K_d .

$$K_d \text{ after taxes} = K_d (1 - \text{tax rate})$$

- Irredeemable preference shares are those shares issuing by which the company has no obligation to pay back the principal amount of the shares during its lifetime. The only liability of the company is to pay the annual dividends. The cost of irredeemable preference shares is:

$$K_p \text{ (cost of pref. share)} = \frac{\text{Annual dividend of preference shares}}{\text{Market price of the preference stock}}$$

- Redeemable preference shares are those shares which have a fixed maturity date at which they would be redeemed. The cost of redeemable preference shares is calculated by under given formulae.

$$\text{Cost of Redeemable preference shares} = K_p = \frac{D + (RV - SV) / N}{(RV + SV) / 2}$$

Where K_p = Cost of preference Shares

RV- Redemption value

SV= Sale value

N= No of years to Maturity

D= Annual Dividend

– The cost of equity capital is the minimum rate of return that a company must earn on the equity financed portion of its investments in order to maintain the market price of the equity share at the current level. The cost of equity capital is rather difficult to estimate because there is no definite commitment on the part of the company to pay dividends. However, there are various approaches for computing the cost of equity capital. They are:

– CAPM model : This is a popular approach to estimate the cost of equity. According to the SML, the cost of equity capital is:

$$K_e = R_f + \beta (R_m - R_f)$$

Where:

K_e = Cost of equity

R_f = Risk-free rate

R_m = Equity market required return (expected return on the market portfolio)

β = beta- Systematic Risk Coefficient.

– Bond Yield Plus Risk Premium Approach

This approach is a subjective procedure to estimate the cost of equity. In this approach, a judgmental risk premium to the observed yield on the long-term bonds of the firm is added to get the cost of equity.

Cost of equity = Yield on long-term bonds + Risk Premium.

– Dividend Growth Model Approach

The price of an equity stock depends ultimately on the dividends expected from it. According to this approach $P_0 = D_1 / (r - g)$ and $r = D_1 / P_0 + g$. here

P_0 = Current price of the stock

D_1 = Expected dividend at the end of year 1

r = Equity shareholders' required rate of return

g = Growth rate

– Earnings-Price Ratio approach

According to this approach, the cost of equity capital is:

$$K_e = \frac{E_1}{P_0}$$

Where:

E_1 = Expected earnings per share for the next year

P_0 = Current market price per share

E_1 = (Current EPS) * (1 + growth rate of EPS)

– The weighted average cost of capital (WACC), as the name implies, is the weighted average of the costs of different components of the capital structure of a firm. WACC is calculated after assigning different weights to the components according to the proportion of that component in the capital structure.

– Marginal Cost of Capital (MCC) can be defined as the cost of additional capital introduced in the capital

Lesson 5

Project Finance

LESSON OUTLINE

- Project Finance
- Project Planning
- Preparation of Project Report,
- Project Appraisal under Normal, Inflationary and Deflationary Conditions,
- Project Appraisal by Financial Institutions
- Lending Policies and Appraisal, Norms by Financial Institutions and Banks;
- Loan Documentation,
- Project Review and Control;
- Social Cost and Benefit Analysis of Project.
- Term Loans from Financial Institutions and Banks;
- Lease and Hire Purchase Finance;
- Venture Capital Funds;
- Private Equity;
- International Finance and Syndication of Loans,
- Deferred Payment Arrangements;
- Corporate Taxation and its Impact on Corporate Financing,
- Financing Cost Escalation
- LESSON ROUND UP
- TEST YOURSELF

LEARNING OBJECTIVES

Project Finance is very important aspect of Financial management. To be successful in his endeavour, a finance manager should be well versed about various aspects of project financing, project appraisal techniques, essential of loan documents, project management and control techniques.

The object of the study is to enable the student to understand:

- The meaning of Project Planning
- Project Appraisal by various Financial Institutions
- Project Evaluation Technique
- Loan Documentation
- Loan Syndication – Bridge Loans against Sanctioned Loan
- Monitoring the progress of units assisted by the Financial Institutions
- Social Cost – Benefit Analysis
- Project Review and Control
- Follow-up Reports and Procedures

“Planning without action is futile, action without planning is fatal.”

Cornelius Fitchner

INTRODUCTION

What is Project Finance?

Project finance is the financing of long-term infrastructure, industrial projects and public services, like toll bridges, highways, pipelines, power plants, oil fields etc.

It has following features:-

1. Project finance is done through debt or equity or mix of them.
2. The risk in project determines the amount of loan or equity. Greater risk of project will have greater equity component.
3. Cash flow from the project is primarily used for repayment of loan.
4. Project finance may be with or without recourse.

Steps in Project Finance:-

1. Feasibility study
2. Project Planning
3. Project Report
4. Project Appraisal
5. Definitive Agreement i.e Loan agreement or other documents
6. Disbursal of fund
7. Utilisation Reports to the bank/investor

Feasibility Study:-

The project is evaluated primarily from market, technical and financial feasibility points of view. This is primary stage and a macro view of project is taken.

- (a) Market Feasibility: A study is conducted to evaluate whether potential demand and supply of the proposed product/services are there, within or outside the country. Forecasting is made on that basis.
- (b) Technical Feasibility:- The study of technical aspects include viable technology and its alternatives, availability of raw materials and other resources, product mix, product costs, capacity utilisation, environment etc.
- (c) Financial Feasibility: This requires detailed analysis and projections of prices of inputs and outputs, financing mix, repayment schedule, financial forecasts, risk analysis etc.

PROJECT PLANNING

What is Project Planning?

Once feasibility study gives the positive affirmation for undertaking the project, next stage comes Project Planning. Study Project planning defines the project activities and end products that will be performed and describes how the activities will be accomplished. The purpose of project planning is to define each major task, estimate the

time and resources required, and provide a framework for management review and control. The project planning activities and goals include defining:

1. The specific work to be performed and goals that define and bind the project.
2. Estimates to be documented for planning, tracking, and controlling the project.
3. Commitments that are planned, documented, and agreed to by affected groups.
4. Project alternatives, assumptions, and constraints.

The planning process includes steps to estimate the size of the project, estimate the technical scope of the effort, estimate the resources required to complete the project, produce a schedule, identify and assess risks, and negotiate commitments.

Repetition of these steps is necessary to establish the project plan. Typically, several iterations of the planning process are performed before a plan is actually completed.

Importance of the Project Plan

A project plan is a formal, approved document that is used to manage and control a project.

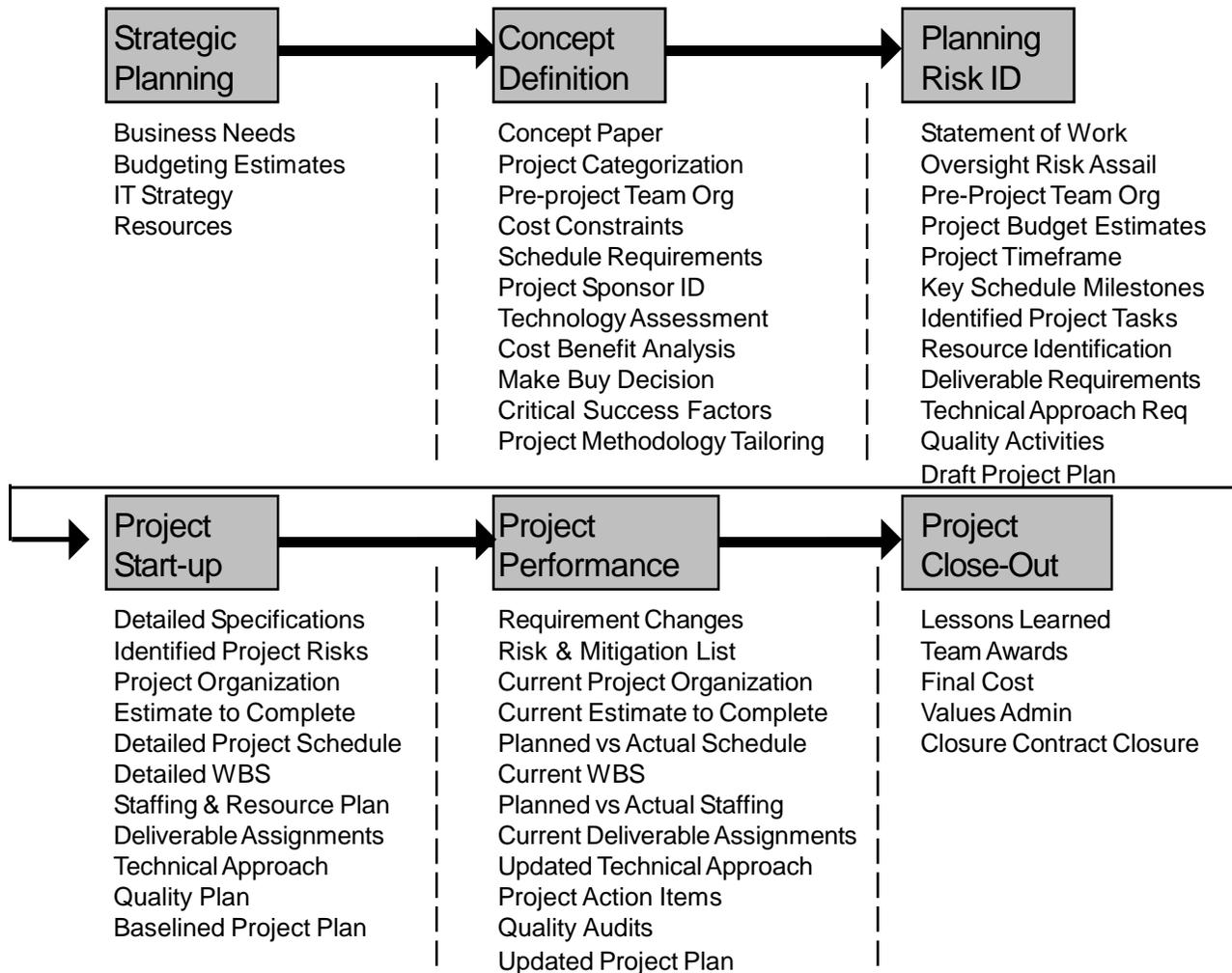
The project plan forms the basis for all management efforts associated with the project. It is a document that is also expected to change over time. The project plan documents the pertinent information associated with the project; the information associated with the plan evolves as the project moves through its various stages and is to be updated as new information unfolds about the project.

Steps in the Project Planning Process

The planning process consists of the following basic tasks:

- (a) Define the technical approach used to solve the problem.
- (b) Define and sequence the tasks to be performed and identify all deliverables associated with the project.
- (c) Define the dependency relations between tasks.
- (d) Estimate the resources required to perform each task.
- (e) Schedule all tasks to be performed.
- (f) Define a budget for performing the tasks.
- (g) Define the organization used to execute the project.
- (h) Identify the known risks in executing the project.
- (i) Define the process used for ensuring quality.
- (j) Define the process used for specifying and controlling requirements.

The Evolving Plan of a Project



The plan defines the objectives of the project, the approach to be taken, and the commitment being assumed. The project plan evolves through the early stages and, by the time the project is ready to begin project execution, contains the detail required to successfully complete the project. Then, when implementation begins, the plan is updated as required.

(1) Planning in the Concept Phase

In the projects concept phase, a need that would result in a product is identified. While only very general information may be known about the project at this time, it is important to capture this information for the planning phase. In this stage, the focus of planning is on the project definition and on getting the project underway. A strategy for deriving a solution to the stated goals is important at this point. The problem being addressed by the project is clearly stated; the project goals and objectives are identified; and success criteria for the project are documented. Also, the assumptions, constraints, and risks that apply to the project are defined. Without a description of this concept information, the completed project plan is difficult to thoroughly understand. Results of the technology assessment also are documented as a precursor to the technical approach that is later defined.

(2) Planning in the Planning Stage

The project plan is completed in the Project Planning and Risk Identification stage of a project. For large projects,

this stage may be run as a mini-project, with a team of people dedicated to performing the effort. For very small projects, the plan may be developed by a group of people as a part-time job. Since various skill sets are required to complete a successful project plan, it is a difficult task for one person to develop the entire plan. During this project stage, details of the plan are determined and an approach is defined. The full project plan is then developed. The plan may include the following elements: a brief project summary, a work breakdown structure, a project organization chart, a schedule, an approach, a list of identified risks, an estimated budget and cost, a list of deliverables, a description of planned quality activities, a description of the configuration management process to be used, and a summary of project requirements.

Even during the planning stage, the development of the project plan is an iterative process. Each element of the plan is regularly revisited for changes and refinements, based upon further analysis and decisions made in developing other plan elements. This refinement also develops buy-in from the project team and stakeholders.

It is critical to get buy off on the project plan from the involved parties prior to actually starting the project. Approval of the plan commits the resources needed to perform the work.

(3) Planning in the Project Start-up Stage

To transition a project from the initial conceptualization and planning to execution requires some type of start-up activities. The project start-up stage is typically a short period that transitions a project from the planning to the execution stage. In the start-up stage, the team is assembled and a kickoff meeting is held to familiarize the team with the elements of the plan and the requirements of the system. Specific work packages detail and specify the activities being performed by the teams, as well as the cost and schedule associated with those activities.

Sometimes, particularly in systems that include procurement, there may be a need to update the project plan during this stage to reflect negotiations or refinements in scope that occurred prior to the actual start of the project. In these cases, the plan is reviewed and updated prior to presentation to the team. Also, in some projects, auxiliary plans (such as the configuration management or quality assurance plans) are detailed in the start-up phase. These plans are developed from strategies defined in the project planning stage.

(4) Planning in the Project Execution Stage

Planning in the project execution stage consists of re-planning when it is determined that the project is not on track with the current plan. This might occur for a variety of reasons. It is very important to know that project plans will change and that re-planning is a natural part of the planning process. Re-planning does not necessarily mean that a project is in trouble. Frequent and extensive re-planning may, however, indicate that there are some serious issues with the project plan. It is better to re-plan than to simply throw away the original plan and operate without a plan.

(5) Planning in the Project Close-Out Stage

A close-out process is performed once the project objectives have been met. Closing a project should be fairly routine. The first step is acceptance of the system by the users. It is important that the user decides when the project is completed. The determination is based upon the success criteria defined in the very early concept and planning stages of the project. This acceptance may be very informal or it may be very formal and depends upon the criteria defined in the plan.

PREPARATION OF PROJECT REPORT

After the project plan is approved by the governing body of the organisation, and is available to the finance department, then next step comes the efforts to search for various sources of fund. Funding can happen through debt or equity or mix of them. A formal project report is now prepared, keeping in mind the requirements of the banks/investors.

The project report is an extremely important aspect of the project. It should be properly structured and also should have necessary and appropriate information regarding the project.

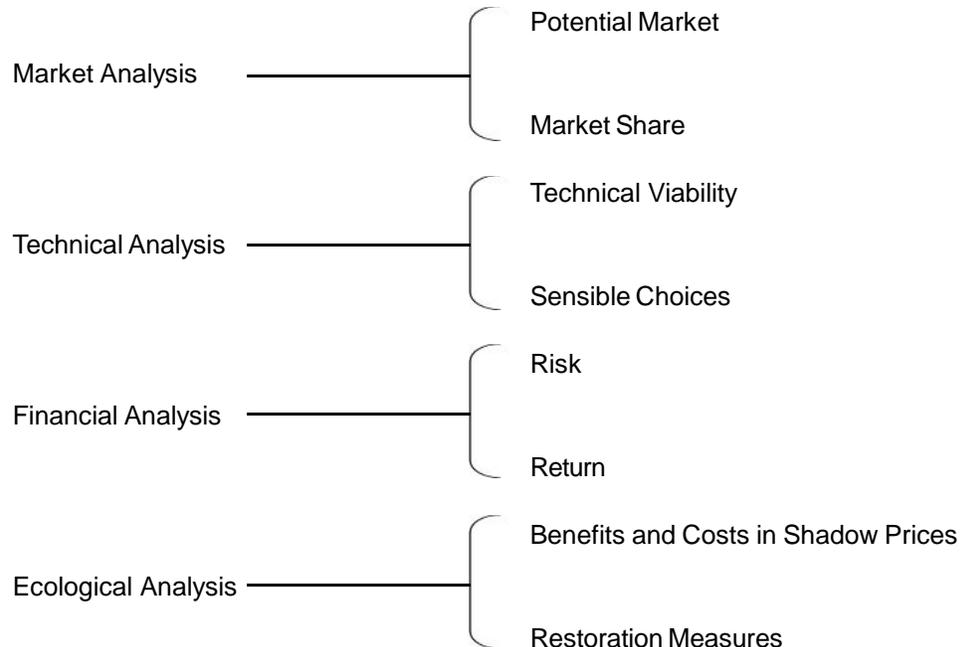
Preparation of project report is a pre-investment study of investment proposal but encompasses a thorough investigating process covering economic, technical, social managerial and commercial aspects. Project report is a working plan for implementation of project proposal after investment decision by a company has been taken.

Importance of preparation of project report has been felt in the wake of sophisticated technology being adopted and the heavy financial state of public funds through financial institutions, banks and investment organisation being contemplated. High technology involvement, higher cost in the project implementation and as such economy cannot afford to tolerate failure of the project. Therefore, to ensure before taking in hand a project whether or not the proposed project is viable, preparation of project report has become essential exercise for all corporate units particularly in the light of the following background:

- (1) Planning in advance, the accomplishment of the following objectives:
 - (a) Performance Objectives
 - (b) Marketing Objectives
 - (c) Operations Objectives
 - (d) Technical Objectives
 - (e) Financial Objectives
 - (f) Personnel Objectives
 - (g) Organisation Objectives
 - (h) The end product Objectives
 - (i) The customer benefit Objectives, and
 - (j) The societal Objectives
- (2) To evaluate above objectives in the right perspective it is essential to consider the input data, analyse the data, predict outcome, choose best alternatives, take action and measure results with predictions. Stress is laid that the objectives become measurable, tangible, verifiable, attainable and the risk of failures is avoided to the maximum desired extents.
- (3) To evaluate constraints on resources viz. manpower, equipment, financial and technological.
- (4) To avail of the financial facilities who require a systematic project report to evaluate desirability of financing the project. Besides, the financial intermediaries today check up and verify the project proposals for accepting the responsibility for a company to procure funds from the capital market. Merchant banks who have entered in the capital market as financial intermediaries are quite careful about the project viability before taking up a contract for making financial services available to corporate units.
- (5) Successful implementation of a project depends upon the course of action suggested in the project report. Besides, comparison of results will depend upon the projected profitability and cash flows, production schedule and targets as planned in the project report.

The above background necessitating the preparation of a project report leaves the impression that the task of preparation of project report involves skills, expertise and experience of field work covering different aspects by financial, technical, commercial, socio-economic, government rules and regulations and the legal requirements

under different laws and can only be handled by a team of experts in different areas. Project idea can be formulated by an entrepreneur but project report cannot be prepared single-handedly as it requires a multi-disciplinary approach to incorporate the following set of analysis in the project report:



- (1) Marketing research to forecast demand for goods/services which may be produced on implementation of the project, capture market and elicit cooperation of the consumers etc.
- (2) Technical analysis comprising systems analysis using technique of operation research to sort out complex problems like allocation problems, replacement problems, inventory problems, scheduling and queuing of operations with use of PERT/CPM, Linear programming. Integral programming, Goal Programming and simulation etc.
- (3) Financial analysis, to project future cash flows, profitability, evaluate net worth, to do cost-benefit analysis, profit planning, budgeting and resource allocation, etc.
- (4) Techno-economic Analysis suggesting to adopt optimal technology for project size/objectives, to explore economic conditions to absorb projects products, etc.
- (5) Project Design and network analysis i.e. detailed work plan to the project and its time profile.
- (6) Input output analysis etc.

Format of Project Report

There is no prescribed format for the preparation of a project report - but a project report should contain mainly the following set of information in general:

- (1) Information about industry and its status in the economy, present production and demand, indicating Licensed, installed capacity, Government policies and export potential. Generally speaking, broad guidelines in this respect may be had from the plan documents of the Government.
- (2) Broad market trend of the product within and outside the states for 5 years.

- (3) Raw material survey, giving specifications and quality of raw materials required and their availability.
- (4) Process - broad description of different processes and their relative economics.
- (5) Availability of technical know-how.
- (6) Location of Plant, its advantages.
- (7) Water - requirement of water for process, boiler feed, cooling etc., sources of water available and making it useable for the factory and to townships.
- (8) Power - total power requirement for the factory specification of power and choice between purchased power and generated power. If power to be generated - total cost of investment, choice of fuel and the cost for fuel available to factory.
- (9) Fuel - its requirement for steam raising or processing source and price at which it will be available for factory including taxes and surcharge.
- (10) Effluents - type and quality of effluents, their treatment and disposal, investment in the effluent treatment and disposal. Government of India has since decided that any project proposal has to have a clearance of Environmental Authority set up by the government.
- (11) Implementation programme: implementation and construction programme in form of CPM/PERT.
- (12) Cost of Project - (Specify foreign exchange cost if any):
 - (a) Land, inclusive of development expenditure incurred on the land;
 - (b) Buildings to be erected for housing the plant and machinery, the administrative office, stores, services, etc. requirements estimates to be included in the project cost;
 - (c) Plant and machinery; including other equipments and their estimated cost;
 - (d) Offsite facilities: utilities and auxiliary facilities;
 - (e) Preliminary expenses (share issue, stamp duty, cost of raising equity etc.);
 - (f) Contingencies;
 - (g) Cost of spare, repairs and maintenance during trial run and commissioning period;
 - (h) Pre-commissioning and commissioning expenses;
 - (i) Working capital margin-details of estimation be given.
- (13) Margin of financing-broad pattern to be indicated.
- (14) Cost of production - project broad pattern five years vis-a-vis design capacity. Breakeven point of production cost should be given, effect of variation of cost of raw materials, utilities, selling price etc. be indicated and elaborated. Price trend of raw material and finished goods be discussed.
- (15) Profitability for five years after commission of the project should be worked out in the prescribed format.
- (16) Cash flow statement and pay period should be worked out for the project.
- (17) Technical feasibility be discussed in detail with financial viability.
- (18) Organisation and management – description of corporate management, promoters experience and background organisational chart, key personnel and delegation of power and responsibility structure be fully described.

PROJECT APPRAISAL UNDER NORMAL CONDITIONS

Appraisal means to critically examine with a focus of attention on specific aspects, areas of operations, and target goals to ensure the conformity of the performance to the proposed goals. Basic task before the appraiser is to study progress in terms of cost productivity ratio, time schedule relationship, inter-action between different agencies, and performance of personnel in terms of their responsibilities and objectives of the company.

Important ingredients of appraisal are the following:

- (1) Objectives as defined in the proposal to be kept in view for satisfactory assessment of operational courses;
- (2) Accuracy of methods and measurements planned to be adopted is well adhered to;
- (3) Objectivity of the proposal is highlighted so as to keep off from the bias and personnel prejudices;
- (4) Ensure the reliability of the data and projected statements;
- (5) Predictors made to conform to reality and should be objective.

In project appraisal above points should be kept in view by the members of appraisal team irrespective of the fact whether the appraisal is being done for an industrial project being implemented by a corporate unit or the project devoted to the national economy sponsored by the state agency.

Form the angle of a company unit the project appraisal of the project may be done at three stages as under:

- (1) Projects appraisal by the corporate unit itself i.e. the promoters of the company are interested in ensuring that on successful implementation of the project whether or not it would generate the required rate of return on the total investment. The promoters make selection of the projects following investment criteria of obtaining the required rate of return. In this appraisal, all aspects with reference to project idea are identified and evaluated. As a matter of fact, it is a feasibility study done to identify the project, identify internal constraints and external difficulties, environmental constraints including government placed restrictions and regulations. Once the promoters are satisfied on this aspect, they have the formal feasibility report prepared and consider it for investment purposes.
- (2) Second stage of project appraisal arises when a project report duly accepted by the promoters is submitted by the corporate unit of financial institution for considering for grant of financial facilities to finance the cost of implementation of the project.
- (3) Project appraisal is done by Government agencies for according approvals required to clear a particular project under the different statues or state regulations. The main criterion followed by Government agencies is the cost benefit analysis and social gains.

PROJECT APPRAISAL UNDER INFLATIONARY CONDITIONS

Timing for project appraisal is most important consideration for all types of appraisers. A project under normal circumstances is appraised from different angles viz. technical feasibility, managerial aspects, commercial aspects, financial viability and economic and social aspects.

Under the normal conditions when prices are generally stable, demand pattern as projected in the project report is unchangeable, the project cost described in the project report remains unchanged at current prices and as such there is not much danger of any sudden escalation in project cost or over run in the projected resources.

There is practically no risk involved of either business or financial nature and evaluation of the project could be done from different angles without providing for any change in project cost and planning for additional financial resources to meet the over run or escalations.

Nevertheless, project appraisal can't be devoid of inflationary pressures as normal conditions for a project do not exist. Because the project is to be implemented over a period of time ranging upon the size and magnitude of the

project, i.e. it could be six months or beyond to run or two or more years. During such a period, it can't be predicted as and when the trade cycles set in and the up-turn in economy is generated.

In a developing economy like India, inflation grow at a planned steady rate because of the economic development activities and as such provision for a probable escalation in the project cost is generally provided as a cushion to inflationary pressures.

However, during inflationary conditions the project cost is affected in magnitude of parameters. Cost of project on all heads viz. labour wage, raw material, fixed assets, equipments, plant and machinery, building material, remuneration of technicians and managerial personnels undergo a shift change. Besides, inflationary conditions place constraints on the resources of the consumers of the product and affect the demand pattern. Thus, cost at production are affected besides the projected statements of profitability and cash flow by the change in the demand pattern and market forecasting figures. The inflationary pressures alone do not stop here. The financial institution and banks revise their rate of lending and their financing cost further escalate during inflationary conditions. Under such conditions, the appraisal of the project generally be done keeping in view the following guidelines which are usually followed by the Government agencies, banks and financial institutions:

- (1) Make provisions for delay in project implementation, escalation in project cost as per the forecasted rate of inflation in the economy particularly on all heads of cost.
- (2) Sources of finance should be carefully scrutinized with reference to revision in the rate of interest to be made by lender and the revision which could be followed in the interest bearing securities. All these factors will push up the cost of financial resources for the corporate unit.
- (3) Profitability and cash flow projections as made in the project report require revision and adjustment should be made to take care of the inflationary pressures affecting adversely future projections.
- (4) Explain fully the criteria followed in adjusting the inflationary pressures viz. there are two criteria followed given as under:-
 - (a) take inflationary rate at average rate and escalate the total cost at that rate;
 - (b) adjust each cost item against inflationary rate. This would make adjustment for inflationary pressures in the cost elements responsible outflows and the revenue elements in the cash. Both cash inflows and outflows will accordingly adjust to inflationary changes at the appropriate rate applicable to each of them respectively.
- (5) Examine the financial viability of the project at the revised rates and assess the same with reference to economic justification of the project. The appropriate measure for this aspect is the economic rate of return for the project which will equate the present value of capital expenditure to net cash flows over the life of the project. The rate of return should be acceptable which accommodates the rate of inflation per annum.
- (6) In inflationary times, early pay back projects should be prepared. Because projects with long pay back are more subjected to inflationary pressures and the cash flow generated by the project will bear high risk.

PROJECT APPRAISAL UNDER DEFLATIONARY CONDITIONS

A different situation may arise in deflationary or recessionary situation. The economy is in down swing, prices are falling, lack of effective demand is discernible, production capacities are already affected narrowing the cash inflows affecting liquidity of the project adversely because wages and salaries and other overhead costs do not fall which keeps the outflow at static rate with declining inflows. The main consideration in project appraisal during this period is the cash inflow, sales, the demand for the projects and sales forecasting outliving the predictions. As a matter of fact new project are delayed as the appraisal never remains so realistic and the sources of supply of money become tight; investors have no enthusiasm in investing this money or savings in the corporate securities for the uncertain working results and higher risk investment. Nevertheless, the appraisal of the project should be done keeping in view the above factors.

From the above discussion, it is concluded that the difference in project appraisal during normal inflationary and deflationary condition is only of degree if due care is taken to adjust the economic, commercial or financial aspects of the project affecting the cost and cash inflows, the profitability and liquidity of the project.

PROJECT APPRAISAL BY FINANCIAL INSTITUTIONS

Project Report submitted by a corporate unit to a financial institution for grant of financial facilities is properly appraised by a team of experts drawn from different disciplines.

The project appraisal is done as a “business risk” and, therefore, efforts are made to corroborate the data submitted by a company with authentic sources. Each project is appraised on its own merits and flexibility is observed while applying the norms of ratio analysis, funds flow analysis, financial indicators, technical norms etc. The basic objective during appraisal remains the project and its future in the form of successful implementation and efficient operation so as to contribute to national economy. If a project remains successful, the money lend by financial institutions is returned safely. The growth of the project is the best security for the financial institutions than the physical and legal security. No doubt this security form an important part in the entire transaction for lending and borrowing for the project.

Viewing from the above angle, project appraisal, in general, by the financial institutions seek to consider *inter alia* the following aspects:

- (1) The project profile, its reliable and formulation and project report;
- (2) The promoter’s capacity and competence;
- (3) Viability Tests:
 - (A) Technical Aspects
 - (B) Financial Aspects
 - (C) Economic Aspects
 - (D) Societal/Distributive Aspects
 - (E) Environment, Energy Management and Economical Aspects
 - (F) Organisation and Management Aspects
 - (G) Commercial including Marketing Aspects

Now, we would be analyzing each aspect in detail

1. The Project

The first and foremost consideration for appraisal of project report by a financial institution is the examination of the project itself. It may be recalled that the term lending financial institutions have been established by the Government with the sole objective to promote development and growth of the industries which are given planned priorities for the economic development of the country. Therefore, the project should be such which meet this standard and falls within the category of approved projects.

Another important consideration in this area is that the project report prepared by the corporate unit should confirm to the prescribed standard of the financial institutions. To be on the safe side, it is desirable if the project report is prepared by the reputed consultants approved by the financial institutions or the Technical Consultancies organisation established in different parts of the country by the financial institution.

There is no standard performa for preparation of project report but to facilitate its easy appraisal it should be self contained study with all necessary feasibility reports, market surveys, projected financial statements, managerial personnel and organisational charts, status of the company in the ownership and title to the property and the legal relationship with the promoters be clearly specified to avoid discrepancies and confusions. In reality, the prescribed

application form for financing by the financial institutions contains clauses to bring out most of the salient features in accepting a project proposal.

2. The Promoters: Capacity and competence

The promoter's capacity and competence should be examined with reference to their management background, traits as entrepreneurs, business or industrial experience, and past performance in other concerns, their integrity and reputation, market standing and legal competence.

Different considerations have got to be applied for the established entrepreneurs, or promoters and the new entrepreneurs. The basic requirement is that their profile should inspire confidence of their abilities and capacities to run the project successfully and continue the interest therein till the repayment of the financial facilities disbursed by the institutions to the unit promoted by them. In the cases of technocrats who are coming up and taking up the industrial project, these aspects are paid more attention than their experience with entrepreneurship ability or skills.

3. Viability Tests

After analyzing the Project and Promoters capacity, a bank/financial institution carries out the different validity tests.

A. Technical Aspects of Project Appraisal

This involves studying the feasibility of selected technical processes and its suitability under Indian conditions, Location of the project, Plant layout, appropriateness of the chosen equipment, machinery and technology, availability of raw material, power and other inputs, appropriateness of technology chosen from social point of view, availability of infrastructure for the project, the techno economic assumptions and parameters used for analyzing costs and benefits and viability provision for treatment of effluents, training of manpower, legal requirement on documentation, license and registration.

The technical feasibility is generally examined by technical specialists in the organizations. In case of highly specialized projects, the banks seek opinions or get the projects appraised through experts like consultants, or organizations like Technical Consultancy Organizations (TCOs).

B. The Financial Aspects of Project Appraisal

Financial Appraisal of a project is most important for a banker. The primary aim of financial analysis is to determine whether the project satisfies the investment criteria of generating acceptable level of profitability. The project should be able to service the debt and ensure expected returns to the investor. The important aspects which are examined while conducting financial appraisal are investment outlay, means of financing, projected financial statements, viability and profitability, break-even point analysis, sensitivity analysis and risk analysis.

Cash flow statement is the basis for financial analysis. In the initial period there is a negative cash flow because of investment in capital assets, but after the project takes off, the cash flow becomes positive due to the increased income.

Investment is generally required in the initial years, which is a cash outflow for the project. In the operational phase, there is inflow from the business, which results in positive cash flow till the project is wound up. In the last year, the inflow is higher due to the residual value adding to the cash inflow.

The period from start of the project till its winding up is known as project life and will vary from project to project. Generally, projects with more than 20 years life are analyzed for financial cost and benefits for 20 years only, as the benefits accruing after that have a negligible present value.

(a) Measures of Financial Viability – NPV, BCR and IRR

Financial viability is measured by net present value, benefit cost ratio, internal rate of return and debt service coverage ratios.

Net Present Value (NPV) representing wealth creation by the Project, is calculated by taking the discounted sum of the stream of cash flows during the project life. In symbolic terms, we can express NPV of a project as under:

$$\text{NPV} = \frac{C_1}{(1+r)} + \frac{C_2}{(1+r)^2} + \dots + \frac{C_n}{(1+r)^n} - \text{Investment}$$

Where C = Cash Flows for different periods, r = Discount Rate and Invest. = Initial Investment

In other words, NPV represents the difference between the present value of the cost and benefit streams.

A project is considered viable if the NPV is positive at a given discount rate and vice-versa. When two or more mutually exclusive projects are being appraised, the project with the highest NPV should be selected. Among the discounted techniques, NPV is considered the most important parameter for assessing viability.

- (i) **Benefit Cost Ratio (BCR):** BCR is the ratio of discounted value of benefit and discount value of cost. It can be expressed as under:-

$$\text{BCR} = \frac{\text{Summation of discounted value of Benefits}}{\text{Summation of discounted value of Costs}}$$

The project is viable when BCR is one or more than one and is unviable when it is less than one.

- (ii) **Internal Rate of Return (IRR):** IRR represents the returns internally generated by the project. This is also the rate which makes the net present value equal to 0. The calculation of IRR is a process of trial and error. Normally, the process starts with the minimum discount rate and as the discount rate is increased the NPV will come down and becomes 0 or negative. If NPV is positive at one rate and negative at the immediate next rate (for example if NPV is positive at 20% discount rate and is negative at 25%), 'Interpolation Method' could be used for finding out the exact IRR by the following formula.

$$\text{Exact IRR by interpolation method} = \frac{L + (H - L) \times (\text{NPV at L})}{\{(\text{NPV at L}) - (\text{NPV at H})\}}$$

Where, IRR = Internal Rate of Return; L = Lower discount rate where NPV was positive; H = Higher discount rate at which NPV was negative.

The project is considered viable if the IRR is more than the acceptable rate for the entrepreneur which could be the opportunity cost for his funds. In case of agricultural and rural development projects generally the prescribed IRR for viability is 15% in India and other developing countries.

(b) Sensitivity Analysis

Projects are sensitive to fluctuation in values of critical variables like costs of inputs and prices of outputs. It is important to examine how sensitive is the project to fluctuations in the values of these variables because the basic assumptions taken for projections of balance sheet, cash flow statements for future years have an element of uncertainty. Different projects may, however, get affected differently from changes in the assumption of cost and return items. Sensitivity analysis helps us in finding out that how sensitive is the project to these fluctuations. Sensitivity analysis involves identification of crucial variable relating to costs and returns, specification of alternative values of the crucial variables and re-computation of the NPV and IRR by using the alternative values. A project, which is highly sensitive to even small fluctuations in cost and price, is a risky project for financing.

(c) Scenario Analysis

Sensitivity analysis takes care of only one or two variable which is at times inadequate. This limitation is partially overcome by what is known as scenario analysis, where scenario of certain prices, cost and other variables are created and the financial parameters are computed.

(d) Risk Analysis

Even though through sensitivity analysis and scenario analysis techniques, some of the uncertainties in the project are taken care, both these types of analysis have limitation that they have deterministic values for the variables. In a significant improvement over these methods, under risk analysis, probabilistic analysis is done by identification of key risk variables, finding out values of each risk variable, assigning probabilities for each value to each of the risk variables, using these values for risk analysis and finding out the probability of negative outcome of the project, i.e. what is the probability that the NPV of the project will be negative.

The risk analysis adds valuable information to the project analysis and it is an important tool in this respect but to take up investment or not depends on the risk taking capacity of the entrepreneur which will vary from person to person. Therefore, it is judgmental in nature.

C. Economic Appraisal

The objective of economic appraisal is to examine the project from the entire economy's point of view to determine whether the project will improve the economic welfare of the country. Economic appraisal is traditionally not conducted in banks or financial institutions. It is generally conducted by agencies like the World Bank and the development agencies of the Government for the projects having huge investment and profound implication for the economy. Examples of the projects where economic analysis is conducted are big dams, forestry projects and big industrial projects.

D. Social/distributive Appraisal

For an analysis of a project to be complete, it should include not only the financial and economic but also social appraisal. The social analysis consists of two parts: measurement of the distribution of the income due to the project and identification of the impact on the basic needs objectives of the society.

The steps involved in social appraisal are: conducting financial analysis, economic analysis and appraisal of distributional effect of the net benefits (externalities) of the project. Here, the affected parties like farmers, dealers of the goods, existing operators and Government are to be identified. One party (like farmers whose lands will be irrigated in the case of a dam) is a gainer but the other (like those who are displaced due to the dam) is a loser.

After social and distributive analysis it may emerge that a project is financially unviable but socially and economically is viable. In such situations the decisions to undertake the project would depend upon the goals of the Government. If the Government believes that the positive externalities are worth the negative financial cash flow, it may decide to implement the project.

E. Environmental Aspects

Developing countries including India are now becoming increasingly aware of the urgency to integrate environmental concerns into their project formulations and appraisal. This has led to the increased importance being attached to the environmental aspects in the projects and now most of the banks and financial institutions insist on what is known as Environmental Impact Assessment (EIA). The essence of EIA is a prediction of the consequences to the natural environment from development projects.

The emphasis in EIA is on those consequences of the projects which are relatively well known and whose magnitudes can be easily estimated. Conditional, uncertain or probabilistic aspects of the impacts are not considered. Another elaborate analysis called Environmental risk Assessment (ERA) is used to differentiate a new and additional analysis in which the probabilistic element is explicitly addressed.

In India, the consciousness has already come at the policy level. A separate ministry has been formed and Environment (Protection) Act, 1986 was passed by the Government of India. Further, Central Pollution Control Board (CPCB) has been formed for ensuring proper implementation of the provisions of the Act. Most of the

industries are covered by the Act and therefore such industries have to seek clearance not only before setting up of industries but also on a regular basis from the state level PCBs. State level PCBs implement the standards set by CPCB. Reserve Bank of India has also directed the banks not to extend certain credit facilities to industries which have deleterious effects on the environment. Thus, environmental aspects of the projects are becoming very important in project appraisal.

F. Organizational and Managerial Aspects

The organizational and managerial aspects evaluate the managerial capacity of the organization or the entrepreneur, responsible for implementing the project. Even if very good technology is chosen for the project, it may fail due to lack of or inadequate managerial capability. In small agricultural and other projects the entrepreneur is responsible for taking care of all these aspects. It is important for the banker to judge the borrower's managerial capability and also his financial capability (worth). In case of cost escalation he should be in a position to meet the additional financial requirement for the project.

G. Commercial Aspects Including Marketing

Commercial aspects of a project include arrangement for supply of inputs for the initiation and operation of the project and marketing of outputs. Some experts prefer to have a separate marketing module and would treat it as the most important aspect of appraisal.

LENDING POLICIES AND APPRAISAL NORMS BY FINANCIAL INSTITUTIONS AND BANKS

Lending policy and appraisal norms by banks are decided by the Reserve Bank of India. Banks determine their lending policies on the basis of RBI circulars/instructions and government policies.

To lend, banks depend largely on deposits from the public. Banks act as custodian of public deposits. Since the depositors require safety and security of their deposits, want to withdraw deposits whenever they need and also adequate return, bank lending must necessarily be based on principles that reflect these concerns of the depositors.

These principles include: safety, liquidity, profitability, and risk diversion.

(1) Safety

Banks need to ensure that advances are safe and money lent out by them will come back. Since the repayment of loans depends on the borrowers' capacity to pay, the banker must be satisfied before lending that the business for which money is sought is a sound one. In addition, bankers many times insist on security against the loan, which they fall back on if things go wrong for the business. The security must be adequate, readily marketable and free of encumbrances.

(2) Liquidity

To maintain liquidity, banks have to ensure that money lent out by them is not locked up for long time by designing the loan maturity period appropriately. Further, money must come back as per the repayment schedule. If loans become excessively illiquid, it may not be possible for bankers to meet their obligations vis-à-vis depositors.

(3) Profitability

To remain viable, a bank must earn adequate profit on its investment. This calls for adequate margin between deposit rates and lending rates. In this respect, appropriate fixing of interest rates on both advances and deposits is critical. Unless interest rates are competitively fixed and margins are adequate, banks may lose customers to their competitors and become unprofitable.

(4) Risk diversification

To mitigate risk, banks should lend to a diversified customer base. Diversification should be in terms of geographic location, nature of business etc. If, for example, all the borrowers of a bank are concentrated in one region and that region gets affected by a natural disaster, the bank's profitability can be seriously affected.

LOAN POLICY

Based on the general principles of lending stated above, the Lending Policy Committee (LPC) of individual banks prepares the basic Lending policy of the Bank, which has to be approved by the Bank's Board of Directors. The loan policy outlines lending guidelines and establishes operating procedures in all aspects of Lending management including standards for presentation of Lending proposals, financial covenants, rating standards and benchmarks, delegation of Lending approving powers, prudential limits on large Lending exposures, asset concentrations, portfolio management, loan review mechanism, risk monitoring and evaluation, pricing of loans, provisioning for bad debts, regulatory/ legal compliance etc. The lending guidelines reflect the specific bank's lending strategy (both at the macro level and individual borrower level) and have to be in conformity with RBI guidelines. The loan policy typically lays down lending guidelines in the following areas:

- Level of Lending-deposit ratio
- Targeted portfolio mix
- Hurdle ratings
- Loan pricing
- Collateral security

LOAN DOCUMENTATION

Term lending by the Financial Institutions is a high risk business and is therefore important for them to satisfy themselves that no legal lacuna or formality is omitted as might expose the Financial Institutions to the danger of losing the money lent. The relationship between the Lender and the Borrower is a legal relationship which results in mutual rights, duties and liabilities and commercial prudence demands that these should be well expressed and be fool proof as far as possible. Loan documentation is one of the most important aspects of banking and banks are very cautious in documentation for a project financing

Procedure for execution of documents has been standardized in most of the cases. Sometimes delay takes place in providing certain documents required in connection with the execution of the loan documents. The Company Secretary of the Borrower should therefore in consultation with Legal Department of the financial institution and the Company's advocate arrange to have:

- (a) Inspection and investigation of the Title Deeds of the Borrower in respect of its properties by the Lenders and/or by the advocates chosen by the Borrower from the panel maintained by the Lenders to establish a clear and marketable title in favour of the Borrower to its properties.
- (b) Approval of the shareholders of the company for mortgaging/charging company's properties in favour of the Financial Institutions as required under Section 180(1)(a) of the Companies Act, 2013;
- (c) Shareholders' Authority to the Board of directors of the company to borrow in excess of the limits of its paid-up capital and free reserves as required under Section 180(1)(a) of Companies Act, 2013;
- (d) Resolution of the Board of directors of the Company accepting the terms and conditions of the Sanction Letter or Letter of Intent issued by the Financial institution sanctioning the term loan and execution of Loan Agreement and Deed of Hypothecation.
- (e) Normally the Lending Institution obtains several undertakings from the borrower on stamp papers. These are:

- (i) Undertakings from the Promoters Group regarding non-disposal of their shares in the Company without prior approval of the Lender;
- (ii) Undertaking by the Promoters to meet the over-run in the cost of the project without having recourse to the Institutions and agreeing not to withdraw the unsecured loans and deposits brought in by the Promoters/their Group for financing the project;
- (iii) Undertaking to complete the pending formalities given in the Sanction Letter within a stipulated period and also to create the Mortgage (if not completed) within a stipulated period.
- (f) The Institution in the case of bridge loan gets a Demand Promissory Note signed by the authorized Director, along with Board's resolution for authorizing the director.
- (g) The Institution also obtains a 'No-lien' letter from the Company's Bank to which the sanctioned loan amount is to be credited. Format of this 'No-lien' letter is provided by the Lending institution.
- (h) Permission of the Income-tax authorities under Section 281 of Income Tax Act.
- (i) Letter of Confirmation under Section 9A of IDBI Act that none of its Directors are interested in the project being financed.
- (j) Permission/exemption under Urban Land Ceiling Act, wherever required.

As such before signing the Loan Documents with the Financial Institutions, the Company secretary should, besides keeping the aforementioned documents/paper, constantly liaise with the lenders to ascertain if any further compliance is required to enable disbursement of the loan amount as soon as the documentation gets completed.

The importance of the Loan Agreement and its main terms and conditions are discussed hereunder.

Loan Agreement of Financial Institutions

The Loan agreement is an agreement expressed in writing and entered into between the borrower and the lender bank, institution or other creditors. It envisages a relationship taking into account the commitment made at that time and the conduct of the parties carrying legal sanctions.

A company, as a borrower, delivers power to borrow under the Memorandum of Association and Articles of Association read with the provision of the Companies Act. The agreement as such is required to be on behalf of the company under its express or implied authority and may in the same manner be varied or discharged.

Loan agreement for borrowing money from financial institutions can be executed under the authority of the Board authorization and authorizing affixation of the common seal of the company on the documents at the time of its execution. An agreement, thus executed, binds the company and is valid in the eyes of law.

Usual conditions in Loan Agreement

(1) Loan Agreement Terms

The loan agreement begins with the 'date of execution and 'description of the parties to the agreement'. The main terms used in the loan agreement are defined and a 'brief description of project and financing plan' is given.

The Terms of Loan

- (a) Under the terms of the loan, the exact amount of the loan the company agreed to borrow is specified.
- (b) After mention of the loan agreement amount, another important clause in the loan agreement is 'interest which contains the exact rate of interest applicable to the loan and mode of its payment which is quarterly instalments falling due on specified dates. In the eventuality of default in payment of instalment of interest, the clause contains provisions of compound interest being reckoned with rests taken or made quarterly. There is provision for interest on defaulted instalments of principal. Again liquidation damages are to be

paid on such defaulted sums at the rate settled by the financial institutions. The clause also describes the mode of computation of interest and other charges.

- (c) Another important clause in the Loan Agreement is the conversion of the option into Equity. In line with the Government's policy, mandatory conversion option has been done away with. Institutions shall, however, have a right to convert loan into equity in the event of default and assistance granted for rehabilitation of the borrower concern or to meet a part of the cost of over-run. In case of conversion of loan into equity is applicable to a particular loan it is so stated under the clause 'conversion right'. The institutions reserve a right to convert at par the entire outstanding amount into equity and in the case of conversion option attached to over-run cost of the project upto 20% of the additional assistance sanctioned by the institutions. The consequence of conversion is that the portion of the loan so converted would cease to carry interest as from the date of conversion and the loan stands correspondingly reduced. Upon partial conversion, the instalment of loan payable after the date of conversion stands reduced proportionately by the amount of the loan so converted into equity shares of the company. On such conversion, the lender becomes the equity holder.
- (d) Disbursement of the loan amount is another important aspect. The loan agreement describes the terms of disbursement. The basic idea is that the loan amount is required to be used by the borrower company as per the schedule of expenditure submitted by it and all expenditure is to be adhered to as per the schedule. The institutions want that the amount so disbursed by them should be used for the purpose of project implementation only. With this end in view, the draw-down schedule of the loan amount is drawn and mode of disbursement for the loan is also specified in the agreement.
- (e) Another important term of the loan agreement is the repayment of loan. The borrower has to repay the principal amount of the loan in quarterly instalments to the lender institution from a particular date depending upon the moratorium allowed as per the information furnished in the application for the financial assistance. The repayment clause contains provisions to exercise right by the lending institution to vary or alter the repayment schedule wherever cash inflow/profitability position so warrants. The company shall not make premature repayment of loan without prior permission of the lenders, and on such request being made by the company, the lenders reserve the right to impose such conditions to accept premature repayment. Generally, lenders stipulate payment of premium with such premature repayments. However, premature repayment of foreign currency loan is not possible and only in very special case the Institutions recommend such premature repayment after obtaining the approval of the Ministry of Finance and of the Reserve Bank of India.

(2) The Security for loan

The security clause is an important clause in the loan agreement. The borrower company has to execute security documents in favour of the lender on the basis of the provisions made in the agreement.

Loan Agreement stipulates security for the loan in the forms of mortgage of immovable properties, hypothecation of movable assets and personal guarantee of the promoters/directors of the borrowing company. The security clause stipulates first mortgage over the borrower's immovable and movable properties including its movable machinery, spares, tools, and accessories, present and future, and also a first charge on all the remaining assets of the borrower, present and future, (save and except book debts in the case of hypothecation), subject to prior charges created and/to be created in favour of the borrowers' bankers on the borrowers' stocks of the raw materials, semi-finished goods and finished goods, consumable stores and book debts and such other movables as may be agreed to by the lenders for securing borrowing for working capital requirements in the ordinary course of the business. Where there are more than one lending institution involved, the mortgage and charge are to be created on *pari-passu* basis in favour of such institutions.

The provision of personal guarantee of Promoter/Directors made in the security clause is discretionary. The institutions in some cases obtain pledge of unencumbered shares held by the promoter as security for the loan. In these

cases, it is to be ensured that the shares are not subject to lock-in-period or the intention to create the pledge is discussed in the prospectus.

(3) Borrowers Warranties

Under this clause the borrower ensures the lenders of the accurate description of the project in the Loan Application, on the basis of which the borrower has been granted the loan followed by execution of the agreement. The borrower also undertakes to furnish correct information relating to the project to the lender in future also. Besides, this clause requires the borrower to disclose any material affecting the project in future also. Such changes may cover scope of the projects, the location of its factory, the processes to be used for the manufacture of its products, the line of activity, the specifications of machinery and equipment required for the project, buying and selling arrangements, the management set-up, the arrangements entered into with collaborators, machinery suppliers and technical consultants etc. except as approved by the lenders from time to time.

Warranties clause also cover assurance by the borrower for a good title to its properties. The assurance specifies that there has been no changes or encumbrances on the property or the assets of the borrower; that the properties are not involved in any litigation of title or ownership; that there is no defect in the property affecting its title, of ownership; that there is no infringement of public law, or no default in payment of demands of Municipalities or other statutory authorities etc. Further, warranty also covers that the properties are not affected by any public schemes like widening of public roads etc.

In addition to the above, the warranties clause covers briefly about the selling and purchasing arrangements; management agreements; financial position; auditors certificates, permissions under FEMA; various consents/licence from Government of India or State Agencies; Agreement with technical consultants/collaborators; agreements with machinery suppliers; construction schedules; cash budgets; supply of power, water, raw material, arrangements for working capital and arrangements for meeting short fall in the resources for completion of the project. Compliance of provisions of the Companies Act, 2013 in relation to borrowing like passing of requisite resolutions under Sections 180(1)(a) and 180(1)(c); adequacy of technical, financial and executive staff; resolving conflict in Memorandum of Association and Articles of Association exist in loan agreement. This list of warranties is not complete or exhaustive but only illustrative. Additional conditions befitting the circumstances are appended whenever the Institution deems them fit.

(4) Condition Precedent to Disbursement of the Loan

To safeguard the interest of the financial institutions, the borrower is required to comply with the following matters incorporated under this clause in the Loan Agreement:

- (a) The borrower shall have share capital paid-up to the required extent as stipulated in the loan agreement;
- (b) The borrowers shall have created security in favour of lenders having proved to the satisfaction of the lenders about the borrowers clear and marketable title over its properties;
- (c) The borrower shall have complied with the provisions of the Companies Act, 2013, viz. under Section 180(1)(a) as applicable;
- (d) The borrower shall have entered into arrangements with other financial institutions and banks where so required for the balance portion of the funds required for completion of the project;
- (e) The borrower has furnished tax clearance certificate under Section 230A of the Income-tax Act, 1961; (whenever applicable)
- (f) That there are no legal proceedings pending against the borrower company involving any claim on its properties;
- (g) There has been no default discharge of its obligations to the financial institutions;
- (h) The borrower shall satisfy the lender of the utilisation of earlier disbursed amount of the loan.

Here, also additional conditions precedent to disbursement could be added depending upon the circumstances of each case as the Institution may deem fit. Similarly, some of the above conditions could even be deleted where the circumstances so warrant when compliance of such conditions in a particular case is not required.

(5) Concurrent Covenants

The affirmative covenants and terms as given in the Loan Agreement which apply during the currency of the Loan Agreement cover the following subject matter:

- (a) Project implementation;
- (b) Utilisation of loan;
- (c) Adequate loan amount to be kept in separate Bank Account i.e. Escrow account in case of project finance;
- (d) Adequate Insurance of the mortgaged assets and insurance policies to be furnished to the lenders endorsing the Lenders as Mortgages;
- (e) To report to the lender any changes in project;
- (f) To report to the lender any adverse changes in the production and profitability projections;
- (g) To report to the lender the changes in different contractors/agreements as covered in the loan agreement specially those made with machinery suppliers/collaborators/technicians or technical consultants and suppliers of raw materials;
- (h) Borrower to ensure proper maintenance of the property;
- (i) Borrower to inform the lender of the notices received by it about the winding up proceedings and other legal process instituted against the company;
- (j) Borrower to inform the lenders of the causes of delay in completion of the project;
- (k) Borrower to inform any loss-damages the borrower suffers due to any unforeseen circumstances;
- (l) On happening of certain events proportionate repayment of the loan is required to be made by the borrower. These, events may include payment being made to other lenders covered under the loan syndication arrangements without making proportionate payments to all i.e. preference being made in payment of dues by paying one over the other;
- (m) The borrower to reimburse and pay costs/charges and expenses to lenders e.g. travelling expenses of lender's inspection team etc.
- (n) Furnish to lenders the documents executed in favour of banks and other institutions;
- (o) Make alterations in memorandum of association and articles of association as desired by the lenders;
- (p) Pass necessary resolutions to entitle lenders to rights shares/bonus shares where a right of conversion of loan into equity has been exercised by the lenders;
- (q) Furnish details of additional property, movable or immovable acquired by the company subsequent to the creation of mortgage;
- (r) Borrower shall facilitate the appointment of the lender's nominee directors;
- (s) Borrower to agree to the lenders' right to depute observers at meetings of the Board of directors or General Meeting of the Borrower Company.
- (t) Borrower to place before its Board of Directors for consideration of all important matters and also those matters which the lenders may desire;

- (u) Borrower to uphold lenders' rights to appoint Technical/Management consultants and chartered accountants as and when the lender may so decide.

Negative Covenants

In addition to the above positive covenants, there are certain 'negative covenants in the agreement which is required to be performed by the borrower. These negative covenants restrict the company (1) to pay commission to promoters, directors, managers or other persons for furnishing guarantee or indemnity or for undertaking any other liability in connection with any financial assistance obtained and/or to be obtained by the borrower for the purpose of the project; (2) to pay dividend to the equity share holders if default has been committed in payment of interest or repayment of instalments of principal to the lenders; (3) to create charge or lien on its assets; (4) to enter into any partnership, profit-sharing or royalty agreements or enter into any similar arrangements whereby the business or operations of the company are affected; (5) to create any subsidiary or become subsidiary to any other existing concern; (6) to recognize or register any transfer of shares in the borrowers' share capital by the promoter directors, their relatives and associates who are required to furnish "Undertaking for non-disposal of shares" to the Financial Institutions; (7) to permit withdrawal of unsecured loans and deposits brought in or to be brought in by the Promoter Directors Group or Associates to finance capital cost of the project and to meet the working capital needs unless such withdrawal or payment of interest on such unsecured loan and deposit is permitted by the lenders.

The various other aspects covered under the 'negative covenants include not to carry out (1) the amendment of the memorandum of association and articles of association or alteration in the capital structure of the Company i.e. borrower (2) transfer of undertaking, trading activity other than the activities permitted by the Lenders (3) payment of directors remuneration, in addition to what has been approved by the Central Government and the Institution. Negative covenants also relate to (1) Mergers/consolidation etc. utilisation of funds, donations, new project, change of registered office and location of factory, not to raise loans or debentures or invest funds in other concerns etc. without the prior approval of the Lenders.

(6) Reporting System and Inspections

The borrower company is required to submit to the lender the quarterly/half-yearly progress reports during the period when project implementation is in progress. Once the project is completed and production is commenced the borrower company is required to submit quarterly progress reports of production, sales, gross profits and other important details having a bearing on the operational performance of the company. Besides, the audited annual accounts of the company are also required to be submitted by the company to the lenders.

In addition to above and obtaining the information through periodical reports, the loan agreement contains provision for having the inspection of the borrower concern carried out periodically by the lenders to verify project expenditure, Books of Accounts and records; technical-cum-financial-cum-legal inspections through the Institutional Inspection team of experts in different areas. This practice continues till the entire amount of the loan is repaid. The cost of such inspection is borne and paid by the company on demand and until payment; the same shall carry interest at the same rate as on defaulted sums under the loan agreement.

(7) Remedies for the Breach

The main remedy of the lender against the borrower is to call back the loan amount with interest and other dues. The clause for remedies specifies those circumstances in which the lender can take recourse to such remedies. These circumstances, *inter alia*, are default in payment of principal sum of the loan; interest and arrears of interest, non-performance of covenants and conditions; supply of misleading information to the tenders relating to the projects, its promoters or relating to its operations; refusal to disburse loan by other Financial Institutions; sales, disposal or removal of Assets of the Company without lenders approval etc. etc.

(8) Cancellation, Suspension and Termination of Loan

The lender may cancel any part of the loan by giving notice to the borrower if such loan amount remains unavailed of by the borrower company. Any portion of the loan may be suspended or terminated for non-compliance of the terms and conditions of the loan agreement by the borrower or on emergence of any extraordinary situation. Such suspension shall continue till the default is remedied.

PROJECT REVIEW AND CONTROL

Project review is a very important aspect of entire project life.

Even projects that are well designed, comprehensively planned, fully resourced and meticulously executed will face challenges. These challenges can take place at any point in the life of the project and the project team must work to continually revisit the design, planning and implementation of the project to confirm they are valid and to determine whether corrective actions need to be taken when the project's performance deviates significantly from its design and its plan. This is the purpose of the Project Monitoring, Evaluation and Control Phase.

Not surprisingly, the three principle categories of activities taking place during the Monitoring, Evaluation and Control Phase are:

- Project Monitoring
- Project Evaluation
- Project Control

These activities are intended to occur continuously and continually, taking place through the entire life of the project. For example, the earliest iterations of the project indicators are already being developed during the Project Identification and Design Phase; the Monitoring Plan is developed during the Planning Phase; monitoring visits are conducted during the implementation phase, and many evaluation activities are undertaken during the End of Project Transition Phase.

Differentiating Monitoring, Evaluation and Control

Before examining each of the three categories of activities in the Project Monitoring, Evaluation and Control Phase in detail, it is first important to differentiate between them.

Progress Monitoring tracks the operational work of the project. It answers questions like “Have activities been completed as planned?” “Have outputs been produced as anticipated?” “Is the work of the project progressing as projected?” At a fundamental level it is a **passive process**, it changes nothing. Instead, it tells the project manager where the project performance is in terms of money, time, risk, quality, and other areas of project progress. At its core, the goal objectives, timing and activities of project progress monitoring are perhaps best identified via the following table:

The What, Why, When and How of Monitoring

What	A continuous review of project progress at the activity and outputs levels Identify necessary corrective action
Why	Analyze current situation, identify issues and find solutions, discover trends and patterns, keep project activities on schedule, measure progress against outputs, make decisions about human, financial and material resources
When	Continuous
How	Field Visits Records Reports

Examples of Monitoring Indicators

	Agriculture Example	Microfinance Example	Water Example
Outputs – ‘The tangible products or services’	Number of farmer groups created - competence of trainees	Number of clients receiving and correctly using credit Number of clients participating in savings programs	Number of new water systems installed and functioning properly
Activities – ‘Tasks or actions taken to implement project interventions’	Number of staff visits to farming communities Number of training sessions organized	Number of staff visits to villages Number of bank training sessions - competence of trainees	Number of communities organized for water system installation

Project Evaluation tends to focus on tracking progress at the higher levels of the logical framework – i.e. project outcomes. Evaluations tend to explore questions like, “Is the project successful at achieving its outcomes?” “Is the project contributing to its ultimate goal?” Evaluation data is collected and analyzed less frequently and often requires a more formal intervention (often by technical advisors or external evaluators) to show project results.

Examples of Evaluation Indicators

	Agriculture Example	Microfinance Example	Water Example
Goals – ‘Are the project outcomes contributing to a larger impact within the target communities?’	% of families who produce enough food to cover lean periods Decreased % of malnourished children	Increase in net household income Positive change in household consumption patterns	Reduced morbidity and mortality from water related diseases
Outcomes – ‘Are the project outputs resulting in the desired project outcomes?’	% of families adopting improved techniques % of hectares covered with improved techniques	% of households with increased working capital	% of households using safe water supply increase in per capita consumption of water

**Note – While projects are expected to contribute to the achievement of the goal level indicators, it is NOT the responsibility of the project to achieve (or to monitor) the goals.*

Project Control involves establishing the systems and decision-making process to manage variances between the project plans (in terms of scope, cost, schedule, etc.) and the realities of project implementation. It also involves establishing how project variances and changes are managed, documented and communicated with stakeholders.

The Project Monitoring and Evaluation Plan

Connecting the Logical Framework and the Monitoring and Evaluation Plan	
Project Management is Iterative!	As discussed, the Monitoring, Evaluation and Control Phase extends through the entire life of the project. The project logical framework is the first step in developing the full monitoring and evaluation plan for the project. The indicators and means of verification that are included for the logical framework will ultimately become the building blocks for the full monitoring and evaluation plan of the project.

A crucial element of a comprehensive implementation plan is a monitoring and evaluation plan which identifies the system for tracking and measuring project progress, performance and impact. The appropriate time to develop the formal Monitoring and Evaluation plan is after the project is approved for funding but before the start-up of project activities. However, the preparatory work that contributes to that plan will start long before this point.

Strong project design makes it easier to create and align comprehensive monitoring and evaluation systems. The Monitoring and Evaluation Plan expands on the initial progress indicators provided in the logical framework and the project proposal; and provides additional details for each of the levels of the project logical framework. While the format of project monitoring and evaluation plans varies, the plan usually includes the following information:

- What indicators are being monitored and evaluated?
- What information is needed to track the indicator?
- What are the sources of the information?
- What data collection methods are appropriate?
- Who will collect the information?
- How often will it be collected?
- Who will receive and use the results?

While there are many considerations (budget, resources, donor requirements, etc.) to keep in mind when identifying what data to collect in the Project Monitoring and Evaluation Plan, the most important consideration should be the usefulness of the data. When identifying indicators, the project team should always ask “What will this information tell us?” and “What are the expected improvements in decision-making resulting from this data?”

Monitoring Project Progress and Project Risk	
Project Management is Comprehensive!	While the attention of the monitoring and evaluation plan is focused on tracking the project’s progress against the indicators at each of the levels of the project log frame, the project team must also track the project risk throughout the life of the project. Risk monitoring, in comparison to progress monitoring, involves continuously surveying the project horizon and anticipating the possibility that something may go wrong, or not turn out as planned. The project manager needs to continually and comprehensively survey the risks which have the potential to threaten project success and actively manage these threats throughout the life of the project.

SOCIAL COST AND BENEFIT ANALYSIS (SCBA) OF PROJECT

Social cost-benefit analysis is a systematic and cohesive method to survey all the impacts caused by a project. It comprises not just the financial effects (investment costs, direct benefits like tax and fees, etc), but all the social effects, like: pollution, safety, indirect (labour) market, legal aspects, etc. The main aim of a social cost-benefit analysis is to attach a price to as many effects as possible in order to uniformly weigh the above-mentioned heterogeneous effects. As a result, these prices reflect the value a society attaches to the caused effects, enabling the decision maker to form a statement about the net social welfare effects of a project.

Major advantages of a social cost-benefit analysis are that it enables investors to systematically and cohesively compare different project alternatives. Hence, these alternatives will not just be compared intrinsically, but will also be set against the “null alternative hypothesis”. This hypothesis describes “the most likely” scenario development in case a project will not be executed. Put differently, investments on a smaller scale will be included in the null alternative hypothesis in order to make a realistic comparison in a situation without “huge” investments.

The social cost-benefit analysis calculates the direct (primary), indirect (secondary) and external effects:

- (a) Direct effects are the costs and benefits that can be directly linked to the owners/users of the project properties (e.g., the users and the owner of a building or highway).
- (b) Indirect effects are the costs and benefits that are passed on to the producers and consumers outside the market with which the project is involved (e.g., the owner of a bakery nearby the new building, or a business company located near the newly planned highway).
- (c) External effects are the costs and benefits that cannot be passed on to any existing markets because they relate to issues like the environment (noise, emission of CO₂, etc.), safety (traffic, external security) and nature (biodiversity, dehydration, etc.).

The results of a social cost-benefit analysis are:

1. **An integrated way of comparing the different effects:** All relevant costs and benefits of the different project implementations (alternatives) are identified and monetized as far as possible. Effects that cannot be monetized are described and quantified as much as possible.
2. **Attention for the distribution of costs and benefits:** The benefits of a project do not always get to the groups bearing the costs. A social cost-benefit analysis gives insight in who bears the costs and who derives the benefits.
3. **Comparison of the project alternatives:** A social cost-benefit analysis is a good method to show the differences between project alternatives and provides information to make a well informed decision.
4. **Presentation of the uncertainties and risks:** A social cost-benefit analysis has several methods to take economic risks and uncertainties into account. The policy decision should be based on calculated risk.

DIFFERENT SOURCES OF FINANCE

Term Loans from Financial Institutions and Banks

Term loan is a long term secured debt extended by banks or financial institutions to the corporate sector for carrying out their long term projects maturing between 5 to 10 Years which is normally repaid in monthly or quarterly equal instalment. They are external source of finance paid in instalments governed by loan agreement and covenants.

All the capital requirements cannot be fulfilled by the promoters or equity share issues and that is where the term loans come into picture. Term loan or project finance is a long term source of finance for a company normally extended by financial institutions or banks for a period of more than 5 years to a maximum of around 10 years. One

common feature which helps management in relatively substituting equity by term loans is the longer term of the loan.

Term loan is a type of funding which is most suitable for projects involving very heavy investment which is not possible by an individual or promoters. Big projects cannot be concluded in a year or two. To yield return from them, long term perspective is required. Such big ventures are normally financed by big banks and financial institutions. If the investment is too large, several banks come together and finance it. Such type of term loan funding is also called as consortium loan

Term loan is acquired for new projects, diversification of business, expansion projects, or for modernization or technology upgradation. Here also, the underlying fact is that the investment in these projects is normally very huge. Lack of option of funding from other sources such as equity etc for any reason also directs a company to go for term loan.

Financial Leverage and Term Loan

At times, important reason for selecting term loan is financial leverage. By opting for debt finance like term loan, a company tries to magnify the returns to their equity shareholders. This help management of a company achieve the core objective of wealth maximization for its shareholders and also preserve the control and share of existing shareholders.

Features of a Term Loan:

1. Loan in any Currency: These loans are provided both in home or foreign currency. Home currency loans are offered normally for purchase of fixed assets such as land, building, plant and machineries, preliminary and preoperative expenses, technical know-how, working capital etc. On the other hand, foreign currency loans are offered for import of certain plant or machinery, payment of foreign consulting fee etc.

2. Secured Loan: Term loans come under secured category of loans. Two kinds of securities are there – primary and collateral. Primary security is the asset which is purchased using the loan amount and collateral security is the charge on other assets of the borrower.

3. Loan Instalments: Repayment of loan is done in instalments. These instalments cover both principal and interest. Normally, loan instalments are decided by banks based the borrower's cash flow capacity. There may be instalments paid monthly, quarterly, biannually, or even annually. Instalments are normally equal but they may be structured based on the borrower's business. Moratorium or grace period is also given by banks in which no instalment or very low instalment is asked from the borrower. Sometimes, small instalments are kept in the initial year or two and then the remaining loan is split into the remaining maturity period making the later instalments higher than the initial ones.

4. Maturity: Normally a term loan is ranging between 5 to 10 years. Forecasting for more than 10 years in the current changing business environment is very difficult.

5. Loan Agreement: An agreement is drafted between the borrower and the bank regarding the terms and conditions of the loans which is signed by the borrower and is preserved with bank.

6. Loan Covenant: Covenants are a part of loan agreement. They are certain statements in the agreement which states certain do's and don't's for the company. They are normally related to use of assets, creation of liabilities, cash flow, and control of the management. They are positive / affirmative or negative in nature.

Leasing and hire purchase are currently a supplementary form of debt finance.

LEASE FINANCE

A lease represents a contractual arrangement whereby the lessor grants the lessee the right to use an asset in return for periodic lease rental payments. While leasing of land, buildings, and animals has been known from times immemorial, the leasing of industrial equipments is a relatively recent phenomenon, particularly on the Indian scene.

There are two broad types of lease: finance lease and operating lease.

Finance Lease

A finance lease or capital lease is essentially a form of borrowing. Its salient features are:

1. It is an intermediate term to a long-term non-cancellable arrangement. During the initial lease period, referred to as the 'primary lease period'. Which is usually three years or five years or eight years, the lease cannot be cancelled.
2. The lease is more or less fully amortised during the primary lease period. This means that during this period, the lessor recovers, through the lease rentals, his investment in the equipment along with an acceptable rate of return. Thus, a finance lease transfers substantially all the risks and rewards incident to ownership to the lessee.
3. The lessee is responsible for maintenance, insurance, and taxes.
4. The lessee usually enjoys the option for renewing the lease for further periods at substantially reduced lease rentals.

Operating Lease

An operating lease can be defined as any lease other than a finance lease. The salient features of an operating lease are:

1. The lease term is significantly less than the economic life of the equipment.
2. The lessee enjoys the right to terminate the lease at a short notice without any significant penalty.
3. The lessor usually provides the operating know-how and the related services and undertakes the responsibility of insuring and maintaining the equipment. Such an operating lease is called a 'wet lease'. An operating lease where the lessee bears the costs of insuring and maintaining the leased equipment is called a 'dry lease'.

From the above features of an operating lease it is evident that this form of a lease does not result in a substantial transfer of the risks and rewards of ownership from the lessor to the lessee. The lessor structuring an operating lease transaction has to depend upon multiple leases or on the realisation of a substantial resale value (on expiry of the first lease) to recover the investment cost plus a reasonable rate of return thereon. Therefore, specialising in operating lease calls for an in-depth knowledge of the equipments and the secondary (resale) market for such equipments. Of course, the prerequisite is the existence of a resale market. Given the fact that the resale market for most of the used capital equipments in our country lacks breadth, operating leases are not in popular use. In recent years there have been attempts to structure car lease and computer lease transactions in the operating lease format.

The key features of lease finance in India:

- Most leases in India are finance leases not operating leases

- Lease finance is available for identifiable performing assets
- Lease finance is available in small volume
- There is a great deal of flexibility in structuring lease finance
- Lease of immovable assets is not possible by banks
- Lease tenors up to eight years is available

HIRE-PURCHASE

Hire Purchase is a loan or contract that involves an initial deposit, linked to a specific purchase, which is a way of obtaining the use of an asset before payment is completed. The payments of the HP are in monthly instalments, plus interest within which at the end of the agreement. Finance companies usually offer the facility of leasing as well as hire-purchase to its clients.

The main features of a hire-purchase arrangement are as follows:

- The hiree (the counterpart of lessor) purchases the asset and gives it on hire to the hirer (the counterpart of lessee).
- The hirer pays regular hire-purchase instalments over a specified period of time. These instalments cover interest as well as principal repayment. When the hirer pays the last instalment, the title of the asset is transferred from the hiree to the hirer.
- The hiree charges interest on a flat basis. This means that a certain rate of interest, usually around 8 percent, is charged on the initial investment (made by the hiree) and not on the diminishing balance.
- The total interest collected by the hiree is allocated over various years. For this purpose, the 'sum of the years digits' method is commonly employed.

The following differences between leasing and hire-purchase, from the point of view of the lessee (hirer), may be noted.

<i>Leasing</i>	<i>Hire-Purchase</i>
<ul style="list-style-type: none"> – The lessee cannot claim depreciation. – The entire lease rental is a tax-deductible expense for the lessee. – The lessee, not being the owner of the asset, does not enjoy the salvage value of the asset. 	<ul style="list-style-type: none"> – The hirer is entitled to claim depreciation. – Only the interest component of the hire-purchase instalment is a tax-deductible expense for the hirer. – The hirer, being the owner of the asset, enjoys the salvage value of the asset.

VENTURE CAPITAL

Venture capital is a source of financing for new businesses. Venture capital funds pool investors' cash and loan it to startup firms and small businesses with perceived, long-term growth potential. This is a very important source of funding startups that do not have access to other capital and it typically entails high risk (and potentially high returns) for the investor.

Venture capital provides long-term, committed share capital, to help unquoted companies grow and succeed. If an entrepreneur is looking to start-up, expand, buy-into a business, buy-out a business in which he works, turnaround

or revitalise a company, venture capital could help do this. Obtaining venture capital is substantially different from raising debt or a loan from a lender. Lenders have a legal right to interest on a loan and repayment of the capital, irrespective of the success or failure of a business. Venture capital is invested in exchange for an equity stake in the business. As a shareholder, the venture capitalists return is dependent on the growth and profitability of the business. This return is generally earned when the venture capitalist “exits” by selling its shareholding when the business is sold to another owner.

Venture capitalist prefers to invest in “entrepreneurial businesses”. This does not necessarily mean small or new businesses. Rather, it is more about the investment’s aspirations and potential for growth, rather than by current size. Such businesses are aiming to grow rapidly to a significant size. As a rule of thumb, unless a business can offer the prospect of significant turnover growth within five years, it is unlikely to be of interest to a venture capital firm. Venture capital investors are only interested in companies with high growth prospects, which are managed by experienced and ambitious teams who are capable of turning their business plan into reality.

Venture capital firms usually look to retain their investment for between three and seven years or more. The term of the investment is often linked to the growth profile of the business. Investments in more mature businesses, where the business performance can be improved quicker and easier, are often sold sooner than investments in early-stage or technology companies where it takes time to develop the business model.

Just as management teams compete for finance, so do venture capital firms. They raise their funds from several sources. To obtain their funds, venture capital firms have to demonstrate a good track record and the prospect of producing returns greater than can be achieved through fixed interest or quoted equity investments. Most UK venture capital firms raise their funds for investment from external sources, mainly institutional investors, such as pension funds and insurance companies.

PRIVATE EQUITY

Private equity is essentially a way to invest in some assets that isn’t publicly traded, or to invest in a publicly traded asset with the intention of taking it private. Unlike stocks, mutual funds, and bonds, private equity funds usually invest in more illiquid assets, i.e. companies. By purchasing companies, the firms gain access to those assets and revenue sources of the company, which can lead to very high returns on investments. Another feature of private equity transactions is their extensive use of debt in the form of high-yield bonds. By using debt to finance acquisitions, private equity firms can substantially increase their financial returns.

Private equity consists of investors and funds that make investments directly into private companies or conduct buyouts of public companies that result in a delisting of public equity. Capital for private equity is raised from retail and institutional investors, and can be used to fund new technologies, expand working capital within an owned company, make acquisitions, or to strengthen a balance sheet. Generally, the private equity fund raise money from investors like Angel investors, Institutions with diversified investment portfolio like –pension funds, insurance companies, banks, funds of funds etc.

Types of Private Equity

Private equity investments can be divided into the following categories:

Leveraged Buyout (LBO): This refers to a strategy of making equity investments as part of a transaction in which a company, business unit or business assets is acquired from the current shareholders typically with the use of financial leverage. The companies involved in these transactions are typically more mature and generate operating cash flows.

Venture Capital: It is a broad sub-category of private equity that refers to equity investments made, typically in less mature companies, for the launch, early development, or expansion of a business.

Growth Capital: This refers to equity investments, most often minority investments, in companies that are looking for capital to expand or restructure operations, enter new markets or finance a major acquisition without a change of control of the business.

Structure of Private Equity

Huss (2005) describes that investing in private equity can be done in two ways: a direct investment or an investment through a fund. A direct investor participates in privately placed offerings and is responsible for the investment process. Such an investment is not only very time consuming and costly, but it requires a certain know-how and experience in the private equity market. When investing through a fund, one can be faced with problems due to asymmetric information between investors and entrepreneurs. These entrepreneurs have a better knowledge about the real conditions of the firm, the market and potential risk factors.

Characteristics of Private Equity

The structure of private equity funds is a fixed limited partnership; therefore early withdrawals are not possible. Moreover, there is often a sales restriction that underlies private equity investments. Private equity investments generally are liquid, because when there is a possibility of a secondary sale of fund shares, investors can expect a substantial discount on the net asset value if selling in the secondary market.

When participating in a limited partnership, the investor needs a minimum amount of capital commitment. This minimum differs from fund to fund, but it is a small fraction of the wealth of an investor. So, the potential for diversification is highly restricted. The private equity market is not transparent. One of the key characteristics in this market is that there is little publicly available information. The lacking of transparency is seen as a necessity for achieving the results, because substantial part of the returns, private equity experiences, is due to the ability to exploit inside information.

Most private equity funds are structured as limited partnerships and are governed by the terms set forth in the limited partnership agreement or LPA. Such funds have a general partner (GP), which raises capital from cash-rich institutional investors, such as pension plans, universities, insurance companies, foundations, endowments, and high-net-worth individuals, which invest as limited partners (LPs) in the fund. Among the terms set forth in the limited partnership agreement are the following:

- **Term of the partnership:** The partnership is usually a fixed-life investment vehicle that is typically 10 years plus some number of extensions.
- **Management Fees:** An annual payment made by the investors in the fund to the fund's manager to pay for the private equity firm's investment operations (typically 1 to 2% of the committed capital of the fund).
- **Distribution Waterfall :** The process by which the returned capital will be distributed to the investor, and allocated between Limited and General Partner. This waterfall includes the preferred return: a minimum rate of return (e.g. 8%) which must be achieved before the General Partner can receive any carried interest, and the carried interest, the share of the profits paid the General Partner above the preferred return (e.g. 20%).
- **Transfer of an interest in the fund:** Private equity funds are not intended to be transferred or traded; however, they can be transferred to another investor. Typically, such a transfer must receive the consent of and is at the discretion of the fund's manager.
- **Restrictions on the General Partner:** The fund's manager has significant discretion to make investments and control the affairs of the fund. However, the LPA does have certain restrictions and controls and is often limited in the type, size, or geographic focus of investments permitted, and how long the manager is permitted to make new investments.

DEFERRED PAYMENT ARRANGEMENTS

A deferred payments arrangement is one of the sources of finance to industry. Machinery suppliers in India or overseas where machinery is proposed to be imported may agree to accept payment in a scheduled manner in instalments in the period ahead of delivery. This is known as deferred payment arrangement with the machinery suppliers. The machinery suppliers in India or abroad may agree to above arrangement on security which is procured in the form of guarantee from financial institutions and banks of repute relied upon by the machinery suppliers.

Guarantee for deferred payments are offered by All India Institution viz, IFCI, IDBI, ICICI to foreign machinery supplier and also to indigenous machinery supplier against the request of the company for financing project cost of the company. The application made by the borrower for facility of guarantee is processed in the same manner as applicable for loan. However, the borrower company to be able to avail the facility should be in possession of requisite import licence where the guarantee is required for import of machinery from abroad or should have tied up the foreign currency loan from the foreign institution with the approval of the Government of India where the guarantee for such loans is required to be given to such foreign lending institution.

INTERNATIONAL FINANCE AND SYNDICATION OF LOANS

International finance plays a very important role in financing the cost of capital of projects of the corporate sector.

In international financial market the borrower from one country may seek lenders in other countries in specific currency which need not be of the participant country. In international financial market, the availability of foreign currency is assured under four main systems:

- (a) Euro currency market; (b) Export credit facilities; (c) Bond issues; and (d) Financial institutions.
 - (a) Euro currency market—Here funds are made available as loans through syndicated Euro credits/instruments known as Floating Rate Notes FRNs. Interest rates vary every 3 to 6 months based on London—Interbank offered—Rate. Syndicated Euro Currency bank loan has developed into one of the most important instruments for international lending. Syndicated Euro credit is available through instruments viz. Term loan and Revolving Line facility.
 - (b) Export Credit Facilities are made available by several countries through an institutional frame work in which EXIM Banks play a prominent role. EXIM Bank of India is playing a significant role in financing exports and other off shore deals.
 - (c) International Bond Market provides facilities to raise long term funds by using different types of instruments. The bond market is generally known as Euro bond market.
 - (d) UN Agency financial institutions viz. IMF of World Bank and its allied agencies, IFC (W), ADB, etc. provide finance in foreign currency.

New International Instruments

Swap is the international finance market instrument for managing funds. The basic concept involved in swaps is matching of difference between spot exchange rate for a currency and the forward rate. The swap rate is the cost of exchanging one currency into another for a specified period of time. The swap will represent an increase in the value of the forward exchange rate (premium of a decrease discount). There are three main types of swaps (a) interest swap; (b) currency swap; (c) combination of both.

Syndicated Euro Currency Loans

The Eurocurrency market refers to the availability of a particular currency in the international financial market outside the 'home country' of that currency. For example, the Eurodollar market refers to the financial market for US dollars in England, France, Germany, Hong Kong and other financial centres outside the US. The Eurodollar borrowing may be evidenced by issue of commercial paper in the form of promissory notes, or by subscription to bond/debentures or it may be syndicated loans type.

Main Objectives of Syndication (Borrowers' point of view)

- (a) Large sums are arranged without delay and at least cost.
- (b) Gets better introduction to enter into international loan market without much difficulty.
- (c) Funds are made available easily for meeting balance of payment deficit and for financing large industrial projects.
- (d) The borrower is allowed to select the length of the roll over period and in choosing different currencies to repay or cancel agreements after a short notice period without penalty.

Lenders' point of view

- (1) It helps the bank to share large credits with other banks, to finance many borrowers.
- (2) Different size banks can participate.
- (3) It provides more profitability to banks as costs are relatively low.
- (4) Syndicated loan is under-written by a small group banks which resell portions of the commitments to other banks.

CORPORATE TAXATION AND THE IMPACT ON CORPORATE FINANCING

Corporate Finance is the field of finance dealing with financial decision that business enterprises make and the tool and analysis used to make the decisions. There are three methods used in corporate financing, these are borrowings, Issue of shares and retained earnings. Corporate taxations play a vital role in taking decision of corporate financing. The provisions of tax laws have wider impact on Capital investment decisions that deal with which project to invest in, whether it is feasible to fund the investment with debt or equity, as well as the time when dividend should be paid to the shareholders.

The deductibility of interest paid on debt reduces the tax liability of the company therefore the companies preferred to fund the new project out of borrowed capital. However, the Companies with low expected marginal tax rates on their interest deductions are less likely to finance new investment with debt. Availability of deductions under the tax laws will reduce the taxable income which will lower the average tax rate and ultimately minimize the tax benefit on interest paid on borrowings. The companies have to pay tax first on the earned profits and secondly when it declares dividend. The companies have to pay Corporate Dividend Tax on the declared dividend.

In tax laws, there are certain types of deductions, tax incentives available to the corporates which need to be considered while taking financial decisions.

While local jurisdictions, such as states, may also provide tax incentives for businesses, country-wide incentives are most widely applicable, and are broadly organized into four categories: location-based, industry-specific, export-linked, and activity-based.

These benefits, subject to specified conditions, include incentives for units situated in special economic zones (SEZs) or less-developed regions; incentives for specific industries, such as power, ports, highways, electronics, and software; newly set-up Indian companies, startups recognized under the National Startup Policy, and establishing a new industrial undertaking.

Incentives are also available to non-resident companies in the form of presumptive taxation in areas such as shipping, oil and gas services, aircraft, and power industries, among others.

Tax incentives for SEZs

Special economic zones have been set up throughout the country in order to promote competitive business environments. Both developers and occupiers of SEZs enjoy substantial long-term tax holidays and concessions that are worth exploring when establishing an operation in India, although these may be phased out under the direct tax code (DTC) for SEZs that are operationalised after March 31, 2020.

Presently, units in SEZs enjoy 100 percent income tax exemptions on export income for the first five years, 50 percent for the next five years thereafter, and 50 percent of the plowed back export profit for another five years.

Other benefits include a refund of integrated goods and services tax (IGST) on goods imported by units and developers of SEZs, easy refund procedure of input GST paid on procurement of goods and services if any, and minimal compliance requirement and return filing procedure.

Units in SEZs also receive additional benefits from respective state governments in the form of stamp duty exemption, VAT exemption or refund, and electricity duty exemption.

Conditions for SEZ developers

- To avail incentives, the firm must be involved in the development, operation, and maintenance of SEZs, including their infrastructure facilities.

Conditions for SEZ unit

- Must be engaged in the export of goods and services from April 1, 2005 onward;
- Must not be formed by splitting up or reconstructing an existing business; and,
- Not to be formed by transferring a previously owned plant and machinery to the SEZ unit.

Tax incentives in Northeast, Himalayan states in India

Businesses setting up, undertaking, or manufacturing units anywhere in the notified regions of the northeast and Himalayan states of India are eligible for special tax benefits. The notified regions include northeastern states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura and Himalayan states of Jammu and Kashmir, Himachal Pradesh, and Uttarakhand.

A deduction of 100 percent of business profits for a period of 10 years is permitted for companies manufacturing, producing goods, providing eligible services, or undergoing substantial expansion between July 1, 2017, and March 31, 2027.

Further, a refund is available on excise duty payable on specified value addition for 10 consecutive years.

A refund is not available with respect to the manufacture or production of tobacco, pan masala (betel leaf), plastic carry bags of less than 20 microns, or goods produced by petroleum and gas refineries.

Service sectors eligible for the benefits include hotels (two stars and above), nursing homes (25 beds or more), old age homes, vocational training institutes for hotel management, catering and food crafts, entrepreneurship development, nursing and paramedical, civil aviation related training, fashion design and industrial training, IT related training centers, IT hardware manufacturing units, and biotechnology.

Tax incentives for startups

To strengthen the startup ecosystem in the country and provide support, the Indian government offers several tax benefits to startups recognized under the National Startup Policy. Benefits include a tax holiday for a period of seven previous years, beginning from the year the startup is incorporated; exemption from tax on long-term capital gains; and approval to set-off carry forward losses and capital gains in case of a change in shareholding pattern.

As a form of further relief, the government also provides an exemption from angel investment tax, introduced in 2012. Under this, funds from angel investors or family and friends – domestic funds that are not registered as venture capital (VC) funds – or funds which are raised from VC firms set up for the very purpose of backing such ventures, will not be taxed on their investment into a startup firm.

An eligible startup under the National Startup Policy is a company that holds an eligible business certificate from the inter-ministerial board of certification under the Department of Industrial Policy and Promotion (DIPP). The company must be incorporated on or after April 1, 2016, but before April 1, 2021. Additionally, the total turnover of such a company must not exceed Rs 250 million (US\$3.87 million) in any of the previous years beginning on or after April 1, 2016, and ending on March 31, 2022.

Tax incentives for new companies

For newly set-up Indian companies, the government has announced a discounted CIT rate of 25 percent – plus applicable surcharge and education cess – with effect from FY 2016-17.

The company may avail the discounted rate, provided it fulfils the following conditions:

- The company is registered and set up on or after March 1, 2016;
- The company has not claimed a benefit for establishing its unit in an SEZ, benefit of accelerated depreciation, or benefit of additional depreciation, investment allowances, expenditure on scientific research, and any deduction in respect of certain income; and,
- The company has not claimed set-off of loss carried forward from any earlier assessment years, provided such loss is attributable to the deductions referred in the above condition.

FINANCING COST ESCALATION

Cost escalation results in the increase in project cost for many reasons viz. delay in implementation of project and inflationary pressure on corporate purchasing.

Financing cost escalation will depend upon the corporate arrangements as to how the project cost has originally been financed. There may be two different aspects to treat the financing of cost escalation as discussed below:

1. Firstly, financing cost escalation in the case when the project is new and financed by owner fund only. In such cases, the raising of equity is costly but issue of right shares to existing shareholder could be planned and this cost be met out.

There may be another situation when the company is existing company and project cost is being financed by its internal funds. In this case the company can capitalise its reserves and surplus and use the amount in financing cost escalation.

2. In the second situation where the company has been using borrowed sums in addition to equity capital for financing the project cost, it can always make request of additional funds to the lending institutions to meet the cost escalations or over runs in the project cost. In case the cost escalation is of greater magnitude then the company will have to go to raise funds from equity holders besides raising loans from the institutions so as to maintain the debt equity ratio in the existing balanced and planned proportions.

LESSON ROUND UP

- Project decisions are taken by the management with basic objective to maximize returns on the investment being made in a project.
- Project report is a working plan for implementation of project proposal after investment decision by a company has been taken.
- Project appraisal should be analyzed for determining the project objects, accuracy of method and measurement, objective of the proposal, reliability of data and project statements.
- A careful balance has to be struck between debt and equity. A debt equity ratio of 1:1 is considered ideal but it is relaxed up to 1.5:1 in suitable cases.
- Economic Rate of Return is a rate of discount which equates the real economic cost of project outlay to its economic benefits during the life of the project.
- Domestic Resource Cost measures the resource cost of manufacturing a product as against the cost of importing/exporting it. The output from any project adds to domestic availability implying a notional reduction in imports to the extent of output of the project or an addition to exports if the product is being exported.
- Effective Rate of Protection attempts to measure the net protection provided to a particular stage of manufacturing
- The Loan agreement is an agreement expressed in writing and entered into between the borrower and the lender bank, institution or other creditors. It envisages a relationship taking into account the commitment made at that time and the conduct of the parties carrying legal sanctions.
- Loan syndication involves obtaining commitment for term loans from the financial institutions and banks to finance the project. Basically it refers to the services rendered by merchant bankers in arranging and procuring credit from financial institutions, banks and other lending and investment organization or financing the client project cost or working capital requirements
- In Social Cost-Benefit Analysis, a project is analyzed from the point of view of the benefit it will generate for the society as a whole.

TEST YOURSELF

1. What is Project report? Why is it necessary to prepare project report? Sketch a format for project report to be submitted to a financial institution.
2. Discuss the important covenant incorporated in a long term loan agreement. Also state its relevance.
3. How do financial institutions monitor the projects financed by them?
4. Narrate the steps taken by financial institutions while appraising a project.
5. Write short notes:
 - (i) Promoters contribution
 - (ii) Social Cost benefit analysis
 - (iii) Viability tests
 - (iv) Economic aspects of project appraisal
 - (v) Borrowers warranties in loan agreement
 - (vi) Social Cost Benefit Analysis.
6. Discuss various techniques of economic appraisal followed by the lending institutions.

Lesson 6

Dividend Policy

LESSON OUTLINE

- Meaning of Cost of Capital
- Introduction
- Types of Dividend Policies
- Determinants and Constraints of Dividend Policy
- Type/ Forms of Dividend
- Different Dividend Theories –
 - (a) Walter's Model
 - (b) Gordon's Model
 - (c) Modigliani-Miller Hypothesis of Dividend Irrelevance Policy
- Practical and Legal Constraints
- Marginal Analysis and Residual Theory of Dividend
- Case Studies
- LESSON ROUND UP
- TEST YOURSELF

LEARNING OBJECTIVES

Dividend is the part of EAT (Earnings after taxes) which is paid to the shareholders. There is no stipulation in the legislations about dividend policy of an organisation. Dividend policy of an organisation depends on multiple factors. A finance manager should be aware about the different aspects affecting the dividend policy of an organisation. The object of the lesson is to enable the student to understand:

- Dividend Policy
- Types of the Dividend Policies
- Determinants of Dividend Policy
- Dividend Relevance – Walter's Model Gordon's Model
- Dividend Growth Model
- Dividend Irrelevance – Modigliani – Miller Hypothesis
- Marginal Analysis and Residual Theory

Dividend decision is one of the crucial parts of the financial manager, as it determines the amount available for financing the organisation long term growth and it plays very important part in the financial management

INTRODUCTION

Dividend policy determines what portion of earnings will be paid out to stock holders and what portion will be retained in the business to finance long-term growth. Dividend constitutes the cash flow that accrues to equity holders whereas retained earnings are one of the most significant sources of funds for financing the corporate growth. Both dividend and growth are desirable but are conflicting goals to each other. Higher dividend means less retained earnings and vice versa. This position is quite challenging for the finance manager and necessitate the need to establish a dividend policy in the firm which will evolve a pattern of dividend payments having no adverse effects on future actions of the firm.

The formulation of the dividend policy poses many problems. On the one hand theory would seem to dictate that the firm should retain all funds which can be employed at a higher rate than the capitalization rate; on the other hand, stock-holders preference must be considered.

Two important considerations evolve from the above, firstly, whether owners' needs are more important than the needs of the firm. It is not easy to ascertain the extent to which shareholders best interest or desires affect dividend policy because of the following difficulties: (1) in determining the dividend 'needs of the stock-holders, as related to tax position, capital gains, current incomes; it is also difficult to locate exactly what more affects the interest of the shareholders current income requirements or alternative use of funds, or tax considerations. (2) Existing conflict of interest amongst shareholders dividend policy may be advantageous to one and not to other. Nevertheless, investor's expectations of dividend are mainly based on three factors viz., (a) reduction of uncertainty due to current earnings by way of dividend. (b) Indication of company's strength and sound position that reposes confidence in investors. (c) To meet the need of current income.

Secondly, need of the firm are easier to determine which the centre of attention is for the policy makers. Firm-oriented matters relating to dividend policy can be grouped under the following six categories, affecting directly or indirectly the determination and the appropriateness of the policy:

- (1) Firms' contractual obligations, restrictions in loan agreement and/or legal limitations/considerations; and insufficiency of cash to pay dividends.
- (2) Liquidity, credit standing and working capital requirement and considerations. Ability to borrow, nature of stockholders, degree of control, timing of investment opportunities, inflation and need to repay debt.
- (3) Need for expansion-availability of external finance, financial position of promoters, relative cost of external funds, the ratio of debt to equity.
- (4) Business cycle considerations.
- (5) Factors relating to future financing.
- (6) Past dividend policies and stockholders relationship.

The above factors affect the different firms or industry in different manner in different situations.

Types of Dividend Policies

There are basically four types of dividend policy. Let us discuss them on by one:

(1) Regular dividend policy: in this type of dividend policy the investors get dividend at usual rate. Here, the investors are usually persons who want to get regular incomes. This type of dividend payment can be maintained only if the company has regular earning.

Merits of Regular Dividend Policy:

- It helps in creating confidence among the shareholders.

- It stabilizes the market value of shares.
- It helps in maintaining the goodwill of the company.
- It helps in giving regular income to the shareholders.

(2) Stable dividend policy: Here the payment of certain sum of money is regularly made to the shareholders. It is of three types:

- (a) Constant dividend per share:** In this case, reserve fund is created to pay fixed amount of dividend in the year when the earning of the company is not enough. It is suitable for the firms having stable earning.
- (b) Constant payout ratio:** Under this type the payment of fixed percentage of earning is paid as dividend every year.
- (c) Stable rupee dividend + extra dividend:** Under this type, there is payment of low dividend per share constantly + extra dividend in the year when the company earns high profit. The extra dividend may be considered as a “bonus” paid to the shareholders as a result of usually good year for the firm. This additional amount of dividend may be paid in the form of cash or bonus shares, subject to the firm’s liquidity position.

Merits of stable dividend policy:

- It helps in creating confidence among the shareholders.
- It stabilizes the market value of shares.
- It helps in maintaining the goodwill of the company.
- It helps in giving regular income to the shareholders.

(3) Irregular dividend: as the name suggests here the company does not pay regular dividend to the shareholders. The company uses this practice due to following reasons:

- Due to uncertain earning of the company.
- Due to lack of liquid resources.
- The company is sometime afraid of giving regular dividend.
- Due to uncertainty of business.

(4) No dividend: the company may use this type of dividend policy due to requirement of funds for the growth of the company or for the working capital requirement.

DETERMINANTS/CONSTRAINTS OF DIVIDEND POLICY

In the company/organisation, dividend policy is determined by the Board of directors having taken into consideration a number of factors which include legal restrictions imposed by the Government to safeguard the interests of various parties or the constituents of the company.

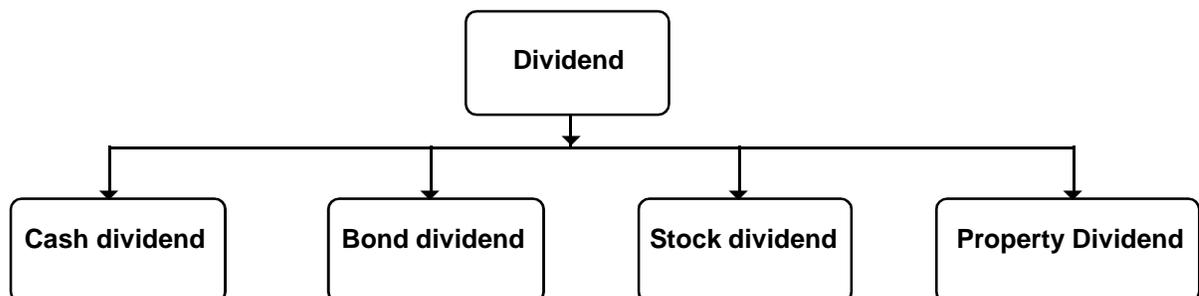
The main considerations are as follows:

- (1) Legal:** As regards cash dividend policy several legal constraints bear upon it – a firm may not pay a dividend which will impair capital. Dividend must be paid out of firm’s earnings/current earnings. Contract/Agreements for bonds/loans may restrict dividend payments. The purpose of legal restriction is to ensure that the payment of dividend may not cause insolvency.
- (2) Financial:** There are financial constraints to dividend policy. A firm can pay dividend only to the extent that it has sufficient cash to disburse; a firm can’t pay dividend when its earnings are in accounts receivables or firm does not have adequate liquidity.

- (3) **Economic Constraints:** Besides, there are economic constraints also. The question arise, does the value of dividend affects the value of the firm. If the answer to it is yes then there must be some optimum level of dividend, which maximises the market price of the firm's stock.
- (4) **Nature of Business Conducted by a Company:** A company having a business of the nature which gives regular earnings may like to have a stable and consistent dividend policy. Industries manufacturing consumer/ consumer durable items have a stable dividend policy.
- (5) **Existence of the Company:** The length of existence of the company affects dividend policy. With their long standing experience, the company may have a better dividend policy than the new companies.
- (6) **Type of Company Organisation:** The type of company organisation whether a private limited company or a public limited company affects dividend decisions. In a closely held company, a view may be taken for acquiescence and conservative dividend policy may be followed but for a public limited company with wide spread of shareholder, a more progressive and promising dividend policy will be the better decision.
- (7) **Financial Needs of the Company:** Needs of the Company for additional capital affects the dividend policy. The extent to which the profits are required to be invested in the company for business growth is the main consideration in dividend decisions. Working capital position of a company is an important condition that affects the dividend policy as no company would declare a dividend to undermine its financial strength and threaten its solvency and existence.
- (8) **Market Conditions:** Business cycles, boom and depression, affects dividend decisions. In a depressed market, higher dividend declaration are used to market securities for creating a better image of the company. During the boom, the company may like to save more, create reserves for growth and expansion or meeting its working capital requirements.
- (9) **Financial Arrangement:** In case of financial arrangements being entered into or being planned like merger or amalgamation with another company, liberal policy of dividend distribution is followed to make the share stock more attractive.
- (10) **Change in Government Policies:** Changes in Government Policies particularly those affecting earnings of the company are also taken into consideration in settling dividend decisions. For example, higher rate of taxation will definitely affect company earnings and carry impact on dividend decisions. Besides, fiscal, industrial, labour, industrial policies do affect in different magnitude the dividend decisions of individual corporate enterprises.

TYPES OF DIVIDEND/FORMS OF DIVIDEND

Dividend may be distributed among the shareholders in the form of cash or stock. Hence, Dividends are classified into:



(1) Cash Dividend

If the dividend is paid in the form of cash to the shareholders, it is called cash dividend. It is paid periodically out

the business concern's EAIT (Earnings after interest and tax). Cash dividends are common and popular type followed by majority of the business concerns.

(2) Stock Dividend

Stock dividend is paid in the form of the company stock due to raising of more finance. Under this type, cash is retained by the business concern. Stock dividend may be bonus issue. This issue is given only to the existing shareholders of the business concern.

(3) Bond Dividend

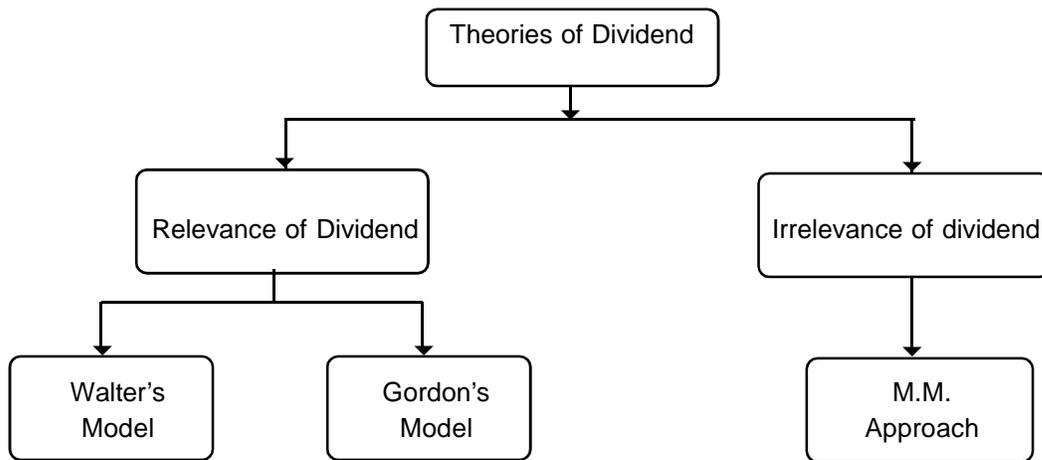
Bond dividend is also known as script dividend. If the company does not have sufficient funds to pay cash dividend, the company promises to pay the shareholder at a future specific date with the help of issue of bond or notes.

(4) Property Dividend

An alternative to cash or stock dividend, a property dividend can either include shares of a subsidiary company or physical assets such as inventories that the company holds. The dividend is recorded at the market value of the asset provided. It will be distributed under exceptional circumstances. This type of dividend is not prevalent in India.

THEORIES OF DIVIDEND

Dividend decision of the business concern is one of the crucial parts of the financial manager, because it determines the amount of profit to be distributed among shareholders and amount of profit to be treated as retained earnings for financing its long term growth. Hence, dividend decision plays very important part in the financial management. Dividend decision consists of two important concepts which are based on the relationship between dividend decision and value of the firm.



RELEVANCE OF DIVIDEND

If the choice of the dividend policy affects the value of a firm, it is considered as relevant. In that case a change in the dividend payout ratio will be followed by a change in the market value of the firm. If the dividend is relevant, there must be an optimum payout ratio. Optimum payout ratio is the ratio which gives highest market value per share.

1. Walter's Model

Professor James E. Walter has developed a theoretical model which shows the relationship between dividend

policies and common stock prices. The basic premise underlying the formulation is that prices reflect the present value of expected dividend in the long run. The model operates on the objective of maximising common stockholders wealth. In general, if a firm is able to earn a higher return on earnings retained than the stockholder is able to earn on a like investment then it would appear beneficial to retain these earnings, all other things being equal.

Walter's model is based on the following assumptions:

1. The firm finances all investment through retained earnings; that is debt or new equity is not issued;
2. The firm's internal rate of return (r), and its cost of equity capital (k_e) are constant;
3. All earnings are either distributed as dividend or reinvested internally immediately.
4. Beginning earnings and dividends never change. The values of the earnings per share (E), and the dividend per share (D) may be changed in the model to determine results, but any given values of E and D are assumed to remain constant forever in determining a given value.
5. The firm has a very long or infinite life.

$$P = \frac{D + \frac{r}{k_E}(E - D)}{k_e}$$

Where:

P : market price per share of common stock

D : dividend per share

E : earnings per share

r : return on investment

k_e : market capitalization rate.

The above equation clearly reveals that the market price per share is the sum of the present value of two sources of income:

- (i) The present value of an infinite stream of constant dividends, (D/k_e) and
- (ii) The present value of the infinite stream of stream gains, $[r(E-D)/k_e/k_e]$

According to the theory, the optimum dividend policy depends on the relationship between the firm's internal rate of return and cost of capital. If $r > k_e$, the firm should retain the entire earnings, whereas it should distribute the earnings to the shareholders in case the $r < k_e$. The rationale of $r > k_e$ is that the firm is able to produce more return than the shareholders from the retained earnings.

Walter's view on optimum dividend payout ratio can be summarised as below:

- (a) Growth Firms ($r > k_e$):-** The firms having $r > k_e$ may be referred to as growth firms. The growth firms are assumed to have ample profitable investment opportunities. These firms naturally can earn a return which is more than what shareholders could earn on their own. So optimum payout ratio for growth firm is 0%.
- (b) Normal Firms ($r = k_e$):-** If r is equal to k_e , the firm is known as normal firm. These firms earn a rate of return which is equal to that of shareholders. In this case, dividend policy will not have any influence on the price per share. So there is nothing like optimum payout ratio for a normal firm. All the payout ratios are optimum.

(c) **Declining Firm ($r < k_e$):**- If the company earns a return which is less than what shareholders can earn on their investments, it is known as declining firm. Here it will not make any sense to retain the earnings. So entire earnings should be distributed to the shareholders to maximise price per share. Optimum payout ratio for a declining firm is 100%.

So according to Walter, the optimum payout ratio is either 0% (when $r > k_e$) or 100% (when $r < k_e$).

Example 1: The earnings per share of company are and the rate of capitalisation applicable to the company is 10%. The company has before it an option of adopting a payout ratio of 25% or 50% or 75%. Using Walter's formula of dividend payout, compute the market value of the company's share if the productivity of retained earnings is (i) 15% (ii) 10% and (iii) 5%.

Solution: According to Walter's formula

$$P = \frac{D}{k_e} + \frac{r(E-D)}{k_e}$$

where, P = Market price per share

D = Dividend per share

r = Internal rate of return or productivity of retained earnings.

E = Earnings per share and

k_e = Cost of equity capital or capitalisation rate

Computation of Market Value of Company's Shares

a) When dividend payout ratio is 25%

i) $r=15\%$

$$P = \frac{2}{0.10} + \frac{0.15(8-2)}{0.10}$$

$$= 2 / 0.10 + 9/0.10 = 11 / 0.10 = \text{Rs. } 110$$

ii) $r = 10\%$

$$P = \frac{2}{0.10} + \frac{0.10(8-2)}{0.10}$$

$$= 2 / 0.10 + 6 / 0.10 = 8 / 0.10 = \text{Rs. } 80$$

iii) $r=5\%$

$$P = \frac{2}{0.10} + \frac{0.05(8-2)}{0.10}$$

$$= 2 / 0.10 + 3 / 0.10$$

$$= 5 / 0.10 = \text{Rs } 50$$

b) When dividend payout ratio is 50%

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i) $r = 15\%$

$$P = \frac{4}{0.10} + \frac{0.15(8-4) / 0.10}{0.10}$$

$$= 4 / 0.10 + 10 / 0.10$$

$$= 4 / 0.10 + 6 / 0.10$$

$$= 10 / 0.10 = \text{Rs. } 100$$

ii) $r = 10\%$

$$P = \frac{4}{0.10} + \frac{0.10(8-4) / 0.10}{0.10}$$

$$= 4 / 0.10 + 10 / 0.10$$

$$= 4 / 0.10 + 4 / 0.10$$

$$= 8 / 0.10 = \text{Rs. } 80$$

iii) $r = 5\%$

$$P = \frac{4}{0.10} + \frac{0.05(8-4) / 0.10}{0.10}$$

$$= 4 / 0.10 + 10 / 0.10$$

$$= 4 / 0.10 + 2 / 0.10$$

$$= 6 / 0.10 = \text{Rs. } 60$$

c) When dividend payout ratio is 75%

i) $r = 15\%$

$$P = \frac{4}{0.10} + \frac{0.15(8-2) / 0.10}{0.10}$$

$$= 6 / 0.10 + 3 / 0.10$$

$$= 9 / 0.10 = \text{Rs. } 90$$

ii) $r = 10\%$

$$P = \frac{6}{0.10} + \frac{0.10(8-6) / 0.10}{0.10}$$

$$= 6 / 0.10 + 2 / 0.10$$

$$= 8 / 0.10 = \text{Rs. } 80$$

iii) $r = 5\%$

$$P = \frac{6}{0.10} + \frac{0.10(8-6) / 0.10}{0.10}$$

$$\begin{aligned}
 & 0.10 \qquad 0.10 \\
 = & 6 / 0.10 + 1 / 0.10 \\
 = & 7 / 0.10 = \text{Rs.}70
 \end{aligned}$$

Criticism of Walter's Model

Walter's model is quite useful to show the effects of dividend policy on an all equity firm under different assumptions about the rate of return. However, the simplified nature of the model can lead to conclusions which are not true in general, though true for Walter's model.

The criticisms on the model are as follows:

1. Walter's model of share valuation mixes dividend policy with investment policy of the firm. The model assumes that the investment opportunities of the firm are financed by retained earnings only and no external financing debt or equity is used for the purpose when such a situation exists either the firm's investment or its dividend policy or both will be sub-optimum. The wealth of the owners will maximise only when this optimum investment is made.
2. Walter's model is based on the unrealistic assumption that r is constant, but it does not hold good. This reflects the assumption that the most profitable investments are made first and then the poorer investments are made.

The firm should stop at a point where $r = k_e$. This is clearly an erroneous policy and fail to optimise the wealth of the owners.

3. A firm's cost of capital or discount rate, k_e , does not remain constant; it changes directly with the firm's risk. Thus, the present value of the firm's income moves inversely with the cost of capital. By assuming that the discount rate, k is constant, Walter's model abstracts from the effect of risk on the value of the firm.

Example:

r = return on investment is given as 0.12

k = market capitalization rate is as 0.10

E = earnings per share is ₹ 4/-

D = dividend per share is ₹ 2/-

Then, the market price per share as per Walter's Model would be:

$$\begin{aligned}
 P &= \frac{2 + (0.12 \div 0.10)(4 - 2)}{0.10} \\
 &= ₹ 44/-
 \end{aligned}$$

The optimal payout ratio is determined by varying D until we obtain the maximum market price per share. According to Walter, the dividend payout ratio should be zero if r is greater than k . This will maximise the market price of the share. In the instant case, we have $P = ₹ 48$ as calculated under:

$$\begin{aligned}
 P &= \frac{0 + (0.12 \div 0.10)(4 - 0)}{0.10} \\
 &= ₹ 48/-
 \end{aligned}$$

So, with payout ratio 0, the market price is maximised and comes to ₹ 48/-. Similarly, if r is less than k the optimal payout ratio should be 100%. This point can be exemplified if $r = 0.08$ instead of 0.12 and other figures remain

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unchanged as in the above example, then we have market price of share as under:

$$P = \frac{2 + (0.08 \div 0.10)(4 - 2)}{0.10}$$

$$= ₹ 36/-$$

However, with Dividend payout ratio at 100%, we have:

$$P = \frac{4 + (0.8 \div 0.10)(4 - 4)}{0.10}$$

$$= ₹ 40/-$$

Thus, market price per share can be maximised with complete distribution of earnings. If r is equal k_e , then market price per share is insensitive to payout ratio. To sum up Walter's conclusions, the firm should distribute all the earnings in dividends if it has no profitable opportunities to invest.

2. Gordon's Model

Another theory, which contends that dividends are relevant, is the Gordon's model. This model which opines that dividend policy of a firm affects its value of the share and firm is based on the following assumptions:

- (a) The firm is an all equity firm (no debt).
- (b) There is no outside financing and all investments are financed exclusively by retained earnings.
- (c) Internal rate of return (r) of the firm remains constant.
- (d) Cost of capital (k) of the firm also remains same regardless of the change in the risk complexion of the firm.
- (e) The firm derives its earnings in perpetuity.
- (f) The retention ratio (b) once decided upon is constant. Thus the growth rate of firm (g) is also constant ($g=br$).
- (g) $k_e > g$.
- (h) Corporate Taxes do not exist.
- (i) Retention ratio is always less than 1, i.e. $b < 1$

Gordon used the following formula to find out price per share:

$$P = \frac{E(1-b)}{k_e - br}$$

Where, P = Market price of a share

E = Earning per share

b = Retention ratio or percentage of earnings retained or (1 – Payout ratio)

(1 - b) = dividend payout ratio, i.e., percentage of earnings distributed as dividend

k_e = Capitalisation rate/cost of capital

br = growth rate in r , i.e., rate of return on investment of an all equity firm.

The model is also referred to as the dividend capitalization model. Graham and Dodd Myron Gordon and others worked on the model which considers capitalization of dividends and earnings. The model is also referred to as the dividend growth model. The model considers the growth rate of the firm to be the product of its retention ratio and its rate of return.

The capitalization model projects that the dividend division has a bearing on the market price of the shares. According to Gordon, when $r > k_e$ the price per share increases as the dividend payout ratio decreases. When $r < k_e$ the price per share increases as the dividend payout ratio increases.

When $r = k_e$ the price per share remains unchanged in response to the change in the payout ratio.

Thus Gordon's view on the optimum dividend payout ratio can be summarised as below:

- (1) The optimum payout ratio for a growth firm ($r > k_e$) is zero.
- (2) There no optimum ratio for a normal firm ($r = k_e$).
- (3) Optimum payout ratio for a declining firm $r < k_e$ is 100%.

Thus the Gordon's Model's is conclusions about dividend policy are similar to that of Walter. This similarity is due to the similarities of assumptions of both the models.

Example

Determine the market price of a share of LMN Ltd., given

$$k_e = 11\%$$

$$E = ₹ 20$$

$$r = \text{(i) } 12\%; \text{ (ii) } 11\%; \text{ and (iii) } 10\%$$

- The market price be determined if –
- (a) $b = 90\%$
 - (b) $b = 60\%$ and
 - (c) $b = 30\%$

Solution

$$P = \frac{E(1-b)}{k_e - br}$$

$$\text{(i) } r = 12\%$$

$$\text{(a) } b = 90\%$$

$$br = 0.9 \times .12 = 0.108$$

$$P = \frac{₹ 20(1-0.9)}{0.11-0.108} = ₹ 1,000$$

$$\text{(b) } b = 60\%$$

$$br = 0.6 \times .12 = 0.072$$

$$P = \frac{₹ 20(1-0.6)}{.11-.072} = ₹ 210.52$$

$$\text{(c) } b = 30\%$$

$$br = 0.3 \times 0.12 = 0.036$$

$$P = \frac{₹ 20(1-0.3)}{.11-.036} = ₹ 189.19$$

$$\text{(ii) } r = 11\%$$

$$\text{(a) } b = 90\%$$

$$br = 0.9 \times .11 = 0.099$$

$$P = \frac{\text{₹ } 20(1-0.9)}{0.11-0.099} = \text{₹ } 181.82$$

(b) $b = 60\%$

$$br = 0.6 \times .11 = 0.066$$

$$P = \frac{\text{₹ } 20(1-0.6)}{0.11-.066} = \text{₹ } 181.82$$

(c) $b = 30\%$

$$br = 0.3 \times .11 = 0.033$$

$$P = \frac{\text{₹ } 20(1-0.3)}{0.11-0.033} = \text{₹ } 181.82$$

(i) $r = 10\%$

(a) $b = 90\%$

$$br = 0.9 \times .10 = 0.090$$

$$P = \frac{\text{₹ } 20(1-0.9)}{0.11-0.090} = \text{₹ } 100$$

(b) $b = 60\%$

$$br = .6 \times .10 = 0.060$$

$$P = \frac{\text{₹ } 20(1-0.6)}{0.11-0.060} = \text{₹ } 160$$

(c) $b = 30\%$

$$br = 0.3 \times .10 = 0.030$$

$$P = \frac{\text{₹ } 20(1-0.3)}{0.11-0.030} = \text{₹ } 175$$

The impact of dividend growth model can thus be analysed in three situations:

(1) When normal capitalization rate is less than the actual capitalization rate: $CR_{\text{norm}} < CR_{\text{act}}$

In such a situation, the shareholder gains more earnings by investing in the company than he expects as a norm. The shareholder would want the firm to retain more than to pay as dividend. If dividend payout is enhanced it will lower the intrinsic value as it lowers the growth rate of a highly profitable company.

(2) Another situation could be where normal capitalization rate equals the actual capitalization rate: $CR_{\text{norm}} = CR_{\text{act}}$

This situation represents that the company is doing well and shareholders are indifferent as to the level of dividend. If dividend is declared, it would be reinvested in the companies. Thus, the dividend payout ratio does not effect the intrinsic value of the company.

(3) Where normal capitalization rate is more than actual capitalization rate i.e., $CR_{\text{norm}} > CR_{\text{act}}$:

This situation represents the opposite side of (1) above. Here, the company is not doing well as expected, the shareholders would like to invest elsewhere in more profitable avenues, so dividend payout has to be higher and intrinsic value of shares accordingly gets enhanced.

The dividend growth model, thus an additional measure of the intrinsic value of shares that may be used to supplement other valuation methods.

DIVIDEND AND UNCERTAINTY: THE BIRD-IN-HAND ARGUMENT

Gordon revised this basic model later to consider risk and uncertainty. Gordon's model, like Walter's model, contends that dividend policy is relevant. According to Walter, dividend policy will not affect the price of the share when $r = k_e$. But Gordon goes one step ahead and argues that dividend policy affects the value of shares even when $r = k_e$. The crux of Gordon's argument is based on the following two assumptions :

1. Investors are risk averse and
2. They put a premium on a certain return and discount (penalise) uncertain return.

The investors are rational. Accordingly they want to avoid risk. The term risk refers to the possibility of not getting the return on investment. The payment of dividends now completely removes any chance of risk. But if the firm retains the earnings the investors can expect to get a dividend in the future. But the future dividend is uncertain both with respect to the amount as well as the timing. The rational investors, therefore prefer current or near dividend to future dividend. Retained earnings are considered as risky by the investors. In case earnings are retained, therefore the price per share would be adversely affected. This behaviour of investor is described as "Bird in Hand Argument". A bird in hand is worth two in bush. What is available today is more important than what may be available in the future. So the rational investors are willing to pay a higher price for shares on which more current dividends are paid, all other things held constant. Therefore the discount rate (K) increases with retention rate. Thus, distant dividends would be discounted at a higher rate than the near dividends.

DIVIDEND IRRELEVANCE: MODIGLIANI – MILLER MODEL

Professor Modigliani and Miller in their article, "Dividend Policy, Growth and the Valuation of Shares" advanced most comprehensive arguments to hold that investors are indifferent to dividends and capital gains and so dividends have no effect on the wealth of shareholders. They argue that the value of the firm is determined by the earning power of firm's assets or its investment policy. The manner in which earnings are divided into dividends and retained earnings does not affect this value. These conclusions of MM model are based on certain assumptions which sidelined the importance of the dividend policy and its effect thereof on the share price of the firm. According to the theory the value of a firm depends solely on its earnings power resulting from the investment policy and not influenced by the manner in which its earnings are split between dividends and retained earnings.

Following are the assumptions under M-M hypothesis :

1. Capital markets are perfect- Investors are rational, information is freely available, transaction cost are nil, securities are divisible and no investor can influence the market price of the share.
2. There are no taxes- No difference between tax rates on dividends and capital gains.
3. The firm has a fixed investment policy which will not change. So if the retained earnings are reinvested, there will not be any change in the risk of the firm. So k remains same.
4. Floatation cost does not exist.

With these assumptions, the market price of a share at the beginning of the period is defined as equal to the present value of dividend paid at the end of the period plus the market price at the end of the period. Thus,

$$P_0 = \frac{1}{1+r} (D_1 + P_1)$$

Where

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P_0 = market price per share at 0 time

r = Capitalisation rate for firm in that risk class (assumed constant throughout)

D_1 = Dividend per share at time 1

P_1 = Expected market price per share at time 1.

Suppose a share is expected to sell at ₹ 100/- one year from now, and is to pay a dividend of ₹ 5/- one year from now, the current value of stock is ₹ 105/- discounted by the appropriate rate r . A firm committed to equity financing may retain earnings and forego selling additional shares or it may pay dividend and sell shares. According to MM, the discounted value per share before and after a dividend payment (with an accompanying sale of shares) will be the same as if earnings had been retained (with no accompanying sale of shares). Let 'n' share be outstanding at period t_0 and let n be number of new shares sold at t_1 at a price of P_1 , the new equation will be written as:

$$nP_0 = \frac{1}{1+r} [nD_1 + (n + n) P_1 - nP_1]$$

The total value of new shares to be sold (nP_1) will depend on the volume of new Investment I , the net income earned Y during the period and the dividend paid on outstanding shares (nD_1) will be:

$$nP_1 = I - (Y - nD_1) \text{ or } I - Y + nD_1$$

Substituting the above into main equation above we have:

$$nP_0 = \frac{1}{1+r} [(n + n) P_1 - I + Y]$$

Since D_1 does not appear in the above equation MM concludes that P_0 is not a function of D_1 , the other variable n , n , P_1 , I , Y are assumed to be independent of D_1 .

The substance of MM arguments may be stated as below:

If the company retains the earnings instead of giving it out as dividends, the shareholders enjoy capital appreciation, which is equal to the earnings, retained.

If the company distributes the earnings by the way of dividends instead of retention, the shareholders enjoy the dividend, which is equal to the amount by which his capital would have been appreciated had the company chosen to retain the earnings.

Hence, the division of earnings between dividends and retained earnings is irrelevant from the point of view of shareholders.

Question

In the light of above, consider the following data:

$$r = .12$$

$$P_0 = 10$$

$$D_1 = .40$$

Shares outstanding 5,00,000

Solution

Dividend is paid to shareholders

$$P_0 = \frac{1}{1+r} (D_1 + P_1)$$

$$P_0(1+r) - D_1 = P_1$$

$$10(1.12) - 0.40 = P_1 \text{ or } P_1 = ₹ 10.80$$

If no dividend is paid, then the share price is $10(1.12) - 0 = ₹11.20$.

If the company earns ₹1/- per share next year, new investment of ₹10,00,000 are expected and company pays dividend then new shares to be issued are as under :

$$nP_1 = I - (Y - nD_1)$$

$$n(10.80) = 10,00,000 - (5,00,000 - 2,00,000)$$

$$n = \frac{7,00,000}{10.80}$$

$$= 64,815 \text{ shares}$$

If no dividend is paid by the company, the new share to be issued are:

$$n(11.20) = 10,00,000 - 5,00,000$$

$$n = \frac{5,00,000}{11.20}$$

$$= 44,643 \text{ shares}$$

The discounted value per share before and after a dividend payment will be the same as if earnings had been retained. Further, the total value of new shares to be sold will depend on the volume of new investment I , the net income earned during the period Y and the dividend paid on outstanding shares nD_1 which established that P_0 is not function of D_1 and all the variables in the equation are independent of D_1 .

However, the unrealistic assumptions of MM hypothesis render the hypothesis unrealistic and insignificant.

Marginal Analysis and Residual Theory of Dividend

The residual theory of dividend assumes that if the firm has retained earnings left over after financing all acceptable investment opportunities, these earnings would then be distributed to shareholders in the form of cash dividends. If no funds is left, no dividend will be paid. In such a case, the dividend policy that results is a strictly a financing decision. As a result the payment of cash dividend is a passive residual. Thus the treatment of dividend policy as a passive residual determined strictly by the availability of acceptable investent proposals implies that dividends are irrelevant; the shareholders are indifferent between dividends and retention.

Thus, if the available investment opportunities are plenty, the percentage of dividend payout will likely to be zero. On the other hand, if the firm is unable to find profitable investment opportunities, the dividend payout ratio is likely to be 1.

As regards the acceptability of investment opportunities, it may be stated that the firm will retain the earnings for investment in new projects up to the point where the marginal return on the new investment equals to the marginal cost of capital. Thus, the amount of retained earnings to be used by the firm for investment purposes will depend upon the expected return on the available investment opportunities. If the expected returns on the available investment opportunities are more than the firm's marginal cost of capital, the firm will undertake as many of these opportunities as are within its financial capability and thus, no dividend will be paid to shareholders. Conversely, if the expected returns are less than the firm's marginal cost of capital, the firm will not accept the investment opportunities and the entire earnings may be distributed by way of dividend.

Exercise No. 1

1. X Company Ltd., has 1,00,000 shares outstanding. The current market price of the shares is ₹ 15 each. The company expects the net profit of ₹ 2,00,000 during the year and it belongs to a rich class for which the appropriate capitalisation rate has been estimated to be 20%. The company is considering dividend of ₹ 2.50 per share for the

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current year. What will be the price of the share at the end of the year (i) if the dividend is paid and (ii) if the dividend is not paid?

Solution

$$P_0 = \frac{D_1 + P_1}{1 + k_e}$$

P_0 = market price per share at 0 time

k_e = capitalisation rate for firm in that risk class (assumed constant throughout)

D_1 = dividend per share at time 1

P_1 = market price per share at time 1.

(i) If the dividend is paid

$$P_0 = ₹15$$

$$k_e = 20\%$$

$$D_1 = 2.50$$

$$P_1 = ?$$

$$15 = \frac{(2.50 + P_1)}{1 + 0.20}$$

$$2.50 + P_1 = 15 \times 1.2$$

$$P_1 = 18 - 2.50$$

$$P_1 = ₹ 15.50$$

(ii) If the dividend is not paid

$$P_0 = 15$$

$$k_e = 20\%$$

$$D_1 = 0$$

$$P_1 = ?$$

$$15 = \frac{(0 + P_1)}{1 + 0.20}$$

$$0 + P_1 = 15 \times 1.20$$

$$P_1 = ₹ 18.$$

Exercise No. 2

Ram Company belongs to a risk class for which the appropriate capitalization rate is 12%. It currently has outstanding 30000 shares selling at ₹ 100 each. The firm is contemplating the declaration of dividend of ₹ 6 per share at the end of the current financial year. The company expects to have a net income of ₹ 3,00,000 and a proposal for making new investments of ₹ 6,00,000. Show that under the MM assumptions, the payment of dividend does not affect the value of the firm. How many new shares issued and what is the market value at the end of the year?

Solution

$$P_0 = \frac{(D_1 + P_1)}{1 + k_e}$$

P_0 = market price per share at 0 time

k_e = capitalisation rate for firm in that risk class (assumed constant throughout)

D_1 = dividend per share at time 1

P_1 = market price per share at time 1.

In the given problem

$$P_0 = 100$$

$$D_1 = ₹ 6$$

$$P_1 = ?$$

$$k_e = 12\%$$

$$P_0 = \frac{(D_1 + P_1)}{(1 + k_e)}$$

$$100 = \frac{(6 + P_1)}{(1 + .12)}$$

$$= 100(1.12) = 6 + P_1$$

OR

$$6 + P_1 = 112$$

$$P_1 = 112 - 6$$

$$P_1 = ₹ 106$$

If Dividend is not declared

$$K_e = 12\%, P_0 = 100, D_1 = 0, P_1 = ?$$

$$100 = \frac{(0 + P_1)}{1 + 0.12}$$

$$112 = P_1$$

The following illustration shows the calculation of number of new shares to be issued/ Market Value of Firm when dividend is paid/not paid

	Dividends is Paid	Dividends is not Paid
Net Income (₹)	3,00,000	3,00,000
Total Dividend (₹)	1,80,000	Nil
Retained earning (₹)	1,20,000	3,00,000
Investment required (₹)	6,00,000	6,00,000
Amount to be raised from new shares (A) (₹)	4,80,000	3,00,000
Relevant Market Price (B) (₹)	106	112
No. of shares to be issued (A/B) (₹)	4,528	2,679

Total number of shares at the end of the year	30,000	30,000
Total Number of shares	34,528	32,679
Market Price per share (₹)	106	112
Market Value for shares (₹)	36,60,000	36,60,000

There is no change in the total market value of shares whether dividends are distributed or not distributed.

Exercise No 3:

A company has 10,000 shares of ₹ 100 each. The capitalisation rate is 12%. Income before tax is ₹ 1,50,000. Tax rate is 30%. Dividend pay-out ratio is 60%. The company has to take up a project costing ₹ 4,00,000. Find Market Price Per Share (MPS) at the end of the current year and the number of shares to be issued for financing the new project if (a) dividend is paid, and (b) if dividend is not paid. Base the answer on M-M approach.

Solution

Net income = ₹ 1,50,000(1 – 0.30) = ₹ 1,05,000

Dividend = ₹ 1,05,000 × 0.6 = ₹ 63,000

Dividend per share = ₹ 63,000/10,000 = ₹ 6.30

MPS when dividend is paid= ₹ (100 × 1.12) – 6.30 = ₹ 105.70

Additional investment required = ₹ 4,00,000 – ₹ 1,05,000 – ₹ 63,000 = ₹ 2,32,000

No. of shares to be issued additionally = ₹ 2,32,000/105.70 = 2,195

MPS when dividend is not paid= ₹ 105.70 + 6.30 = ₹ 112

Additional investment required = ₹ 4,00,000 – 1,05,000 = ₹ 2,95,000

No. of shares to be issued additionally = ₹ 2,95,000/112 = 2,634 shares

Exercise No. 4

From the following information supplied to you, determine the theoretical market value of equity shares of a company as per Walter's model:

Earnings of the company	₹ 5,00,000
Dividends paid	₹ 3,00,000
Number of shares outstanding	₹ 1,00,000
Price earnings ratio	8
Rate of return on investment	0.15

Are you satisfied with the current dividend policy of the firm? If not, what should be the optimal dividend payout ratio in this case?

Solution

$$P = \frac{D + \frac{r}{k_e}(E - D)}{k_e} = \frac{₹3 + \left[\frac{0.15}{0.125} \right] (₹5 - ₹3)}{0.125} = ₹43.20$$

No, we are not satisfied with the current dividend policy.

The optimal dividend payout ratio, given the facts of the case, should be zero.

Working Notes

- (i) k_e is the reciprocal of P/E ratio = $1/8 = 12.5$ per cent
 (ii) $E = \text{Total earnings} \div \text{Number of shares outstanding}$
 (iii) $D = \text{Total dividends} \div \text{Number of shares outstanding}$

Exercise No. 5

X company earns ₹ 5 per share, is capitalised at a rate of 10 per cent and has a rate of return on investment of 18 per cent. According to Walter's model, what should be the price per share at 25 per cent dividend payout ratio? Is this the optimum payout ratio according to Walter?

Solution

$$(a) P = \frac{D + \frac{r}{k_e}(E - D)}{k_e} = \frac{₹1.25 + \left[\frac{0.18}{0.10}\right](₹5 - ₹1.25)}{0.10} = ₹80$$

This is not the optimum dividend payout ratio because Walter suggests a zero per cent dividend payout ratio in situations where $r > k_e$ to maximise the value of the firm. At this ratio, the value of the share would be maximum, that is, ₹ 90.

Exercise No. 6

A company has the following facts:

Cost of capital (k_e) = 0.10

Earnings per share (E) = ₹10

Rate of return on investments (r) = 8%

Dividend payout ratio: Case A: 50% Case B: 25%

Show the effect of the dividend policy on the market price of the shares.

Solution:**Case A:**

D/P ratio = 50%

When EPS = ₹10 and D/P ratio is 50%, $D = 10 \times 50\% = ₹5$

$$P = \frac{5 + [0.08 / 0.10] [10 - 5]}{0.10} = ₹90$$

Case B:

D/P ratio = 25%

When EPS = ₹10 and D/P ratio is 25%, $D = 10 \times 25\% = ₹2.5$

$$P = \frac{2.5 + [0.08 / 0.10] [10 - 2.5]}{0.10} = ₹85$$

Exercise No. 7: Determination of value of shares, given the following data:

	Case A	Case B
D/P Ratio	40	30
Retention Ratio	60	70
Cost of capital	17%	18%
r	12%	12%
EPS	₹20	₹20

Solution

$$P = \frac{₹20 (1 - 0.60)}{0.17 - (0.60 \times 0.12)} \Rightarrow ₹ 81.63 \text{ (Case A)}$$

$$P = \frac{₹20 (1 - 0.70)}{0.18 - (0.70 \times 0.12)} \Rightarrow ₹ 62.50 \text{ (Case B)}$$

Gordon's model, thus, asserts that the dividend decision has a bearing on the market price of the shares and that the market price of the share is favorably affected with more dividends.

Exercise 8

Pinnacle Mills Ltd. has at present outstanding 50,000 shares selling at Rs. 100 each. The Company is contemplating to declare a dividend of Rs. 5 per share at the end of the current year. The capitalisation rate of the Company is 10 percent.

The management expects to earn a net income of Rs. 5,00,000 and decides to invest Rs. 10,00,000 in a project. Show the price of the share at the end of the year if (i) a dividend is declared and (ii) a dividend is not declared. Also calculate the number of new shares which the Company must issue to raise the needed funds.

Solution:

A) The value of the share, when dividends are paid:

i) Value of shares at the end of year 1:

$$P_0 = D_1 + P_1 / (1 + K)$$

$$P_1 = \text{Rs.}100 (1.10) - \text{Rs.} 5$$

$$= \text{Rs.}110 - \text{Rs.}5$$

$$= \text{Rs.}105$$

ii) Amount required to be raised from the issue of new shares

$$mP_1 = \text{Rs.}10,00,000 - (\text{Rs.}5,00,000 - \text{Rs.} 2,50,000)$$

iii) Number of additional shares to be issued

$$\ddot{A}m = \text{Rs.}7,50,000 / \text{Rs.}105 = 7143 \text{ shares (rounded)}$$

iv) Value of the firm:

$$nP_0 = (50,000 / 1 + 1,50,000 / 21)(\text{Rs.}105) - (\text{Rs.} 10,00,000 - \text{Rs.} 5,00,000) / 1.10$$

$$= \text{Rs.} 55,00,000 / 1.10$$

$$= \text{Rs.} 50,00,000$$

(B) Value of the firm when dividends are not paid:

i) Price per share at the end of period 1

$$P_0 = D_1 + P_1 / (1 + K)$$

$$Rs. 100 = P_1 / 1.10$$

$$Rs. 110 = P_1$$

ii) Amount required for financing

$$mP_1 = Rs. 10,00,000 - Rs. 5,00,000$$

$$= Rs. 5,00,000$$

iii) Number of shares to be issued

$$n = Rs. 5,00,000 / Rs. 110 = 4545 \text{ shares}$$

iv) Value of the firm

$$= \frac{50,000}{1} + \frac{50,000}{11} - (Rs. 105) - (Rs. 10,00,000 - Rs. 5,00,000) / 1.10$$

$$= Rs. 55,00,000 / 1.10$$

$$= Rs. 50,00,000$$

Thus the value of the firm remains unaffected whether dividends are paid or not

Exercise 9

The following financial information of Excel Company Limited are available:

r = (i) 12%, (ii) 10%, (iii) 8%.

K = 10%.

E = Rs. 10.

Determine the value of a share of the company when D/P ratio is 25%, 60% and 80%.

Solution

Dividend Policy and Value of the Firm		
Growth firm: r>k	Normal firm: r=k	Declining firm: r<k
Payout ratio = 25%, Retention Ratio, b = 75%		
$g=br = 0.75 \times 0.12 = 0.090$	$g=br = 0.75 \times 0.10 = 0.075$	$g=br = 0.75 \times 0.08 = 0.060$
$P = 10(1 - 0.75) / 0.10 - 0.09 = Rs. 250$	$P = 10(1 - 0.75) / 0.10 - 0.075 = Rs. 100$	$P = 10(1 - 0.75) / 0.10 - 0.060 = Rs. 62.50$
Payout ratio = 60%, Retention Ratio, b = 40%		
$g=br = 0.40 \times 0.12 = 0.0480$	$g=br = 0.40 \times 0.10 = 0.040$	$g=br = 0.40 \times 0.08 = 0.032$
$P = 10(1 - 0.4) / 0.10 - 0.024 = Rs. 105.86$	$P = 10(1 - 0.20) / 0.10 - 0.04 / 0.10 - 0.040 = Rs. 100$	$P = 10(1 - 0.4) / 0.10 - 0.032 = Rs. 88.24$
Payout ratio = 80%, Retention Ratio, b = 20%		
$g=br = 0.20 \times 0.12 = 0.024$	$g=br = 0.20 \times 0.10 = 0.020$	$g=br = 0.08 \times 0.08 = 0.016$
$P = 10(1 - 0.20) / 0.10 - 0.024 = Rs. 105.86$	$P = 10(1 - 0.20) / 0.10 - 0.020 = Rs. 100$	$P = 10(1 - 0.2) / 0.10 - 0.016 = Rs. 95.24$

Exercise 10

The Best Performers Ltd. which earns Rs. 10 per share, is capitalized 20% and has a return on investment of 25%. Determine the price per share, using Walter's model.

Solution:

$$\begin{aligned}
 P &= D + r / K (E - D) / K \\
 &= 25\% / 20\% (\text{Rs.}10) / 20\% \\
 &= \text{Rs.}12.50 / 20\% \\
 &= \text{Rs. } 62.50
 \end{aligned}$$

LESSON ROUND-UP

- Dividend Policy determines what portion of earnings will be paid out to stockholders and what portion will be retained in the business to finance long term growth.
- The amount of dividend payout fluctuates from period to period in keeping with fluctuations in the amount of acceptable investment opportunities available to the firm. If the opportunities abound, percentage of payout is likely to be zero; on the other hand, if the firm is unable to find out profitable investment opportunities, payout will be 100 per cent.
- Walter's Model: Prices reflect the present value of expected dividend in the long run. A firm is able to earn a higher return on earnings retained than the stockholder is able to earn on a like investment then it would appear beneficial to retain these earnings all other things being equal. Walter's model is as under:

$$P = \frac{D + \frac{r}{k}(E - D)}{k}$$

- Dividend Capitalization model projects that dividend decision has a bearing on the market price of the share.

$$P = \frac{E(1 - b)}{K_e - br}$$

- Modigliani Miller Approach: According to MM, the discounted value per share before and after a dividend payment will be same as if earnings had been retained.

$$nP_0 = \frac{1}{1+r} [nD_1 + (n+1)P_1 - nP_1]$$

- Dividend Policy is determined by the Board of Directors having taken into consideration a number of factors which include legal restrictions imposed by the Government to safeguard the interest of various parties or the constituents of the company.
- An appropriate dividend policy must be evaluated in the light of the objectives of the firm.

TEST YOURSELF

(These are meant for re-capitulation only. Answers to these questions are not to be submitted for evaluation)

1. What do you understand by 'dividend policy'? What are the main determinants of dividend policy in a corporate enterprise?
2. Do you feel that a dividend decision is backed by a theoretical framework? What are different dividend theories? Describe each of them briefly.

Lesson 7

Working Capital

LESSON OUTLINE

- Meaning, Types, Determinants and Assessment of Working Capital Requirements
- Negative Working Capital
- Operating Cycle Concept and Applications of Quantitative Techniques
- Financing of Working Capital; Banking Norms and Macro Aspects
- Inventories Management, Receivables Management
- Factoring and Forfeiting, Cash Management
- Case Studies
- LESSON ROUND UP
- TEST YOURSELF

LEARNING OBJECTIVES

Working capital is very important aspect for an organisation. It is called the blood of the organisation. As without proper blood circulation in the body, it will face various diseases, similarly proper circulation of working capital is vital for the proper and smooth functioning of an organisation. Seeing the importance of working capital management, it is very necessary for a corporate professional to know about management of different constituents of working capital.

The objective of the lesson is to enable the student to understand:

- Concept of Working Capital
- Determinants of Working Capital
- Current Assets and Fixed Assets Financing
- Operating Circle
- Application of Quantitative Techniques
- Techniques for Allocation and control of Working Capital
- Financing of Working Capital
- Working Capital Leverage
- Banking Norms and Macro Aspect of Working Capital Management
- Cash Management
- Inventory Management
- Receivable Management

All companies should focus on the proper management of working capital. Inventory, accounts receivable, and accounts payable are of specific importance since they can be influenced most directly by operational management and here starts the role of Management.

MEANING OF WORKING CAPITAL -THE BASIC CONCEPT

The capital which is required to finance current assets is called working capital. It is the capital of a business which is used to carry out day-to-day business operations of a firm.

“Working capital may be defined as all the short term assets used in daily operation”—John. J Harpton.

$$\text{Working Capital} = \text{Current assets} - \text{Current Liabilities}$$

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 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 (Cash equivalents are 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.)

In general, Working capital management is essentially managing Current Assets, management of working capital arises as a part of the process of such management.

Short term assets of a firm means cash money, short-term securities, inventory, bill receivable, note receivable, debtors etc. In operating daily business, fixed assets are also needed in addition to current assets. Though some fixed assets help on the daily operation of a firm, these can't be termed as working capital, because these can't be converted into cash in the current accounting period. So, the assets which can be converted into raw material from cash—R/M—Finished Goods—B/R—Cash and helps in operating daily business of the firm, is called working Capital. Working capital is also called ‘Trading Capital’, Circulating capital/Short term capital /Short /Current Assets management.

Working capital is defined keeping in view the varying objectives and purposes. To businessmen, working capital comprises current assets of business whereas to the accountant/creditors/investment analysts working capital is understood as the difference of current assets and current liabilities. This is also called the Net Working Capital. There is operative aspects of working capital i.e. current assets (which is known as ‘funds’ also) employed in the business process from the gross working capital. Current assets comprise: cash, receivables, inventories, marketable securities held as short-term investment and other items near cash or equivalent to cash. This is also known as going-concern concept of working capital.

SIGNIFICANCE OF WORKING CAPITAL

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 the firm 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 example, 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.

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.

TYPES OF WORKING CAPITAL

The working capital may be classified into the following kinds.

- 1. Initial working capital:** The capital, which is required at the time of the commencement of business, is called initial working capital. These are the promotion expenses incurred at the earliest stage of formation of the enterprise which include the incorporation fees, attorney's fees, office expenses and other preliminary expenses.
- 2. Regular working capital:** This type of working capital remains invested in the enterprise for the successful operation. It supplies the funds necessary to meet the current working expenses i.e. for purchasing raw material and supplies, payment of wages, salaries and other sundry expenses.

3. Fluctuating working capital: This capital is needed to meet the seasonal requirements of the business. It is used to raise the volume of production by improvement or extension of machinery. It may be secured from any financial institution which can, of course, be met with short term capital. It is also called variable working capital.

4. Reserve margin working capital: It represents the amount utilized at the time of contingencies. These unpleasant events may occur at any time in the running life of the business such as inflation, depression, slump, flood, fire, earthquakes, strike, lay off and unavoidable competition etc. In this case, greater amount of capital is required for maintenance of the business.

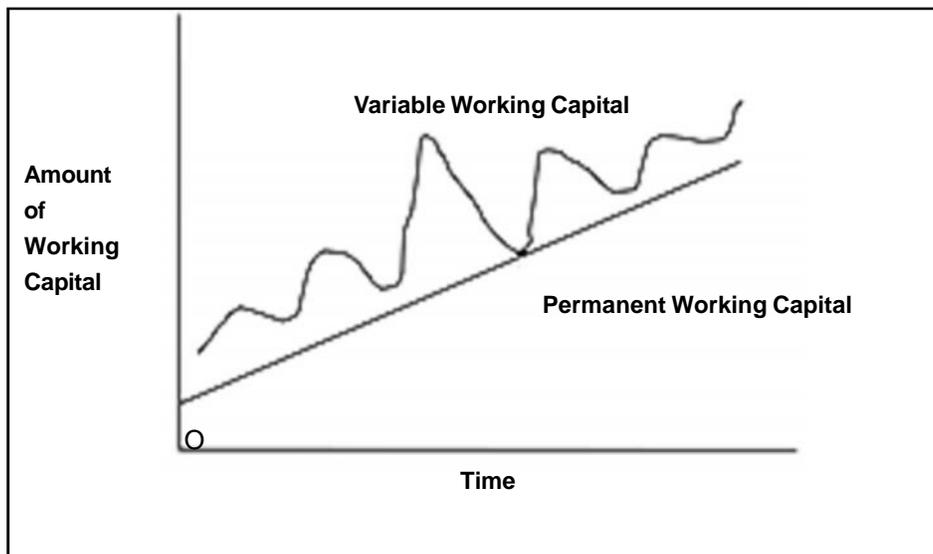
5. Permanent and Temporary Working Capital: The Operating Cycle creates the need for Current Assets (Working Capital). However, the need does not come to an end once the cycle is completed. It continues to exist. To explain the continuing need of current assets, a distinction should be drawn between temporary and permanent working capital.

Business Activity does not come to an end after the realization of cash from customers. For a company, the process is continuing, and hence, the need for regular supply of working capital. However, the, magnitude of Working Capital required is not constant but fluctuating. To carry on a business, a certain minimum level of working capital is necessary on a continuous and uninterrupted basis. For all practical purposes, this requirement has to be met permanently as with other fixed assets. This requirement is referred to as permanent or fixed working capital.

Any amount over and above the permanent level of working capital is temporary, fluctuating or variable working capital. The position of the required working capital is needed to meet fluctuations in demand consequent upon changes in production and sales as a result of seasonal changes.

Both kinds of working capital are necessary to facilitate the sales proceeds through the Operating Cycle.

Permanent & Temporary Working Capital



6. Long Term working capital: The long-term working capital represents the amount of funds needed to keep a company running in order to satisfy demand at lowest point. There may be many situations where demand may fluctuate considerably. It is not possible to retrench the work force or instantly sell all the inventories whenever demand declines due to temporary reasons. Therefore the value, which represents the long-term working capital, stays with the business process all the time. It is for all practical purpose known as permanent fixed assets. In other words, it consists of the minimum current assets to be maintained at all times. The size of the permanent working capital varies directly with the size of Operation of a firm.

7. Short term working capital: Short-term capital varies directly with the level of activity achieved by a company. The Volume of Operation decides the quantum of Short-term working capital. It also changes from one form to another; from cash to inventory, from inventory to debtors and from debtors back to cash. It may not always be gainfully employed. Temporary Working capital should be obtained from such sources, which will allow its return when it is not in use.

8. Gross Working Capital: Gross working capital refers to the firm's investment in current assets. Current assets are those assets which can be converted in to cash with in an accounting year and includes cash, short term securities, debtors bills receivable and stock.

9. Net Working Capital: Net working capital refers to the difference between current asset and Current liabilities. Current liabilities are those claims of outsiders, which are expected to mature for payment within accounting year and include creditors, bills payable and outstanding expenses. Net Working capital can be positive or negative. A positive net working capital will arise when current assets exceed current liabilities.

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 value 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:-

1. Nature of Business: A company's working capital requirements are directly related to the kind of business it conducts. A company that sells a service primarily on a cash basis does not have the pressure of keeping considerable amounts of inventories or of carrying customer's receivables. On the other hand, a manufacturing enterprise ordinarily finances its own customers, requires large amounts to pay its own bills, and uses inventories of direct materials for conversion into end products. These conditions augment the working capital requirements.

2. Degree of Seasonality: Companies that experience strong seasonal movements have special working capital problems in controlling the internal financial savings that may take place. Aggravating this difficulty is the fact that no matter how clearly defined a pattern may be, it is never certain. Unusual circumstances may distort ordinary relationships. Although seasonality may pull financial manager from the security of fixed programmes to meet recurring requirements, flexible arrangements are preferable to guard against unforeseen contingencies. An inability to cope with sharp working capital swings is one of the factors that encourages companies to undertake diversification programmes.

3. Production Policies: Depending upon the kind of items manufactured, by adjusting its production schedules a company may be able to offset the effect of seasonal fluctuations upon working capital, at least to some degree, even without seeking a balancing diversified line. Thus, in one year, in order to avoid burdensome inventories, firm may curtail activity when a seasonal upswing normally takes place. As a matter of policy, the choice will rest on the one hand, and maintaining a steady rate of production and permitting stocks of inventories to build up during off season periods, on the other. In the first instance, inventories are kept to minimum levels but the production manager must shoulder the burden of constantly adjusting his working staff; in the second, the uniform manufacturing rate avoids fluctuations of production schedules, but enlarged inventory stocks create special risks and costs. Because the purchase of inventories is often financed by suppliers, the mere fact that a company carries bigger amounts does not necessarily mean that its cash problem is more serious.

4. Growth Stage of Business : As a company expands, it is logical to expect that larger amounts of working capital will be required to avoid interruptions to the production sequence. Although this is true it is hard to draw up firm rules for the relationship between the growth in the volume of a company's business and the growth of its working capital. A major reason for this is management's increasing sophistication in handling the current assets, besides other factors operating simultaneously.

5. Position of the Business Cycle: In addition to the long-term secular trend, the recurring movements of the business cycle influence working capital changes. As business recedes, companies tend to defer capital replacement programmes and deflect depreciations to liquid balances rather than fixed assets. Similarly, curtailed sales reduce amounts receivable and modify inventory purchases, thereby contributing further to the accumulation of cash balances. Conversely, the sales, capital, and inventory expansions that accompany a boom produce a greater concentration of credit items in the balance sheet.

The tendency for companies to become cash-poor as the tide of economic prosperity rises and cash-rich as it runs out is well known economic phenomenon. The pressure on company finances during boom years is reflected in the business drive for loans and the high interest rate of these years as compared with a reversal of such conditions during the periods of economic decline. The financial implications of these movements may be deceptive. A weakening of the cash position in favourable economic environment may suggest the need or difficulty of raising capital for the further expansion rather than a shortage of funds to take care of current needs. On the other hand, a strong cash position when the economic outlook is bleak may be the forerunner of actual financial difficulties. The financial manager must learn to look behind the obvious significance of the standard test of corporate liquidity interpret their meaning in the light of his knowledge of the company's position in the industry, the prospects of new business and the availability of external sources for supplying additional capital.

6. Competitive Conditions: A corporation that dominates the market may relax its working capital standard because failing to meet customers requirements promptly does not necessarily lead to a loss of business. When competition is keen, there is more pressure to stock varied lines of inventory to satisfy customer's demands and to grant more generous credit terms, thereby causing an expansion in receivables.

7. Production Collection Time Period: Closely related to a company's competitive status are the credit terms, it must grant. These arrangements may be result of tradition, policy within the industry, or even carelessness in failing to carry out announced principles. And the arrangements, in turn, are part of the overall production collection time sequence, that is, the time intervening between the actual production of goods and the eventual collection of receivables, flowing from sales. The length of this period is influenced by various factors.

Purchases may be on a cash basis, but the manufacturing cycle may be prolonged and sales terms generous, causing a wide gap between cash expenditure and receipt and possibly placing heavy financing pressure on the firm. The pressure may be eased, despite long manufacturing cycle, if the company can persuade its suppliers to bear a large part of its financing burden or the manufacturing cycle may be short, and get the pressures heavy because suppliers do not bear a large part of financial burden. The financing requirements of the company may always be traceable to the relation between purchasing and sales credit volume and terms of operations.

8. Dividend Policy: A desire to maintain an established dividend policy may affect the volume of working capital, or changes in working capital may bring about an adjustment of dividend policy. In either event, the relationship between dividend policy and working capital is well established, and very few companies ever declare a dividend without giving consideration to its effect on cash and their needs for cash.

9. Size of Business: The amount needed may be relatively large per unit of output for a small company subject to higher overhead costs, less favourable buying terms, and higher interest rates. Small though growing companies

tend to be hard pressed in financing their working capital needs because they seldom have access to the open market as do large established business firms have.

10. Sales Policies: Working capital needs vary on the basis of sales policy of the same industry. A department store which caters to the “carries trade” by carrying a quality line of merchandise and offering extensive charge accounts will usually have a slower turnover of assets, a higher margin on sales, and relatively larger accounts receivable than many of its non-carriage, trade competitors. Another department store which stresses cash and carry operations will usually have a rapid turnover, a low margin on sales, and small or no accounts receivable.

11. Risk Factor: The greater the uncertainty of receipt and expenditure, more the need for working capital. A business firm producing an item which sells for a small unit price and which necessitates repeat buying, such as canned foods or staple dry goods etc., would be subject to less risk than a firm producing a luxury item which sells for a relatively high price and is purchased once over a period of years, such as furniture, automobiles etc.

INVESTMENT AND FINANCING OF WORKING CAPITAL

Working capital policy is a function of two decisions, first, investment in working capital and the second is financing of the 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 part 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, an 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 to 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.

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.

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.

Example 1

A firm has the following data for the year ending 31st March, 2019:

	(₹)
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. Show the effect of the three alternative current assets policies.

SOLUTION**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 riskier 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.

ESTIMATING WORKING CAPITAL NEEDS

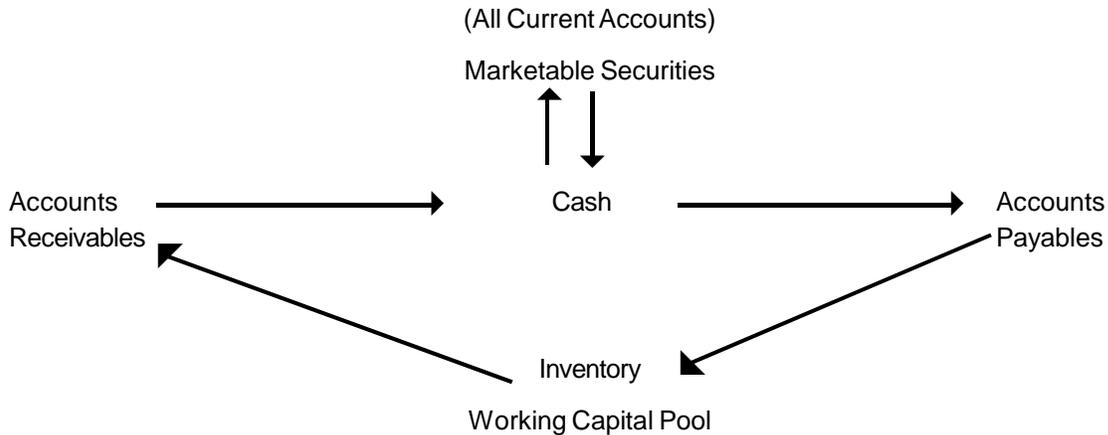
Operating cycle is one of the most reliable methods of Computation of Working Capital. However, other methods like ratio of sales and ratio of fixed investment may also be used to determine the Working Capital requirements. These methods are briefly explained as follows:

- (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.

CURRENT ASSETS AND FIXED ASSETS FINANCING

The more of the funds of a business are invested in working capital, lesser is the return in term of profitability and less amount is available for investing in long-term assets such as plant and machinery, etc. Therefore, the corporate enterprise has to minimise investment in working capital and to concentrate on investment of resources in fixed assets. Some economists argue that current assets be financed by current liabilities. But this all depends upon economic conditions prevailing in the economy at particular time requiring a company to keep business resources liquid so that business can take immediate advantage of knocking opportunities. In short-run, opportunity may arise for investment in stocks to make immediate gains due to movement in prices, whereas investment in plant and machinery may not be possible.

Current assets financing can be viewed from the working capital pool as under:



Current assets usually are converted into cash within a current accounting cycle in one year. Cash is used to purchase raw material etc., i.e. to create inventories. When inventories are sold, it gives rise to accounts receivables. Collection of receivables brings cash into company and the process forms a circle and goes on as depicted in figure above:

Thus, the current assets represent cash or near cash necessary to carry on business operations at all times. A level of current assets is thus maintained throughout the year and this represents permanent working capital. Additional assets are also required in business at different times during the operating year. Added inventory must be maintained to support peak selling period when receivables also increase and must be financed. Extra cash is needed to pay increased obligations due to spurt in activities.

Fixed assets financing is different to current assets financing. In fixed assets investment is made in building, plant and machinery which remains blocked over a period of time and generates funds through the help of working capital at a percentage higher than the return on investment in current assets. Working capital financing or current assets financing is done by raising short-term loans or cash credits limits but fixed assets financing is done by raising long-term loans or equity.

The working capital leverage and the capital structure leverage are, therefore, two different concepts. Capital structure leverage is associated with the fixed assets, financing, with an optional mix of owner's funds and borrowed funds. Owner's funds are the internal funds of the company comprised of equity holder's money in the shape of equity, retained earnings, depreciation fund and reserves. Borrowed funds are the external sources of funds raised from banks, financial institutions, issue of debentures, stock and term deposits from public. Financing of fixed assets with borrowed funds is cheaper than using owner's funds which increases the earnings per share and tends to increase the value of owner's capital in the share market.

OPERATING OR WORKING CAPITAL CYCLE : CONCEPT AND APPLICATION OF QUANTITATIVE TECHNIQUES

The operating cycle is the length of time between the company's outlay on raw materials, wages and other expenditures and the inflow of cash from the sale of the goods. In a manufacturing business, operating cycle is the average time that raw material remains in stock less the period of credit taken from suppliers, plus the time taken for producing the goods, plus the time the goods remain in finished inventory, plus the time taken by customers to pay for the goods. Operating cycle concept is important for management of cash and management of working capital because the longer the operating cycle the more financial resources the company needs. Therefore, the management has to remain cautious that the operating cycle should not become too long.

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 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:

$$\text{Operating Cycle} = R + W + F + D - C$$

Where,

R = Raw material storage period

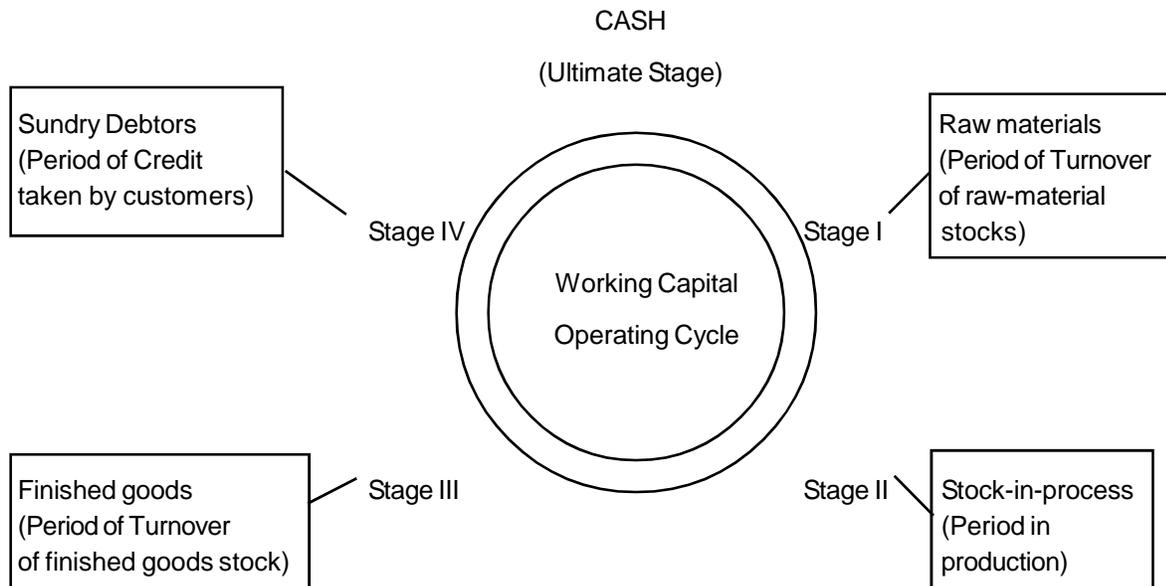
W = Work-in-progress holding period

F = Finished goods storage period

D = Receivables (Debtors) collection period

C = Credit period allowed by suppliers (Creditors)

The stages of operating cycle could be depicted through the following diagram :



The above figure would reveal that operating cycle is the time that elapses between the cash outlay and the cash realisation by the sale of finished goods and realisation of sundry debtors. Thus, cash used in productive activity, often some time comes back from the operating cycle of the activity. The length of operating cycle of an enterprise is the sum of these four individual stages i.e. components of time.

The various component operating cycle can be calculated as shown below:

S.No.	Name of Working Capital Component	Formula	Days
1.	<p>Raw materials</p> <p>Period of raw material stock</p> <p>Less: Period of credit granted by supplier</p>	$\frac{\text{Average value of Raw material stock}}{\text{Consumption of raw material per day}}$ $\frac{\text{Average level of creditors}}{\text{Purchase of raw materials per day}}$	

2.	Period of Production	$\frac{\text{Average value of work in progress}}{\text{Average cost of production per day}}$	
3.	Period of turnover of finished goods stock	$\frac{\text{Average Stock of finished goods}}{\text{Average cost of goods sold per day}}$	
4.	Period of credit taken by customers	$\frac{\text{Average receivable}}{\text{Average value of credit sales per day}}$	
	Total operating cycle period	Sum of Sl. Nos. 1, 2, 3, 4	

Example No. 2

Calculate the Operating cycle from the following figures related to company 'X':

Particulars	Average amount Outstanding ₹	Average value per day (340 days assumed) ₹
Raw Material inventory	1,80,000	
Work-in-progress inventory	96,000	
Finished goods inventory	1,20,000	
Debtors	1,50,000	
Creditors	1,00,000	
Purchase of Raw Material		2,500
Cost of Sales		4,000
Sales		5,000

Solution**Calculation of operating cycle**

			Days
1. Period of Raw Material Stock	$\frac{1,80,000}{2,500}$	72	
Less: Credit granted by supplier	$\frac{1,00,000}{2,500}$	40	32
2. Period of Production	$\frac{96,000}{4,000}$		24
3. Turnover of Finished Goods	$\frac{1,20,000}{4,000}$		30
4. Credit taken by customers	$\frac{1,50,000}{5,000}$		30
Operating Cycle Period			116

Comments: Operating cycle is long and a number of steps could be taken to shorten this operating cycle. Debtors could be cut by a quicker collection of accounts.

Finished goods could be turned over more rapidly, the level of raw material inventory could be reduced or the production period shortened.

Example No. 3

The following information is available for Swati Ltd.

	<i>Amount (₹)</i>
Average stock of raw materials and stores	2,00,000
Average work-in-progress inventory	3,00,000
Average finished goods inventory	1,80,000
Average accounts receivable	3,00,000
Average accounts payable	1,80,000
Average raw materials and stores purchased on credit and consumed per day	10,000
Average work-in-progress value of raw materials committed per day	12,500
Average cost of goods sold per day	18,000
Average sales per day	20,000

Calculate the duration of operating cycle.

Solution

Calculation of operating cycle

Period of raw material stage	$\frac{2,00,000}{10,000}$	= 20 days
Period of work-in-progress stage	$\frac{3,00,000}{12,500}$	= 24 days
Period of finished goods stage	$\frac{1,80,000}{18,000}$	= 10 days
Period of Accounts receivable stage	$\frac{3,00,000}{20,000}$	= 15 days
Period of Accounts payable stage	$\frac{1,80,000}{10,000}$	= 18 days

Duration of operating cycle = (20 + 24 + 10 + 15) – 18 = 51 days

ASSESSMENT OF WORKING CAPITAL

Requirement of working capital over the operating cycle period could be guessed for short-term, medium term as well as long-term. For short term, working capital is required to support a given level of turnover to pay for the goods and services before the cash is received from sales to customers. Effort is made that there remains no idle cash and no shortage of money to erase liquidity within the company's working process. For this purpose sales budget could be linked to the expected operating cycle to know working capital requirement for any given period of time or for each month. Medium term working capital include profit and depreciation provisions. These funds are retained in business and reduced by expenditure on capital replacements and dividend and tax payment. By preparing budget the minimum amount required for medium term working capital can be estimated. The company can work out its working capital needs for different periods through cash budget which is key part of working capital planning. To

prepare such a budget operating cycle parameters are of great use as estimation of future sales level, time and amount of funds flowing into business, future expenditure and costs all can be made with least difficulty to help the main target.

Then, operating cycle help in assessing the needs of working capital accurately by determining the relationship between debtors and sales, creditors and sales and inventory and sales. Even requirement of extra working capital can be guessed from such estimate.

WORKING CAPITAL REQUIREMENT ASSESSMENT

Working capital requirement assessment requires :

1. Calculation of average value of Raw Material Inventory, Work in Progress inventory and Finished Goods inventory
2. Calculation of Trade receivables
3. Calculation of Cash and Cash Convertibles required for normal running of business,
4. Calculation of trade payables.

The formula which is used for assessing the working capital requirement is listed below:

A.	Current Assets	₹
	Value of Raw Material Stock	XXXX
	Value of Work in Progress	XXXX
	Value of Finished Goods Stock	XXXX
	Value of Trade Receivables	XXXX
	Value of Cash Required	XXXX
	Total of A	XXXXX
B.	Current Liabilities	
	Value of Trade Payable	XXXX
	Value of Bank Overdraft	XXXX
	Value of Outstanding expenses	XXXX
	Total of B	XXXXX
	Working Capital Total of (A)-Total of (B)	XXXX

Financing of Working Capital

Sources of financing of working capital differ as per the classification of working capital into permanent working capital and variable working capital.

1. Sources of permanent working capital are the following:

- (a) Owner's funds are the main source. Sale of equity stock or preference stock could provide a permanent working capital to the business with no burden of repayment particularly during short period. These funds can be retained in the business permanently. Permanent working capital provides more strength to the business.
- (b) Another source of permanent working capital is bond financing but it has a fixed maturity period and ultimately repayment has to be made. For repayment of this source, company provides sinking funds for retirement of bonds issued for permanent working capital.
- (c) Term loan from banks or financial institutions has the same characteristics as the bond financing of

permanent working capital.

- (d) Short-term borrowing is also a source of working capital finance on permanent basis.

2. Source of variable working capital

Working capital required for limited period of time may be secured from temporary sources as discussed below:

- (a) **Trade Creditors:** Trade credit provide a quite effective source of financing variable working capital for the period falling between the point goods are purchased and the point when payment is made. The longer this period, the more advantageous it becomes for the firm to avoid efforts of seeking finance for holding inventories or receivables.
- (b) **Bank loan:** Bank loan is used for variable or temporary working capital. Such loans run from 30 days to several months with renewals being very common. These loans are granted by bank on the goodwill and credit worthiness of the borrower, and collateral may include goods, accounts/notes receivable or Government obligations or other marketable securities, commodities and equipments.
- (c) **Commercial Paper:** It can be defined as a short term money market instrument, issued in the form of promissory notes for a fixed maturity. It will be totally unsecured and will have a maturity period ranging from 90 days to 180 days. It will meet the short term finance requirements of the companies and will be good short term investment for parking temporary surpluses by corporate bodies.
- (d) **Depreciation as a source of working capital:** Increase in working capital results from the difference in the amount of depreciation allowance deducted from earnings and new investment made in fixed assets.

Usually, the entire amount deducted towards depreciation on fixed assets is not invested in the acquisition of fixed assets and is saved and utilised in business as working capital. This is also a temporary source of working capital so long as the acquisition of fixed asset is deferred.

- (e) **Tax liabilities:** Deferred payment of taxes is also a source of working capital. Taxes are not paid on day-to-day basis rather they are paid periodically, but estimated liability for taxes is indicated in Balance Sheet. The entity collects taxes by way of income tax payable on salaries of staff deducted at source, old age retirement benefits, excise taxes, sales taxes, etc. and they are retain by them for some period in business until they are actually paid and hence used as working capital.

- (f) Other miscellaneous sources are Dealer Deposits, Customer advances etc.

WORKING CAPITAL – A POLICY DECISION

The working capital policy of a company refers to the level of investment in current assets for attaining their targeted sales. In formulating a Firm's Working Capital Policy, an important consideration is the trade-off (balance) between profitability and risk. In other words, the level of a firm's Net Working Capital (Current Assets – Current Liabilities) has a bearing on its profitability as well as risk. The term profitability here means profits after expenses. The term risk is defined as the probability that a firm will become technically insolvent so that it will not be able to meet its obligations when they become due for payment.

The risk of becoming technically insolvent is measured using net working capital. It is assumed that the greater the amount of Net Working Capital, the less risky the firm is, and *vice-versa*. The relationship between liquidity, Net Working Capital and risk is such that if either net working capital or liquidity increases, the firm's risk decreases.

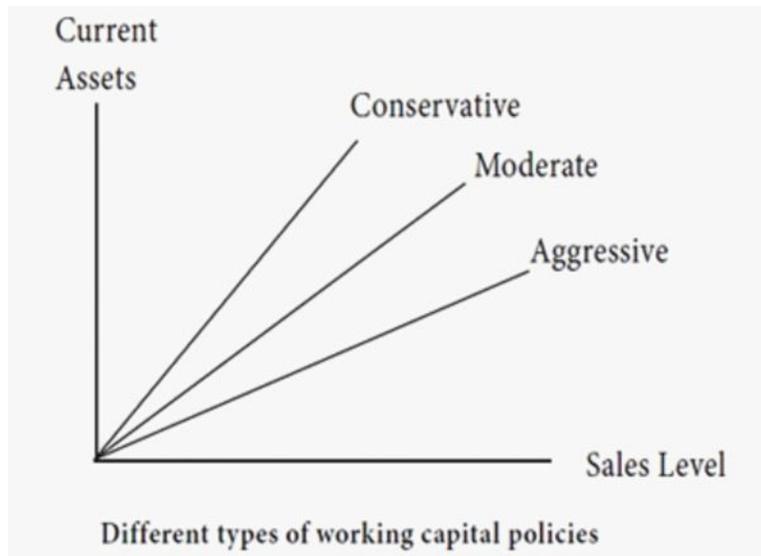
What proportion of current assets should be financed by current liabilities and how much by long term sources will depend, apart from liquidity – profitability trade off, on the risk perception of the management. Two broad policy alternatives, in this respect, are:

- (a) **A conservative current Asset financing policy:** It relies less on short term bank financing and more on long term sources.

No doubt it reduces the risk that the firm will be unable to repay its short term debt periodically, but enhances the cost of financing.

- (b) **An aggressive current Asset Financing Policy:** It relies heavily on short term bank finance and seeks to reduce dependence on long term financing. It exposes the firm to a higher degree of risk, but reduces the average cost of financing thereby resulting in higher profits.

The relationship between current assets and sales under different current asset policies is shown in the following figure:



To explain, an aggressive current asset policy aims at minimising the investment in current assets corresponding to increase in sales thereby exposing the firm to greater risk but at the result of higher expected profitability. On the other hand, conservative policy aims at reducing the risk by having higher investment in current assets and thereby depressing the expected profitability. In between these two, lies a moderate current asset policy.

Working Capital Leverage

Working capital leverage refers to the impact of level of working capital on company's profitability. The working capital management should improve the productivity of investments in current assets and ultimately it will increase the return on capital employed. The working capital leverage reflects the sensitivity of the return on capital employed to the changes in level of current assets. Working capital leverage expresses the relation of efficiency of working capital management with the profitability of the company.

Working capital management should enhance the productivity of the current assets deployed in business.

Current assets reflect the funds position of a company and is known as Gross Working Capital. Working Capital leverage is nothing but current assets leverage which refers to the asset turnover aspect of ROI. This reflects company's degree of efficiency in employing current assets. In other words, the ability of the company to guarantee large volume of sales with small current asset base is a measure of company's operating efficiency. This phenomenon is asset turnover which is a real tool in the hands of finance manager in a company to monitor the employment of fund on a cumulative basis to result into high degree of working capital leverage.

Short-term loans or cash credit raised by the company to meet the requirements of working capital i.e. to finance the current assets, add to the profitability of the company's turnover of current assets in comparison to the cost associated in terms of interest charges on such loans. This is the exact measure of working capital leverage. However, the concept of working capital leverage has not been much in use in academic discussions and its real importance is also to be understood by the business enterprises. To maximise profits, finance managers unanimously

view the investment in current assets be kept to the minimum and should be financed from the funds such as current liabilities or low cost funds.

Ways to Improve Working Capital Position

Working capital is a highly effective barometer of a company's operational and financial efficiency and effectiveness. The better its condition, the better positioned a company is to focus on developing its core business. By addressing the drivers of working capital, in fact, a company is sure to reap significant operating cost and customer service improvement.

Liberating the billions in cash trapped on the balance sheet is easier than one may think. Dell Inc., for instance lauded for overall strong corporate management and working capital performance builds a computer only when it has received payment for an order, and doesn't pay its own suppliers for an agreed-upon period of time thereafter. As a result, Dell enjoys negative working capital and, the more it grows, the more its suppliers finance its growth.

Not all companies can operate like Dell, but most can improve their working capital position by at least 20 percent over time if they pay attention to the following list of cash management do's and don'ts:

(1) Get educated. There is more to working capital management than simply forcing debtors to pay as quickly as possible, delay paying suppliers as long as possible and keep stock levels as low as possible. A properly conceived and executed improvement program will certainly focus on optimizing each of these components, but also, it will deliver additional benefits that extend far beyond operational rewards. All this underscores the need for ambitious executives to integrate working capital management into their strategic and tactical thinking, rather than view it as an extraneous added bonus.

(2) Institute dispute management protocols. Consider a case where a company's working capital is deteriorating due to an increase in past-due accounts receivable (A/R). A review of the past-due A/R illustrates a high level of customer disputes, which are taking on average of 30 days to resolve and consuming significant amounts of sales, order-entry and cash collectors' time.

By tackling the root cause of the disputes in this case, poor adherence to pricing policies, the company can eliminate the disputes, thereby improving customer service. Established dispute-management protocols free up time for sales, order-entry and cash collections' personnel to be more effective at their designated roles, and they also will increase productivity, reduce operating costs and potentially boost sales. And finally, days payable outstanding (DPO) and working capital will improve, as customers won't have reason to hold payment.

(3) Facilitate collaborative customer management. One of the most important cash management and working capital strategies that executives CFOs and treasurers, as well as CEOs can employ is to avoid thinking linearly and concerning themselves solely with their own company's needs. If it is feasible to collaborate with customers to help them plan their inventory requirements more efficiently, it may be possible to match your production to their consumption, efficiently and cost-effectively, and replicate this collaboration with your suppliers.

By aligning ordering, production and distribution processes, companies can increase inherent efficiency and achieve direct cost savings almost instantly. At this point, payment terms can be most effectively negotiated.

(4) Educate personnel, customers and suppliers. A business imperative should be to educate staff to consider the trade-offs between various working capital assets when negotiating with customers and suppliers. Depending on the usage pattern of a raw material, there may be more to gain from negotiating consignment stock with a supplier instead of pushing for extended terms - particularly in cases of long lead-time items or those that require high minimum-order quantities.

(5) Agree to formal terms with suppliers and customers and document carefully. This step cannot be stressed enough. Terms must be kept up to date and communicated to employees throughout the organization, especially to those involved in the customer-to-cash and purchase-to-pay processes; this includes your sales organization.

Avoid prolific new product introductions without first establishing a clear product-range management strategy.

Whether in the consumer products or aluminium extrusions business, many companies rely heavily on new products to maintain and grow market share. However, poor product-range management creates inefficiency in the supply chain, as companies must support old products with inventory and manufacturing capability. This increases operating costs and exposes the company to obsolete inventory.

(6) Don't forget to collect your cash. This may sound obvious, but many businesses fail to implement effective ongoing collection procedures to prevent excess overdue funds or build-up of old debts. Customers should be asked if invoices have been received and are clear to pay and, if not, to identify the problems preventing timely payment. Confirm and reconfirm the credit terms. Often, credit terms get lost in the translation of general payment terms and what's on the payables ledger in front of the payables clerk.

(7) Steer clear of arbitrary top-down targets. Many companies, for example, impose a 10 percent reduction in working capital for each division that fails to take into account the realistic reduction opportunities within each division. This can result in goals that de-motivate employees by establishing impossible targets, creating severe unintended consequences. Instead, try to balance top-down with bottom-up intelligence when setting objectives.

(8) Establish targets that foster desired behaviours. Many companies will incentivise collections staff to minimize A/R over 60 days outstanding when, in fact, they should reward those who collect A/R within the agreed-upon time period. After all, what would stop someone from delaying collections activities until after 60 days when they can expect to be rewarded? Likewise, a purchasing manager may be driven by the purchase price and rewarded for buying when prices are low, but this provides no incentive to manage lot sizes and order frequency to minimize inventory.

(9) Do not assume all answers can be found externally. Before approaching existing customers and suppliers to discuss cash management goals, fully understand your own process gaps so you can credibly discuss poor payment processes. Approximately 75 percent of the issues that impact cash flow are internally generated.

(10) Treat suppliers as you would like customers to treat you. Far greater cash flow benefits can be realized by strategically leveraging your relationship with suppliers and customers. A supplier is more likely to support you in the case of emergency if you have treated them fairly, and, likewise, a customer will be willing to forgive a mistake if you have a strong working relationship.

That said, also realize that each customer is unique. Utilize segmentation tactics to split your customers and suppliers into similar groups. For customers, segmentation may be based on criteria including, profitability, sales, A/R size, past-due debt, average order size and frequency. Once segmentation is complete, it is important to define strategies for each segment based around the segmentation criteria and your strategic goals.

For example, you should minimize the management cost for low-margin customers by changing service levels, automating interaction, etc. Finally, allocate your resources according to the segmentation, with the aim of maximizing value.

Control of Working Capital

The direct approach to working capital control is to develop effective policies for the control of each of the components of working capital. Since deviations occur in actual operations, indirect control techniques are needed by management to reduce its working capital requirements. Control of cash, receivables and inventories be maintained in a synchronized way so that a matching balance in all parameters of working capital could be obtained.

BANKING NORMS AND MACRO ASPECT OF WORKING CAPITAL MANAGEMENT

Banks normally provide working capital finance to hold an acceptable level of current assets viz. raw materials and stores, stocks in progress, finished goods and sundry debtors for achieving a pre-determined level of production and sales. The assessment of funds required to be blocked in each of these items of the working capital required by an industry is discussed as under:

1. Raw Material: Raw material, of any kind is necessarily required by an industrial unit to continue the production process. Different raw material could be procured from different sources may be indigenous or overseas and accordingly different treatment of procurement time is bound to be given. Mode of payment for the raw material may also be different. Thus, affecting the credit requirements of the client, the funds blocked up in procurement and stocking of material will have to be taken into consideration. Total materials including those in transit and for which advance payment is made can normally be expressed in terms of number of months consumption and requirements of funds can be assessed by multiplying the figure by the amount of monthly consumption.

2. Work in Process: The time taken by the raw material to be converted into finished product is the period of material processing and all the expenses of the process are involved in it. Therefore, the assessment of funds blocked in the process is made by taking into account the raw material consumption during the processing period and the expenses incurred during such period i.e. the cost of production for the period of processing.

3. Finished goods in the next stage: The funds blocked in finished goods inventories are assessed by estimating the manufacturing cost of product.

4. Sundry Debtors: When goods sold is not realised in cash, sundry debtors are generated. The credit period followed by a particular industrial unit in practice is generally the result of industry practices. Investment in accounts receivable remains blocked from the time of sale till the time amount is realised from debtors. The assessment of funds blocked should be on the basis of cost of production of the materials against which bank extends working capital credit.

5. Expenses: One month's total expenses, direct or indirect, are provided by way of cushion in assessing the requirement of funds which may include rent, salaries, etc. depending upon the length of operating cycle.

6. Trade Credit received on purchases reduces working capital funds requirements and has to be taken into account for correct assessment of funds.

7. Advances received alongwith purchase orders for the products also reduce the funds requirements for working capital.

Taking into consideration the above parameters of operating cycle, the working capital for a unit can be assessed as under:

S.No.	Component of Working Capital	Basis of Calculation	₹
1.	Raw material	Month's consumption	100
2.	Stock in process	Week's (cost of production for period of processing)	100
3.	Finished goods	Month's cost of production required to be stocked	100
4.	Sundry debtors	Month's cost of production	100
5.	Expenses	One month's	100
		Total	500
	Less: Trade credit on month's purchases	₹ 100	
	Less: Advance payment on Orders received	₹ 100	200
	Working Capital required		300

Banks do not provide the entire amount of ₹ 300 towards working capital. At every stage bank would insist upon the

borrower's stake in the form of margin which depends on various factors like saleable quality of product, durability, price fluctuations, market conditions and business environment, etc. Thus, the bank at every stage would allow the margin at the pre-determined rate as noted below:

		Permissible Limit (₹)
Raw material	100	
Less: Margin 10%	10	90
Stock in process	100	
Less: Margin 40%	40	60
Finished goods	100	
Less: Margin 25%	25	75
Sundry Debtors (at sale value)	100	
Less: Margin 10%	10	90
Expenses for one month	100	
100% Margin	100	–
Total permissible limit		315
Working capital requirement of the unit		500
Permissible limits (Bank loan)		315
Gap (contribution to be provided by Borrower)		<u>185</u>

Before sanctioning the working capital of ₹ 315, the bank would ensure that borrower is in a position to bring in margin money of ₹ 185 by way of excess current assets over current liabilities based on projected balance sheet.

DIFFERENT COMMITTEE OF RBI FOR WORKING CAPITAL MANAGEMENT

Commercial banks grant working capital advances by way of cash credit limits and are the major suppliers of working capital to trade and industry. In the past, the practices in commercial banks as revealed by the findings of different Study Groups appointed by RBI were as follows:

1. Daheja Study Group

To control the tendency of over-financing and the diversion of the banks funds, Daheja Study Group (National Credit Council constituted in 1968 under the Chairmanship of V.T. Daheja) made recommendations for the banking system to finance industry on the basis of a total study of the borrower's operations rather than on security considerations. Credit application should be appraised by the bankers with reference to present and projected total financial position as shown by cash flow analysis and forecast submitted by borrowers. The recommendations given by Dehejia Committee could not be implemented, further in view of unprecedented inflation during 1974 the demand for bank credit rose sharply.

2. Tandon Committee

Although the above recommendations were implemented but no improvement was noticed in money drain to strong industrial groups by banks and RBI appointed another study group under the chairmanship of Shri P.L. Tandon in July, 1974. Tandon committee made certain recommendations inter alia comprising of recommendations on norms for inventory and receivables for 15 major industries, new approach to bank lending, style of lending credit, information system and follow up, supervision and control and norms of capital structure. A brief appraisal of the Tandon committee recommendations is given below:

Bank lending: The Committee introduced the concept of working capital gap. This gap arised due to the non-

coverage of the current assets by the current liabilities other than bank borrowings. A certain portion of this gap will be filled up by the borrower's own funds and long-term borrowings. The Committee developed three alternatives for working out the maximum permissible level of bank borrowings:

1. 75% of the working capital gap will be financed by the bank i.e.

Total Current assets

Less: Current Liabilities other than Bank Borrowings

= Working Capital Gap.

Less: 25% of Working Capital gap from long-term sources.

2. Alternatively, the borrower has to provide for a minimum of 25% of the total current assets out of long-term funds and the bank will provide the balance. The total current liabilities inclusive of bank borrowings will not exceed 75% of the current assets:

Total Current Assets

Less: 25% of current assets from long-term sources.

Less: Current liabilities other than Bank borrowings

= Maximum Bank Borrowing permissible.

3. The third alternative is also the same as the second one noted above except that it excludes the permanent portion of current assets from the total current assets to be financed out of the long-term funds, viz.

Total Current assets

Less: Permanent portion of current assets

Real Current Assets

Less: 25% of Real Current Assets

Less: Current liabilities other than Bank Borrowings

= Maximum Bank Borrowing permissible.

Thus, by following the above measures, the excessive borrowings from banks will be gradually eliminated and the funds could be put to more productive purposes.

The above methods may be reduced to equation as under:

$$\text{1st Method} \quad : \quad \text{PBC} = 75/100 \times \text{WCG}$$

$$\text{2nd Method} \quad : \quad \text{PBC} = \text{TCA} - [(25/100 \times \text{TCA}) + \text{OCL}]$$

$$\text{3rd Method} \quad : \quad \text{PBC} = \text{TCA} - [\text{CRA} + 25/100 (\text{TCA} - \text{CRA}) + \text{OCL}]$$

Where,

PBC stands for Permissible Bank Credit

WCG stands for Working Capital Gap

TCA stands for Total Current Assets

OCL stands for Other Current Liabilities

(i.e. Current Liabilities other than Bank Borrowings)

CRA stands for Amount required to finance Core Assets.

3. Chore Committee

Reserve Bank of India accepted the above recommendations of the Tandon Committee but found that the gap between sanctioned cash credit limit and its utilisation has remained unanswered. In this context, RBI appointed in April 1979 a working group under the Chairmanship of Mr. K.B. Chore to look into this gap between the sanctioned limits and their utilisation.

The Chore Committee has, *inter alia*, recommended as follows:

- (1) emphasised need for reducing the dependance of large and medium scale units on bank finance for working capital;
- (2) to supplant the cash credit system by loans and bills wherever possible; and
- (3) to follow simplified information system but with penalties when such information is not forthcoming within the specified limit.

Chore Committee also suggested that the banks should adopt henceforth Method II of the lending recommended by the Tandon Committee so as to enhance the borrowers' contribution towards working capital. The observance of these guidelines will ensure a minimum current ratio of 1.33 : 1.

4. Marathe Committee

In 1982, it was felt that an independent review of the Credit Authorisation Scheme (CAS) which had been in operation for several years would be useful and accordingly the Reserve Bank of India appointed a Committee referred as "Marathe Committee" in November 1982 to review the working of the Credit Authorisation Scheme. The Committee submitted its report in July 1983.

The Marathe Committee which was given terms of reference to examine the Credit Authorisation Scheme from the point of view of its operational aspects stressed that the 'CAS is not to be looked upon as a mere regulatory measure which is confined to large borrowers. The basic purpose of CAS is to ensure orderly credit management and improve quality of bank lending so that all borrowings, whether large or small, are in conformity with the policies and priorities laid down by the Central Banking Authority. If the CAS scrutiny has to be limited to a certain segment of borrowers, it is because of administrative limitations or convenience, and it should not imply that there are to be different criteria for lending to the borrowers above the cut off point as compared to those who do not come within the purview of the scheme.

5. Chakraborty Committee

The Reserve Bank of India constituted a committee under the chairmanship of Sukhomoy Chakraborty to review the working of monetary system in India. The committee examined the matter in details and submitted its report in April, 1985 with wide ranging suggestions for its improvement. The committee made two major recommendations which were as under –

- i) The observation of the committee was that the delay in making payment by public sector units, some big private sector units and Government, departments continues unabated. The suggestion of committee in this regard was that the Government, should take initiative to include a penal interest payment clause in purchase contracts with suppliers for delayed payments beyond a pre-specified period.
- ii) The credit limits to be sanctioned to a borrower should be segregated under three different heads - Cash credit-I - to cover the supplies to Govt. Cash credit II - to cover special circumstances and contingencies Normal working capital limit - to cover the balance of the credit facilities.

6. Kannan Committee

With a view to free the banks from rigidities of the Tandon Committee recommendations in the area of Working

Capital Finance and considering the ongoing liberalizations in the financial sector, IBA constituted, following a meeting of the Chief Executives of Selected public sector banks with the Deputy Governor of Reserve Bank of India on 31.8.96, a committee on 'Working Capital Finance' including Assessment of Maximum Permissible Bank Finance (MPBF), headed by Mr. K. Kannan, the then Chairman and Managing Director of the Bank of Baroda.

The Committee examined all the aspects of working capital finance and gave far reaching recommendations on the modalities of assessment of working capital finance in its report, submitted to IBA on February 25, 1997. In its final report, the Kannan Committee also pointed that alongwith modification of existing systems of working capital assessment and credit monitoring, certain undermentioned areas also need to be addressed:

- (1) Regular interface with the borrower to have a better understanding of (i) his business/activity; and, (ii) problems/constraints faced by him and the future action plan envisaged;
- (2) Periodical obtaining of affidavits from the borrowers, declaring highlights of their assets, liabilities and operating performance (in lieu of subjecting even the high rated/high valued borrowers to several routine inspections/ verifications) in order to bestow faith-oriented, rather than *ab initio* doubt-oriented, approach in monitoring the credit dispensation.
- (3) Periodical exchange of information between/among financing banks/financial institutions to pick-up the alarm signals at the earliest.
- (4) Establishing, within, a time bound programme, a "Credit Information Bureau" to provide updated information of existing/new borrowers before taking a credit decision. (Modality of Information Bureau in advanced countries may be taken as a guide for floating an appropriate Credit Information Bureau).

Concurring with recommendations of the Kannan Committee, Reserve Bank of India (vide circular No. IECD No. 23/08.12.01/96 dated 15.04.1997) advised to all the banks, inter-alia, as under:

It has now been decided that the Reserve Bank of India shall withdraw forthwith the prescription in regard to assessment of working capital needs based on the concept of maximum permissible bank finance (MPBF) enunciated by Tandon Working Group. Accordingly, an appropriate system may be evolved by banks for assessing the working capital needs of borrowers within the prudential guidelines and exposure norms already prescribed.

Reserve Bank of India further directed that Working capital credit may henceforth be determined by banks according to their perception of the borrower and the credit needs. Banks should lay down, through their boards a transparent policy and guidelines for credit dispensation in respect of each broad category of economic activity.

Note: The above committee recommendations are given just for better understanding of working capital needs and financing, practically these recommendations are no more relevant.

PRESENT SCENARIO OF WORKING CAPITAL

Credit Monitoring Arrangements (CMA)

Credit Monitoring Arrangement report is the report showing the projected performance and the past performance of a business in financial terms. It is compiled with all the required financial ratios and metrics to help Financial Analysts and Bankers to ascertain the financial health of a business. Most of the Banking and Financial Institution request the applicant (Business Loan Applicant) to prepare a Credit Monitoring Arrangement report (CMA report) in order to understand the flow and application of funds in a business. A CMA report which is professionally prepared can enhance the chances of obtaining a bank loan.

Under the Credit Monitoring Arrangement (CMA), banks have been permitted for sanctioning credit proposals (of large borrowers) after detailed analysis of the past performance. There is another requirement for the Banks. They need to submit the large credit proposals to the Reserve Bank of India for post-sanction scrutiny. These proposals

involve working capital limits of Rupees 500 lakhs (5 crores) and above and/or term loan in excess of Rupees 200 lakhs (2 crores).

Statements covered in the CMA report

It covers the following statements:

1. Particulars of current & proposed limits:

The first statement in the Credit Monitoring Arrangement (CMA) report states about the existing fund & non-fund based credit limits, their usage limits and history. In addition to this, the statement also contains the proposed or applied limit of the borrower. This document is a basic document which is to be provided by the borrower to the banker.

2. Operating statement

This is the second statement which indicates the borrower's business plan showing the Current Sales, profit before & after tax, sales projections, direct & indirect expenses, and profit position for 3 to 5 years. These requirements are case to case specific on the basis of the borrower's working capital request. This is a scientific analysis of existing & projected profit-generating capacity of the borrower.

3. Analysis of Balance sheet

This is the third statement in the CMA data, this statement contains an analysis of the current & projected financial years. It helps in providing a comprehensive analysis of current & non-current assets, current & non-current liabilities and cash & bank position of the borrower. This statement also specifies the net worth position of the borrower for the future projected years. As the name states, it is the analysis of the Balance sheet and gives a complete picture of the financial position of the borrower.

4. Comparative statement of Current Asset & Current liabilities

This is the fourth statement which provides the comparative analysis of the movement of the current assets & liabilities. Basically, this analysis helps to decide the capacity of the borrower to meet the working capital requirements and the actual working capital cycle for the projected period.

5. Calculation of Maximum Permissible Bank Finance (MPBF)

This is the fifth statement and a very important one. This includes a calculation which indicates the Maximum Permissible Bank Finance. It shows the borrower's capacity to borrow money.

6. Fund flow statement

The next statement is the Fund flow analysis for the current & projected period. In this analysis, it indicates the fund position of the borrower with reference to the projected balance sheets and MPBF (Maximum Permissible Bank Finance) calculations. The main objective of this statement is to capture the movement of the fund for the given period.

7. Ratio analysis

This is the last statement in Credit Monitoring Arrangement report (CMA report) which provides key financial ratios for the Financial Analysts and Bankers use. The basic key ratios are GP (Gross profit) ratio, Net profit ratio, Current ratio, Quick ratio, Stock turnover ratio, Net worth, the ratio of Net worth to Liabilities, DP limit, MPBF, Asset turnover, Current asset turnover, Working capital turnover, Fixed asset turnover, Debt-Equity ratio etc.

Documents/Information required to prepare CMA

- Previous 2 years Audited Financials
- Latest Sanction letter (in case of renewal)

- Provisional Financial for the current year
- Term Loan Repayment Schedule,(if any)
- Details of proposed enhancement (if any) along with the terms and conditions

OTHER ISSUES INVOLVED IN THE MANAGEMENT OF WORKING CAPITAL

Apart from the discussion of the nature of various components of working capital, we need to consider various other aspects of this intricate system of financial management. These aspects undertake a finer and more microscopic analysis of the components in order to strengthen control over the current assets on one hand and to improve the productivity of working capital on the other. Some of the relevant issues are described as under:

(A) The Concept of Negative Working Capital

Negative Working capital is a situation in which current liabilities of the company are higher than current assets. Generally negative working capital is a sign that the company may be facing bankruptcy or a serious financial trouble. Under the best circumstances, poor working capital leads to financial pressure on a company, increased borrowing, and late payments to creditor - all of which result in a lower credit rating. A lower credit rating means banks charge a higher interest rate, which can cost a corporation a lot of money over time. Companies with negative working capital may lack the funds necessary for growth.

Another situation is where companies can sell their inventory and generate cash so quickly that they actually have a negative working capital. These are companies which takes advance first against supply of goods or services.

McDonald's had a negative working capital of \$698.5 million between 1999 and 2000). Amazon.com is another example. This happens because customers pay upfront and so rapidly that the business has no problems raising cash. In these companies, products are delivered and sold to the customer before the company even pays for them.

In order to understand how a company can have a negative working capital, let us take an example of Wal-Mart. Suppose Wal-Mart orders 500,000 copies of a DVD to Warner Brothers and they were supposed to pay within 30 days. What if by the sixth or seventh day, Wal-Mart had already put the DVDs on the shelves of its stores across the country? By the twentieth day, they may have sold all of the DVDs. Here, Wal-Mart received the DVDs, shipped them to its stores, and sold them to the customer (making a profit in the process), all before they had paid Warner Brothers! If Wal-Mart can continue to do this with all of its suppliers, it doesn't really need to have enough cash on hand to pay all of its accounts payable. As long as the transactions are timed right, they can pay each bill as it comes due, maximizing their efficiency.

The bottom line is that a negative working capital can also be a sign of managerial efficiency in a business with low inventory and accounts receivable (which means they operate on an almost strictly cash basis).

Example No. 4

From the following information, you are required to estimate the net working capital:

	Cost per unit (₹)
Raw Material	200
Direct Labour	100
Overheads (excluding depreciation)	250
Total Cost	550

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Estimated data for the forthcoming period is given as under:

Raw material in stock	average 6 weeks
Work-in-progress (assume 50% completion stage with full material consumption)	average 2 weeks
Finished goods in stock	average 4 weeks
Credit allowed by suppliers	average 4 weeks
Credit allowed to debtors	average 6 weeks
Cash at bank is expected to be	₹ 75,000
Selling price	₹ 800 per unit
Output	52,000 units per annum

Assume that production is sustained at an even pace during the 52 weeks of the year. All sales are on credit basis. State any other assumptions that you might have made while computing.

Solution

Computation of Net working Capital

Nature of Asset/Liabilities	Basis of Calculation	Amount (₹)
A. Current Assets		
(i) Raw material stock	Average 6 weeks	
	$\frac{52,000 \times 200 \times 6}{52}$	12,00,000
(ii) Work-in-progress	Average 2 weeks	
(a) Raw Material	$\frac{52,000 \times 200 \times 2}{52}$	4,00,000
(b) Direct labour and overhead (50% completion stage)	$\frac{52,000 \times 175 \times 2}{52}$	3,50,000
(iii) Finished goods stock	Average 4 weeks	
	$\frac{52,000 \times 550 \times 4}{52}$	22,00,000
(iv) Debtors	Average 6 weeks	
	$\frac{52,000 \times 800 \times 6}{52}$	48,00,000
(v) Cash at bank		75,000
Total of A		90,25,000
B. Current Liabilities		
(i) Creditors	Average 4 weeks	
	$\frac{52,000 \times 200 \times 4}{52}$	8,00,000
C. Net Working Capital (A-B)		82,25,000

Note: (i) It has been assumed that the material has been introduced at the commencement of the process.

(ii) Lag in payment of overheads is nil.

(iii) There is no depreciation charge.

(iv) Debtors are calculated at selling price.

Example No. 5

Astle Garments Ltd. is a famous manufacturer and exporter of garments to the European countries. The Finance manager of the company is preparing its working capital forecast for the next year. After carefully screening all the documents, following information is collected:

Production during the previous year was 15,00,000 units. The same level of activity is intended to be maintained during the current year. The expected ratios of cost to selling price are:

Raw material	40%
Direct wages	20%
Overheads	20%

The raw materials ordinarily remain in stores for 3 months before production. Every units of production remains in the process for 2 months and is assumed to be consisting of 100% raw material, wages and overheads. Finished goods remain in the warehouse for 3 months. Credit allowed by the creditors is 4 months from the date of the delivery of raw material and credit given to debtors is 3 months from the date of dispatch.

Estimated balance of cash to be held	₹ 2,00,000
Lag in payment of overhead expenses	½ month
Lag in payment of direct wages expenses	½ month

Selling price is ₹ 10 per units. Both production and sales are in regular cycle. You are required to make provision of 10% for contingency (except cash). Relevant assumption may be made.

As the Finance Manager of the Company, you are required to prepare the forecast statement of estimated working capital required.

Solution

Calculation of Profit Margin

Particulars	%	₹ (per unit)
Raw material	40	4
Direct wages	20	2
Overheads	20	2
Total cost	80	8
Add: Profit	20	2
Selling price	100	10

Estimation of Working Capital

(₹)

Current Assets

Raw materials stock	(15,00,000 units × ₹ 4 × 3/12)	15,00,000
Work-in-progress	(15,00,000 units × ₹ 8 × 2/12)	20,00,000
Finished goods stock	(15,00,000 units × ₹ 8 × 3/12)	30,00,000
Debtors	(15,00,000 units × ₹ 10 × 3/12)	37,50,000
	(a)	1,02,50,000

Current Liabilities

Creditors for raw material	(15,00,000 units × ₹ 4 × 4/12)	20,00,000
Wages outstanding	(15,00,000 units × ₹ 2 × 0.5/12)	1,25,000
Outstanding expenses	(15,00,000 units × ₹ 2 × 0.5/12)	1,25,000
	(b)	22,50,000
Current assets less current liabilities	(a) – (b)	80,00,000
Add: Contingency	(10% of ₹ 80,00,000)	8,00,000
Add: desired cash balance		2,00,000
Estimated Working capital		90,00,000

(B) The Myth of Adequate Current Assets

Traditionally, it has been believed that liquidity is proportional to the level of current assets. A firm having a high current ratio is treated as favorably placed as regards payment of its current liabilities. This is myth since the holding of current assets is always in proportion to the turnover. If level of current assets is rising disproportionately to the turnover, then notwithstanding the high current ratio, the situation has the following implications:

- The age of current assets is increasing which tells upon their quality. As the current assets, particularly inventory and receivables, get older the chances of their easy and complete conversion into cash recede. Once this happens, there is every possibility of the operating cycle cracking.
- The firm is paying a huge cost for the higher build up of current assets. This cost consists of
 - (a) The amount spent towards raw materials and intermediate inputs
 - (b) The cost incurred towards storing and maintaining the inventory.
 - (c) The interest cost for obtaining finance against these current assets
 - (d) The cost of obsolescence associated with holding inventory for longer periods and
 - (e) The cost of expected default on receivables as reflected in charge to profit and loss account towards bad debts.

(C) Does the balance sheet give a true picture of current assets?

We have restricted the discussion of current assets to the position obtained as on a particular date. This position may not be representative of the state of affairs prevailing on a day to day basis throughout the year. In order to even out the effects of daily variation in the level of current assets, it is advisable to take average of weekly, monthly or

quarterly holding depending upon the nature of the industry and turnover of the assets. The position at the end of a day is a static position which is not representative of the entire year. By taking period averages some amount of dynamism is brought into the picture.

The second point to be noted is that an industry might have seasonal peaks or troughs of working capital requirement. For example agro based industry like fruit processing unit would need to stock more raw material during the peak season when the crop has been harvested than during the lean season. In such cases different norms have to be applied for peak season and non peak season for holding of current assets for judging the reasonability of their holding.

We find, therefore that the high level of current assets is nothing but a fiction when we seek to realize the current assets. It may happen that the inventory carried by the firm may consist of obsolete items, packing materials, finished goods which have been rejected by buyers and items like dies and tools which are more fixed than current in character. Prudence would advise that the firm should get rid of these current assets as early as possible.

On the other hand, the current liabilities are more ascertainable and less fictions. The payment of these liabilities, if not possible from the operating cycle, has to be arranged from long term sources of funds which results in a mismatch that is not conducive to financial health of the firm.

(D) The various forms of cash holding

Cash is considered to be the most liquid of current assets. It is held either as cash balances with the firms or in bank accounts. There are two ways of holding bank balances – first as current accounts through which the day to day transactions of the firm are carried out and secondly as fixed deposits in which balances are held for a specified time period. Current account balances are most liquid. Fixed account balances are convertible into cash by adjustment downwards of the rate of interest even before maturity. Hence even fixed deposit balances should be treated at par as regards liquidity. But there is a catch here. Quite a few fixed deposits are not held *per se*, but as margin money deposits for availing the facilities like letters of credit and guarantee from banks. To the extent of such margin money deposits, the liquidity of bank balances of the firm is impaired.

Cash balances are also held as unavailed portion of the working capital facilities granted by the banks. All such balances earn money for the firm in terms of the interest that is saved on unavailed portion. Yet the money remains available to the firm almost on call. Such balances are most suitable to a firm for enhancement of liquidity provided the firm has the policy of availing bank finance for its working capital requirements.

These firms maintain just enough balance in their current accounts and transfer the surplus immediately to the borrower accounts for saving interest thereon. In most such cases, even the routine transactions are carried out through the borrowal accounts, thus precluding the need for maintaining current accounts even.

Example No.6

MNO Ltd. has furnished the following cost data relating to the year ending of 31st March, 2018.

	₹ (in Lakhs)
Sales	450
Material consumed	150
Direct wages	30
Factory overheads (100% variable)	60
Office and Administrative overheads (100% variable)	60
Selling overheads	50

The company wants to make a forecast of working capital needed for the next year and anticipates that:

- Sales will go up by 100%,
- Selling expenses will be ₹ 150 lakhs,
- Stock holdings for the next year will be-Raw material for two and half months, Work-in-progress for one month, Finished goods for half month and Book debts for one and half months,
- Lags in payment will be of 3 months for creditors, 1 month for wages and half month for Factory, Office and Administrative and Selling overheads.

You are required to:

- (i) Prepare statement showing working capital requirements for next year, and
- (ii) Calculate maximum permissible bank finance as per Tandon Committee guidelines assuming that core current assets of the firm are estimated to be ₹ 30 lakhs.

Solution

Working:

Statement showing the projected Cost and Profitability for the year ending on 31-3-2019

	Year ending 31/3/2018 (₹ in lakhs)	Increase/ Decrease	Forecast for the next Year ending 31/3/2019 (₹ in lakhs)	Per month
Sales:	450	+100%	900	75
Direct Materials Consumed	150	+100%	300	25
Direct Wages	<u>30</u>	+100%	<u>60</u>	<u>5</u>
Prime Cost	180		360	30
+ Factory overheads	<u>60</u>	+100%	<u>120</u>	<u>10</u>
Works cost	240		480	40
+ Office & Administrative overheads	<u>60</u>	+100%	<u>120</u>	<u>10</u>
Cost of Production	300		600	50
+ Selling overheads	<u>50</u>	Increase	<u>150</u>	<u>12.50</u>
Total Cost	350		750	62.50
Profit	100		150	12.50

(i) Statement showing Working Capital Requirements of MNO Ltd. for the year 31-3-2019

	Amount (₹ in lakhs)
(A) Current Assets	
Raw Material	(25 x 2.5 month) 62.50
Work-in-Progress	
Raw Material	(25 x 1 month) 25.00
Direct Wages	(5 x 1 month) 5.00
Factory Overheads	(10 x 1 month) 10.00
Finished goods	(600 x 0.5/ 12) 25.00
Debtors	(900 x 1.5/12) 112.50
Total (A)	<u>240.00</u>

(B) Current Liabilities - Lags in payment:		
(i) Creditors	(300 x 3/12)	75.00
(ii) Wages	(60 x 1/12)	5.00
(iii) Factory overheads	(120 x 0.5/12)	5.00
(iv) Office & Administrative overheads	(120 x 0.5/12)	5.00
(v) Selling overhead	(150 x 0.5/12)	<u>6.25</u>
Total (B)		<u>96.25</u>
Networking capital (A-B)		<u>143.75</u>

Note: In the above answer while computing Work-in-Progress the degree of completion in respect of Labour and Overheads components have been assumed at 100%, which can be assumed otherwise also.

(ii) Maximum permissible Bank Finance (MPBF):

First Method	₹ in lakhs
Total current assets	240
(-) Current Liabilities	<u>96.25</u>
Working Capital gap	143.75
(-) 25% from long term sources (approx.)	<u>35.94</u>
	MPBF <u>107.81</u>
Second Method	
Total current assets	240
(-) 25% from long term sources	<u>60</u>
	180
(-) Current Liabilities	<u>96.25</u>
	MPBF <u>83.75</u>
Third Method	
Total current assets	240
(-) Core Current Assets	<u>30</u>
	210
(-) 25% from long term sources	<u>52.5</u>
	157.5
(-) Current Liabilities	<u>96.25</u>
	MPBF <u>61.25</u>

INVENTORY MANAGEMENT

Inventory Management is the second important segment of working capital management. Inventory is the second step in the operating cycle wherein cash is converted into various items of the inventory. Inventory has the following major components:

- (a) Raw Material
- (b) Work in Process
- (c) Finished Goods.

Inventories form a link between production and sale of a product. A manufacturing company must maintain a certain

amount of inventory during production, the inventory known as work in process (WIP). Although other types of inventory – namely, raw materials and finished goods – are not necessary in the strictest sense, they allow the company to be flexible. Raw materials inventory gives the firm flexibility in its purchasing. Finished goods inventory allows the firm flexibility in its production scheduling and in its marketing. Production does not need to be geared directly to sales. Large inventories also allow efficient servicing of customer demands. If a product is temporarily out of stock, present as well as future sales may be lost. Thus, there is an incentive to maintain large stocks of all three types of inventory.

Benefits versus Costs

The advantages of increased inventories are several. The firm can effect economies of production and purchasing and can fill orders more quickly. In short, the firm is more flexible. The obvious disadvantages are the total cost of holding the inventory, including storage and handling costs, and the required return on capital tied up in inventory. An additional disadvantage is the danger of obsolescence. Because of the benefits, however, the sales manager and production manager are biased toward relatively large inventories. Moreover, the purchasing manager often can achieve quantity discounts with large orders, and there may be a bias here as well. It falls on the financial manager to dampen the temptation for large inventories. This is done by forcing consideration of the cost of funds necessary to carry inventories as well as perhaps the handling and storage costs.

Inventories should be increased as long as the resulting savings exceed the total cost of estimates of holding the added inventory. The balance finally reached depends on the estimates of actual savings, the cost of carrying additional inventory, and the efficiency of inventory control. Obviously, this balance requires coordination of the production, marketing, and finance areas of the firm in keeping with an overall objective. Our purpose is to examine various principles of inventory control by which an appropriate balance might be achieved.

Extent and Quantum of Inventory Management

Let us take a look at the extent and quantum of inventory in real life examples taken up for consideration by us for working capital management.

(₹ in crores)

	Firm A		Firm B		Firm C	
	2018	2019	2018	2019	2018	2019
Total Current Assets	907.47	955.73	2,761.30	3610.78	674.64	1,623.21
Inventories	312.8	300.12	1182.10	1424.04	0	0
Sundry Debtors	247.63	216.50	264.51	424.78	375.22	395.61
Cash and Bank Balance	27.95	27.49	522.08	913.16	151.75	1,098.34
Other Current Assets	12.51	60.2	48.53	50.61	0	0
Loans and advances	306.29	351.42	744.08	798.19	147.68	129.26
Inventory as % of Total current assets	34.48	31.40	42.80	39.43	0	0

Firm A, being in the current manufacturing sector has over 30% of the current assets held in the form of inventories, while firm B, being in the FMCG manufacturing and trading sector has over 35% of the current assets in the inventory form. Firm C, in the software export segment has obviously zero inventory holding.

Strategy for Inventory Management

A successful strategy for inventory management has at its core the objective of holding the optimum level of inventory at the lowest cost.

The cost of holding inventory has the following three elements:

(i) Carrying Cost

This is the cost of keeping or maintaining the inventory in a usable condition. This includes the storage costs, i.e. the cost of storing the inventory in rented premises or the opportunity cost of storing in own premises + the wage cost of personnel assigned to storing and securing it + cost of utilities and insurance + cost of financing.

Inventory carrying cost is directly proportional to the level of inventory assuming that the loading of carrying cost is done pro rata to the space occupied. Thus if inventory level rises, its carrying cost also rises.

(ii) Ordering Cost

It is the cost associated with placing each individual order for supply of raw materials, stores, packing materials etc. If these items are procured in small lots, then the ordering cost per unit of inventory would be more and vice versa.

(iii) Stock-out Cost

It is the cost associated with procuring an inventory item, which has gone out of stock and is needed for immediate supply. This cost includes the reduction of profit and costs accruing due to disruption in the operating cycle.

How cost of inventory can be lowered:

Cost of inventory can be lowered by–

- Entering into long term arrangements for supply of raw materials at market driven prices.
- Arranging for direct supply of raw material at manufacturing locations.
- Promoting ex-factory sales of the finished goods.
- Availing quantity discounts and spot payment discounts if the carrying cost and financing cost is less than the discounts.
- Apart from these general steps, a technique called ABC analysis is also used for monitoring inventory costs.

Managing the Inventory Level

1. Economic Order Quantity (EOQ) Model

Inventory level can be managed by adopting the Economic Order Quantity (EOQ) model. This model determines the order size that will minimize the total inventory cost. According to this model, three parameters are fixed for each item of the inventory:

- (1) Minimum level of that inventory to be kept after accounting for usage rate of that item and time lag in procuring that item and contingences.
- (2) The level at which next order for the item must be placed to avoid possibility of a stock-out.
- (3) The quantity of the item for which the re-order must be placed.

In addition to the determination of above parameters, the EOQ model is based on the following assumptions:

- The total usage of that particular item for a given period is known with certainty and the usage rate is even throughout the period.
- There is no time gap between placing an order and receiving supply.
- The cost per order of an item is constant and the cost of carrying inventory is also fixed and is given as a percentage of the average value of inventory.
- There are only two costs associated with the inventory and these are the cost of ordering and the cost of carrying the inventory.

Given the above assumptions, the optimum or economic order quantity is represented as:

$$EOQ = \sqrt{\frac{2AO}{C}}$$

Where A = Total annual requirement for the item

O = Ordering cost per order of that item

C = Carrying cost per unit per annum.

2. ABC Analysis

This system is based on the assumption that in view of the scarcity of managerial time and efforts, more attention should be paid to those items which account for a larger chunk of the value of consumption rather than the quantity of consumption. Let us take an example of a firm having three major components of raw material:

Component	Units Consumed	% to total	Value per unit	Total Value (Lacs)	%
A	5000	45.45	1000	50.00	22.93
B	4000	36.36	1200	48.00	22.00
C	2000	18.18	6000	120.00	55.05
	11000	100.00	218.00	100.00	

Thus, the cost of raw material C which accounts for 55% of the total consumption value should be given priority over item A although the number of units consumed of the latter is much more than former.

Example No.8

(a) The following details are available in respect of a firm:

- | | |
|--|-----------------|
| (i) Annual requirement of inventory | 40,000 units |
| (ii) Cost per unit (other than carrying and ordering cost) | ₹ 16 |
| (iii) Carrying cost are likely to be | 15% per year |
| (iv) Cost of placing order | ₹ 480 per order |

Determine the economic order quantity.

(b) The experience of the firm being out of stock is summarised below:

(1) Stock out (No. of units)	No. of times (% Probability)
500	1 (1)
400	2 (2)
250	3 (3)
100	4 (4)
50	10 (10)
0	80 (80)

Figures in brackets indicate percentage of time the firm has been out of stock.

(2) Stock out costs are ₹ 40 per unit.

(3) Carrying cost of inventory per unit is ₹ 20

Determine the optimal level of stock out inventory.

(c) A firm has 5 different levels in its inventory. The relevant details are given. Suggest a breakdown of the items into A, B and C classifications:

Item No.	Avg. No. of units inventory	Avg. Cost per unit
1	20,000	₹ 60
2	10,000	₹ 100
3	32,000	₹ 11
4	28,000	₹ 10
5	60,000	₹ 3.40

Solution

(a) Carrying cost per unit per annum

= cost per unit x carrying cost % p.a.

= ₹ 16 x 0.15 = ₹ 2.40

Now from the formula for Economic Order Quantity (EOQ)

$$= \sqrt{\frac{2 \times \text{total consumption p.a.} \times \text{ordering cost per order}}{\text{Carrying cost per unit}}}$$

$$= \sqrt{\frac{2 \times 40,000 \times 480}{2.40}} = 4000 \text{ units}$$

Alternative working:

Ordering size (units)	1,000	2,000	2,500	4,000	5,000	8,000	10,000
No. of orders required	40	20	16	10	8	5	4
Average inventory (units)	500	1,000	1,250	2,000	2,500	4,000	5,000
Total carrying cost of Average inventory in ₹	1,200	2,400	3,000	4,800	6,000	9,600	12,000
Total ordering cost = No. of orders x Cost of placing each order	19,200	9,600	7,680	4,800	3,840	2,400	1,920
Total cost in ₹	20,400	12,000	10,680	9,600	9,840	12,000	13,920

Hence, least cost of ₹ 9,600 is at the ordering size of 4,000 units.

(b)

Safety stock level (units) (1)	Stock out (units) (2)	Stock out cost @ ₹ 40 per unit ₹ (3)	Probability of stock out (4)	Expected stock out at this level (5)	Total expected stock out cost (6)
500	0	0	0	0	0
400	100	4000	0.01	40	40
250	250	10,000	0.01	100	
	150	6000	0.02	120	260
100	400	16,000	0.01	160	
	300	12,000	0.02	240	
	150	6,000	0.03	180	840
50	450	18,000	0.01	180	
	350	14,000	0.02	280	
	200	8,000	0.03	240	
	50	2,000	0.04	80	1,620
0	500	20,000	0.01	200	
	400	16,000	0.02	320	
	250	10,000	0.03	300	
	100	4,000	0.04	160	
	50	2,000	0.10	200	2,800

Safety stock level (units)	Expected stock out costs	Carrying ₹ cost at ₹ 20 per unit	Total safety stock cost
0	2,800	0	2,800
50	1,620	1,000	2,620
100	840	2,000	2,840
250	260	5,000	5,260
400	40	8,000	8,040
500	0	10,000	10,000

Optimum safety stock where the total cost is the least is at 50 units level.

(c)

Item No.	Units	% of total Units	Unit cost ₹	Total cost ₹	% of total cost
1	20,000	13.3	60.00	12,00,000	39.5]
2	10,000	6.7	100.00	10,00,000	32.9] A

3	32,000	21.3	11.00	3,52,000	11.6]
4	28,000	18.7	10.00	2,80,000	9.2] B
5	<u>60,000</u>	<u>40.0</u>	<u>3.40</u>	<u>2,04,000</u>	<u>6.8] C</u>
	1,50,000	100.0		30,36,000	100.0

Item Nos. I and II being very valuable are to be controlled first though in quantity are hardly 20% of the total, hence can be classified as A. Next priority is for items 3 and 4, though quantity wise 40% to be classified as B and last priority item 5 though in quantity bulk but value is less hence to be classified as C.

Example No.9

A publishing house purchases 72,000 rims of a special type paper per annum at cost ₹ 90 per rim. Ordering cost per order is ₹ 500 and the carrying cost is 5 per cent per year of the inventory cost. Normal lead time is 20 days and safety stock is NIL. Assume 300 working days in a year:

You are required:

- (i) Calculate the Economic Order Quantity (E.O.Q).
- (ii) Calculate the Reorder Inventory Level.
- (iii) If a 1 per cent quantity discount is offered by the supplier for purchases in lots of 18,000 rims or more, should the publishing house accept the proposal?

Solution

(i) $EOQ = \sqrt{\frac{2AO}{C}}$

Where,

A = Annual consumption

O = Ordering cost per order

C = Stock carrying cost per unit per annum

$$= \sqrt{\frac{2 \times 72,000 \times 500}{5\% \text{ of Rs. } 90}}$$

$$= \sqrt{1,60,00,000}$$

$$= 4,000 \text{ Rims.}$$

- (ii) Re-order Level = Normal Lead Time ´ Normal Usage

$$= 20 \times 240$$

$$= 4,800 \text{ Rims.}$$

Note:

$$\text{Normal Usage} = \frac{\text{Annual usage}}{\text{Normal working days in a year}}$$

$$= \frac{72,000}{300} = 240 \text{ Rims.}$$

(iii) Evaluation of Quantity Discount Offer:

	EOQ	Discount Offer
Size of order	4,000 Rims	18,000 Rims
No. of orders in a year	18	4
Average inventory $\left(\frac{\text{Order size}}{2}\right)$	2,000 Rims	9,000 Rims
Cost:	₹	₹
Ordering Cost @ ₹ 500 per order	9,000	2,000
Inventory carrying cost		
At EOQ – $(4,000/2) \times ₹ 4.5$	9,000	-
At Discount offer – $(18,000/2) \times ₹ 4.455$	-	40,095
Purchases Cost		
At EOQ – $72,000 \times ₹ 90$	64,80,000	-
At discount offer – $72,000 \times ₹ 89.10$	_____	<u>64,15,200</u>
Total Cost	<u>64,98,000</u>	<u>64,57,295</u>

The total cost is less in case of quantity discount offer. Hence, quantity discount offer should be accepted.

RECEIVABLES MANAGEMENT

Receivables are near the terminating point of the operating cycle. When raw material has been converted into finished goods, the final product is sold by the firm. Some of the sales are done on spot basis while the remaining sales are made on credit. The extent of credit sales varies from industry to industry and within an industry. Period of credit depends upon the position of the firm in the industry. If the firm has a monopoly position, period of credit would be very low. If the industry consists of a large number of players in keen competition with each other, the period of credit would tend to be fairly long. Also, during periods of demand recession, even a firm in monopoly situation might be forced to extend credit in order to promote sales.

Receivables are generally referred to by the name of "Sundry Debtors" in the books of account, Strictly speaking, Sundry Debtors refer to receivables created in the course of operation of the working capital cycle, i.e. those persons which owe payment to the firm for goods supplied or services rendered. Thus sundry debtors represent an intermediate stage between reconversion of finished goods into cash. So long as the sundry debtors persist, the firm is strained of cash. So, logically the firm seeks to minimize the level of sundry debtors.

The period of credit allowed to debtors also depends upon the industry practice. This period of credit has two components. First component is a small period of week to ten days which is normally allowed in all industries and no interest is charged on the amount due. The second component is the larger one, length of which varies from industry to industry and interest is usually charged for this period. In the alternative, the firm may charge full invoice value for payment made after the credit period and allow discount for spot payments.

Apart from the Sundry Debtors, cash flow of the firm is also affected by Loans and Advances made to suppliers, subsidiaries and others. These advances are not exactly working capital advances but nevertheless these are treated as current assets because these are assumed to be recoverable or converted into inventory, fixed assets or investments within one year.

Credit policy can have a significant influence on sales. In theory, the firm should lower its quality standard for accounts accepted as long as the profitability of sales generated exceeds the added costs of the receivables. What are the costs of relaxing credit standards? Some arise from an enlarged credit department, the clerical work of

checking additional accounts, and servicing the added volume of receivables. We assume for now that these costs are deducted from the profitability of additional sales to give a net profitability figure for computational purpose. An other cost comes from the increased probability of bad-debt losses.

Illustration

To assess the profitability of a more liberal extension of credit, we must know the profitability of additional sales, the added demand for products arising from the relaxed credit standards, the increased slowness of the average collection period, and the required return on investment. Suppose a firm's product sells for ₹ 10 a unit, of which ₹8 represents variable costs before taxes, including credit department costs. The firm is operating at less than full capacity, and an increase in sales can be accommodated without any increase in fixed costs. Therefore, the contribution margin of an additional unit of sales is the selling price less variable costs involved in producing the unit, or $₹10 - ₹8 = ₹2$.

At present, annual credit sales are running at a level of ₹2.4 million, and there is no underlying trend in such sales. The firm may liberalize credit, which will result in an average collection experience of new customers of 2 months. Existing customers are not expected to alter their payment habits and continue to pay in 1 month. The relaxation in credit standards is expected to produce a 25 percent increase in sales, to ₹3 million annually. This ₹6,00,000 increase represents 60,000 additional units if we assume that the price per unit stays the same. Finally, assume that the opportunity cost of carrying additional receivables is 20 percent before taxes.

This information reduces our evaluation to a trade-off between the added profitability on the additional sales and the opportunity cost of the increased investment in receivables. The increased investment arises solely from new, slower paying customers; we have assumed existing customers continue to pay in 1 month. With the additional sales of ₹6,00,000 and receivable turnover of 6 times a year (12 months divided by the average collection period of 2 months), the additional receivable are $₹ 6,00,000 / 6 = ₹ 1,00,000$. For these additional receivables, the firm invests the variable costs tied up in them. For our example, ₹ .80 of every Re.1.00 in sales represents variable costs. Therefore, the added investment in receivables is $.80 \times ₹1,00,000 = ₹80,000$. In as much as the profitability on additional sales, ₹1,20,000, far exceeds the required return on the additional investment in receivables, ₹16,000, the firm would be well advised to relax its credit standards. An optimal credit policy would involve extending trade credit more liberally until the marginal profitability on additional sales equals the required return on the additional investment in receivables.

Now, we shall revert back to our sample firms and examine the level of Sundry Debtors and loans and Advances *vis-a-vis* the level of operations.

How do firms ensure realisations?

Timely realisation of receivables is an important element of working capital management. Practices in this respect vary from firm to firm. Most of the firms dissuade credit sales to first time customers and gradually allow credit after development of relationship. While giving credit, some firms obtain post dated cheques from their clients. In other cases, firms have special staff earmarked for recovery efforts. The key elements here are the opportunity cost of funds blocked in receivables and the net expenses of maintaining recovery infrastructure. Expenses of maintaining recovery infrastructure include the costs associated with recovering the amount from debtors. If the funds realised from receivables can yield better return than the interest recovered from debtors, then the firm would be better off by promoting cash sales.

Desirable Level of receivables

Considering the under given situation, let us find out whether there is a desirable level of receivables for a firm in relation to its turnover:

	A		B		C	
	2016	2017	2016	2017	2016	2017
1 Sundry Debtors	247.63	216.50	264.51	424.78	470.76	464.10
2 Loans and Advances	306.29	351.42	744.09	798.19	136.91	104.73
3 Sales/Services	3,031.76	3,322.44	10,603.79	10,971.90	1,381.91	1,882.61
4 (1) as % of (3)	8.17	6.52	2.49	3.87	34.08	24.65
5 (2) as % of (3)	10.10	10.57	7.02	7.27	9.91	5.56

Obviously firm B has adopted a tight and conservative policy towards debtors. It is recovering its receivables quickly. Similarly the outgo on loans and advances is not disproportionate as compared to sales. One reason for this is that the firm B has undertaken a qualitative analysis of loans and advances and has treated some of these as doubtful. Such doubtful advances, including loans and advances to subsidiary companies have been charged to the Profit and Loss Account as part of prudent accounting practice. Similar treatment has been accorded to sundry debtors as well.

In the case of firm C, the sundry debtors are a fairly high percentage of total sales and rightly so, because the firm has no inventory and most of the working capital is locked in receivables only. The loans and advances are, however at around 6-10% of sales.

It is difficult to prescribe a reasonable level for loans and advances for any firm because of the percentage of sundry debtors to sales varies widely among these firms. In case of firm A sundry debtors are between 6 to 8% of sales while loans and advances are around 10% of sales. The loans and advances consist of various types of deposits, pre payments and advances etc. Not all loans and advances are meant to be converted into cash. That is why loans and advances, although considered as current assets, are not treated part of the working capital. In fact some of the advances get converted into either capital expenditure or investments. For example advances for supply of capital goods would ultimately get shaped into fixed assets. Advances towards share application money or as loans to subsidiary are converted into investments. Similarly, pre-paid taxes & duties are ultimately treated as expenses. In the case of firm B, the sundry debtors are just around 3-4% of sales while loans and advances are around 7% of sales.

If a firm is buying raw material or traded goods on credit, then ideally the level of such creditors should be more than the level of debtors at any point of time. Benchmarking of the receivable level can also be done against historical industry trends. To guard against the receivables rising beyond tolerable levels, firms usually treat all advances and debts over six months old as doubtful cases and, if needed, charge such amounts to the profit and loss account.

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.

EVALUATION OF CREDIT POLICIES (FORMAT)

	Existing Policy	Option 1	Option 2	Option 3
A. Expected Profit:				
(a) Credit Sales	xxx	xxx	xxx	xxx
(b) Total Cost other than Bad Debts				
(i) Variable Costs	xxx	xxx	xxx	xxx
(ii) Fixed Costs	xxx	xxx	xxx	xxx
(c) Bad Debts	xxx	xxx	xxx	xxx
(d) Cash discount	xxx	xxx	xxx	xxx
(e) Expected Net Profit before Tax (a-b-c-d)	xxx	xxx	xxx	xxx
(f) Less: Tax	xxx	xxx	xxx	xxx
(g) Expected Profit after Tax	Xxx	xxx	xxx	xxx
B. Opportunity Cost of Investments in Receivables locked up in Collection Period	Xxx	xxx	xxx	xxx
Net Benefits (A – B)	xxx	xxx	xxx	xxx

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 $\frac{\text{Collection period (Days)} \times \text{Required Rate of Return}}{365 \text{ (or } 360) \times 100}$

Example No. 9

Ash Ltd. follows collection policy as detailed below :

- (i) 10% of the sales is collected in the same month
- (ii) 20% of the sales is collected in the 2nd month
- (iii) 40% of the sales is collected in the 3rd month
- (iv) 30% of the sales is collected in the 4th month.

Sales of the company for the first three quarters of the year are as follows :

Month of the Quarter	Quarter-I (in ₹)	Quarter-II (in ₹)	Quarter-III (in ₹)
1	15,000	7,500	22,500
2	15,000	15,000	15,000
3	15,000	22,500	7,500
Total	45,000	45,000	45,000
No. of working days	90	90	90

You are required to work out average age of receivables.

Solution: Calculation of Receivable at the end of 3rd month of quarter

Out of sale of Month	1	2	3	Balance at the end
1 100 –	(10% + 20% + 40%)			30%
2 100 –		(10% + 20%)		70%
3 100 –			(10%)	90%

Recoverable at the end of Q-I

Month	Amount Recoverable (₹)	Recovered (₹)	Balance (₹)	Balance Amount (₹)
1	15,000	70%	30%	4,500
2	15,000	30%	70%	10,500
3	15,000	10%	90%	13,500
	45,000			28,500

Average age of receivables = $28500/45000 \times 90 = 57$ days

Recoverables at the end of Q-II

Month	Amount Recoverable (₹)	Recovered (₹)	Balance (₹)	Balance Amount (₹)
1	7,500	70%	30%	2,250
2	15,000	30%	70%	10,500
3	22,500	10%	90%	20,250
	45,000			33,000

Average age of receivables = $33000/45000 \times 90 = 66$ days

Recoverables at the end of Q-III

Month	Amount Recoverable (₹)	Recovered (₹)	Balance (₹)	Balance Amount (₹)
1	22,500	70%	30%	6,750
2	15,000	30%	70%	10,500
3	7,500	10%	90%	6,750
	45,000			24,000

Average age of receivables = $24,000/45,000 \times 90 = 48$ days

Recovery speed is lowest in Q-II

Example No.10

XYZ Co. Ltd, manufacturer of electronic gadgets, has an annual sales of ₹ 50 lakh. It offers 30 days credit on sales. The fixed costs are ₹ 5 lakh and the variable costs are 80% of the sales.

The company is considering a change in its credit policy. Based upon its knowledge of market response, it has estimated likely sales figure against each of the proposed collection period as follows:

Policy	Collection period (days)	Projected sales (₹ lakhs)
A	45	56
B	60	60
C	75	62
D	90	63

If the expected rate of return is 20%, which policy should be adopted and why?

Solution:

Evaluation of credit policy

(₹ lakhs)

	Current policy	Policy A	Policy B	Policy C	Policy D
Credit period (days)	30	45	60	75	90
Projected sales	50	56	60	62	63
Less: variable cost @ 80%	(40)	(44.8)	(48)	(49.6)	(50.4)
Contribution	10	11.2	12	12.4	12.6
Less: Fixed cost	(5)	(5)	(5)	(5)	(5)
Net profit	5	6.2	7	7.4	7.6
Cost of sales (Variable cost + Fixed cost)	45	49.8	53	54.6	55.4
Investment in debtors Cost of sales × credit period/360 days	3.75	6.225	8.833	11.375	13.85
Net profit	5	6.2	7	7.4	7.6
Less: cost of funds in debtors balances @ 20%	(0.75)	(1.245)	(1.767)	(2.275)	(2.77)
Net return	4.25	4.955	5.233	5.125	4.83

Analysis: Since the net return is highest for credit policy B, it is suggested to extend the credit policy upto 60 days, to maximize the company's profitability.

Control of Bad debts

Control of bad-debts is an important part of controlling the working capital or the current assets of the company. Credit policy should be followed which may not lead to bad-debts and expedite collections. Periodical checks should be maintained by classifying debtors as outstandings from 0-30 days, 30-60 days, 60-90 days and 90 and over. Amount due for 60 days or more should be followed seriously and collected.

CASH MANAGEMENT

By cash management, we mean the management of cash in currency form, bank balances and readily marketable securities. Cash is the most important component of working capital of a firm. It is also the terminal conversion point for other constituents. Each firm holds cash to some extent at any point of time. Source of this cash may be the working capital operating cycle or capital inflows. Similarly the outflow of cash from the cash reservoir of a firm can be either to the operating cycle or for capital repayment.

The various forms of cash holding

Cash is considered to be the most liquid of current assets. It is held either as cash balances with the firms or in bank accounts. There are two ways of holding bank balances – first as current accounts through which the day to day transactions of the firm are carried out and secondly as fixed deposits in which balances are held for a specified twice period. Current account balances are most liquid. Fixed account balances are convertible into cash by adjustment downwards of the rate of interest even before maturity. Hence even fixed deposit balances should be treated at par as regards liquidity. But there is a catch here. Quite a few fixed deposits are not held *per se*, but as margin money deposits for availing the facilities like letters of credit and guarantee from banks. To the extent of such margin money deposits, the liquidity of bank balances of the firm is impaired.

Cash balances are also held as unavailed portion of the working capital facilities granted by the banks. All such balances earn money for the firm in terms of the interest that is saved on unavailed portion. Yet the money remains available to the firm almost on call. Such balances are most suitable to a firm for enhancement of liquidity provided the firm has the policy of availing bank finance for its working capital requirements.

These firms maintain just enough balance in their current accounts and transfer the surplus immediately to the borrower accounts for saving interest thereon. In most such cases, even the routine transactions are carried out through the borrowal accounts, thus precluding the need for maintaining current accounts even.

Motives for holding cash

At the basic level, a firm like individuals, has three motives for holding cash. These are as under:

- (a) Transactional motive
- (b) Speculative motive
- (c) Contingency motive

(a) Transactional Motive

This is the most essential motive for holding cash because cash is the medium through which all the transactions of the firm are carried out. Some examples of transactions of a manufacturing firm are given below:

- Purchase of Capital Goods like plant and machinery
- Purchase of raw material and components

- Payment of rent and wages
- Payment for utilities like water, power and telephone
- Payment for service like freight and courier

These transactions are paid for from the cash pool or cash reservoir which is all the time being supplemented by inflows. These inflows are of the following kinds:

- Capital inflows from promoters' capital and borrowed funds
- Sales proceeds of finished goods
- Capital gains from investments

The size of the cash pool depends upon the overall operations of the firm. Ideally, for transaction purposes, the working capital inflows should be more than the working capital outflows at any point of time. The non-working capital inflows should be utilized for similar outflows such as purchase of fixed assets together with the surplus of working capital inflows.

(b) Speculative Motive

Since cash is the most liquid current asset, it has the maximum potential of value addition to a firm's business. The value addition can come in two forms. First, as the originating and terminal point of the operating cycle, cash is invaluable. But cash has an opportunity cost also and if cash is kept idle, it becomes a liability rather than an asset. Therefore, efficient firms seek to deploy surplus cash in short term investments to get better returns. It is here that the second form of value addition from cash can be had. Since this deployment of cash needs to be done skillfully, not all the firms hold cash for speculative motive. Further, the amount of cash held for speculative motive should not cause any strain upon the operating cycle.

(c) Contingency Motive

This motive of holding cash takes into account the element of uncertainty associated with any form of business. The uncertainty can result in prolongation of the working capital operating cycle or even its disruption. It is possible that cost of raw materials or components might go up or the time taken for conversion of raw materials into finished goods might increase. For such contingencies, some amount of cash is kept by every firm.

Level of cash holding

The level of cash holding of a firm depends upon a number of factors. Prominent among these factors are the nature of the firms' business, the extent and reach of the business. The level of cash is measured as a percentage of turnover of the firm.

1. Nature of the business

If the firm is engaged in cash purchase of raw material from a number of sources, its requirement of cash would be more than that a firm which buys on credit. Also a firm having cash purchase and cash sale would need to maintain more cash balance than a firm which buys on credit and sells on credit. A firm buying in cash and selling on credit is likely to have strained cash flows. On the other hand, a firm buying on credit and selling in cash has comfortable cash balances.

2. Extent and reach of the business

A multi location firm having a number of large and small branches has more cash requirement than a single location firm. Also the problems associated with moving cash between the branches and maintaining liquidity are much more in a multi location firm.

For illustration, let us assume the amount of cash and bank balances maintained by the firm:

(₹ in crores)

	Firm A		Firm B		Firm C	
	2018	2019	2018	2019	2018	2019
Income	3,031.76	3,322.44	10,948.86	11,353.68	1,381.91	1,882.61
Cash and Bank Balances	27.95	27.49	522.08	913.16	315.21	1,089.34
Cash balance as Percentage of Income	0.92	.082	4.77	8.04	22.81	57.86

Firm A is a large cement manufacturer, Firm B is a FMCG giant and Firm C is a leading software company. Out of the above three Firms, Firm A has been holding the minimum quantum of cash and bank balances as percentage of total income while Firm C has the maximum quantum. On the face of it, the first impression that one is likely to get is that Firm A is the most efficient user of cash and bank balances while Firm C is the most inefficient user. But that would be a hasty conclusion. We have to move further and probe into the status of cash and bank balances *vis-à-vis* other current assets:

Current Assets incl. Loans and Advances	Firm A		Firm B		Firm C	
	2018	2019	2018	2019	2018	2019
Inventories	312.60	30.12	1182.10	1240.03	0	0
Sundry Debtors	247.63	216.50	264.51	424.78	375.22	395.61
Cash and Bank Balances	27.95	27.49	522.08	913.16	151.74	1098.34
Other Current Assets	12.81	6.02	48.53	50.61	0	0
Loans and Advances	306.29	351.42	744.09	798.19	147.68	129.26
Total Current Assets	907.48	901.55	2761.31	3426.77	674.64	1623.1
Cash & Bank Balance as % of Total current Assets	3.08	3.05	18.90	26.65	22.49	67.66

From the above table, we may note that Firm A holds just around 3% of its current assets as cash balances, i.e. its operating cycle has an extended and large span requiring conversion into Loans and Advances, Inventories, Sundry Debtors before re-conversion into cash. Firm B is engaged in manufacture and trading of consumer non-durables having a relatively shorter operating cycle. As such, holding of cash by this firm as a percentage of total current assets is larger. Firm C has 22.49% of the current assets in cash and bank balances in 2018 while the figure has gone up to 67.66% in 2019. The abnormal rise is due to the fact that out of the cash and bank balances of ₹ 1098.34 lacs represented unutilised proceeds of the capital issue made by the firm. Ignoring this figure, the cash and bank balances are ₹ 666.84 lacs, still 56.43% of the current assets. The implication of this is that the firm C, being in the services sector as a software exports, has a short operating cycle. The inventory holding is nil and current assets are generally held either as cash or receivables. So, the level of cash and bank balances viewed *per se*, is no indicator of the efficiency of cash management. We have to analyse the various components of cash holding to arrive at a more accurate conclusion.

Components of cash and bank balances

Cash and bank balances are held by the firms in three major forms, i.e. cash and cheques in hand, balances with banks and investment in liquid securities.

1. Cash and Cheques in hand

This is the most liquid and readily accessible component of cash. The cash is held to meet day-to-day payments

of small amounts. It is generated from counter cash receipts of the firm, if any, and from cash withdrawals from the bank. The volume of cash in hand maintained by the firm again depends upon the nature of operations of the firm. In case of major portion of the sales being in cash, firm is left with large amounts of cash at the end of the day which needs to be taken care of safely. This entails security and custody arrangements for the cash before it is deposited in the bank. Moreover, since receipt and payment of cash is a primary level transaction which is culminated with the handing over of the cash, special care is required while handling cash.

Cheques in hand are clubbed with cash in a categorization because a cheque is a secondary form of cash and is equivalent to holding cash. The care and precaution required for holding cheques is much less than required for cash because almost all the cheques are “account payee cheques” which can be credited to the account of the firm only. The cheques in hand need to be deposited carefully and expeditiously into the bank in order to get credit to the correct account well in time. Attention also needs to be paid to those cheques which are dishonoured at the time of presentation to the payee banks since the drawer of the cheques has to be contacted for obtaining rectified cheques.

2. Bank Balances

Bank balances represent the amount held with banks in savings, current or deposit accounts. In the case of firms, balances are not held in savings accounts. A firm has at least one main current account with a bank through which the transactions are carried out. All the excess cash is deposited into this account together with the cheques. Payments to employees, creditors and suppliers are made by way of cheques drawn on this account. Being a current account, no interest is payable to the firm on the balance maintained in this account. Therefore, the firm seeks to keep just sufficient balance in the current account for meeting immediate payment liabilities. After accounting for these liabilities, the surplus is transferred either to an interest bearing deposit account or invested in short term liquid instruments. In case the firm has borrowed funds for working capital, the surplus cash and cheques are credited to those accounts, thereby reducing the liability of the company.

William J. Baumal Model for Optimal Cash Balance Management

Cash management model of William J. Baumal assumes that the concerned company keeps all its cash on interest yielding deposits from which it withdraws as and when required. It also assumes that cash usage is linear over time. The amount of money is withdrawn from deposits in such a way that the cost of withdrawal is optimally balanced with those of interest foregone by holding cash. The model is almost same as economic stock order quantity model.

$$\text{Formula Economic lot size} = \sqrt{\frac{2 \times T b}{I}}$$

Where T= Projected cash requirement

b= Conversion cost per lot

I= Interest earned on marketable securities per annum.

Strategy for effective cash management

The strategy for effective cash management in any firm has a core component of ensuring uninterrupted supply of cash to the operating cycle. This cash is ideally generated from the cycle itself but under certain circumstances infusion of cash from outside the cycle also takes place. Examples of such circumstances are:

- (a) when the firm has been newly set up and the cycle has yet to commence;
- (b) when due to disruption in the cycle, cash gets stuck in other current assets and outside cash infusion in the form of promoters lenders' contribution is done.

Essential elements of a successful cash management strategy are:-

- Realistic cash forecasting
- Speeding up collections
- Spreading out payments

(1) Realistic cash forecasting

By realistic cash forecasting we mean that a cash forecast for the entire next year should be prepared at its commencement. The cash forecast has two parts—one is the forecast of cash flows from the operating cycle and the second part is the capital flows. The first part originates from the sales forecast for the year while the second part originates from the capital budget. The surplus of cash generated from the operating cycle is called the internal accruals of the firm and it is used to fund the capital outlays together with bank borrowings.

For a realistic cash forecast, the sales projections and capital budget have to be drawn up after extensive deliberations in the management committee of the firm. Such a forecast carries a cushion for normal contingences like sudden spurt or shrinkage in demand for which mid-term modifications in the forecast are made. Involvement of operational level people, both from production and sales areas, is essential for a realistic cash forecast.

(2) Speeding up Collections

After the cash forecast has been prepared, the firm should ensure that in day to day operations cash (including cheques) should be collected speedily. Towards this end, a schedule of receivables should be prepared and kept updated. Before due date of each payment, the debtor should be reminded for it. When the cheques are received on due dates, these should be credited to the bank account expeditiously. For a multi-locational firm, arrangements should be made with the bank for on-line transfer of funds to the main account. Similarly, facilities like drop boxes can be provided by firms having a large user base whereby customers can drop their payments in boxes placed at vantage locations.

(3) Spreading out Payments

Simultaneously with speeding up collection, the firm should spread out payments as far as possible. It means that if credit period is available in some payments, it should be utilized fully. Bunching of payments should be avoided. For outstation customers, arrangement can be made with the bank for making at par payment.

Example No.7

The annual cash requirement of A Ltd. is ₹ 10 Lakhs. The company has marketable securities in lot sizes of ₹ 50,000, ₹ 1,00,000, ₹ 2,00,000, ₹ 2,50,000 and ₹ 5,00,000. Cost of conversion of marketable securities per lot is ₹ 1,000. The company can earn 5% annual yield on its securities.

You are required to prepare a table indicating which lot size will have to be sold by the company.

Also show that the economic lot size can be obtained by the Baumal Model.

Solution

Table indicating lot size of securities

Total annual cash requirements = T = ₹ 10,00,000

Lot Size (₹) = C	50,000	1,00,000	2,00,000	2,50,000	5,00,000
Number of Lots (T/C)	20	10	5	4	2
Conversion Cost (₹) = (T/C) × b	20,000	10,000	5,000	4,000	2,000

b Where b = cost of conversion per lot.

Interest charges ₹ = $(C/2)I$	1,250	2,500	5,000	6,250	12,500
Total Cost ₹ =	21,250	12,500	10,000	10,250	14,500

Economic lot size is ₹ 2,00,000 at which total costs are minimum.

Optimal Cash Balance Management Model of William J. Baumal assumes that the concerned company keeps all its cash on interest yielding deposits from which it withdraws as and when required. It also assumes that cash usage is linear over time. The amount of money is withdrawn from deposits in such a way that the cost of withdrawal are optimally balanced with those of interest foregone by holding cash. The model is almost same as economic stock order quantity model.

$$\text{Formula Economic lot size} = \sqrt{\frac{2 \times Tb}{I}}$$

Where T = Projected cash requirement = ₹ 10,00,000

b = Conversion cost per lot = ₹ 1000

I = Interest earned on marketable securities per annum. = 5%

By substituting the figures in the formula

$$\begin{aligned} \text{Economic lot size} &= \sqrt{\frac{2 \times 10,00,000 \times 1000}{0.05}} \\ &= ₹ 2,00,000 \end{aligned}$$

FACTORING SERVICES

As the accounts receivable amount to the blocking of the firm's funds, the need for an outlet to impart these liquidity is obvious. Other than the lag between the date of sale and the date of receipt of dues, collection of receivables involves a cost of inconvenience associated with tapping every individual debtor. Thus, if the firm could contract out the collection of accounts receivable it would be saved from many things such as administration of sales ledger, collection of debt and the management of associated risk of bad-debts etc.

Factoring is a type of financial service which involves an outright sale of the receivables of a firm to a financial institution called the factor which specialises in the management of trade credit. Under a typical factoring arrangement, a factor collects the accounts on the due dates, effects payments to the firm on these dates (irrespective of whether the customers have paid or not) and also assumes the credit risks associated with the collection of the accounts. As such factoring is nothing but a substitute for in-house management of receivables. A factor not only enables a firm to get rid of the work involved in handling the credit and collection of receivables, but also in placing its sales *in effect* on cash basis.

Definition and functions – Factoring Services

Factoring is a financial **service** in which the business entity sells its Trade receivables/debtors to a third party at a discount in order to raise funds. The Bank/Financial institution purchasing the receivable is known as factor. Factoring may be with or without recourse. 'With a recourse' means that in the event of bad debts factor (Bank) can approach the 'supplier'.

Though the purchase of book debts is fundamental to the functioning of factoring, there are a number of functions associated with this unique financial services. A proper appreciation of these functions would enable one to distinguish it from the other sources of finance against receivables. They are:

- assumption of credit and collection function;

- credit protection;
- encashing of receivables;
- collateral functions such as:
 - (a) loans on inventory,
 - (b) loans on fixed assets, other security and on open credit,
 - (c) advisory services to clients.

Factoring vs. Accounts Receivable Loans

Accounts receivable loan is simply a loan secured by a firm's accounts receivable by way of hypothecation or assignment of such receivables with the power to collect the debts under a power of attorney. In case of factoring however, there is an outright sale of receivables. Thus, in case of the former, the bank may debit client's account for 'handling charges' if the debt turns out to be bad as against non-recourse factoring.

Factoring vs. Bill Discounting

Under a bill discounting arrangement, the drawer undertakes the responsibility of collecting the bills and remitting the proceeds to the financing agency, whereas under factoring agreement, the factor collects client's bills. Moreover, bill discounting is always with recourse whereas factoring can be either with recourse or without recourse. The finance house discounting bills does not offer any non-financial services unlike a factor which finances and manages the receivables of a client.

Mechanics of Factoring

Factoring offers a very flexible mode of cash generation against receivables. Once a line of credit is established, availability of cash is directly geared to sales so that as sales increase so does the availability of finance. The dynamics of factoring comprises of the sequence of events outlined in figure.

- (1) Seller (client) negotiates with the factor for establishing factoring relationship.
- (2) Seller requests credit check on buyer (client).
- (3) Factor checks credit credentials and approves buyer. For each approved buyer a credit limit and period of credit are fixed.
- (4) Seller sells goods to buyer.
- (5) Seller sends invoice to factor. The invoice is accounted in the buyers account in the factor's sales ledger.

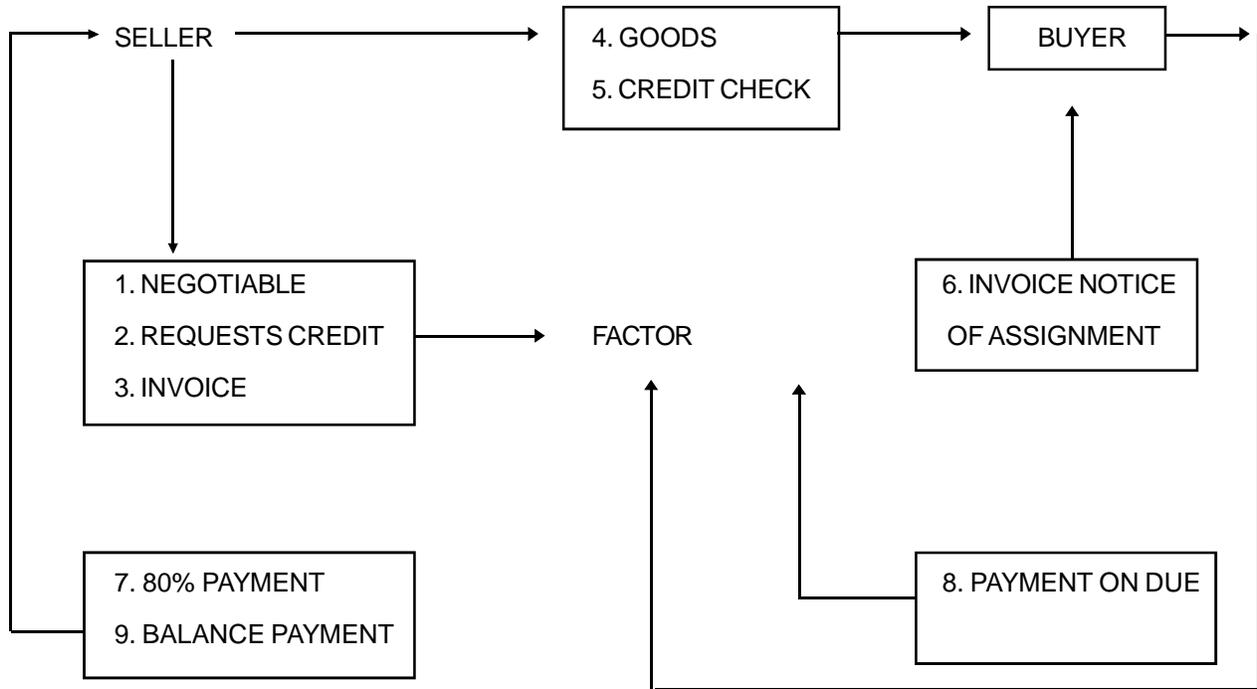


Figure: Mechanics of Factoring

Source: Ranjani Chari, 1991, *Factoring in India*, M.Phil, Dissertation, Delhi University

- (6) Factor sends copy of the invoice to buyer.
- (7) Factor advises the amount to which seller is entitled after retaining a margin, say 20%, the residual amount paid later.
- (8) On expiry of the agreed credit period, buyer makes payment of invoice to the factor.
- (9) Factor pays the residual amount to seller.

Types of Factoring: Factoring services may be rendered to cover domestic as well as international sales. The various services offered by factors for domestic sales are of six types whose essential characteristics are outlined in Table 1.

Table 1 : Types of Factoring Services

Type of Factoring	Type of Functions					
	Avail-ability of Finance bad debts	Pro-tection* against	Credit Advice	Sales Ledger Adminis-tration	Collec-tion	Disclo-sure Custo-mers
Full Source(Non-Recourse)	Yes	Yes	Yes	Yes	Yes	Yes
Recourse Factoring	Yes	¾	Yes	Yes	Yes	Yes
Agency Factoring	Yes	Possible	¾	No	No	Yes
Bulk Factoring	Yes	Possible	¾	No	No	Yes
Invoice** Discounting	Yes	Possible	No	No	No	No
Undisclosed Factoring	Yes	Possible	No	No	No	No

* Any form which includes this element may be referred to as 'non-recourse factoring'

** Also referred to as confidential or non-notification factoring.

Source: Ranjani Chari-opicit. P. 28.

Example No.11

- The turnover of Zenith Ltd. is ₹ 100 lakh of which 72% is on credit. Debtors are allowed one month to clear off the dues. A factoring company is willing to advance 80% of the bills raised on credit for a fee of 1% a month plus a commission of 5% on the total amount of debts. Zenith Ltd. as a result of this arrangement is likely to save ₹ 48,000 annually in management costs and avoid bad debts at 1% on the credit sales.
- A bank has come forward to make an advance equal to 80% of the debts at an annual interest rate of 15%. However, its processing fee will be at 1% on the debts. Would you accept factoring or the offer from the bank?

Solution:

Cost of Factoring

Annual Credit Sales	=	100 x 72%	=	₹ 72 Lakh
Monthly Credit Sales	=	72 Lakh / 12	=	₹ 6 Lakh
Fee [6,00,000 x 0.80]	=	4,80,000		
4,80,000 x 0.01			=	₹ 4,800
Commission [600000 x 0.05]			=	₹ 30,000
			=	₹ 34,800

Less : Savings in Cost:

Management Cost [48000/12]	₹ 4,000	
Savings in Bad Debts [₹ 600000 x 0.01]	<u>₹ 6,000</u>	<u>₹ 10,000</u>
Net Cost of Factoring [Per Month]		<u>₹ 24,800</u>

Cost of Bank Advance

Interest [₹ 600000 x 0.80 x 0.15 x 1/12]	₹ 6,000
Processing Fee [₹ 600000 x 0.01]	₹ 6,000
Bad Debts [₹ 600000 x 0.01]	₹ 6000
Management Cost	<u>₹ 4,000</u>
Net Cost (Per Month)	<u>₹ 22,000</u>

Since cost of Bank Finance is less than the cost of factoring, therefore, it is advisable to accept bank offer.

OTHER TECHNIQUES FOR CONTROL OF WORKING CAPITAL

Cash forecast technique can be used for control of funds flowing in and out of business to check surpluses and shortages. Daily, weekly, monthly, cash flow statements are used to regulate flow of funds and arrange for fund shortage and invest surplus cash.

1. Fund Flow Statement

Fund flow statements are used to find changes in assets over a period of time showing uses of funds and sources

of funds. Funds flow represent movement of all assets particularly of current assets because movement in fixed assets is expected to be small except at times of expansion or diversification.

2. Forfeiting Services

Forfeiting is a form of financing of receivables pertaining to international trade. It denotes the purchase of trade bills/promissory notes by a bank/financial institution without recourse to the seller. The purchase is in the form of discounting the documents covering entire risk of non-payment in collection. All risks and collection problems are fully the responsibility of the purchaser (forfeiter) who pays cash to seller after discounting the bills/notes. The salient features of forfeiting as a form of export relating financing are as under:

- (i) The exporter sells and delivers goods to the importer on deferred payment basis.
- (ii) The importer draws a series of promissory notes in favour of the exporter for payment including interest charge. Alternatively the exporter draws a series of bill which are accepted by the importer.
- (iii) The bills/notes are sent to the exporter. The promissory notes/bills are guaranteed by a bank which may not necessarily be the importer's bank. The guarantee by the bank is referred to as an Aval, defined as an endorsement by a bank guaranteeing payment by the importer.
- (iv) The exporter enters into a forfeiting agreement with a forfeiter which is usually a reputed bank. The exporter sells the availed notes/bills to the bank at a discount without recourse and receives the payment.
- (v) The forfeiter may hold these notes/bills till maturity for payment by the importers bank.

Forfeiting vs. Export Factoring

Forfeiting is similar to cross border factoring to the extent both have common features of non recourse and advance payment. But they differ in several important respects:

- (a) A forfeiter discounts the entire value of the note/bill but the factor finances between 75-85% and retains a factor reserve which is paid after maturity.
- (b) The availing bank which provides an unconditional and irrevocable guarantee is a critical element in the forfeiting arrangement whereas in a factoring deal, particularly non-recourse type, the export factor bases his credit decision on the credit standards of the exporter.
- (c) Forfeiting is a pure financing arrangement while factoring also includes ledger administration, collection and so on.
- (d) Factoring is essentially a short term financing deal. Forfeiting finances notes/bills arising out of deferred credit transaction spread over three to five years.
- (e) A factor does not guard against exchange rate fluctuations; a forfeiter charges a premium for such risk.

3. Ratio Analysis

Ratio Analysis is normally used for working capital control. The following ratios are commonly used:

1. Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$
2. Acid Test Ratio = $\frac{\text{Current Assets} - \text{Inventories}}{\text{Current Liabilities}}$
3. Inventory Turnover = $\frac{\text{Cost of goods sold}}{\text{Average Inventory}}$

$$4. \text{ Current Assets Turnover} = \frac{\text{Annual Sales}}{\text{Current Assets}}$$

$$5. \text{ Receivable Turnover} = \frac{\text{Sales}}{\text{Debtors}}$$

$$6. \text{ Debt-equity ratio} = \frac{\text{Total long term debts}}{\text{Shareholder funds}}$$

Besides above, for managing current assets, it is advisable to calculate the following ratios also:

1. Quantum of shareholders funds invested in current assets.
2. Quantum of shareholders funds and long-term debts invested in current assets.
3. Relationship between the shareholders and long term funds on one hand and the short term funds on the other pertaining to current assets.

CASE STUDIES

Exercise No. 1 : Calculate cash conversion period from the financial variables given hereunder:

(₹ in lakh)

	Year 2016-2017	Year 2017-18	Year 2018-19
Sales	7,936		
Cost of Goods sold	7,036		
Inventory		940	936
Bills Receivables		942	962
Bills Payable		608	606

Solution :

$$\text{Inventory conversion period:} \quad \frac{\{(940 + 936)/2\} \times 365}{7,036} = 48.7 \text{ days}$$

$$\text{B/R conversion period:} \quad \frac{\{942 + 962\} \times 365}{7,936} = 43.8 \text{ days}$$

$$\text{Payables conversion period:} \quad \frac{\{(608+606)/2\} \times 365}{7036} = 31.5 \text{ days}$$

$$\text{Cash conversion period:} \quad 48.7 + 43.8 - 31.5 = 61 \text{ days}$$

Exercise No. 2: Find the average conversion period with the help of the following data:

Gross operating cycle	88 days
Net operating cycle	65 days
Raw material storage period	45 days
Work-in-progress conversion period	4 days
Finished goods storage period	25 days

Solution :

Average conversion period : $88 - (45 + 4 + 25) = 14$ days

Exercise No. 3: Calculate the finished goods conversion period if:

	(₹ lakh)
Finished goods opening stock	525
Finished goods closing stock	850
Cost of production	8,000
Administrative expenses	2,250
Excise duty	3,000

Solution :

Average stock of finished goods : ₹ $(525 + 850)/2 = ₹ 687.5$ lakh

Cost of goods sold : ₹ $525 \text{ Lakh} + 8,000 \text{ Lakh} + 2,250 \text{ Lakh} + 3,000 \text{ Lakh} - 850 \text{ Lakh} = ₹ 12,925$ lakh

Daily average = $12,925/365 = ₹ 35.41$ lakh

Finished goods conversion period = $687.5/35.41 = 19.42$ days

Exercise No. 4 : Firm uses 1,100 units of a raw material per annum, the price of which is ₹ 1,500 per unit. The order cost per order is ₹ 150 and the carrying cost of the inventory is ₹ 200 per unit. Find the EOQ and the number of orders that are to be made during the year.

Solution :**Economic Order Quantity**

$$= \sqrt{\frac{2 \times \text{Annual Requirement} \times \text{Ordering Cost Per order}}{\text{Carrying Cost per unit per annum}}}$$

$$= \sqrt{\frac{2 \times 1100 \times 150}{200}}$$

$$= 41$$

No. of orders during the year = $1,100/41 = 26.8$ or 27

Exercise No. 5 : A factory uses 40,000 tonnes of raw material priced at ₹ 50 per tonne. The holding cost is ₹ 10 per tonne of inventory. The order cost is ₹ 200 per order. Find the EOQ. Will this EOQ be maintained if the supplier introduces 5% discount if the order lot is 2000 tonnes or more?

Solution :

$$\text{Economic Order Quantity} = \sqrt{\frac{2 \times \text{Annual Requirement} \times \text{Ordering Cost Per order}}{\text{Carrying Cost per unit per annum}}}$$

$$\text{EOQ Without discount} = \sqrt{\frac{2 \times 40,000 \times 200}{10}}$$

$$= 1265$$

No. of orders = $40,000/1265 = 31.62$

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$$\text{Order cost} = ₹ 200 \times 31.62 = 6325$$

$$\text{Carrying cost} = ₹ 10/2 \times 1265 = 6,325$$

$$\text{Total cost} = ₹ 6,325 + 6,325 = ₹ 12,650$$

EOQ with discount:

$$\text{No. of orders} = 40,000/2000 = 20$$

$$\text{Order cost} = ₹ 200 \times 20 = ₹ 4,000$$

$$\text{Carrying cost} = ₹ 10/2 \times 2,000 = ₹ 10,000$$

$$\text{Price discount} = 40000 \times 0.05 = ₹ 2,000$$

$$\text{Total cost} = 4,000 + 10,000 - 2,000 = ₹ 12,000$$

Since total cost without discount > total cost with discount, discount may be availed. In this case, there will be deviation from the EOQ.

Exercise No. 6 : Find out the average size of receivables if the goods are sold for ₹ 10,00,000 on a net 60 credit term with an assumption that 20% of the customers do not pay within the prescribed time. Will there be any change in the average size if the terms of credit change to 2/10 net 60 with an assumption that 60% of the customers avail the discount?

Solution**Case I:**

$$\text{Average collection period} = 60 + 0.20 \times 60 = 72 \text{ days}$$

$$\text{Average size of receivables} = ₹ (10,00,000/360) \times 72 = ₹ 2,00,000$$

Case II:

$$\text{Average collection period} = (0.6 \times 10) + 0.4 (60 + 0.2 \times 60)$$

$$= 6 + 28.8 = 35 \text{ days}$$

$$\text{Average size of receivables} = ₹ (10,00,000 / 360) \times 35 = ₹ 97,222.22$$

Exercise No. 7 : A firm sells 25,000 units at an average price of ₹ 200 per unit. The variable cost is 80 per cent of the sale price. The credit term is 1/10 net 30. One-tenth of the customers avail the discount and the average collection period is 28 days. Administrative cost is ₹ 20,000. Collection cost/sales and bad debt/sales ratios are 2% each. To increase the level of sales, credit term is changed as 2/10 net 30 as a result of which the sales are expected to be 50,000 units. The administrative cost, collection cost ratio and bad debt ratio are expected to be unchanged. The cost of funds is 10%. Tax rate is 30%. Find the net benefit of the changed credit terms.

Solution

Average size of receivables:

$$\text{Case I : } ₹ (50,00,000 / 360) \times 28 = ₹ 3,88,889$$

$$\text{Case II : } ₹ (1,00,00,000 / 360) \times 28 = ₹ 7,77,778$$

Financing cost:

$$\text{Case I: } ₹ 3,88,889 \times 0.10 = ₹ 38,889$$

$$\text{Case II: } ₹ 7,77,778 \times 0.10 = ₹ 77,778$$

Net Benefit:

Amount (₹)

	<i>Case I</i>	<i>Case II</i>
Revenue (sales)	50,00,000	1,00,00,000
Less variable cost	<u>(40,00,000)</u>	<u>(80,00,000)</u>
Net revenue	10,00,000	20,00,000
Less financing cost	(38,889)	(77,778)
Less administrative cost	(20,000)	(20,000)
Less collection cost	(1,00,000)	(2,00,000)
Less bad debt losses	<u>(1,00,000)</u>	<u>(2,00,000)</u>
Profit before tax	7,41,111	15,02,222
Less tax @ 30%	<u>(2,22,333)</u>	<u>(4,50,667)</u>
Net profit after tax	5,18,778	10,51,555

Net benefit of liberal term = ₹ 10,51,555 – 5,18,778 = ₹ 5,32,777

Exercise No. 8 : From the following information extracted from the books of a manufacturing company, compute the operating cycle in days and the amount of working capital required:

<i>Particulars</i>	<i>Amount in ₹</i>
Average Total of Debtors Outstanding	48,000
Raw Material Consumption	4,40,000
Total Production Cost	10,00,000
Total Cost of Sales	10,50,000
Sales for the year	16,00,000
Value of Average Stock maintained:	
Raw Material	32,000
Work-in-progress	35,000
Finished Goods	26,000
Period Covered in days	365
Average period of credit allowed by suppliers in days	16

Solution**Computation of Operating Cycle**(i) *Raw material held in stock:*

$$\begin{aligned} \text{Raw material Inventory holding period} &= \frac{\text{Average stocks of raw material held}}{\text{Average raw material consumption per day}} \\ &= \frac{32,000 \times 365}{4,40,000} = 27 \text{ days} \end{aligned}$$

Less: Average credit period granted by Suppliers = 16 days

Period for raw material holding = 11 days

$$(ii) \text{ Work in progres holding period} = \frac{\text{Average WIP Maintained}}{\text{Average cost of production per day}}$$

$$= \frac{35,000 \times 365}{10,00,000} = 13 \text{ days}$$

$$(iii) \text{ Finished goods holding period} = \frac{\text{Average Finished Goods Maintained}}{\text{Average cost of Goods sold}}$$

$$= \frac{26,000 \times 365}{10,50,000} = 9 \text{ days}$$

$$(iv) \text{ Credit period allowed to debtors} = \frac{\text{Average debtors outstanding}}{\text{Average credit sales per day}}$$

$$= \frac{48,000 \times 365}{16,00,000} = 11 \text{ days}$$

Total operating cycle period: (i) + (ii) + (iii) + (iv) = 44 days

Number of Operating cycles in a year = $365/44 = 8.30$

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

$$\text{Amount of Working Capital required} = \frac{10,50,000}{8.30} = ₹ 1,26,500 \text{ (approx)}$$

Exercise No. 9 : From the following information calculate;

- (1) Re-order level
- (2) Maximum level
- (3) Minimum level
- (4) Average level

Normal usage	: 100 units per week
Maximum usage	: 150 units per week
Minimum usage	: 50 units per week
Re-order quantity (EOQ)	: 500 units
Lag in time	: 5 to 7 weeks

Solution

- (1) Re-order Level

$$= \text{Maximum consumption} \times \text{Maximum Re-order period}$$

$$= 150 \times 7 = 1050 \text{ units}$$

- (2) Maximum Level

$$= \text{Re-order level} + \text{Re-order quantity} - (\text{Minimum consumption} \times \text{Minimum delivery period})$$

$$= 1050 + 500 - (50 \times 5) = 1300 \text{ units}$$

(3) Minimum Level

= Re-order level – (Normal consumption × Normal delivery period)

= 1050 – (100 × 6) = 450 units

(4) Average Level = $\frac{\text{Maximum Stock Level} + \text{Minimum Stock Level}}{2}$ Average Level = $\frac{1300 + 450}{2}$ = 875 units**Exercise No. 10**

A Ltd. has a total sales of ₹ 3.2 crores and its average collection period is 90 days. The past experience indicates that bad-debt losses are 1.5% on sales. The expenditure incurred by the firm in administering its receivable collection efforts are ₹ 5,00,000. A factor is prepared to buy the firm's receivables by charging 2% commission. The factor will pay advance on receivables to the firm at an interest rate of 18% p.a. after withholding 10% as reserve.

Calculate the effective cost of factoring to the Firm.

Answer

Average level of Receivables = 3,20,00,000 × 90/360	₹ 80,00,000
Factoring commission = 80,00,000 × 2/100	(1,60,000)
Factoring reserve = 80,00,000 × 10/100	<u>(8,00,000)</u>
	<u>70,40,000</u>

Factor will deduct his interest @ 18% :-

Interest = $\frac{₹ 70,40,000 \times 18 \times 90}{100 \times 360}$	= 3,16,800
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Advance to be paid = ₹ 70,40,000 – ₹ 3,16,800 = ₹ 67,23,200

Annual Cost of Factoring to the Firm:

Factoring commission (₹ 1,60,000 × 360/90)	₹ 6,40,000
Interest charges (₹ 3,16,800 × 360/90)	<u>12,67,200</u>
Total	<u>19,07,200</u>

Firm's Savings on taking Factoring Service:

Cost of credit administration saved	₹ 5,00,000
Cost of Bad Debts (₹ 3,20,00,000 × 1.5/100) avoided	<u>4,80,000</u>
Total	<u>9,80,000</u>
Net Cost to the firm (₹ 19,07,200 – ₹ 9,80,000)	<u>9,27,200</u>

Effective rate of interest to the firm = $\frac{₹ 9,27,200}{₹ 67,23,200}$	= 13.79%*
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Note: The number of days in a year have been assumed to be 360 days.

A Case Study on Working Capital Management

Background

Bajaj Auto Ltd is a flagship of Bajaj Group which is amongst the top 10 business houses in India. Bajaj Auto is the world's third-largest manufacturer of motorcycles and the second-largest in India. It is the world's largest three-wheeler manufacturer. Bajaj Auto came into existence on 29 November 1945 as M/s Bachraj Trading Corporation Private Limited. It started off by selling imported two- and three-wheelers in India. In 1959, it obtained a license to manufacture two-wheelers and three-wheelers and it became a public limited company in 1960. In 1970, it rolled out its 100,000th vehicle. In 1977, it sold 100,000 vehicles in a financial year. In 1985, it started producing at Waluj near Aurangabad. It was founded by Jamnalal Bajaj in Rajasthan in the 1930s. It is based in Pune, Mumbai, with plants in Chakan (Pune), Waluj (near Aurangabad) and Pantnagar in Uttarakhand. The oldest plant at Akurdi (Pune) now houses the R & D centre 'Ahead'. On 31 March 2013, its market capitalization was INR 520 billion (US\$9.57 billion), making it India's 23rd largest publicly traded company by market value.

With the launch of motorcycles in 1986, the company has changed its image from a scooter manufacturer to a two-wheeler manufacturer. According to the authors of *Globality: Competing with Everyone from Everywhere for Everything*, Bajaj has operations in 50 countries by creating a line of bikes targeted to the preferences of entry-level buyers. Bajaj Auto Ltd., incorporated in the year 2007, is a Large Cap company (having a market cap of Rs 58,491.2 Cr.) operating in Auto sector. Bajaj Auto Ltd. key Products/Revenue Segments include Automobile - Vehicles which contributed Rs 18800.53 Cr to Sales Value (88.85% of Total Sales), Auto Spare Parts (Trading) which contributed Rs 1659.97 Cr to Sales Value (7.84% of Total Sales), Export Incentives which contributed Rs 335.94 Cr to Sales Value (1.58% of Total Sales), Auto Spare Parts which contributed Rs 241.97 Cr to Sales Value (1.14% of Total Sales), Scrap which contributed Rs 54.82 Cr to Sales Value (0.25% of Total Sales), Royalty Income which contributed Rs 40.59 Cr to Sales Value (0.19% of Total Sales), Vehicles - Trading Items which contributed Rs 24.57 Cr to Sales Value (0.11% of Total Sales), Other Operating Revenue which contributed Rs 0.52 Cr to Sales Value (0.00% of Total Sales), for the year ending 31-Mar-2014. For the quarter ended 31-Dec-2014, the company has reported a Standalone sales of Rs. 5520.01 Cr., down -5.27% from last quarter Sales of Rs. 5826.85 Cr. and up 9.86% from last year same quarter Sales of Rs. 5024.76 Cr. Company has reported net profit after tax of Rs. 861.24 Cr. in latest quarter. Bajaj Auto with its strong brand image and other competency features maintained dominant position in India. Year on year the company increased production size and attained economies of scale.

Working Capital

Working Capital is that which is required to operate routine business activities. It reflects the liquidity position of the company. Working capital is excess of current assets over current liabilities. Current assets include cash, bank balance, marketable securities, inventories and receivables whereas current liabilities include creditors, bills payable and provisions. Working capital has great influence on profitability and solvency. As we increase the liquidity the profitability will be effected and if we decrease it the solvency will be effected.

Working Capital of Bajaj Auto Ltd. is given below:

Current Assets	Mar'2014	Mar'2013	Mar'2012	Mar'2011	Mar'2010
Inventories	639.72	636.28	678.53	547.28	446.21
Sundry Debtors	796.21	767.58	423.20	362.76	272.84
Cash and Bank Balance	495.48	558.86	446.49	155.45	100.20
Total Current Assets	1,931.41	1,962.72	1,548.22	1,065.49	819.25
Loans and Advances	2,116.46	1,987.44	1,744.82	3,891.66	2,291.29

Fixed Deposits	0.00	0.00	1,208.36	401.04	1.21
Total CA, Loans & Advances	4,047.87	3,950.16	4,501.40	5,358.19	3,111.75
Current Liabilities	3,108.15	2,762.93	2,925.53	2,624.35	2,218.06
Provisions	1,973.69	1,742.47	2,174.89	3,925.72	2,248.72
Total CL & Provisions	5,081.84	4,505.40	5,100.42	6,550.07	4,466.78
Net Current Assets	-1,033.97	-555.24	-599.02	-1,191.88	-1,355.03

On observing the working capital of Bajaj Auto Ltd. From Mar'2010 to 2014 it is evident that company had negative working capital throughout the period which means their current liabilities are more than their current assets. A large amount has been kept as provisions such as provision for gratuity, welfare schemes, warranties, taxes and proposed dividends etc. Current liabilities include dues to micro and small enterprises, current maturities of long term borrowing, annuity payable to employees opted for VRS, advance received from customers, unclaimed dividends, employees benefits and taxes. Credit period for 45 days is extended by suppliers or vendors and payments are released on timely basis so no liability towards interest payments. Company makes long term and short term investments in bonds, debentures, units of mutual funds, commercial papers and certificate of deposits.

Inventories include raw material, work in progress and finished goods.

Liquidity and Activity Ratios

Current Ratio	0.80	0.88	0.88	0.80	0.69
Quick Ratio	0.67	0.74	0.72	0.71	0.55
Inventory Turnover Ratio	31.50	31.43	30.97	32.80	28.87
Debtors Turnover Ratio	25.31	33.59	49.66	51.77	37.4
Receivable days	13.49	10.28	6.98	6.31	9.01
Inventory Days	11.01	11.36	10.93	10.46	11.82
Payable days	46.91	44.28	43.19	46.30	46.37

Current ratio shows the ratio of current assets to current liabilities, which is approximately 0.80 throughout the period whereas quick ratio excludes the inventories from current assets. Inventory turnover ratio shows that how many times inventory gets converted into cash. It is approximately 31 days and debtors turnover ratio is 25 days which is decreasing continuously from the previous years which means they are recovering their money early from the debtors, whereas the payable days are approx. 45. Company first sell the goods and later make payment of raw material which means they have greater payment period. They have improved their inventory management. Company place bulk order with its supplier on condition of extended credit. As a result they enjoy a significant gap in number of days between cash receipt from debtors and creditors payment.

Questions

Q1 Evaluate the working capital management at Bajaj Auto Ltd. How do they manage their working capital?

Q2 How long they would be able to survive with negative working capital and what for the provisions are made?

LESSON ROUND-UP

- Gross Working Capital is the total of all current assets. Networking capital is the difference between current assets and current liabilities.
- Permanent Working Capital is that amount of funds which is required to produce goods and services necessary to satisfy demand at its lowest point.
- Various factors such as nature of firm's activities, industrial health of the country, availability of material, ease or tightness of money markets affect the working capital.
- Factors which influence cash balance include credit position of the company, status of receivables and inventory accounts, nature of business enterprise and management's attitude towards risk.
- The amount of time needed for inventories to travel through the various process directly affect the amount of investment. The investment in inventories is guided by minimization of costs and management's ability to predict the forces that may cause disruption in the follow of inventories like strikes or shifts in demand for the product.
- Factors influencing investment in receivables are mainly the cost and time values of funds.
- The operating cycle is the length of time between the company's outlay on raw materials, wages and other expenditures and the inflow of cash from the sale of the goods.
- In deciding company's working capital policy, an important consideration is trade-off between profitability and risk.
- Working capital leverage may refer to the way in which a company's profitability is affected in part by its working capital management.
- Funds flow represent movement of all assets particularly of current assets because of movement in fixed assets is expected to be small except at times of expansion or diversification.
- Cash management means management of cash in currency form, bank balance and reality marketable securities.
- As John Maynard Keynes put, these are three possible motives for holding cash, such as transaction motive, precautionary motives and speculative motive.
- Inventory management has at its core the objective of holding the optimum level of inventory at the lowest cost.
- There are various technical tools used in inventory management such as ABC analysis, Economic Order Quantity (EOQ) and inventory turnover analysis.
- ABC analysis is based on paid to those item which account for a larger value of consumption rather than the quantity of consumption.
- EOQ determines the order size that will minimize the total inventory cost $EOQ = \sqrt{\frac{2AO}{C}}$
- Factoring is a type of financial service which involves an outright sale of the receivables of a firm to a financial institution called the factor which specializes in the management of trade credit.

TEST YOURSELF

(These are meant for re-capitulation only. Answers to these questions are not to be submitted for evaluation)

1. What do you understand by working capital? What are its components?
2. "Working Capital Management is nothing more than deciding about level, structure and financing of current assets". Comment.
3. How would you assess the working capital requirements for seasonal industry in which you have been appointed as Finance Manager? Illustrate your answer with the example.
4. What are the norms for working capital management to be observed in sick industries? How would you control the liquidity of resources to avoid sickness in industrial unit facing shortage of cash resources?
5. Write short note on banking norms and macro aspects of working capital management keeping in view the recommendations of the Tandon Committee and Chore Committee.
6. What is the significance of working capital for a firm?
7. Briefly describe main constituents of working capital?
8. Why does the operating cycle determine the extent of working capital?
9. Describe the principles of effective cash management.
10. What are the main components of inventory?
11. Write short notes on the following:
 - (i) Working Capital Leverage.
 - (ii) Financing of working capital.
 - (iii) Techniques for control of working capital.

Lesson 8

Security Analysis

LESSON OUTLINE

- Investment Analysis
- Differences between Investment, Speculation and Gambling
- Fundamental Analysis (Economic, Industry and Company)
- Technical Approach and Efficient Capital Market Theory
- Measuring of Systematic and Unsystematic Risk
- Return of the Security
- LESSON ROUND UP
- TEST YOURSELF

LEARNING OBJECTIVES

Security Analysis is very important aspect of financial management and is an essential function of a finance manager. Security analysis is about valuing the securities using publicly available information. Keeping this important aspect in view, this lesson on Security Analysis has been included in the syllabus. The object of the study is to enable the students to understand:

- Concept of Investment and Security Analysis
- Risks and its types
- Approaches to Valuation of a Security
- Fundamental Analysis
- Technical Analysis
- Efficient – Market Theory

“Security analysis does not assume that a past average will be repeated, but only that it supplies a rough index to what may be expected of the future. A lead, however, cannot be used as a rough index; it represents a definite prediction of either better or poorer results, and it must be either right or wrong.”

– Benjamin Graham

INTRODUCTION

“An Investment is the current commitment of money or other resources in the expectation of reaping future benefits.” (Zvi Bodie, 2016). Investment means to forego present consumption for the increased consumption resource available in the future. It can be in any form, assets of all type and kind be it jewellery, commodity, real estate etc. An investor can buy a share of a company in anticipation of getting good returns in future. In this section of the book, we are interested in the Financial Assets or securities like equity shares, bonds and debentures etc. At this point, reader should understand that the financial assets are different from real assets. While financial assets are the paper claim representing an indirect claim to real assets in form of debt or equity commitments, the real assets are land and building, machines, etc., which are used to produce goods and services. Therefore, a security is understood to be a debt or equity instrument issued by a firm in lieu of the funds raised by it to meet its long term and short term requirements. Among the many properties that distinguish real from financial assets are liquidity and marketability. These features make the financial assets more attractive for investors as they are able to liquidate their investments easily in ready and active markets.

The decision of the investor is confronted with many issues, like- in which asset class to invest; shares, bonds, bullion etc. The investor must decide the time horizon for which he/she needs to invest and balance the combination of his/her expected return to the risk they are ready to face. These are some of the issues which any investor will face. In this chapter we shall describe the term securities generally and discuss the prevalent options available in the Indian Securities market.

WHAT ARE SECURITIES

Securities may be defined as instruments issued by seekers of funds in the investment market to the providers of funds in lieu of funds.

These instruments *prima facie* provide evidence of ownership to the holder of the instrument. The owner is entitled to receive all the benefits due on the instrument and to retrieve his investment at the time of redemption. Securities can broadly be divided into two categories – Debt Securities and Equity Securities. However, Section 2(h) of Securities Contract (Regulation) Act, 1956, defines securities as under:

Securities include –

- (i) shares, scrips, stocks, bonds, debentures, debenture stock or other marketable securities of a like nature in or of any incorporated company or other body corporate.
 - (ia) derivative.
 - (ib) units or any other instrument issued by any collective investment scheme to the Investors in such schemes.
 - (ic) security receipt as defined in clause (zg) of Section 2 of the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002.
 - (id) units or any other such instrument issued to the investors under any mutual fund scheme.
- (ii) Government securities.
- (iia) such other instruments as may be declared by the Central Government to be securities and,
- (iii) rights or interests in securities.

INVESTMENT

Investment is the employment of funds on assets with the aim of earning income or capital appreciation. Investment has two attributes namely time and risk. Present consumption is sacrificed to get a return in the future. The

sacrifice that has to be borne is certain but the return in the future may be uncertain. This attribute of investment indicates the risk factor. The risk is undertaken with a view to reap some return from the investment.

The investor makes a comparison of the returns available from each avenue of investment, the element of risk involved in it and then makes the investment decision that he perceives to be the best having regard to the time frame of the investment and his own risk profile.

Any investment decision will be influenced by three objectives – security, liquidity and yield. A best investment decision will be one, which has the best possible compromise between these three objectives.

- Security
- Liquidity
- Yield

A best investment decision will be one, which has the best possible compromise between these three objectives. When selecting where to invest our funds, we have to analyze and manage following three objectives.

(i) Security: Central to any investment objective is the certainty in recovery of the principal. One can afford to lose the returns at any given point of time, but s/he can ill afford to lose the very principal itself. By identifying the importance of security, we will be able to identify and select the instrument that meets this criterion. For example, when compared with corporate bonds, we can vouch the safety of return of investment in treasury bonds as we have more faith in governments than in corporations. Hence, treasury bonds are highly secured instruments. The safest investments are usually found in the money market and include such securities as Treasury bills (T-bills), certificates of deposit (CD), commercial paper or bankers' acceptance slips; or in the fixed income (bond) market in the form of municipal and other government bonds, and in corporate bonds.

(ii) Liquidity : Because we may have to convert our investment back to cash or funds to meet our unexpected demands and needs, our investment should be highly liquid. They should be encashable at short notice, without loss and without any difficulty. If they cannot come to our rescue, we may have to borrow or raise funds externally at high cost and at unfavorable terms and conditions. Such liquidity can be possible only in the case of investment, which has always-ready market and willing buyers and sellers. Such instruments of investment are called highly liquid investment. Common stock is often considered the most liquid of investments, since it can usually be sold within a day or two of the decision to sell. Bonds can also be fairly marketable, but some bonds are highly illiquid, or nontradable, possessing a fixed term. Similarly, money market instruments may only be redeemable at the precise date at which the fixed term ends. If an investor seeks liquidity, money market assets and non-tradable bonds aren't likely to be held in his or her portfolio.

(iii) Yield: Yield is best described as the net return out of any investment. Hence given the level or kind of security and liquidity of the investment, the appropriate yield should encourage the investor to go for the investment. If the yield is low compared to the expectation of the investor, s/he may prefer to avoid such investment and keep the funds in the bank account or in worst case, in cash form in lockers. Hence yield is the attraction for any investment and normally deciding the right yield is the key to any investment.

INVESTMENT VS. SPECULATION

According to Benjamin Graham "An investment operation is one which, upon thorough analysis, promises safety of principal and an adequate return. Operations not meeting these requirements are speculative."

Thus investment differs from speculation. Speculation also involves deployment of funds but it is not backed by a conscious analysis of pros and cons. Mostly it is a spur of the moment activity that is promoted and supported by half-baked information and rumours. Speculative deployment of funds is generally prevalent in the secondary equity market. What attracts people to speculation is a rate of return that is abnormally higher than the prevailing market rates. The balancing of risk and return nevertheless operates in speculative activity also and as such the risk

element in speculation is very high. Very broadly, the characteristics of an investor differ from the speculator as follows:

<i>BASIS FOR COMPARISON</i>	<i>INVESTMENT</i>	<i>SPECULATION</i>
Meaning	The purchase of an asset with the hope of getting returns is called investment.	Speculation is an act of conducting a risky financial transaction, in the hope of substantial profit.
Basis for decision	Fundamental factors, i.e. performance of the company.	Hearsay, technical charts and market psychology.
Time horizon	Long term	Short term
Risk involved	Moderate risk	High risk
Intent to profit	Changes in value	Changes in prices
Expected rate of return	Modest rate of return	High rate of return
Funds	An investor uses his own funds.	A speculator uses borrowed funds.
Income	Stable	Uncertain and Erratic
Behavior of participants	Conservative and Cautious	Daring and Careless

INVESTMENT VS. GAMBLING

Investment differs from gambling and betting also. Both gambling and betting are games of chance in which return is dependent upon a particular event happening. Here also, there is no place for research-based activity. The returns in gambling are high and known to the parties in advance. Gambling is different from Investment in the following respects:

<i>BASIC FOR COMPARISON</i>	<i>INVESTMENT</i>	<i>GAMBLING</i>
PlanningHorizon	Longer Planning Horizon	Short Planning Horizon
Basis for Decisions	Scientific Analysis of Intrinsic worth of the security	Based on tips and rumors
Nature	Planned activity	Unplanned activity
Risk	Commercial Risk	Artificial Risk
Return Expectation	Risk-return trade-off determines return	Negative returns are expected
Motive	Safety of principal and stability of returns	Entertainment while earning

To say that investors like return and dislike risk is, however, simplistic. To facilitate our job of analyzing securities and portfolios within a risk return context, we must begin with a clear understanding of what risk and return are, what creates them and how they should be measured.

SECURITY ANALYSIS

Security analysis is the first part of investment decision process involving the valuation and analysis of individual securities. Security Analysis is primarily concerned with the analysis of a security with a view to determine the value of the security, so that appropriate decisions may be made based on such valuation as compared with the value placed on the security in the market.

Two basic approaches of security analysis are fundamental analysis and technical analysis.

Fundamental Analysis can be segregated into economic analysis, industry analysis and company analysis

Fundamental analysis is a three level systematic process that analyse the overall external and internal environment of the company before placing a value on its shares. The three levels at which the analysis is carried out are the following:

- (a) Analysis of the economy
- (b) Industry Level Analysis
- (c) Company Analysis

We shall describe the analytical process at all these levels in details hereunder:

Analysis of the economy

Performance of a company is intimately related to the overall economic environment of the country because demand for products and services of the company would under normal circumstances be directly related to growth of the country's economy. If the country has an improving GDP growth rate, controlled inflation and increasing investment activity then chances are that the valuation of securities shall be liberal. The capital market is said to be in a bullish phase with share values shooting up across the board. As the economy is growing, the analyst expects almost every industry to do well.

On the other hand, if the GDP growth rate slackens, inflation is out of control and investment activity is stagnant or declining, the investor or the analyst will expect the performance of industries to slow down. Under such circumstances, valuation of securities tends to be conservative. The capital market enters a bearish phase and share values decline across to board.

Industry Level Analysis

Industry level analysis focuses on a particular industry rather than on the broader economy. In this analysis, the analyst has to look for the composition of the industry, its criticality vis-à-vis the national economy, its position along the industrial life cycle, entry and exit barriers. All these factors have a bearing upon the performance of the company.

Industry is a combination or group of units whose end products and services are similar. Having a common market, the participants in the industry group face similar problems and opportunities. To the extent that an industry loses or gains from certain happenings, the performance of the participants is sure to be similarly impacted. These happenings may be technological changes, shifts in consumer preferences, availability of substitutes etc. These changes also drive the life cycle of the industry.

The industry life cycle or the industry growth cycle can be divided into three major stages-pioneering stage, expansion stage and stagnation stage. The pioneering stage is related to sunrise status of the industry. It is the stage when technological development takes places. The products have been newly introduced in the market and they gain ready acceptance. The pioneering units in the industry make extraordinary profits and thus attract competition. As competition increases profitability in the industry comes under strain and less efficient firms are forced out of the market. At the end of the pioneering stage, selected leading companies remain in the industry.

In the expansion stage of the growth cycle the demand for the products increases but at a lower rate. There is less volatility in prices and production. Capital is easily available in plenty for these units. Due to retention of profits, internal accruals increase.

At the stagnation stage, the growth rate initially slows down, then stagnates and ultimately turns negative. There is no product innovation. External capital is hard to come by. Even the internal capital takes flight. This stage of the industry is most valuable during times of slow down in national economy.

Company Analysis

Armed with the economic and industry forecasts, the analyst looks at the company specific information. Company information is generated internally and externally. The principle source of internal information about a company is its financial statements. Quarterly and annual reports including the income statement, the balance sheet and cash flows must be screened to assure that the statements are correct, complete, consistent, and comparable. Many popular and widely circulated sources of information about the companies emanate from outside, or external sources. These sources provide supplements to company-generated information by overcoming some of its bias, such as public pronouncements by its officers. External information sources also provide certain kinds of information not found in the materials made available by companies themselves. There are traditional and modern techniques of company analysis.

Among the traditional techniques are forecasting expected dividends and earnings using price-earning ratios which help us to determine whether a stock is fairly valued at a point in time. Such approaches allow us to evaluate an equity share for a short term horizon. Moreover, an approach combining the dividend discount model (with variable growth rates) and the concept of systematic risk can also be helpful in evaluating a stock for a longer term holding period. Among the modern methods are regression analysis, and the related tools of trend and correlation analysis, decision tree analysis and simulation. Modern methods have strengths of the traditional methods while attempting to overcome their shortcomings.

Fundamental Analysis Tools: Although the raw data of the Financial Statement has some useful information, much more can be understood about the value of a stock by applying a variety of tools to the financial data.

1. Earnings per Share – EPS
2. Price to Earnings Ratio – P/E
3. Projected Earnings Growth – PEG
4. Price to Sales – P/S
5. Price to Book – P/B
6. Dividend Yield
7. Dividend Payout Ratio
8. Book value per share
9. Return on Equity

TECHNICAL ANALYSIS

In the fundamental analysis, share prices are predicted on the basis of a three stage analysis. After the analysis has been completed, the deciding factors that emerge are the financial performance indicators like earnings and dividends of the company. The fundamentalist makes a judgement of the equity share value with a risk return framework based upon the earning power and the economic environment. However, in actual practice, it often happens that a share having sound fundamentals refuses to rise in value and vice versa. We would now examine an alternative approach to predict share price behavior. This approach is called the Technical Analysis. It is used in conjunction with fundamental analysis and not as its substitute.

Technical analysis is an analysis for forecasting the direction of prices through the study of past market data, primarily price and volume. This Technique assumes market prices of securities are determined by the demand-supply equilibrium. The shifts in this equilibrium give rise to certain patterns of price and volume of trading which have a tendency to repeat themselves over a period of time. An analyst who is familiar with these patterns can predict the future behaviour of stock prices by noticing the formation of these patterns. These predictions are indicative and do not provide irrefutable declarations about future trends. In this type of analysis, no weightage is given to intangible items like investors' attitude, market sentiment, optimism, pessimism etc.

Technical analysis is based on the following assumptions:

- The inter-play of demand and supply determines the market value of shares.
- Supply and demand are governed by various factors – both rational and irrational.
- Stock values tend to move in trends that persist for a reasonable time.
- These trends change as a result of change in demand-supply equilibrium.
- Shifts in demand and supply can be detected in charts of market action.
- Chart patterns tend to repeat themselves and this repetition can be used to forecast future price movements.
- Markets behave in a random style.
- Markets discount every future event that has a bearing upon share values.

DOW JONES THEORY

It is one of the earliest theories of technical analysis. The theory was formulated by Charles H. Dow of Dow Jones & Co. who was the first editor of Wall street Journal of USA. According to this theory, share prices demonstrate a pattern over four to five years.

These patterns can be divided into three distinct cyclical trends- primary, secondary or intermediate and minor trends.

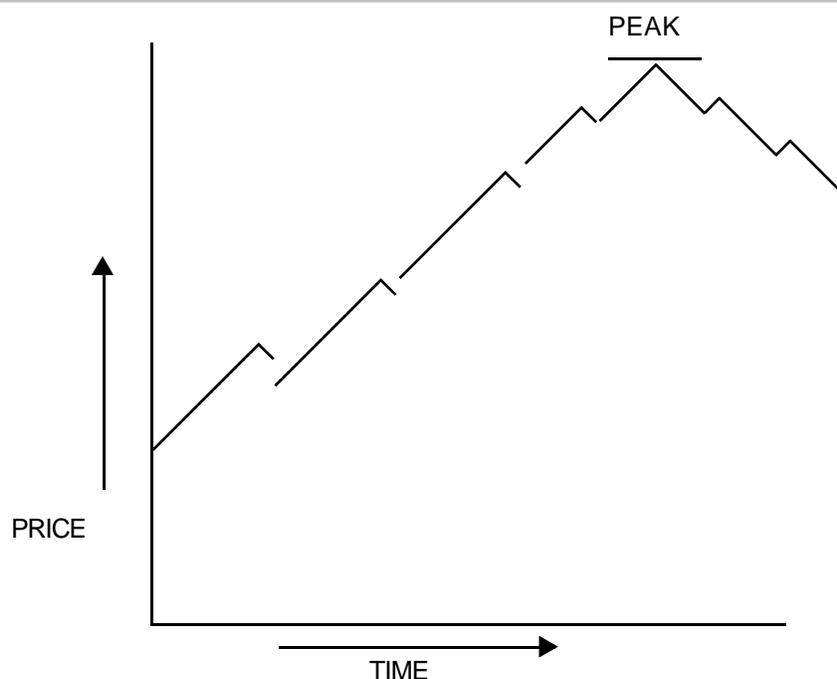
Primary Trends

The primary trend lasts from one to three years. Over this period, the markets exhibit definite upward or downward movement which is punctuated by shorter spans of trend reversal in the opposite directions. The trend reversal is called the secondary trend. Primary trend is indicative of the overall pattern of movement.

In Dow theory, the primary trend is the major trend of the market, which makes it the most important one to determine. This is because the overriding trend is the one that affects the movements in stock prices. The primary trend will also impact the secondary and minor trends within the market.

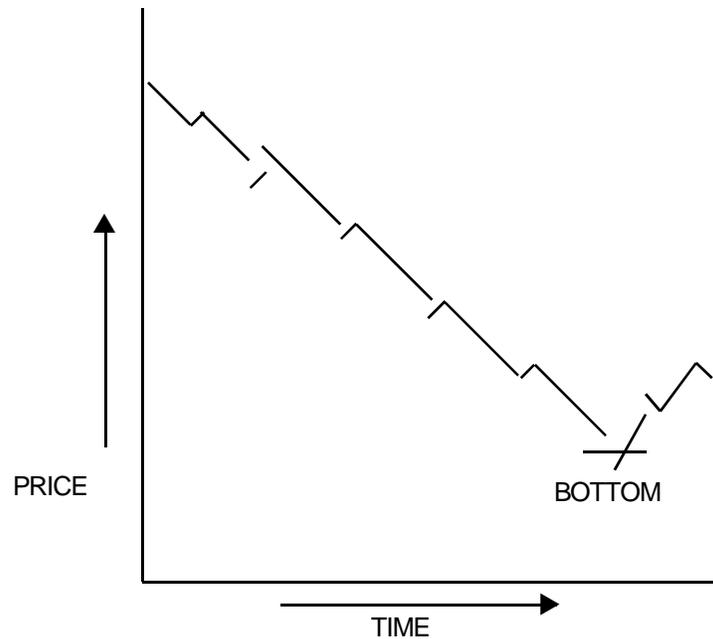
If the primary trend is upward, it is called a bullish phase of the market. If the primary trend is downwards, it is called a bearish phase. Illustrations of bullish phase and bearish phase are given below:

Graph of Bullish Phase



In a bullish phase, after each peak, there is a fall but the subsequent rise is higher than the previous one. The prices reach higher level with each rise. After the peak has been reached, the primary trend now turns to a bearish phase.

Graph of a Bearish Phase



In a bearish phase, the overall trend is that of decline in share values. After each fall, there is slight rise but the subsequent fall is even sharper.

Secondary Trends

In Dow theory, a primary trend is the main direction in which the market is moving. Conversely, a secondary trend moves in the opposite direction of the primary trend, or as a correction to the primary trend.

For example, an upward primary trend will be composed of secondary downward trends. This is the movement from a consecutively higher high to a consecutively lower high. In a primary downward trend the secondary trend will be an upward move, or a rally. This is the movement from a consecutively lower low to a consecutively higher low.

In general, a secondary, or intermediate, trend typically lasts between three weeks and three months, while the retracement of the secondary trend generally ranges between one-third to two-thirds of the primary trend's movement.

Minor Trend

The last of the three trend types in Dow theory is the minor trend, which is defined as a market movement lasting less than three weeks. Minor trends are changes occurring every day within a narrow range. These trends are not decisive of any major movement. The minor trend is generally the corrective moves within a secondary move, or those moves that go against the direction of the secondary trend.

TOOLS OF TECHNICAL ANALYSIS

The two variables concerning groups of securities or individual securities that technicians watch are the behavior of prices and volume of trading contributing to and influenced by changing prices. Technical analysts use two major types of tools for their analysis. These are the charts and the price indicators.

1. TECHNICAL CHARTS

These are the plottings of prices and trading volumes on charts. The purpose of reading and analysing these charts is to determine the demand-supply equation at various levels and thus to predict the direction and extent of future movement of the prices. The charts are not infallible but because of their repeated accuracy, they have come to be accepted. In all the charts, a correlation exists between market price action and the volume of trading when the price increase is accompanied by a surge in trading volumes, it is a sure sign of strength. On the other hand, when the decline in share prices is accompanied by increased volumes, it is indicative of beginning of bearish trend.

There are four ways to construct a chart. These are Line Chart, Bar Chart, Candle Stick Chart and Point & Figure Chart.

Line Chart

A Line chart is a style of chart that is created by connecting a series of data points together with a line. This is the most basic type of chart used in finance and it is generally created by connecting a series of past prices together with a line. Line charts are the most basic type of chart because it represents only the closing prices over a set period. The line is formed by connecting the closing prices for each period over the timeframe and the intra-period highs and lows of stock prices are ignored. This type of chart is useful for making broad analysis over a longer period of time.



Line Chart Example – Source: StockCharts.com

Bar Chart

Bar charts expand upon the line chart by adding the open, high, low, and close – or the daily price range, in other words – to the mix. The chart is made up of a series of vertical lines that represent the price range for a given period with a horizontal dash on each side that represents the open and closing prices. The opening price is the horizontal dash on the left side of the horizontal line and the closing price is located on the right side of the line. If the opening price is lower than the closing price, the line is often shaded black to represent a rising period. The opposite is true for a falling period, which is represented by a red shade.



Bar Chart Example – Source: StockCharts.com

Candlestick Charts

Like a bar chart, candlestick charts have a thin vertical line showing the price range for a given period that is shaded different colors based on whether the stock ended higher or lower. The difference is a wider bar or rectangle that represents the difference between the opening and closing prices.

Falling periods will typically have a red or black candlestick body, while rising periods will have a white or clear candlestick body. Days where the open and closing prices are the same will not have any wide body or rectangle at all.



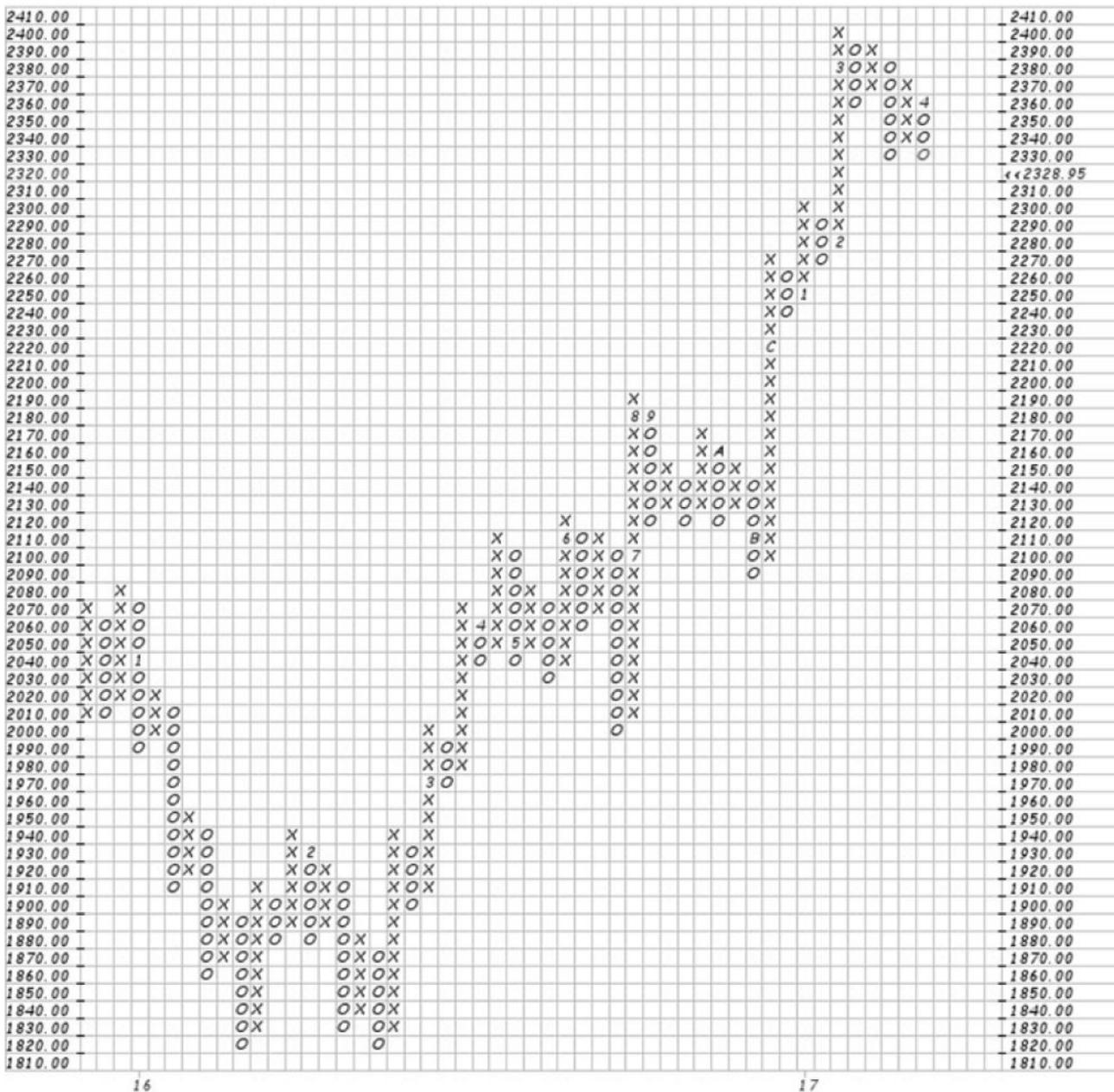
Candlestick Example – Source: StockCharts.com

Point and Figure Charts

In this type of charts, emphasis is laid on charting price changes only and time and volume elements are ignored. The first step in drawing a figure and point chart is to put a X in the appropriate price column of a graph. Successive price increases are added vertically upwards in the same column as long as the uptrend continues. Once the price drops, the figures are moved to another column and Os are entered in downward series till the downward trend is reversed.

\$SPX S&P 500 Large Cap Index INDX
 13-Apr-2017, 16:00 ET, daily, O: 2,341.98, H: 2,348.26, L: 2,328.95, C: 2,328.95, V: 1765447936, Chg: -15.98 (-0.68%)
 No recent chart pattern found
 Scaling: Traditional [Reversal: 3]

(c) StockCharts.com



Point and Figure Chare Example – Source: StockCharts.com

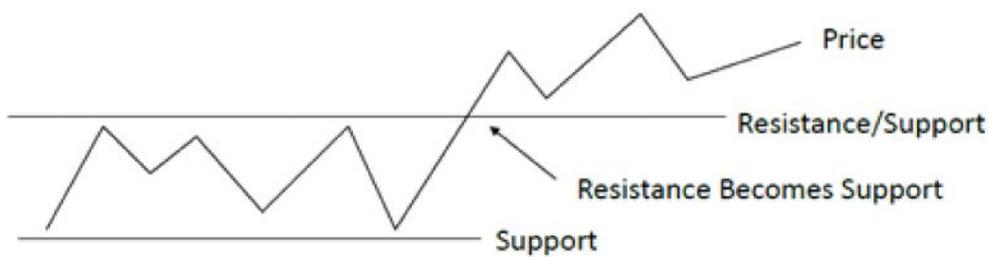
Patterns created by charts

Once the charts have been constructed, analysts seek to locate certain indicators/patterns in the charts. The common patterns are being described below:

1. Support and resistance levels

A support level indicates the bottom which the share values are unable to pierce. After rising time and again, the share price dips to a particular level and then starts rising again. At this level, the share gets buying support. A resistance level is that level after which the share price refuses to move up in repeated efforts. At this level, selling emerges. Support and resistance levels are valid for a particular time period. Once these levels are breached, beginning of a new bull or bear phase is signaled.

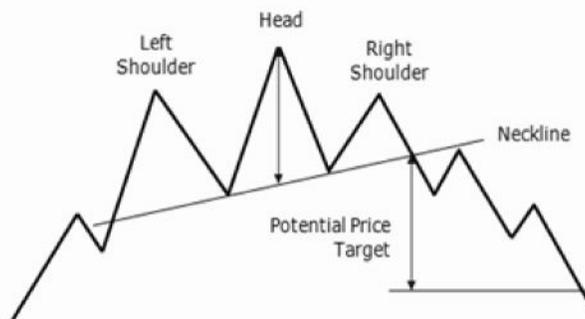
Support and Resistance



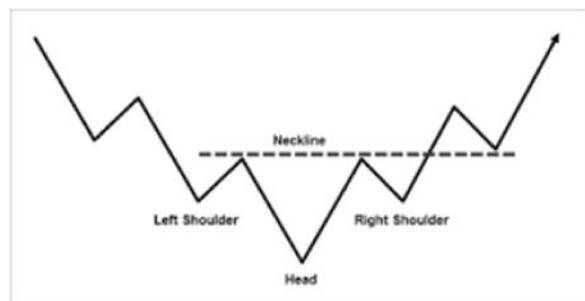
2. Heads and Shoulders configuration

In this type of chart configuration, a formation similar to heads and shoulders is created wherein the neckline acts as the resistance or support line. As the head and shoulder top is formed, a resistance level appears at the top of the head. The volumes start declining near the head top and reversal sets in. The volumes become heavy again and shrink near the neckline where another reversal of trend begins.

Head and Shoulders Top (HST) Pattern

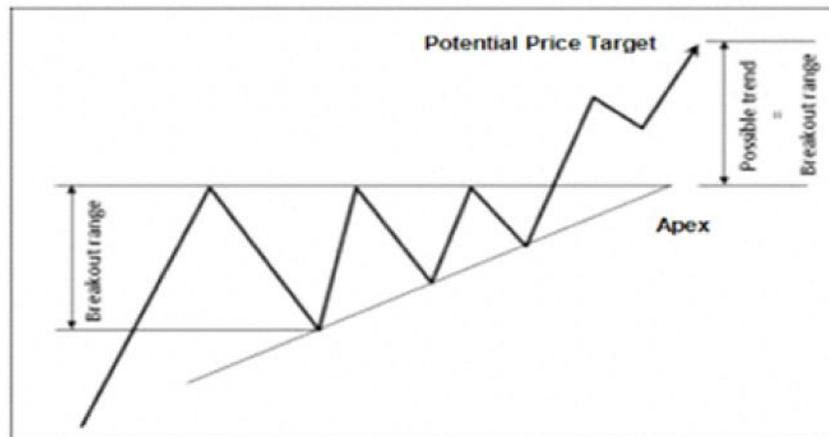


Inverse Head and Shoulder Top (IHST) Pattern



3. Triangle or coil formation

This pattern represents a pattern of uncertainty. Hence it is difficult to predict which way the price will break out.

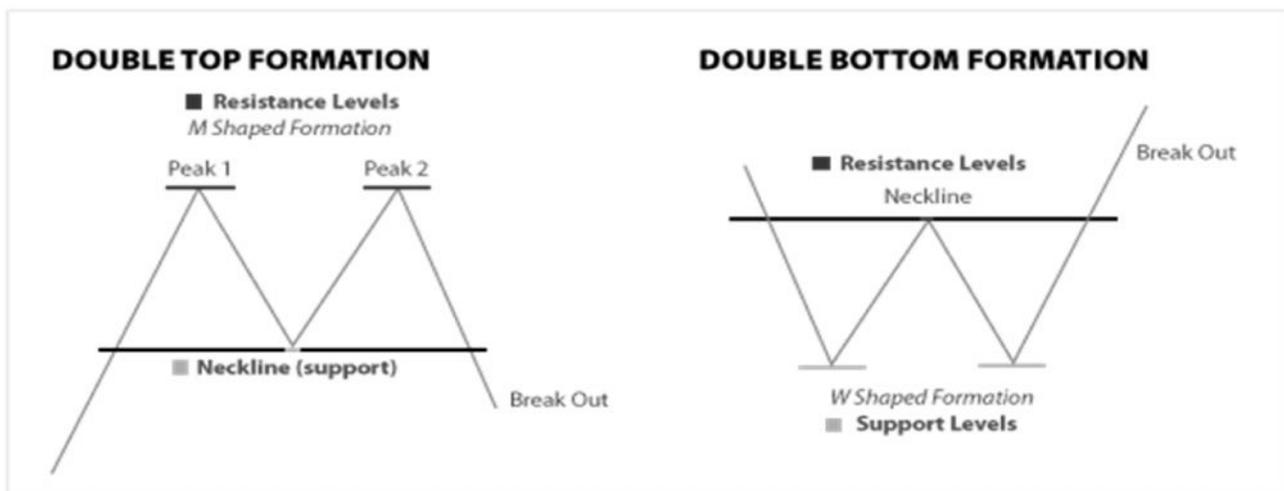


4. Double Top Formation

It represents a bearish development, signaling that the price is expected to fall.

5. Double bottom formation

It represents a bullish development, signaling that the price is expected to rise.



Limitations of charts

Interpretation of charts is prone to subjective analysis. This factor is a major cause of often contradictory analysis being derived from the same charts. Also the changes in charts are quite frequent in the short term perspective leading to a host of buy and sell recommendations which are not in the best interest of the investor. Another disadvantage is that decisions are made on the basis of chart alone and other factors are ignored.

2. TECHNICAL INDICATORS

Apart from the charts, technical analysts use a number of indicators generated from prices of stocks to finalise their

recommendations. These indicators are often used in conjunction with charts. Some of the important indicators are the Advance Decline Ratio, the Market Breadth Index and Moving Averages.

(a) Advance-Decline Ratio

It is the ratio of the number of stocks that increase to the number of stocks that have declined. If the ratio is more than one, the trend is assumed to be bullish. If the ratio starts declining, a change of trend is signaled.

(b) Market Breadth Index

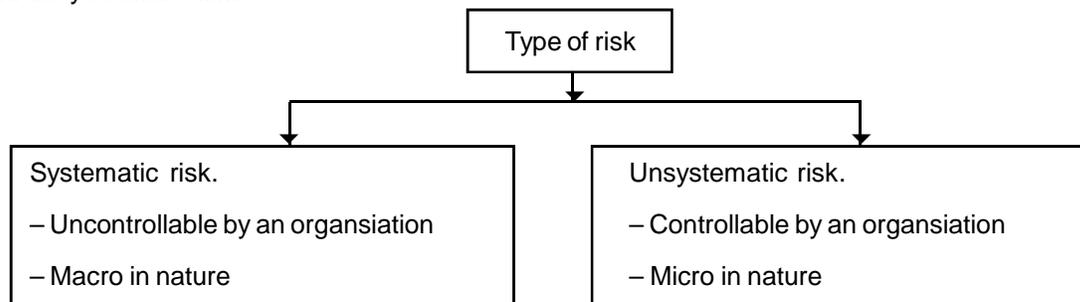
This index is a variation of the Advance-Decline Ratio. This index is computed by taking the difference between the number of stocks rising and the number of stocks falling. If during a month, 400 out of 1000 stocks in the market have risen and 300 have declined while 300 have remained unchanged, then market breadth would be calculated as $= 2(400-300)/300$. The figure of each time period is added to the previous period. If market breadth is increasing along with rise in stock indices, it confirms the bullish trend and vice versa.

(c) Moving Averages

A moving average is the average of share values of a set of consecutive number of days. If we have to calculate 50 days moving average, we calculate the average for days 1–50. Then on day 51, we add the value of day 51 and deduct the value of day 1 and so on. Similarly, moving averages for 100 days, 200 days and 300 days can be calculated. Moving averages provide a benchmark for future valuation. If share value is below the moving average, it has scope for appreciation. If the value is above the moving average, the upside is limited in the near term.

RISK AND ITS TYPES

Risk in security analysis is generally associated with the possibility that the realized returns will be less than the returns that were expected. In finance, different types of risk can be classified under two main groups, viz., systematic risk and unsystematic risk.



A. Systematic risk.

B. Unsystematic risk.

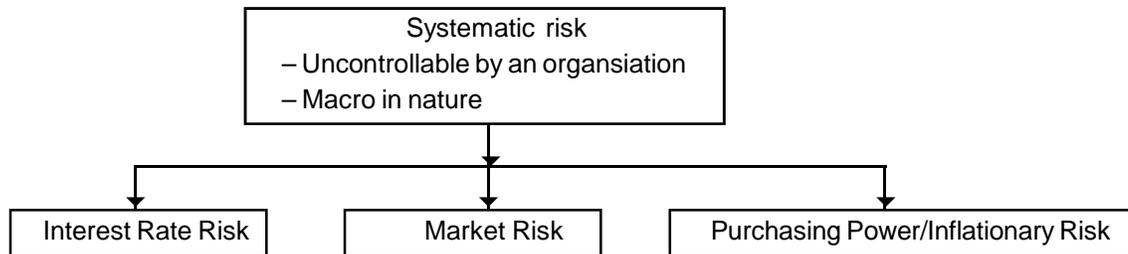
A. Systematic Risk

Those forces that are uncontrollable, external and broad in their effect are called sources of systematic risk. Systematic risk is due to the influence of external factors on an organization. Such factors are normally uncontrollable from an organization's point of view. Systematic risk is a macro in nature as it affects a large number of organizations operating under a similar stream or same domain. It cannot be planned by the organization.

In this way economic, political and sociological changes are sources of systematic risk. For example, if an economy moves into recession or if there is a political upheaval, it will cause the prices of nearly all the securities, whether bond or equity to decline.

Firms with high systematic risk tend to be those whose sales, profits and stock prices follow the general trend in the level of economic or stock market activity. These may include companies that deal in basic industrial goods like automobile manufactures.

The types of systematic risk are depicted and listed below.



1. Interest rate risk,
2. Market risk and
3. Purchasing power or inflationary risk.

Now let's discuss each risk classified under this group.

1. Interest rate risk

Interest-rate risk is the variation in the single period rates of return caused by the fluctuations in the market interest rate. It particularly affects debt securities as they carry the fixed rate of interest.

2. Market risk

Market risk is associated with consistent fluctuations seen in the trading price of any particular shares or securities. That is, it arises due to rise or fall in the trading price of listed shares or securities in the stock market.

3. Purchasing power or inflationary risk

Purchasing power risk is also known as inflation risk. It is so, since it emanates (originates) from the fact that it affects a purchasing power adversely. It is not desirable to invest in securities during an inflationary period.

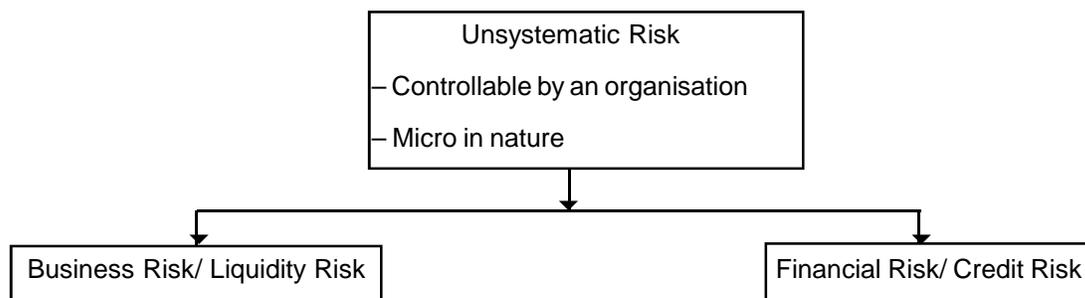
B. Unsystematic Risk

Unsystematic risk is due to the influence of internal factors prevailing within an organization. Such factors are controllable, internal factors which are peculiar to a particular industry or firm/(s). It may be because of change in management, labour strikes which will impact the returns of only specific firms which are facing the problem.

It is a micro in nature as it affects only a particular organization. It can be planned, so that necessary actions can be taken by the organization to mitigate (reduce the effect of) the risk.

Higher proportion of unsystematic risk is found in firms producing non durable consumer goods. Examples include suppliers of telephone, power and food stuffs.

The types of unsystematic risk are depicted and listed below.



1. Business or liquidity risk,
2. Financial or credit risk

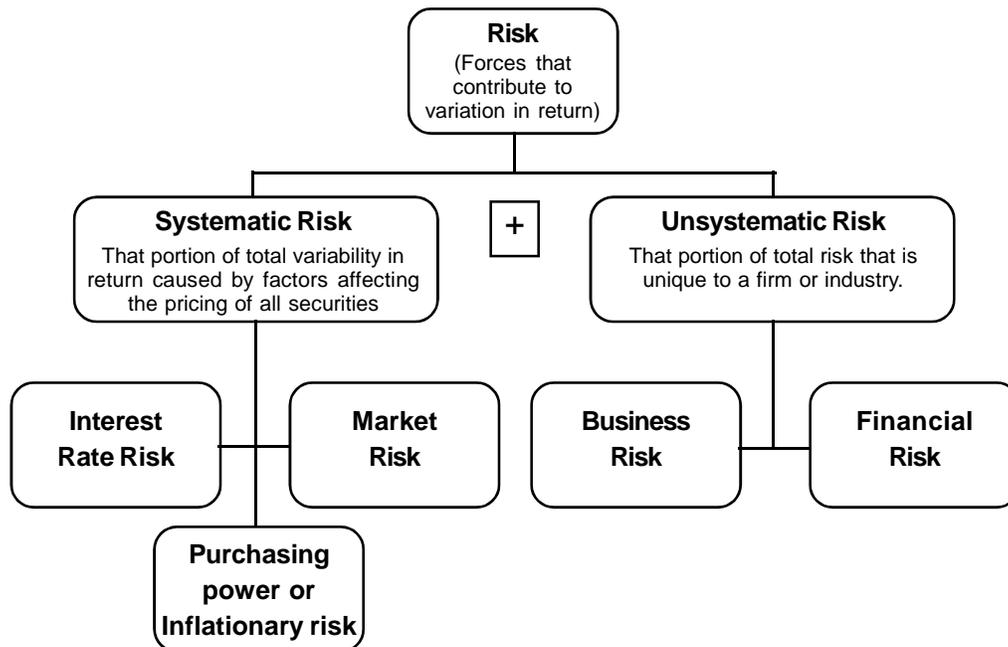
Now let's discuss each risk classified under this group.

1. Business or liquidity risk

Business risk is also known as liquidity risk. It is so, since it emanates (originates) from the sale and purchase of securities affected by business cycles, technological changes, etc.

2. Financial or credit risk

Financial risk is also known as credit risk. It arises due to change in the capital structure of the organization. The capital structure mainly comprises of three ways by which funds are sourced for the projects.



RETURN OF THE SECURITY

Return is the primary motivating force that drives investment. It represents the reward for undertaking investment. One of the important property of a security that the investors are concerned with is the return that can be expected from holding a security. Earning a return on an investment requires a passage of time. After some time has passed, one may make an objective measurement of the rate of an investment return that has been achieved. The word "return" can be misleading, since no single measure of return can answer all possible questions regarding results. The reasons lie in the fact that taxes, inflation, commissions, and the timing of cash flows all play major roles in "correct" calculation of returns.

The return of an investment consists of two components:

Current Return – The first component that comes to mind when one is thinking about return is the periodic cash flow (income), such as dividend or interest, generated by the investment. Current return is measured as the periodic income in relation to the beginning price of the investment.

Capital Return – The second component of return is reflected in the price change called the capital return – it is simply the price appreciation (or depreciation) divided by the beginning price of the asset. For assets like equity stocks, the capital return predominates.

Thus, the total return for any security is defined as:

$$\text{Total return} = \text{Current return} + \text{Capital return}$$

The current return can be zero or positive, whereas the capital return can be negative, zero or positive.

MEASURING RETURN

Total return, or holding period return (r), is perhaps the best unique, rational and comparable measures of results, no matter what type of asset is under discussion. Holding period return is the total return received from holding an asset or portfolio of assets over a period of time, generally expressed as a percentage. Holding period return is calculated on the basis of total returns from the asset or portfolio – i.e. income plus changes in value. It is particularly useful for comparing returns between investments held for different period of time.

Holding Period Return (HPR) and **annualized HPR** for returns over multiple years can be calculated as follows:

Holding Period Return = $\text{Income} + (\text{End of Period Value} - \text{Initial Value}) / \text{Initial Value}$

Annualized HPR = $\{[(\text{Income} + (\text{End of Period Value} - \text{Initial Value})) / \text{Initial Value} + 1]^{1/n} - 1\}$, where n = number of years.

Returns for regular time periods such as quarters or years can be converted to a holding period return through the following formula:

$(1 + \text{HPR}) = (1 + r_1) \times (1 + r_2) \times (1 + r_3) \times (1 + r_4)$ where r_1, r_2, r_3 and r_4 are periodic returns.

Thus,

$$\text{HPR} = [(1 + r_1) \times (1 + r_2) \times \dots \times (1 + r_n)] - 1$$

r = % return per period

n = number of periods

Example:

Mr. A invested ₹10,000 in shares of XYZ Company 10 years ago, and that your shares (including reinvested dividends) are currently worth Rs. 23,800. Using this information, calculate total investment return of Mr. A.

$$\text{Total investment return} = \frac{\text{₹}23,800 - \text{₹}10,000}{\text{₹}10,000} = 1.38 \text{ (or 138\%)}$$

So, total return over a decade has been 138%. Since we're considering a 10-year period, we will use $(1/10)$ i.e. 0.1 as power to calculate the annualized return:

$$\text{Annualised return} = (1 + 1.38)^{0.1} - 1 = 0.0906$$

Translated to a percentage, this shows that Mr. A's 10-year investment in XYZ Company produced an annualized return of 9.06%.

Often, it is necessary to adjust the return for taxes which makes a difference to the total returns. Let us take a simple example to illustrate these point.

Portfolio Information		
Beginning value		₹ 1,00,000
Cash flows		
Dividends received	₹7,500	
Capital appreciation	₹12,500	
Ending value		₹1,20,000
Total Return	[(1,20,000/1,00,000)]-1 = 20%	

Suppose the investor has a tax rate of 30%. The ₹7,500 in dividends yields only ₹5,250 after taxes (₹7500 * .70), and the capital gains is only ₹8,750 after taxes (₹12,500*.70). So, after-tax return equals

$$[(1,00,000+5,250+ 8,750)/1,00,000]-1= 14\%$$

High nominal returns may also reflect high inflation rate. Suppose that during the performance measurement period a 10 percent return was required just to maintain purchasing power. After-tax real return equals

$$[(1,00,000+5,250+ 8,750)/1,00,000(1.10)]-1= 3.6364\%$$

So, the rate of return to this portfolio is either 20% or 14% or 3.6364%. for a tax exempt investor the 20% return is appropriate. For a taxable investor, the return is only 14%. Inflation affects both equally.

APPROACHES TO VALUATION OF SECURITY

Security analysis begins with assessing the intrinsic value of security. There are three main schools of thought on the matter of security price evaluation. Advocates of different schools can be classified as (1) Fundamentalists; (2) Technicians; and (3) efficient market advocates. Let us compare these different perspectives in summary form before describing them in detail.

(1) The Fundamental Approach: The Fundamental approach suggests that every stock has an intrinsic value. Estimate of intrinsic worth of a stock is made by considering the earnings potential of firm which depends upon investment environment and factors relating to specific industry, competitiveness, quality of management, operational efficiency, profitability, capital structure and dividend policy. The earning potential is converted into the present value of the future stream of income from that stock discounted at an appropriate risk related rate of interest. Security analysis is done to compare the current market value of particular security with the intrinsic or theoretical value. Decisions about buying and selling an individual security depends upon the comparison. If the intrinsic value is more than the market value, the fundamentalists recommend buying of the security and vice versa.

(2) Technical Approach: The technical analyst endeavours to predict future price levels of stocks by examining one or many series of past data from the market itself. The basic assumption of this approach is that history tends to repeat itself and the price of a stock depends on supply and demand in the market place and has little relationship with its intrinsic value. All financial data and market information of a given security is reflected in the market price of a security. Therefore, an attempt is made through charts to identify price movement patterns which predict future movement of the security. The main tools used by technical analysis are: (1) The Dow Jones theory which asserts that stock prices demonstrate a pattern over four to five years and these patterns are mirrored by indices of stock prices. The theory employs two Dow Jones averages – the industrial average and the transportation average. If industrial average is rising, then transport average should also rise. Simultaneous price movement is the main prediction which may show bullish as well as bearish results. Chart Patterns are used along with Dow Jones Theory to predict the market movements.

(3) Efficient Capital Market Theory : The theory is popularly known as “Efficient Capital Market Hypothesis: (ECMH). The advocates of this theory contend that securities markets are perfect, or at least not too imperfect. The theory states that it is impossible to beat the market because stock market efficiency causes existing share prices to always incorporate and reflect all relevant information. It is based on the assumption that in efficient capital markets prices of traded securities always fully reflect all publicly available information concerning those securities. Market efficiency was developed in 1970 by the economist Eugene Fama, whose theory of efficient market hypothesis stated that it is not possible for an investor to outperform the market because all available information built in to all stock prices. For market efficiency, there are three essential conditions; (i) all available information is cost free to all market participants; (ii) no transaction costs; and (iii) all investors similarly view the implications of available information on current prices and distribution of future prices of each security.

It has been empirically proved that stock prices behave randomly under the above conditions. These conditions have been rendered unrealistic in the light of the actual experience because there is not only transaction cost involved but traders have their own information base. Moreover, information is not costless and all investors do not take similar data and interpretation with them.

Efficient Market Hypothesis has put to challenge by the fundamental and technical analysts to the extent that random walk model is valid description of reality and the work of chartists is of no real significance in stock price analysis. In practice, it has been observed that markets are not fully efficient in the semi-strong or strong sense.

Inefficiencies and imperfections of certain kinds have been observed in the studies conducted so far to test the efficiency of the market. Thus, the scope of earning higher returns exists by using original, unconventional and innovative techniques of analysis. Also, the availability of inside information and its rational interpretation can lead to strategies for deriving superior returns.

In short, if these theories are taken in their strongest forms, fundamentalists say that a security is worth the present value (discounted) of a stream of future income to be received from the security; technicians assert that the price trend data should be studied regardless of the underlying data; efficient market theorists contend that a share of stock is generally worth whatever it is selling for.

There are four confusing terms which are appearing at this juncture—face value, book value; market value and intrinsic value. Let us first clarify all them.

Face value of the security is the denominating value. It is also called the nominal value. When we say that authorized share capital of a company is ₹ 200 lac divided into 20 lac shares of ₹ 10 each, we mean that the face value or the nominal value of the share is ₹ 10/- each.

The book value may be much more than the face value. Let us assume that the shares of ₹ 10/- each are issued at ₹ 30/- each. The issuer is charging a premium of ₹ 20/- for the intrinsic value equalization. The issuer normally charges premium for the following attributes:

- Long years of establishment and profitable track record.
- Leadership position in the market.
- Potential for continued growth in the future.
- Existence of free reserves with the issuer which makes the book value higher than the face value.

Case Study

Let us clarify the concept of book value a little further. Assuming that a company has been incorporated with an authorized capital of 2 crore shares of ₹ 10/- each and the company operates profitably for three years, the broad financial position of the company shall be as under:

(₹ In lacs)

Item	Year 1	Year 2	Year 3
Income	600	1,200	2,400
Expenditure	800	1,000	1600
Profit/Loss	(200)	200	800
Equity Capital	2,000	2,000	2,000
Free Reserves	– 200	0	800
Face Value/share	10	10	10
Book Value/share (Share capital + free reserves)	9	10	14

Book value of the share of the company became less than face value at the end of the first year due to the loss incurred by it. The book value was equal to the face value at the end of the second year due to recoupment of the loss. At the end of the third year the book value become ₹ 14/- due to building up of reserves. If, after the end of the third year the issuer wishes to come up with an offering of additional shares, the offer price will not be less than ₹ 14.

In actual market conditions does the book value track the market value? We may observe the trend of few company

<i>Sl. No.</i>	<i>Name of the Company</i>	<i>Face Value Per Share</i>	<i>Book Value</i>	<i>Market Value (As on 30 September)</i>
(1)	(2)	(3)	(4)	(5)
1	HB Ltd.	1	13.8	168.70
2	FI Ltd.	10	136.3	250.50
3	IT Ltd.	5	314.3	3411.30
4	ITB Ltd.	10	175.8	349.80
5	BIS	10	299.3	229.70
6	RP Ltd.	10	20.4	22.60
7	RL Ltd.	10	138.2	562.60
8	IDD Ltd.	10	101.9	144.85
9	MTGL Ltd.	10	151.2	109.50
10	SC Ltd.	2	61.4	210.70
11	RLD Ltd.	5	190.5	821.15
12	HCT Ltd.	2	60.5	205.90
13	HPC Ltd.	10	173.8	172.45
14	CIP Ltd.	10	152.8	946.35
15	NES Ltd.	10	27.5	565.85
16	HH Ltd.	2	34.3	248.75
17	TISC Ltd.	10	93.6	116.50
18	LCET Ltd.	10	77.1	129.15
19	T&L Ltd.	10	133.0	167.00
20	BA Ltd.	10	283.2	380.05
21	BHL Ltd.	10	182.6	160.15
22	HIND Ltd.	10	621.5	522.10
23	ZTE Ltd.	1	99.2	57.50
24	BSS Ltd.	10	194.3	216.20
25	GRA Ltd.	10	295.3	309.00
26	GSIM Ltd.	10	75.3	367.15
27	GLX Ltd.	10	155.14	163.00
28	ASC Ltd.	10	171.17	138.15
29	CAS Ltd.	10	32.1	189.80
30	CIG Ltd.	10	18.2	131.20

We note that the market value is not equal to the book value for shares of any of the leading companies of the country. In fact, there is wide divergence between these two. The divergence is mostly on the upper side except in some cases. We can conclude, therefore, that book value is not a perfect indicator of the intrinsic value of a security. At best it can be an indicator of the floor value or base value below which the market value in normal circumstances should not slide. Book value is a historic indicator. It depicts what the company has earned and saved in the past. It does not reflect the future earning potential of the company.

Having considered that the book value is not an appropriate measure for ascertaining the real or intrinsic value of a security, let us take up a more rigorous process of evaluating securities called fundamental analysis.

FUNDAMENTAL APPROACH TO VALUATION

The investor seeks to arrive at the real value or the intrinsic value of a security through the process of security analysis. This value is arrived at by using a number of tools of financial analysis and it approximates the level at which the demand and supply of stock of the security would be in equilibrium leading to stability of prices. Price of the security below and above this level would tend to be unstable.

Money has a "time value." the powerful tools of compounding and discounting can help us build a theoretical framework of valuation of bonds and stocks. Bond values are reasonably easy to determine. As long as a bond is not expected to go into default, the value of the bond is made up of present values of annual interest payments plus the principal amount to be recovered at maturity or sooner. Valuation of equity is different because earnings and dividend streams are uncertain as to timing of receipt and the amount of dividend. The value of an equity stock at any moment in time can be thought of as the discounted value of a series of uncertain future dividends that may grow or decline at varying rates over time.

It is easiest to start with equity valuation where the expected holding period is one year. The benefit any investor receives from holding an equity stock consists of dividends plus any change in price during the holding period. Suppose we buy one share of SBI at the beginning of the year for ₹ 500. We hold the stock for one year. ₹20 in dividends is collected at year-end, and the share is sold for ₹530. the rate of return achieved is the composite of dividend yield and change in price (capital gains yield). Thus, we get

$$\text{Dividend yield} = D/P = 20/500 = .04$$

$$\text{Capital gains yield} = (530-500)/500 = .06$$

The total rate of return achieved is $.04 + .06 = .10$ or 10 percent. How might we express this same notion in terms of present values? Thus:

$$P_0 = \frac{D_1}{(1+r)} + \frac{P_1}{(1+r)}$$

where:

D_1 = dividend to be received at the end of year 1

r = investor's required rate of return or discount rate

P_1 = selling price at the end of year 1

P_0 = selling price today

Therefore,

$$\frac{500}{(1+r)} = \frac{₹ 20}{(1+r)} + \frac{₹ 530}{(1+r)}$$

Will $r = .10$ balance the equation? At a required rate of return of 10 percent, the dividend is worth ₹18.18 (₹20*.909)

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and selling price has a present value of ₹ 481.8182 (₹530 *.909)(see present value table). The combined present value is ₹ 500.

Should a rate of return of 15 percent have been required, the purchase price would have been too high at ₹ 500. (the dividend of ₹20 and selling price of ₹530 remains constant). To achieve a 15% return, the value of the stock at the beginning of the year would have had to be

$$\begin{aligned}
 P_0 &= (\text{₹}20/1.15) + (\text{₹}530/1.15) \\
 &= \text{₹}17.39 + 460.87 \\
 &= \text{₹} 478.26
 \end{aligned}$$

An alternative approach would be to ask the question: at what price must we be able to sell the stock at the end of one year (if purchase price is ₹ 500 and the dividend is ₹ 20) in order to attain a rate of return of 15 percent?

$$\begin{aligned}
 \text{₹} 500 &= (\text{₹}20/1.15) + (P1/1.15) \\
 \text{₹} 500 &= \text{₹}17.39 + .87 P1 \\
 \text{₹} 554.72 &= P1 \text{ (selling price)}
 \end{aligned}$$

Now let us look at a multiple year holding period. In most cases dividends will grow from year to year. We can similarly add the present value of all dividends to be received over the holding period and the present value of the selling price of the stock to the end of the holding period to arrive at the present value of the stock.

To simplify, let us assume that dividends will grow at the constant rate into the indefinite future. Under this assumption the value of a share is

$$P_0 = \frac{D(1+g)}{(1+r)^1} + \frac{D(1+g)^2}{(1+r)^2} + \frac{D(1+g)^3}{(1+r)^3} + \dots + \frac{D(1+g)^n}{(1+r)^n}$$

where n approaches infinity, this equation reduces simply to

$$P_0 = \frac{D_1}{r-g}$$

This model states that the price of a share should be equal to next year's expected dividend divided by the difference between the appropriate discount rate for the share and its expected long term growth rate. Alternatively, this model can be stated in terms of the rate of return on an equity share as

$$r = (D_1/P_0) + g$$

Illustration: An investor is holding 1000 shares of Right Choice Ltd. The current rate of dividend paid by the company is ₹ 5/- per share. The long term growth rate is expected to be 10% and the expected rate of return is 19.62%. We need to find out the current market price of the share:

Solution

$$\begin{aligned}
 P_0 &= \frac{D_0(1+g)}{r-g} \\
 &= \frac{5(1+0.10)}{.1962 - .10} \\
 \frac{5 \times 1.1}{0.0962} &= \frac{5.5}{0.0962} = \text{₹}57.17
 \end{aligned}$$

The real value or intrinsic value is valid for a given set of conditions. These conditionalities include the national and

international economic situation, industry specific and company specific circumstances. The first three conditionalities are viewed from a macro perspective in order to even out the effect of minor happenings. The last conditionality is observed at the micro level because at this level, even relatively smaller happenings can disturb the demand supply equilibrium.

ALTERNATIVE APPROACHES TO VALUATION

1. Random walk theory

In the Fundamental Analysis, factors such as economic influences, industry factors and particular company information are considered to form a judgement on share value. On the other hand, price and volume information is analysed in Technical Analysis to predict the future course of share values. There is another approach which negates both Fundamental and Technical analysis. This approach has been based upon the research aimed at testing whether successive price changes are independent in different forms of market efficiency.

According to the theory, share prices will rise and fall on the whims and fancies of manipulative individuals. As such, the movement in share values is absolutely random and there is no need to study the trends and movements prior to making investment decisions. No sure prediction can be made for further movement or trend of share prices based on the given prices as at a particular moment. The Random Walk Theory is inconsistent with technical analysis. Whereas, it states that successive price changes are independent, the technicians claim that they are dependent. But believing in random walk does not mean that one should not believe in analyzing stocks. The random walk hypothesis is entirely consistent with an upward and downward movement in price, as the hypothesis supports fundamental analysis and certainly does not attack it.

One of the advantages of this theory is that one is not bothered about good or bad judgement as shares are picked up without preference or evaluation. It is easier for believers in this theory to invest with confidence. The second advantage is that there is no risk of being ill informed while making a choice as no information is sought or concealed.

Random walk theory implies that short term price changes i.e day to day or week to week changes are random but it does not say anything about trends in the long run or how price levels are determined.

2. Efficient – Market Theory

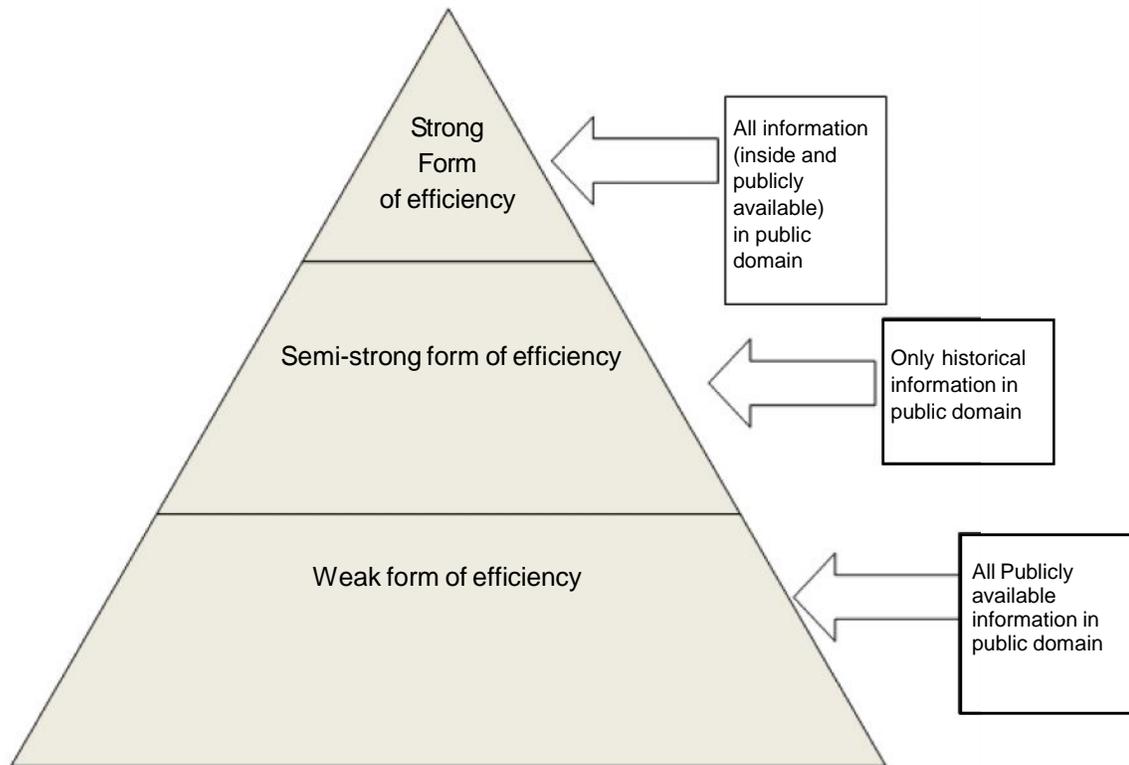
Efficient Market Hypothesis accords supremacy to market forces. A market is treated as efficient when all known information is immediately discounted by all investors and reflected in share prices. In such a situation, the only price changes that occur are those resulting from new information. Since new information is generated on a random basis, the subsequent price changes also happen on a random basis. Major requirements for an efficient securities market are:

- Prices must be efficient so that new inventions and better products will cause a firms' securities prices to rise and motivate investors to buy the stocks.
- Information must be discussed freely and quickly across the nations so that all investors can react to the new information.
- Transaction costs such as brokerage on sale and purchase of securities are ignored.
- Taxes are assumed to have no noticeable effect on investment policy.
- Every investor has similar access to investible funds at the same terms and conditions.
- Investors are rational and make investments in the securities providing maximum yield.

Research studies devoted to test the random walk theory on Efficient Capital Market Hypothesis (ECMH) are put into three categories i.e.

- (a) the strong form,

- (b) the semi-strong form, and
- (c) the weak form theory.



(a) The Strong Form of Efficiency: This test is concerned with whether two sets of individuals – one having inside information about the company and the other uninformed could generate random effect in price movement. The strong form holds that the prices reflect all information that is known. It contemplates that even the corporate officials cannot benefit from the inside information of the company. The market is not only efficient but also perfect. The findings are that very few and negligible people are in such a privileged position to have inside information and may make above-average gains but they do not affect the normal functioning of the market.

(b) Semi-strong form of Efficiency: This hypothesis holds that security prices adjust rapidly to all publicly available information such as functional statements and reports and investment advisory reports, etc. All publicly available information, whether good or bad is fully reflected in security prices. The buyers and sellers will raise the price as soon as a favourable price of information is made available to the public; opposite will happen in case of unfavourable piece of information. The reaction is almost instantaneous, thus, printing to the greater efficiency of securities market.

(c) The Weak Form theory: This theory is an extension of the random walk theory. According to it, the current stock values fully reflect all the historical information. If this form is assumed to be correct, then both Fundamental and Technical Analysis lose their relevance. Study of the historical sequence of prices, can neither assist the investment analysts or investors to abnormally enhance their investment return nor improve their ability to select stocks. It means that knowledge of past patterns of stock prices does not aid investors to make a better choice. The theory states that stock prices exhibit a random behaviour.

In this way, if the markets are truly efficient, then the fundamentalist would be successful only when (1) he has

inside information, or (2) he has superior ability to analyse publicly available information and gain insight into the future of the company. The empirical evidence of the random walk hypothesis rests primarily on statistical tests, such as runs test, correlation analysis and filter test. The results have been almost unanimously in support of the random walk hypothesis, the weak form of efficient market hypothesis.

3. Capital Asset Pricing Mode (CAPM)

CAPM explains the relationship between the Expected Return, Non-Diversifiable Risk (Systematic Risk) and the valuation of securities. Under CAPM price of a security is calculated with the help of expected return from security.

Formula for Computing Expected Return: $E(RP) = R_f + (R_m - R_f) \{\beta\}$

Where $E(RP)$ = Expected Return on Portfolio

R_f = Risk Free Rate of Interest/ Return

β = Portfolio Beta

R_m = Expected Return on Market Portfolio

Note : Detailed discussion on CAPM model is given in Portfolio Management.

LESSON ROUND-UP

- Investment may be defined as a conscious act on the part of a person that involves deployment of money in securities issued by firms with a view to obtain a target rate of return over a specified period of time.
- Investment is conscious act of deployment of money in securities issued by firms. Speculation also involves deployment of funds but is not backed by a conscious analysis of pros and cons.
- Investment is the employment of funds on assets with the aim of earning income or capital appreciation.
- Speculation also involves deployment of funds but it is not backed by a conscious analysis of pros and cons.
- Both gambling and betting are games of chance in which return is dependent upon a particular event happening.
- Risk in security analysis is generally associated with the possibility that the realized returns will be less than the returns that were expected.
- Risk can be classified under two main groups, viz., systematic risk and unsystematic risk.
- Return is the primary motivating force that drives investment. It represents the reward for undertaking investment.
- The main objective of security analysis is to appraise are intrinsic value of security.
- The Fundamental approach suggests that every stock has an intrinsic value which should be equal to the present value of the future stream of income from that stock discounted at an appropriate risk related rate of interest.
- Technical approach suggests that the price of a stock depends on supply and demand in the market place and has little relationship with its intrinsic value.
- Efficient Capital Market Hypothesis (ECMH) is based on the assumption that in efficient capital markets prices of traded securities always fully reflect all publicly available information concerning those securities.
- Performance of a company is intimately related to the overall economic environment of the country

Lesson 9

Portfolio Management

LESSON OUTLINE

- Meaning, Objectives, Portfolio Theory
- Traditional Approach, Fixed and Variable Income Securities
- Markowitz Portfolio Theory
- Modern Approach - CAPM Model
- Sharpe Single & Multi Index Model
- Arbitrage Pricing Theory (APT)
- Risk Adjusted Measure of Performance
- Economic Value Added
- LESSON ROUND UP
- TEST YOURSELF

LEARNING OBJECTIVES

Portfolio Management is the art and science of making decision about investment mix and policy matching investment to objectives, asset allocation and balancing risk against performance. It is an essential function of a finance manager. Keeping this important aspect in view, the topic of Portfolio Management has been included in the syllabus.

The object of the study is enable the students understand –

- Portfolio Management
- Portfolio Analysis
- Risk in Investment situation
- Markowitz Model
- Sharp Index Model
- Capital Asset Pricing Model
- Arbitrage Pricing Theory
- Economic value added

“Portfolio construction is not a science, more an art and involves lots of judgment”

– Neil Woodford

“Waving different types stocks in your portfolio can enhance returns” –

– Kenneth Fisher

PORTFOLIO MANAGEMENT

A portfolio refers to a collection of investments such as stocks, shares, mutual funds, bonds, cash and so on. Portfolio Management refers to the selection of securities and their continuous shifting in the Portfolio for optimizing the return for a given level of risk and maximizing the wealth of an investor.

The Investment process consists of two tasks. The first is security analysis which focuses on assessing the risk and return characteristics of the available investment alternatives. The second task is portfolio selection which involves choosing the best possible portfolio from the set of feasible portfolios.

Portfolio theory was originally proposed by Harry Markowitz in 1950s, and was the first formal attempt to quantify the risk of a portfolio and develop a methodology for determining the optimal portfolio. Markowitz assumed that investor attitudes towards portfolio depend exclusively upon

- (1) expected return and risk, and
- (2) quantification of risk.

And risk is, by proxy, the statistical notion of variance, or standard deviation of return.

Prior to the development of Portfolio theory, investors dealt with the concepts of return and risk somewhat loosely. Intuitively smart investors knew the benefit of diversification which is reflected in the traditional proverb "Do not put all your eggs in one basket". Harry Markowitz was the first person to show quantitatively why and how diversification reduces risk. This chapter describes how investors can construct the best possible portfolios with the help of efficient diversification. It is based largely on the pioneering work of Harry Markowitz and further insights that evolved from his work.

Objectives of Portfolio Management

The objectives of Portfolio management are —

- (i) **Reduce Risk:** To reduce the risk of loss of capital / income, by investing in various types of securities and over a wide range of industries, i.e. diversification.
- (ii) **Safety of Principal:** To keep the capital / principal amount intact, in terms of value and in terms of purchasing power. The capital or the principal amount invested should not erode, either in value or in terms of purchasing power. By earning return, principal amount will not erode in nominal terms, and by earning returns at a rate not lesser than the inflation rate, principal amount will be intact in present value terms too.
- (iii) **Stability of Income:** To facilitate a more accurate and systematic re-investment of income, to ensure growth and stability in returns.
- (iv) **Capital Growth:** to enable attainment of capital growth by reinvesting in growth securities or through purchase of growth securities.
- (v) **Marketability / Liquidity:** To have an easily marketable investment portfolio, so that the investor is able to liquidate investments and take advantage of attractive opportunities in the market.
- (vi) **Tax Savings:** To effectively plan for and reduce the tax burden on income, so that the investor gains maximum from his investment.

PORTFOLIO ANALYSIS

Portfolio Analysis is primarily the study of certain portfolio regarding its performance, ROI and associated risks. Portfolio analysis is conducted with two objective viz. minimizing the risk and maximizing the returns. Individual securities have risk-return characteristics of their own. In any case, given an estimate of return, the investor is always concerned about the probable downside price expectation or the risk. Portfolio, or combination of securities, helps in spreading this risk over many securities. The investors hope that if they hold different assets, even if one goes bad, the others will provide some protection from an extreme loss.

Portfolio management thus refers to efficiently management of the investment in the securities by diversifying the investments across industry lines or market types. The reasons are related to the inherent differences in the debt and equity markets, coupled with a notion that investment in companies in dissimilar industries would most likely do much better than the companies within the same industry.

Expected Return on a Portfolio A.

Based on Past Returns of Stock:

- (i) The Expected Return on a Portfolio is computed as the weighted average of the expected returns on the stocks which comprise the Portfolio. The weights reflect the proportion of the Portfolio invested in the stocks. The equation for its expected return is as follows:

$$\text{Expected Return} = W_A \times R_A + W_B \times R_B + \dots + W_n \times R_n + \dots$$

where:

W_A = Weight of security A

R_A = Expected return of security A

W_B = Weight of security B

R_B = Expected return of security B

W_n = Weight of security n

R_n = Expected return of security n

B. Based on Probability of Expected Returns of the Portfolio:

- (i) Expected Return is the Mean Return computed on the basis of the probability of returns expected from the portfolio as a whole.

Note: Sum total of p, is 1.

We shall clarify the concept of Portfolio with the help of following illustration:

	Stock X	Stock Y
Return (%)	7 or 11	13 or 5
Probability	.5 each return	.5 each return
Expected return(%)	9*	9†
Variance (%)	4	16
Standard deviation(%)	2	4

$$*\text{Expected return} = (.5)(7) + (.5)(11) = 9$$

$$\dagger\text{Expected return} = (.5)(13) + (.5)(5) = 9$$

It is clear that although X and Y have the same expected return, 9 percent, Y is riskier than X (standard deviation of 4 versus 2). Suppose that when X's return is high, Y's return is low, and vice versa. In other words, when the return on X is 11 percent, the return on Y is 5 percent; similarly, when the return on X is 7 percent, the return on Y is 13 percent.

Question: Is a portfolio of some X and some Y in any way superior to an exclusive holding of X alone (has it less risk)?

Let us construct a portfolio consisting of two-thirds stock X and one-third stock Y. The average return of this average return of each security in the portfolio; that is;

$$R_p = \sum_{i=1}^N X_i R_i$$

where:

R_p = expected return to portfolio

X_i = proportion of total portfolio invested in security i

R_i = expected return to security i

N = total number of securities in portfolio

Therefore,

$$R_p = (2/3)(9) + (1/3)(9) = 9$$

But what will be the range of fluctuation of the portfolio? In periods when X is better as an investment, we have $R_p = (2/3)(11) + (1/3)(5) = 9$; and similarly, when Y turns out to be more remunerative, $R_p = (2/3)(7) + (1/3)(13) = 9$. Thus, by putting part of the money into the riskier stock, Y, we are able to reduce risk considerably from what it would have been if we had confined our purchases to the less risky stock, X. If we held only stock X, our expected return would be 9 percent, which could in reality be as low as 7 percent in bad periods or as much as 11 percent in good periods. The standard deviation is equal to 2 percent. Holding a mixture of two-thirds X and one-third Y, or expected and experienced return will always be 9 percent, with a standard deviation of zero. We can hardly quarrel with achieving the same expected return for less risk. In this case we have been able to eliminate risk altogether.

The above illustration indicates that it is better to spread out or diversify the investment in order to minimize the risk associated with investment in single securities. This fact is the essence of Portfolio Analysis.

Portfolio is a collection of securities belonging to a diverse set of industries. Management of a portfolio is considered to be a specialised activity because of the time and effort involved in tracking of each component of the portfolio. Portfolio management is a relatively new concept in security analysis. It gained prominence after World War II when it was realised that the instability of the securities market had put at stake fortunes of individuals, companies and governments. It was then discovered that investing in a basket of stocks maximised profits while minimising risks.

Risk in investment situation

We have seen in the above illustration that investment in securities X and Y has been fraught with risk because the return on investment has varied from one year to the other and obviously from any expected rate of return also that might have been fixed.

Risk means that the return on investment would be less than the expected rate. Risk is a combination of possibilities

because of which actual returns can be different or greatly different from expected returns. Thus risk can be high or low. In case we want to quantify how high or how low the risk in investment is going to be, we have to intimate the probability of various outcomes and their deviation from expected outcome.

The risk involved in individual securities can be measured by standard deviation or variance.

Components of Risk

Total Risk = Systematic Risk + Unsystematic Risk

- Systematic Risk: It represents that portion of Total Risk which is attributable to factors that affect the market as a whole. Beta is a measure of Systematic Risk.
- Unsystematic Risk: It is the residual risk or balancing figure, i.e. Total Risk Less Systematic Risk.

Measure of Risk:

The Total risk is measured by standard deviation. The Standard Deviation is a measure of how each possible outcome deviates from the Expected Value. The higher the value of dispersion (i.e. Standard Deviation), the higher is the risk associated with the Portfolio and vice-versa. Generally, Standard Deviation of a specified security or portfolio is considered to be the Total Risk associated with that security or portfolio. Standard Deviation is the average or mean of deviations. Deviations are the movement in returns from the mean return. It measures the risk in absolute terms. Standard deviation is the square root of the variance. It is one of the measures of dispersion, that is a measure of by how much the values in the data set are likely to differ from the mean. It is denoted by Sigma (σ),

$$\sigma = \sqrt{\frac{1}{N} \sum_{i=1}^N (x_i - \mu)^2}$$

where N is the population size and μ is the population mean.

Standard Deviation of a Portfolio

Risk of a portfolio is not equal to the sum of its parts. This is because all securities are neither correlated with each other to the same extent or in the same manner, nor are relationship expressible in linear or arithmetic terms. Choice of securities in a portfolio can either go about to increase the risk factor which is greater than the sum of the individual risk of securities. It can also be lower than the risk factor of the least risky security in the portfolio. Therefore, Standard Deviation of a Portfolio is not the weighted average of the standard deviation of its individual securities, since it does not consider the correlation between different such securities and a common base, i.e. market return.

Co-Variance as a Measure of Risk

When two securities are combined, we need to consider their interactive risk, or covariance. Co-variance explains the Deviation of the return of Portfolio from its Mean Value. Covariance is an absolute measure of co-movement between two variables, i.e. the extent to which they are generally above their means or below their means at the same time.

If the random variable pair (X, Y) can take on the values (x_i, y_i) for i = 1, ... , n, with equal probabilities 1/n, then the covariance can be equivalently written in terms of the means E (X) and E (Y) as:

$$\text{COV}_{xy} = \frac{1}{n} \sum_{i=1}^n [x_i - E(x)](y_i - E(y))$$

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Where the probabilities are equal and

COV_{xy} = covariance between x and y

x_i = return on security x

y_i = return on security y

$E(X)$ = expected return to security x

$E(Y)$ = expected return to security y

n = number of observations

Continuing with the above illustration,

	<i>Return</i>	<i>Expected Return</i>	<i>Difference</i>	<i>Product</i>
Stock X	7	9	-2	
Stock Y	13	9	4	-8
Stock X	11	9	2	
Stock Y	5	9	-4	-8

$$COV = \frac{1}{2}[(7 - 9)(13 - 9) + [(11 - 9)(5 - 9)]]$$

$$= \frac{1}{2}[(-8) + (-8)] = \frac{-16}{2} = -8$$

If the rates of return of two securities move together, we say their interactive risk or covariance is positive. If rates of return are independent, covariance is zero. Inverse movement results in covariance that is negative.

Coefficient of Correlation

Covariance and correlation are conceptually analogous in the sense that both of them reflect the degree of comovements between two variables.

The coefficient of correlation is a measure designed to indicate the similarity or dissimilarity in the behavior of two variables. We define it as :

$$Cor_{(xy)} = r_{xy} = \frac{cov_{(xy)}}{\sigma_x \sigma_y}$$

where:

r_{xy} = coefficient of correlation of x and y

COV_{xy} = covariance between x and y

σ_x = standard deviation of x

σ_y = standard deviation of y

The coefficient of correlation is, essentially, the covariance taken not as an absolute value but relative to the standard deviations of the individual securities (variables). It indicates, in effect, how much x and y vary together as a proportion of their combined individual variations, measured by $\sigma_x \sigma_y$. In our example, the coefficient of correlation is :

$$r_{xy} = \frac{(-8)}{[(2)(4)]} = \frac{-8}{8} = -1.0$$

If the coefficient of correlation between two securities is -1.0 , then a perfect negative correlation exists (r_{xy} cannot be less than -1.0). If the correlation coefficient is zero, then returns are said to be independent of one another. If the returns on two securities are perfectly correlated, the correlation coefficient will be $+1.0$, and perfect positive correlation is said to exist (r_{xy} cannot exceed $+1.0$).

Thus, correlation between two securities depends upon (1) the covariance between the two securities, and (2) the standard deviation of each security.

Calculation of Portfolio Risk

We have shown the effect of diversification on reducing risk. The key was not that two stocks provided twice as much diversification as one, but that by investing in securities with negative or low covariance among themselves, we could reduce the risk. Markowitz's efficient diversification involves combining securities with less than positive correlation in order to reduce risk in the portfolio without sacrificing any of the portfolio's return. In general, the lower the correlation of securities in the portfolio, the less risky the portfolio will be. This is true regardless of how risky the stocks of the portfolio are when analyzed in isolation. It is not enough to invest in many securities; it is necessary to have the right securities.

Let us conclude our two-security example in order to make some valid generalization. Then we can see what three-security and larger portfolios might be like. In considering a two-security portfolio, portfolio risk can be defined more formally now as:

$$\sigma_p = \sqrt{W_x^2 \cdot \sigma_x^2 + W_y^2 \cdot \sigma_y^2 + 2W_x W_y (r_{xy} \sigma_x \sigma_y)} \quad \text{Eq.9.1}$$

Where:

σ_p = portfolio standard deviation

w_x = percentage weightage of total portfolio value in stock X

w_y = percentage weightage of total portfolio value in stock Y

σ_x = standard deviation of stock X

σ_y = standard deviation of stock Y

r_{xy} = correlation coefficient of X and Y

Note: $r_{xy} \sigma_x \sigma_y = \text{cov}_{xy}$

Thus we now have the standard deviation of a portfolio of two securities. We are able to see that portfolio risk (σ_p) is sensitive to

- (i) the proportions of funds devoted to each stock,
- (ii) the standard deviation of each stock, and
- (iii) the covariance between the two stocks.

If the stocks are independent of each other, the correlation coefficient is zero ($r_{xy} = 0$). Second, if r_{xy} is greater than zero, the standard deviation of the portfolio is greater than if $r_{xy} = 0$. Third, if r_{xy} is less than zero, the covariance term is negative, and portfolio standard deviation is less than it would be if r_{xy} were greater than or equal to zero. Risk can be totally eliminated only if the third term is equal to the sum of the first two terms. This occurs only if (1) $r_{xy} = -1.0$, and (2) the percentage of the portfolio in stock X is set equal to $W_x = \sigma_y / (\sigma_x + \sigma_y)$.

To clarify these general statements, let us return to our earlier example of stocks X and Y. In our example, remember that

	Stock X	Stock Y
Expected return (%)	9	9
Standard deviation (%)	2	4

We calculated the covariance between the two stocks and found it to be -8. The coefficient of correlation was -1.0. The two securities were perfectly negatively correlated.

Changing the proportion of amount invested

What happens to portfolio risk as we change the total portfolio value invested in X and Y? Using Equation 9.1, we get:

Stock X (%)	Stock Y (%)	Portfolio Standard Deviation
100	0	2.0
80	20	0.8
66	34	0.0
20	80	2.8
0	100	4.0

Notice that portfolio risk can be brought down to zero by the skillful balancing of the proportions of the portfolio $r_{xy} = -1.0$ and the proportion of amount invested in X is $W_x = \sigma_y / (\sigma_x + \sigma_y)$, or $4 / (2 + 4) = .666$.

Changing the Coefficient of Correlation

What effect would be there using $x = 2/3$ and $y = 1/3$ if the correlation coefficient between stocks X and Y had been other than -1.0? Using Equation 9.1 and various values for r_{xy} , we have

r_{xy}	Portfolio Standard Deviation
-0.5	1.34*
0.0	1.9
+0.5	2.3
+1.0	2.658

$$*\sigma_p = \sqrt{(.666)^2(2)^2 + (.334)(4)^2 + (2)(.666)(.334)(-5)(2)(4)}$$

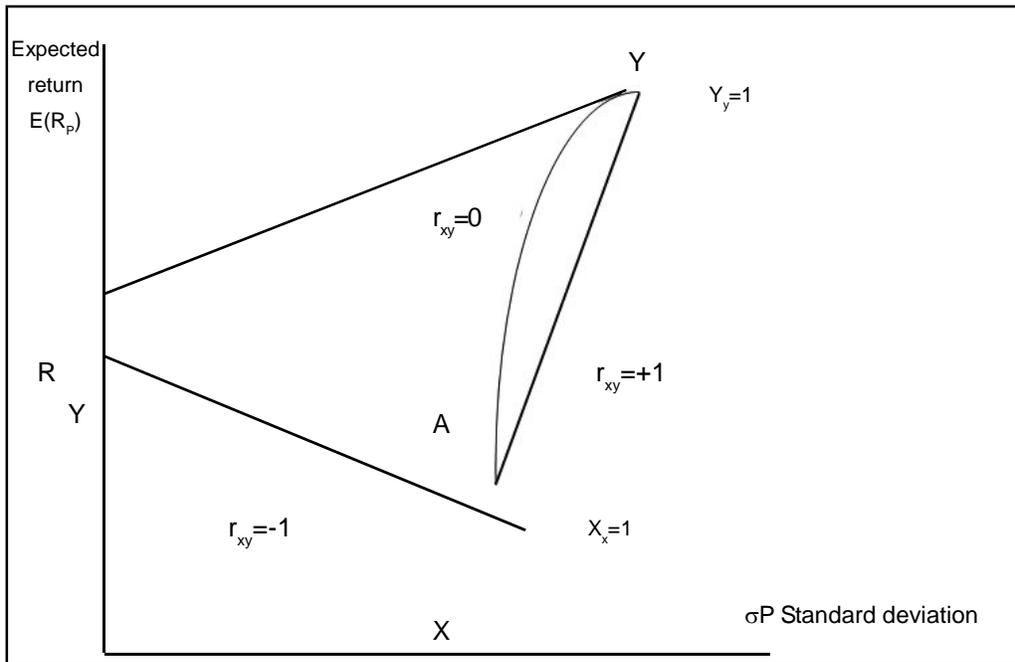
$$\sqrt{1.777 + 1.777 - (.444)(4)} = \sqrt{1.77} = 1.34$$

If no diversification effect had occurred, then the total risk of the two securities would have been the weighted sum of their individual standard deviations:

$$\text{Total undiversified risk} = (.666)(2) + (.334)(4) = 2.658$$

Since the undiversified risk is equal to the portfolio risk of perfectly positively correlated securities ($r_{xy} = +1.0$), we can see that favorable portfolio effects occur only when securities are not perfectly positively correlated.

Figure: 10.1 : Graphic illustration of the correlation between two securities



Line XY represent various combinations of X and Y. Point X has 100% holding of X and point Y has 100% holding of Y. The coefficient of correlation along XY is +1. It means that 100% holding of X is least risky and 100% holding of Y is most risky.

Segment XAY has zero correlation and line XR has -1 coefficient of correlation.

The crucial point of how to achieve the proper proportions of X and Y in reducing the risk to zero will be taken up in the Markowitz model. However, the general notion is clear. The risk of the portfolio is reduced by playing off one set of variations against another.

Case Study

You are thinking about investing your money in the stock market. You have the following two stocks in mind: stock A and stock B. You know that the economy can either go in recession or it will boom. Being an optimistic investor, you believe the likelihood of observing an economic boom is two times as high as observing an economic depression. You also know the following about your two stocks:

State of the Economy	Probability	RA	RB
Boom	2/3	10%	-2%
Recession	1/3	6%	40%

- Calculate the expected return for stock A and stock B
- Calculate the total risk (variance and standard deviation) for stock A and for stock B
- Calculate the expected return on a portfolio consisting of equal proportions in both stocks.
- Calculate the expected return on a portfolio consisting of 10% invested in stock A and the remainder in stock B.
- Calculate the covariance between stock A and stock B.
- Calculate the correlation coefficient between stock A and stock B.

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- g) Calculate the variance of the portfolio with equal proportions in both stocks using the covariance from answer e.
- h) Calculate the variance of the portfolio with equal proportions in both stocks using the portfolio returns and expected portfolio returns from answer c.

ANSWER

- a) $p(\text{boom}) = 2/3$ and $p(\text{recession}) = 1/3$ (Note that probabilities always add up to 1)
- $$E(RA) = 2/3 \times 0.10 + 1/3 \times 0.06 = 0.0867 \text{ (8.67\%)}$$
- $$E(RB) = 2/3 \times -0.02 + 1/3 \times 0.40 = 0.12 \text{ (12\%)}$$
- b) $SD(RA) = [2/3 \times (0.10 - 0.0867)^2 + 1/3 \times (0.06 - 0.0867)^2]^{0.5} = 0.018856 \text{ (1.886\%)}$
- $$SD(RB) = [2/3 \times (-0.02 - 0.12)^2 + 1/3 \times (0.40 - 0.12)^2]^{0.5} = 0.19799 \text{ (19.799\%)}$$
- c) Portfolio weights: $W_A = 0.5$ and $W_B = 0.5$:
- $$E(RP) = 0.5 \times 0.0867 + 0.5 \times 0.12 = 0.10335 \text{ (10.335\%)}$$
- d) Portfolio weights: $W_A = 0.1$ and $W_B = 0.9$:
- $$E(RP) = 0.1 \times 0.0867 + 0.9 \times 0.12 = 0.11667 \text{ (11.667\%)}$$
- e) $COV(RA, RB) = 2/3 \times (0.10 - 0.0867) \times (-0.02 - 0.12) + 1/3 \times (0.06 - 0.0867) \times (0.40 - 0.12) = -0.0037333$
- f) $CORR(RA, RB) = -0.0037333 / (0.018856 \times 0.19799) = -1$ (Rounding)!
- g) $VAR(RP) = 0.52 \times 0.0188562 + 0.52 \times 0.197992 + 2 \times 0.5 \times 0.5 \times -0.0037333 = -0.008022$
- $$SD(RP) = 8.957\%$$
- h) $E(RP|\text{Boom}) = 0.5 \times 0.10 + 0.5 \times -0.02 = 0.04 \text{ (4\%)}$
- $$E(RP|\text{Recession}) = 0.5 \times 0.06 + 0.5 \times 0.40 = 0.23 \text{ (23\%)}$$
- Hence, $E(RP) = 2/3 \times 0.04 + 1/3 \times 0.23 = 0.10335 \text{ (10.335\%)}$
- $$\text{And, } SD(RP) = [2/3 \times (0.04 - 0.10335)^2 + 1/3 \times (0.23 - 0.10335)^2]^{0.5} = 0.08957 \text{ (8.957\%)}$$

MARKOWITZ MODEL

Dr. Harry M. Markowitz is credited with developing the first modern portfolio analysis model. It provides a theoretical framework for analysis of risk-return choices. The concept of efficient portfolios has been enunciated in this model. A portfolio is efficient when it yields highest return for a particular level of risk or minimizes risk for a specified level of expected return.

The Markowitz model makes the following assumptions regarding investor behaviour:

- Investors consider each investment alternative as being represented by a probability distribution of expected returns over some holding period.
- Investors maximize one period expected utility and possess utility curve, which demonstrates diminishing marginal utility of wealth.
- Individuals estimate risk on the basis of variability of expected returns.
- Investors base decisions solely on expected return and variance of returns only.

- At a given risk level, higher returns are preferred to lower returns. Similarly for a given level of expected returns, investors prefer less risk to more risk.

Simple Markowitz Portfolio Optimization

It is possible to develop a fairly simply decision rule for selecting an optimal portfolio for an investor that can take both risk and return into account. This is called a risk-adjusted return. For simplicity, it can be termed the utility of the portfolio for the investor in question. Utility is the expected return of the portfolio minus a risk penalty. This risk penalty depends on portfolio risk and the investor's risk tolerance.

The Risk Penalty

The more risk one must bear, the more undesirable is an additional unit of risk. Theoretically, and as a computational convenience, it can be assumed that twice the risk is four times as undesirable. The risk penalty is as follows:

$$\text{Risk penalty} = \text{Risk squared} / \text{Risk tolerance}$$

Risk squared is the variance of return of the portfolio. Risk tolerance is a number from zero through 100. The size of the risk tolerance number reflects the investor's willingness to bear more risk for more return. Low (high) tolerance indicates low (high) willingness. Risk penalty is less as tolerance is increased.

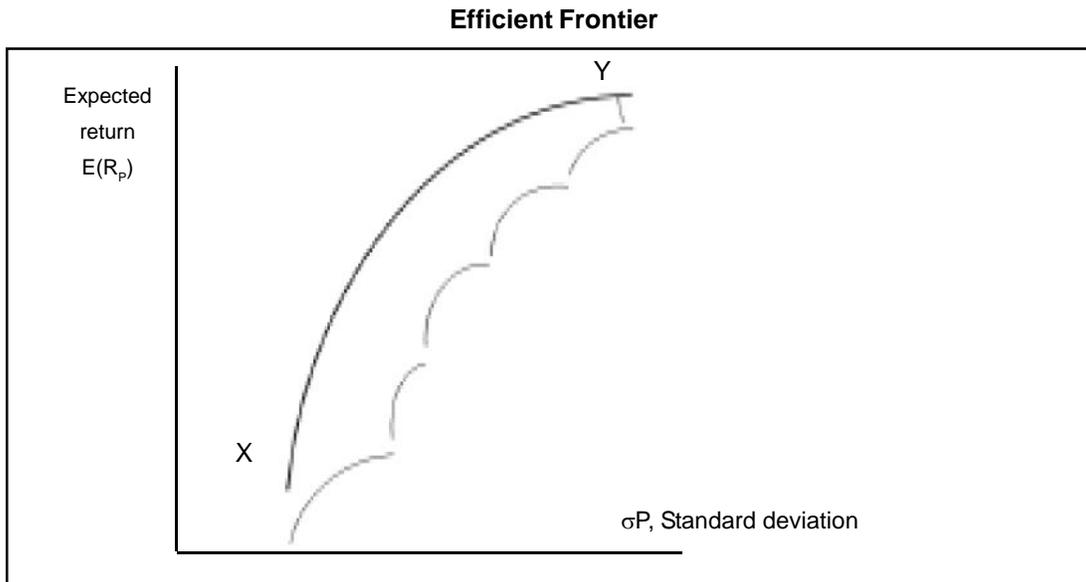
For example, if a portfolio's expected return is 13 percent, variance of return (risk squared) is 225 percent, and the investor's risk tolerance is 50. the risk penalty is 4.5 percent:

$$\text{Risk penalty} = 225\% / 50 = 4.5\%$$

Since utility is expected return minus the risk penalty, we have

$$\text{Utility} = 13 - 4.5 = 8.5\%$$

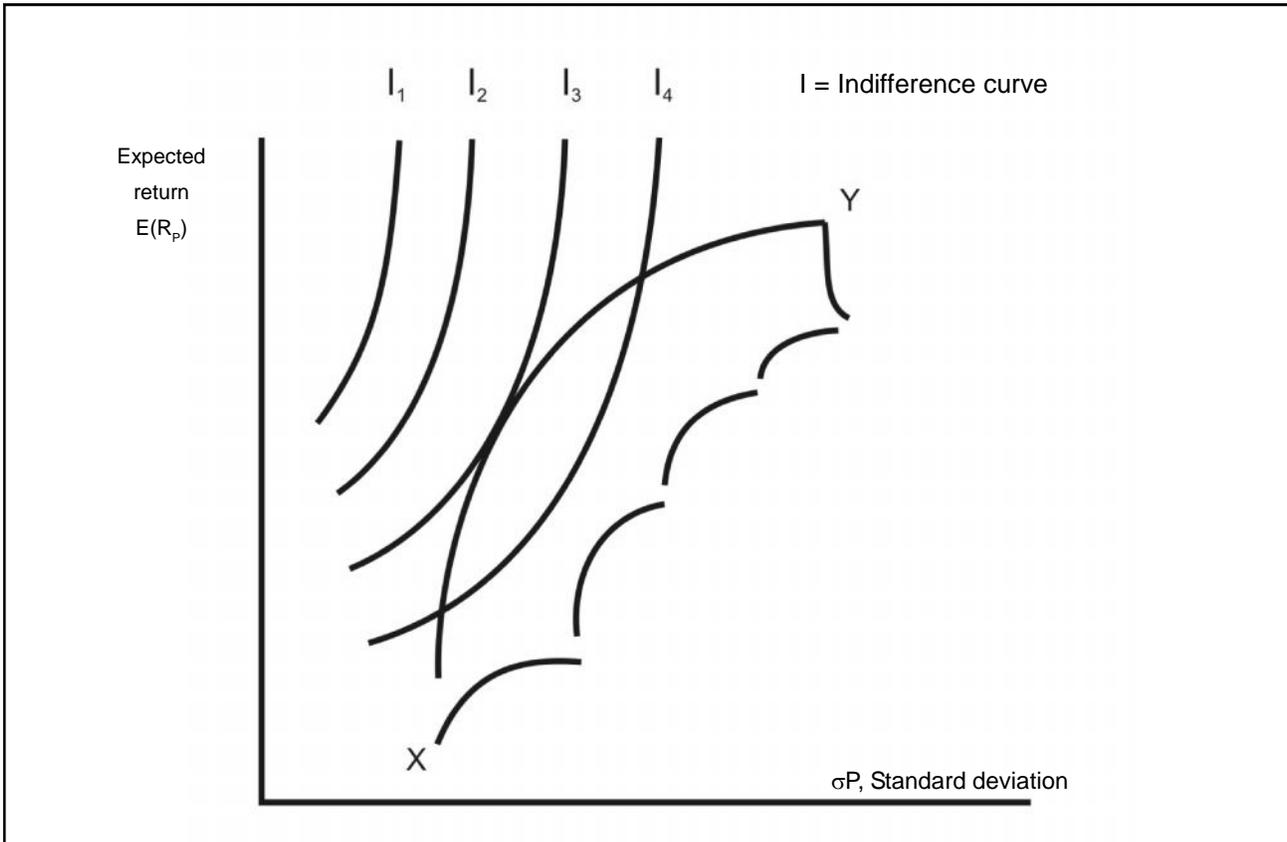
The optimal (best) portfolio for an investor would be the one from the opportunity set (efficient frontier) that maximizes utility.



Standard Deviation

In the above graphic presentation, arc XY is the efficient frontier. All points on this arc provide a superior combination of risk and return to other combinations with the shaded area, which represent attemptable portfolios. Each portfolio has its own combination of risk and return. Investor's final choice out of the range depends on his taste.

Portfolio Optimization



The investor has four indifference curves.

In I_1 to I_4 , I_1 provides greatest satisfaction but since the efficient range touches only I_3 is the maximum that can be achieved.

Limitation of Markowitz Model

The Markowitz approach requires several inputs for portfolio analysis. These are expected return of the securities, variances of their return and co variances. Calculation of efficient portfolios is easy when the number of securities in the portfolio is two or three. As the number of securities in the portfolio increases, which indeed is the case in real life situations, the amount of calculations required to be done becomes enormous. Further, in the real world, portfolio analysts do not keep track of correlations between stocks of diverse industries. As such, correlating a security to a common index is much more convenient than correlating to a large number of individuals securities.

Secondly, the assumption that correlation in the values of two securities depends on the characteristics of these two securities alone is not valid. In fact movement in value of securities is affected by a variety of other factors. A stock index is more representative benchmark that incorporates the general economic conditions more authentically.

CAPITAL ASSET PRICING MODEL

The CAPM developed by William F Sharpe, John Linter and Jan Mossin establishes a linear relationship between the required rate of return of a security and its beta. Beta, as we know is the non-diversifiable risk in a portfolio. A portfolio's standard deviation is a good indicator of its risk. Thus if adding a stock to a portfolio increases its standard deviation, the stock adds to the risk of the portfolio. This risk is the un-diversified risk that can not be

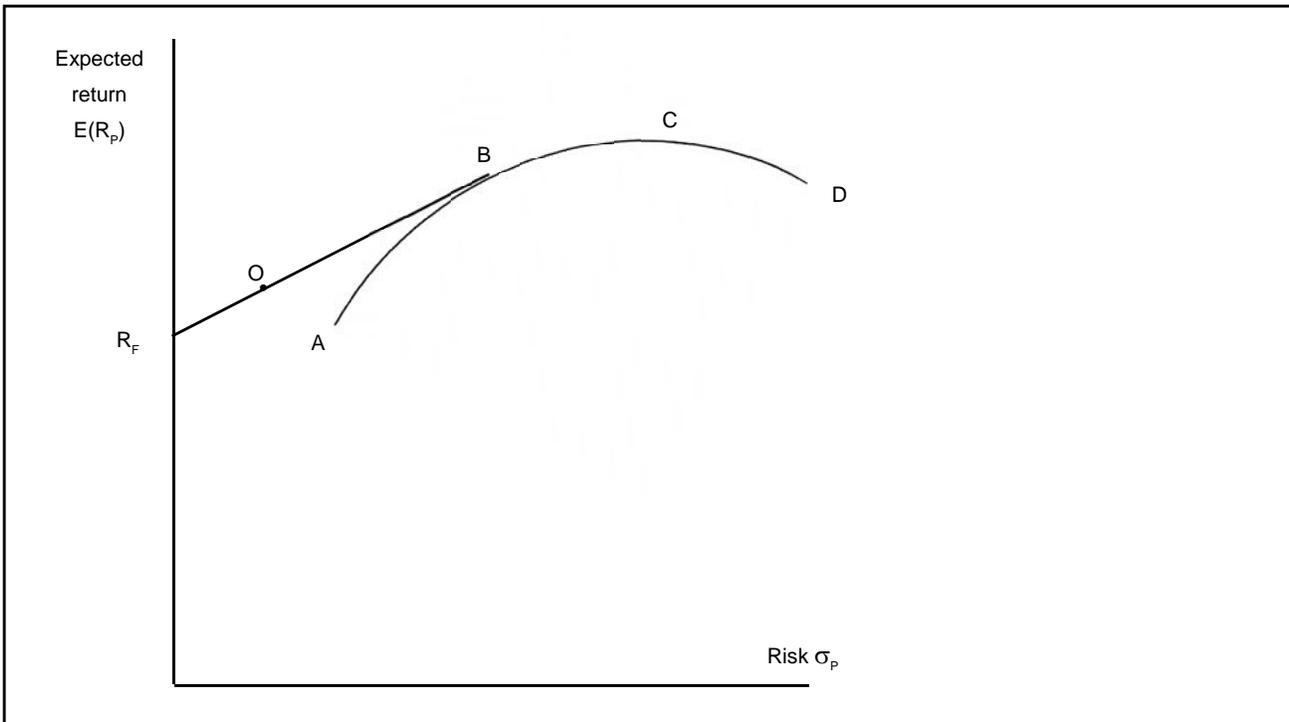
eliminated. Beta measures the relative risk associated with any individual portfolio as measured in relation to the risk of the market portfolio.

$$\text{Beta} = \frac{\text{Non-diversifiable risk of asset or portfolio}}{\text{Risk of market portfolio}}$$

Thus Beta is a measure of the non-diversifiable or systematic risk of an asset relative to that of the market portfolio. A beta of 1 indicates an asset of average risk. If beta is more than 1, then the stock is riskier than the market. On the other hand, if beta is less than one, market is riskier.

Recall that portfolio theory implied that each investor faced an efficient frontier. In general, the efficient frontier will differ among investors because of differences in expectations. When we introduce riskless borrowing and lending there are some significant changes involved. Lending is best thought of as an investment in a riskless security. This security might be a savings account, Treasury bills, or even high-grade commercial paper. Borrowing can be thought of as the use of margin. Borrowing and lending options transform the efficient frontier into a straight line. See Figure below for the standard efficient frontier ABCD. Assume that an investor can lend at the rate of $R_F = .05$, which represents the rate on Treasury bills.

Frontier with introduction of Lending



Hence the point R_F represents a risk-free investment ($R_F = .05; \sigma_p = 0$). The investor could place all or part of his funds in this riskless asset. If he placed part of his funds in the risk-free asset and part in one of the portfolios of risky securities along the efficient frontier, what would happen? He could generate portfolios along the straight-line segment $R_F B$.

Let us examine the properties of a given portfolio along the straight-line segment $R_F B$. Consider point B on the original efficient frontier ABCD where, say, $R_p = .10$ and $\sigma_p = .06$. If we placed one-half of available funds in the riskless asset and one-half in the risky portfolio, B, the resulting combined risk-return measures for the mixed portfolio, O, can be found from Equation A and B:

$$R_p = XR_M + (1 - X)R_F \text{ (Equation A)}$$

where:

R_p = expected return on portfolio

X = percentage of funds invested in risky portfolio

$(1 - X)$ = percentage of funds invested in riskless asset

R_M = expected return on risky portfolio

R_F = expected return on riskless asset

and:

$$\sigma_p = X \sigma_M \text{ (Equation B)}$$

where:

σ_p = expected standard deviation of the portfolio

X = percentage of funds invested in risky portfolio

σ_M = expected standard deviation on risky portfolio

For our example, the risk-return measures for portfolio M are:

$$R_p = \left(\frac{1}{2}\right) (.10) + \left(\frac{1}{2}\right) (.05) = .075$$

$$\sigma_p = \left(\frac{1}{2}\right) (.06) + \left(\frac{1}{2}\right) (.00) = .03$$

The result indicates that our return and risk have been reduced. All point between R_F and B can be similarly determined using equation (A) and (B). As stated, the focus of these points will be a straight line

Introduction of the possibility of borrowing funds will change the shape of our efficient frontier in equation 1 to the right of point B. In borrowing, we consider the possibilities associated with total funds invested being enlarged through trading on the equity.

Consider three cases. If we assume that X is the percentage of investment wealth or equity placed in the risky portfolio, then where $X = 1$, investment wealth is totally committed to the risky portfolio. Where $X < 1$, only a fraction of X is placed in the risky portfolio, and the remainder is lent at the rate R_F . The third case, $X > 1$, signifies that the investor is borrowing rather than lending. It may be easier to visualize this by rewriting Equation A as follows:

$$R_p = XR_M - (X - 1) R_F \text{ (Equation C)}$$

where all terms are as in Equation (A) and the term R_F is the borrowing rate. For simplicity, the borrowing rate and lending rate are assumed to be equal or 5 percent. The first component of Equation (C) is the gross return made possible because the borrowed funds, as well as the original wealth or equity, are invested in the risky portfolio. The second term refers to the cost of borrowing on a percentage basis. For example, $X = 1.25$ would indicate that the investor borrows an amount equal to 25 percent of his investment wealth. This is equivalent to a margin requirement of 80 percent ($X = 1/\text{margin requirement}$). His net return on his investment wealth would become:

$$R_p = (1.25) (.10) - (0.25) (.05) = .1125$$

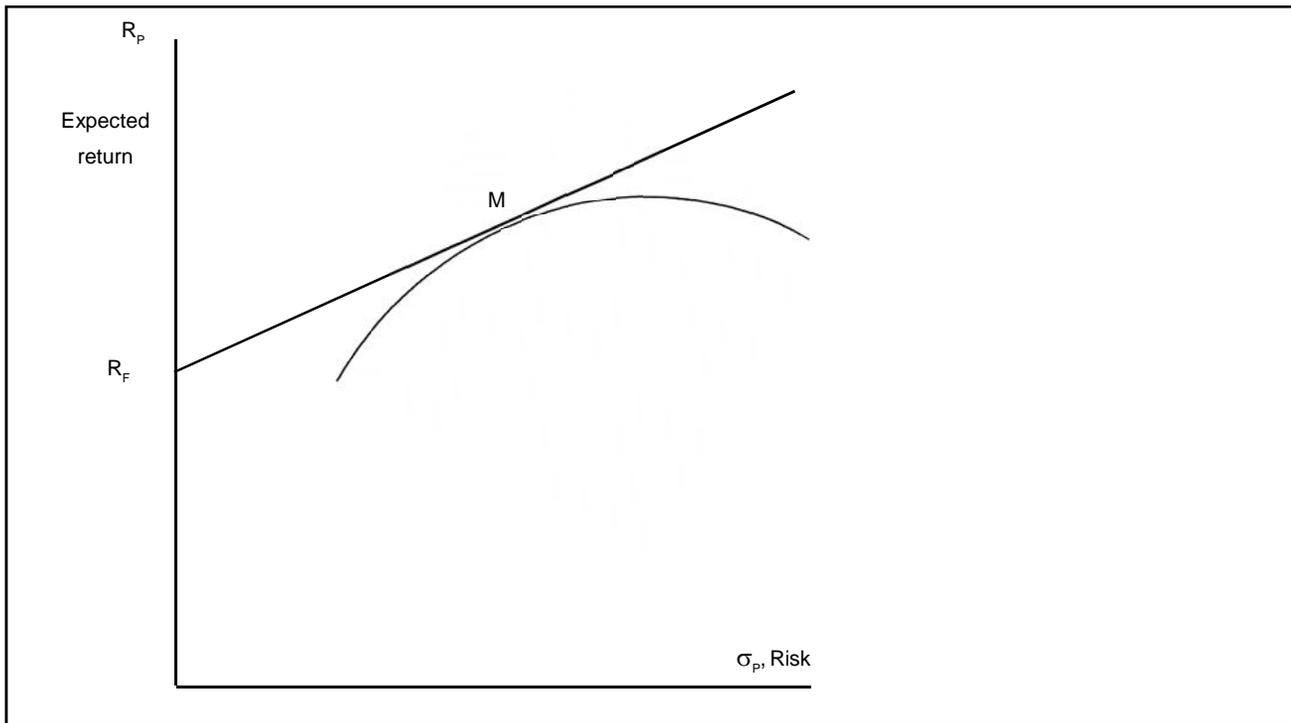
The associated risk would become:

$$\sigma_p = X\sigma_p = (1.25)(.06) = .075$$

Hence the levered portfolio provides increased return with increased risk.

The introduction of borrowing and lending has given us an efficient frontier that is a straight line throughout. In Figure below, we show the new efficient frontier. Point M now represents the optimal combination of risky securities. The existence of this combination simplifies our problem of portfolio selection. The investor need only decide how much to borrow or lend. No other investments or combination of investments available is as efficient as point M. The decision to purchase M is the Investment decision. The decision to buy some riskless asset (lend) or to borrow (leverage the portfolio) is the financing decision.

Efficient Frontier with Borrowing and Lending



These conditions give rise to what has been referred to as the separation theorem. The theorem implies that all investors, conservative or aggressive, should hold the same mix of stocks from the efficient set. They should use borrowing or lending to attain their preferred risk class. This conclusion flies in the face of more traditional notions of selection of portfolios for conservative clients and others for investors who are more daring. This analysis suggests that both types of investors should hold identically risky portfolios. Desired risk levels are then achieved through combining portfolio M with lending and borrowing.

If all investors face similar expectations and the same lending and borrowing rate, they will face a diagram such as that in Figure above and, furthermore, all of the diagrams will be identical. The portfolio of assets held by any investor will be identical to the portfolio of risky assets held by any other investor. If all investors hold the same risky portfolio, then, in equilibrium, it must be the market portfolio (M). The market portfolio is a portfolio comprised of all risky assets. Each asset will be held in the proportion which the market value of the asset represents to the total market value of all risky assets. This is the key: All investors will hold combinations of only two portfolios, the market portfolio and a riskless security.

The straight line depicted in Figure above is referred to as the Capital Market Line. All investors will end up with portfolios somewhere along the capital market line and all efficient portfolios would lie along the capital market line. However, not all securities or portfolios lie along the capital market line. From the derivation of the efficient frontier

we know that all portfolios, except those that are efficient, lie below the capital market line.

Observing the capital market line tells us something about the market price of risk. The equation of the capital market line (connecting the riskless asset with a risky portfolio) is

$$R_e = R_F + \frac{R_M - R_F}{\sigma_M} \sigma_e$$

where the subscript e denotes an efficient portfolio.

The term $(R_M - R_F) / \sigma_M$ can be thought of as the extra return that can be gained by increasing the level of risk (standard deviation) on an efficient portfolio by one unit.

The entire second term on the right side of the equation is thus the market price of risk times the amount of risk in the portfolio. The expression R_F is the price of time. That is, it is the price paid for delaying consumption for one period. The expected return on an efficient portfolio is :

$$(\text{Price of time}) + (\text{Price of risk}) (\text{Amount of risk})$$

Although this equation sets the return on an efficient portfolio, we need to go beyond to deal with returns on nonefficient portfolios or on individual securities.

CAPM assumptions

The CAPM is often criticised as unrealistic because of the assumptions on which the model is based, so it is important to be aware of these assumptions and the reasons why they are criticised. The assumptions are as follows:

Diversified portfolios

This assumption means that investors will only require a return for the systematic risk of their portfolios, since unsystematic risk has been diversified and can be ignored.

Single-period transaction horizon

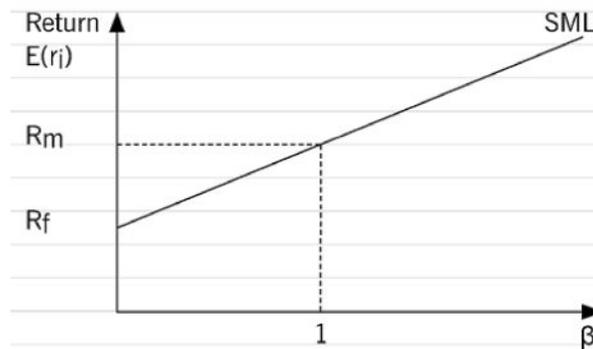
A standardised holding period is assumed by the CAPM to make the returns on different securities comparable. A return over six months, for example, cannot be compared to a return over 12 months. A holding period of one year is usually used.

Investors can borrow and lend at the risk-free rate of return

This is an assumption made by portfolio theory, from which the CAPM was developed, and provides a minimum level of return required by investors. The risk-free rate of return corresponds to the intersection of the security market line (SML) and the y-axis (see Figure 1). The SML is a graphical representation of the CAPM formula.

Perfect capital market

This assumption means that all securities are valued correctly and that their returns will plot on to the SML. A perfect capital market requires the following: that there are no taxes or transaction costs; that perfect information is freely available to all investors who, as a result, have the same expectations; that all investors are risk averse, rational and desire to maximise their own utility; and that there are a large number of buyers and sellers in the market.

FIGURE 1: THE SECURITY MARKET LINE

Advantages of the CAPM

- Considers only systematic risk, reflecting a reality in which most investors have diversified portfolios from which unsystematic risk has been essentially eliminated.
- Theoretically-derived relationship between required return and systematic risk which has been subject to frequent empirical research and testing.
- Much better method of calculating the cost of equity than the dividend growth model (DGM) in that it explicitly considers a company's level of systematic risk relative to the stock market as a whole.
- Clearly superior to the WACC in providing discount rates for use in investment appraisal.

Problems with the CAPM

- Several assumptions behind the CAPM formula that have been shown not to hold in reality. Despite these issues, the CAPM formula is still widely used because it is simple and allows for easy comparisons of investment alternatives.
- Including beta in the formula assumes that risk can be measured by a stock's price volatility. However, price movements in both directions are not equally risky. The look-back period to determine a stock's volatility is not standard because stock returns (and risk) are not normally distributed.
- It assumes that the risk-free rate will remain constant over the discounting period. An increase in the risk-free rate also increases the cost of the capital used in the investment and could make the stock look overvalued.
- The market portfolio that is used to find the market risk premium is only a theoretical value and is not an asset that can be purchased or invested in as an alternative to the stock. Most of the time, investors will use a major stock index, like the S&P 500, to substitute for the market, which is an imperfect comparison.

Most serious critique of the CAPM is the assumption that future cash flows can be estimated for the discounting process. If an investor could estimate the future return of a stock with a high level of accuracy, the CAPM would not be necessary

Security Market Line

For well-diversified portfolios, nonsystematic risk tends to go to zero, and the only relevant risk is systematic risk measured by beta. Since we assume that investors are concerned only with expected return and risk, the only dimensions of a security that need be of concern are expected return and beta.

We have seen that all investments and all portfolios of investments lie along a straight line in the return-to-beta space. To determine this line we need only connect the intercept (beta of zero, or riskless security) and the market portfolio (beta of one and return of R_M). These two points identify the straight line shown in Figure below. The equation of a straight line is

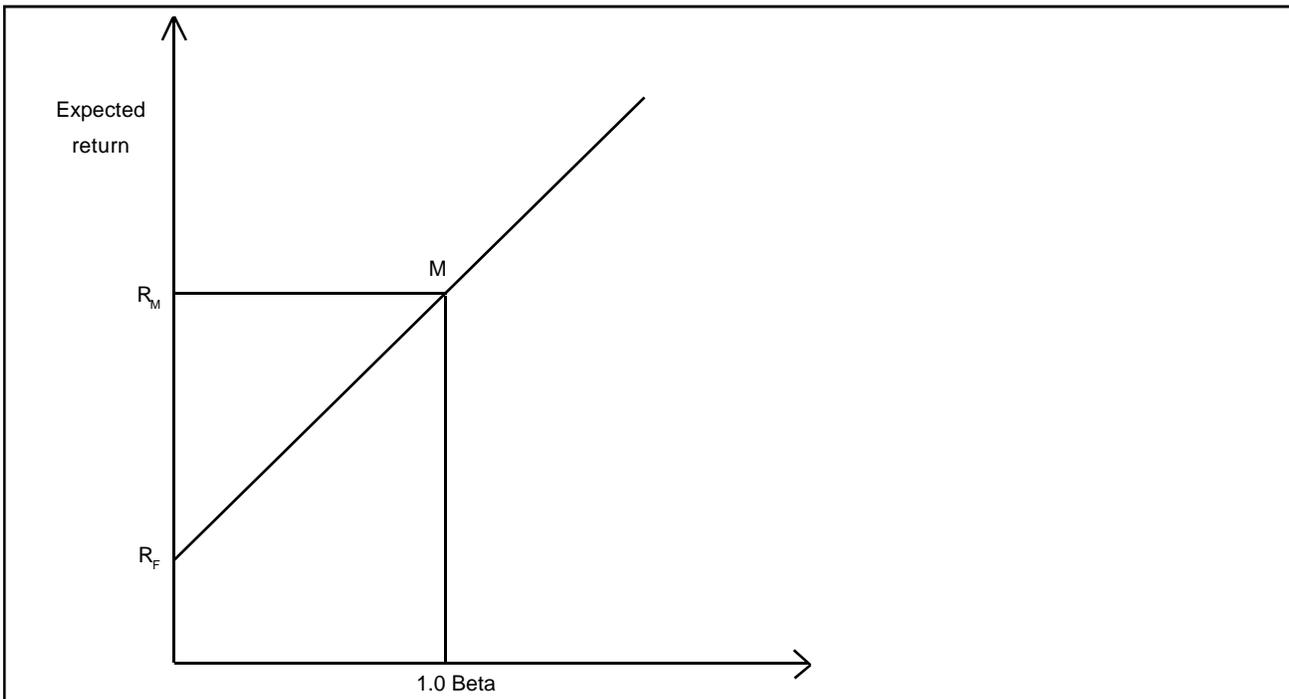
$$R_i = \alpha + b\beta_i$$

The first point on the line is the riskless asset with a beta of zero, so

$$R_F = \alpha + b(0)$$

$$R_F = \alpha$$

FIGURE The Security Market Line



The second point on the line is the market portfolio with a beta of 1. Thus,

$$R_M = \alpha + b(1)$$

$$R_M - \alpha = b$$

$$(R_M - R_F) = b$$

Combining the two results gives us :

$$R_i = R_F + \beta_i (R_M - R_F)$$

This is a key relationship. It is called the Security Market Line. It describes the expected return for all assets and portfolios of assets, efficient or not. The difference between the expected return on any two assets can be related simply to their difference in beta. The higher beta is for any security, the higher must be its expected return. The relationship between beta and expected return is linear.

Recall that the risk of any stock could be divided into systematic and unsystematic risk. Beta is an index of systematic risk. This equation suggests that systematic risk is the only important ingredient in determining expected returns. Unsystematic risk is of no consequence. It is not total variance of returns that affects returns, only that part of the variance in returns that cannot be eliminated by diversification.

Calculation of Beta

Beta measures systematic risk i.e. that which affects the market as a whole, an investor who invests his money in a portfolio of securities; Beta is the proper measure of risk. Beta of a security measures the sensitivity of the security with reference to a broadbased market index like BSE Sensex, NIFTY.

Beta is a factor of the following —

- Standard Deviation (Risk) of the Security or Portfolio,
- Standard deviation (Risk) of the Market, and
- Correlation between the Security and Market

The relationship is explained as follows —

$$\text{Beta of Security } S(\beta) = \frac{\sigma_S \times \rho_{SM}}{\sigma_M}$$

σ_S = Standard Deviation on Security ‘S’

σ_M = Standard Deviation on Security ‘M’

ρ_{SM} = Extent of Correlation between Security S and Market Portfolio

Beta of a portfolio

Portfolio beta refers to the weighted-average beta coefficient of the individual investments in a portfolio. It is calculated as the sum of the products of weights of individual investments and beta coefficient of those investments.

Example

Given below is information of market rates Returns and Data from two Companies P and Q.

	Year 2017	Year 2018	Year 2019
Market (%)	11.0	13.0	6.0
Company P (%)	13.0	11.5	9.8
Company Q (%)	11.0	10.5	9.5

Determine the beta coefficients of the Shares of Company P and Company Q.

Solution:

1. Computation of Factors

Year	Return of			Deviation from Mean			Variance of			Covariance of		
	Mkt. (R_M)	P (R_P)	Q (R_Q)	Mkt. (MM RR^M) (D_M)	P (PP RR^P) (D_P)	Q (QQ RR^Q) (D_Q)	Mkt.) $D(2M)$	Mkt.) $D(2P)$	Mkt.) $D(2Q)$	RM & RP	RM & RQ [$D_M \times D_Q$]	RP & RQ [$D_P \times D_Q$]
(1)	(2)	(3)	(4)	(5) = (2)-10	(6) = (3)-11.43	(7) = (4)-10.33	(8)(5) ²	(9)(6) ²	(10)(7) ²	(11) (5)×(6)	(12) (5)×(7)	(13) (6)×(7)
2017	11	13.0	11.0	1	1.57	0.67	1	2.46	0.45	1.57	0.67	1.05
2018	13	11.5	10.5	3	0.07	0.17	9	0.005	0.03	0.21	0.51	0.01
2019	6	9.8	9.5	-4	-1.63	-0.83	16	2.66	0.69	6.52	3.32	1.35
	30	34.3	31				26	5.125	1.17	8.30	4.50	2.41

	Market	Security P	Security Q
Mean	30/3=10	34.3/3=11.43	31/3=10.33
Variance	26/3=8.67	5.125/3=1.71	1.17/3=0.39
Standard Deviation	= $\sqrt{8.67}$ =2.94	= $\sqrt{1.71}$ =1.31	= $\sqrt{.39}$ =.62

2. Computation of Beta:

$$\text{Beta P} = \frac{\text{COV}_{MP}}{\sigma_M^2} = \frac{2.77}{8.67} = .32$$

$$\text{Beta Q} = \frac{\text{COV}_{MQ}}{\sigma_M^2} = \frac{1.5}{8.67} = .17$$

Example

Diwankar has invested in four securities M, N, O and P, the particulars of which are as follows —

Security (Rs.)	M	N	O	P
Amount Invested	1,25,000	1,50,000	80,000	1,45,000
Beta ()	0.60	1.50	0.90	1.30

If RBI Bonds carries an interest rate of 8% and NIFTY yields 14%, what is the expected return on portfolio?

Answer

(a) Computation of Weighted Beta (Beta of the Portfolio)

Security	Amount Invested	Proportion of Investment to Total Investment	Beta of Invest-ment	Weighted Beta
(1)	(2)	(3) = (2) ÷ 5,00,000	(4)	(5) = (3) x (4)
M	1,25,000	0.25	0.60	0.150
N	1,50,000	0.30	1.50	0.450
O	80,000	0.16	0.90	0.144
P	1,45,000	0.29	1.30	0.377
Total	5,00,000	1.00		1.121

(b) Computation of Expected Return on Portfolio

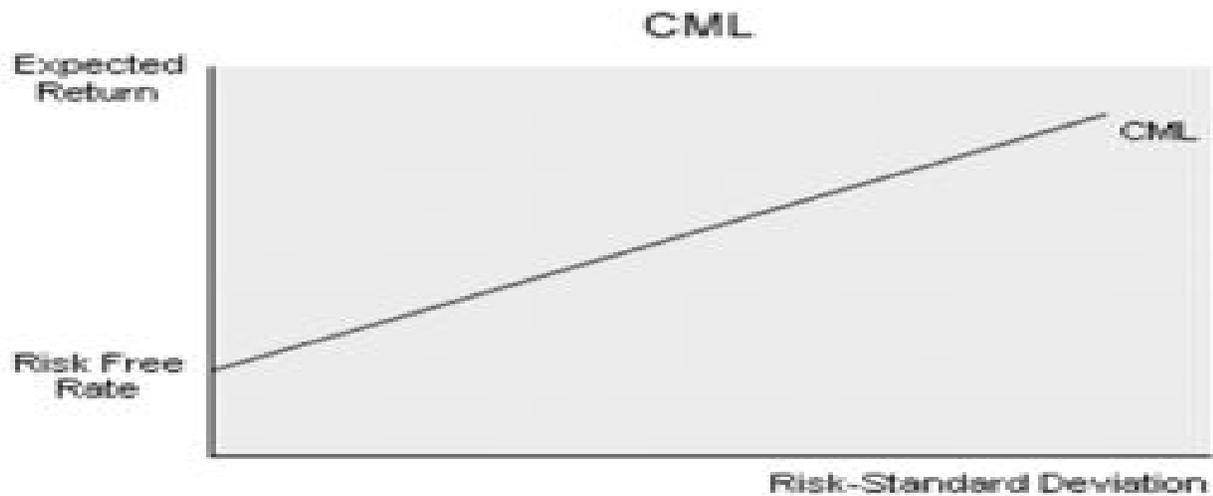
$$\text{Expected Return } [E(R_p)] = R_f + \hat{\rho} \times (R_m - R_f)$$

$$= 8\% + [1.121 \times (14\% - 8\%)]$$

$$= 8\% + [1.121 \times 6\%] = 8\% + 6.726\% = 14.726\%$$

Capital Market Line (CML)

The Markowitz mean-variance model is modified by introducing into the analysis the concept of risk-free asset. Capital market line (CML) is the tangent line drawn from the point of the risk-free asset to the feasible region for risky assets. Capital market line reflects the expected return of a portfolio consisting of all possible proportions between the market portfolio and a risk-free asset. The market portfolio is completely diversified, carries only systematic risk, and its expected return is equal to the expected market return as a whole.

**Purpose:**

The Capital Market Line (CML) provides the best risk and return tradeoff for an investor. CML enables an investor to estimate the Expected Return from a Portfolio.

Feature:

- (i) Portfolio is assumed to be efficient, i.e. exact replication of the market portfolio in terms of risks and rewards.
- (ii) CML assumes no unsystematic risk, i.e. all the unsystematic risk is completely taken care off by proper diversification similar to that of market portfolio.
- (iii) Capital Market Line estimates the return for a portfolio based on the Total Risk Route, i.e. it assumes existence of perfect correlation between the portfolio return and market return.
- (iv) Individual securities does not lie on Capital Market Line. This is because they have some extent of unsystematic risk associated with their returns.

Market Price of Risk

$$\text{Market Price of Risk of Portfolio } X = (R_M - R_F) \div \sigma_M$$

Where R_M = Market Return

R_F = Risk Free Rate of Return

σ_M = Standard Deviation of the Market Portfolio.

Expected Return on Portfolio under CML Approach

$$E(RP) = R_f + \sigma_P \lambda$$

Where $E(RP)$ = Expected Return on Portfolio

R_f = Risk Free Rate of Interest/ Return

λ = Market Price of Risk, i.e. Risk Premium per Unit of Market Risk

σ_P = Risk of the Portfolio (Standard Deviation)

Difference between Capital Market Line (CML) and Security Market Line (SML)

1. Risk Considered	Capital Market Line uses Standard Deviation, i.e. Total Risks across the x-axis.	Security Market Line uses Beta or Systematic Risk across the x-axis. (i.e. that part of Total Risk which is common to the whole of the market).
2. Nature of Portfolios	It uses only efficient portfolios, i.e. one which is a perfect replication of the Market Portfolio in terms of risks and rewards	Security Market Line uses both efficient and non-efficient portfolios.
3. Combination	Every point on the Capital Market Line is a proportional combination between Risk free Rate of Return and Market Return.	It graphs all portfolios and securities which lie on and off the Capital Market Line.

Example:

From the following information, ascertain the Market Price (X) of Risk of the portfolio, Also, determine the expected return from the portfolio by Capital Market Line:

Market Return (R_m)=18%,

Standard Deviation on market Return (σ_M)=6%

Risk Free Return=6%

Standard Deviation on Portfolio (σ_P)=8%

Answer:

Market Price of Risk of Portfolio $\lambda = (R_f - R_m) / (\sigma_M)$

$= (18-6)/6=2$

Expected Return on Portfolio $R_p = R_f + \lambda (\sigma_P)$

$= 6\% + 2 \times 8\% = 22\%$

ARBITRAGE PRICING THEORY

The capital asset pricing model (CAPM) asserts that only a single number – a security's beta against the market – is required to measure risk. At the core of arbitrage pricing theory (APT) is the recognition that several systematic factors affect security return.

The returns on an individual stock will depend upon a variety of anticipated and unanticipated events. Anticipated events will be incorporated by investors into their expectations of returns on individual stocks and thus will be incorporated into market prices. Generally, however, most of the return ultimately realized will result from unanticipated events. Of course, change itself is anticipated, and investors know that the most unlikely occurrence of all would be the exact realization of the most probable future scenario. But even though we realize that some unforeseen events will occur, we do not know their direction or their magnitude. What we can know is the sensitivity of returns to these events.

Systematic factors are the major sources of risk in portfolio returns. Actual portfolio returns depend upon the same set of common factors, but this does not mean that all portfolios perform identically. Different portfolios have different sensitivities to these factors.

Because the systematic factors are primary sources of risk, it follows that they are the principal determinants of the expected, as well as the actual, returns on portfolios. It is possible to see that the actual return, R , on any security or portfolio may be broken down into three constituent parts, as follows:

$$(Z) \quad R = E + bf + e$$

where:

E = expected return on the security

b = security's sensitivity to change in the systematic factor

f = the actual return on the systematic factor

e = returns on the unsystematic factors

Equation Z merely states that the actual return equals the expected return, plus factor sensitivity times factor movement, plus residual risk.

Empirical work suggests that a three-or-four-factor model adequately captures the influence of systematic factors on stock-market returns. Equation Z may thus be expanded to:

$$R = E + (b_1) (f_1) + (b_2) (f_2) + (b_3) (f_3) + (b_4) (f_4) + e$$

Each of the four middle terms in this equation is the product of the returns on a particular economic factor and the given stock's sensitivity to that factor. Suppose f_3 is associated with labor productivity. As labor productivity unexpectedly increases, f_3 is positive, and firms with high b_3 would find their returns very high. The subtler rationale and higher mathematics of APT are left for development elsewhere.

What are these factors? They are the underlying economic forces that are the primary influences on the stock market. Research suggests that the most important factors are unanticipated inflation, changes in the expected level of industrial production, unanticipated shifts in risk premiums, and unanticipated movements in the shape of the term structure of interest rates.

The biggest problems in APT are factor identification and separating unanticipated from anticipated factor movements in the measurement of sensitivities. Any one stock is so influenced by idiosyncratic forces that it is very difficult to determine the precise relationship between its return and a given factor. Far more critical is the measurement of the b 's. The b 's measure the sensitivity of returns to unanticipated movements in the factors. By just looking at how a given stock relates to, say, movements in the money supply, we would be including the influence of both anticipated and unanticipated changes, when only the latter are relevant.

Empirical testing of APT is still in its infancy, and concrete results proving the APT or disproving the CAPM do not exist. For these reasons it is useful to regard CAPM and APT as different variants of the true equilibrium pricing model. Both are, therefore, useful in supplying intuition into the way security prices and equilibrium returns are established.

SHARPE SINGLE AND MULTI INDEX MODELS

Sharpe Index Model

One Simplification of CAPM formula was done by Sharpe (1963), who developed the Single-Index Model. The single-index model imposes restrictions on how security returns can covary. In particular, it is assumed that all covariance arises through an "index." As we will see, this leads to a dramatic reduction in complexity. Sharpe's model has since been extended to multi-index models, and leads to a more general theory called the Arbitrage Pricing Theory, developed by Ross (1976). Besides simplifying the covariance matrix, this approach is easily extended to take account of non-financial factors. In the multi-index model, for example, one of the indexes could easily be the rate of inflation.

Single-Index Model

The major assumption of Sharpe's single-index model is that all the covariation of security returns can be explained by a single factor. This factor is called the index, hence the name "single-index model."

According to the Sharpe single index model the return for each security can be given by the following equation:

$$R_i = \alpha_i + \beta_i R_m + e_i$$

Where R_i = Expected return on a security

α_i = Alpha Coefficient

β_i = Beta Coefficient

R_m = Expected Return in market (an Index)

e = Error term with a mean of zero and a constant standard deviation.

Alpha Coefficient refers to the value of Y in the equation $Y = \alpha + \beta x$ when $x = 0$.

Beta Coefficient is the slope of the regression line and is a measure of the changes in value of the security relative to changes in values of the index.

A beta of +1.0 means that a 10% change in index value would result in a 10% change in the same direction in the security value. A beta of 0.5 means that a 10% change in index value would result in 5% change in the security value. A beta of - 1.0 means that the returns on the security are inversely related.

The equation given above can also be rearranged as shown below:

$$R = \beta R_m + \alpha + e$$

Here the component βR_m is the market related or systematic component of the return. The other component represents the unsystematic component. As is assumed to be near zero the unsystematic return is given by alpha only.

Multi-Index Model

The single index model is in fact an oversimplification. It assumes that stocks move together only because of a common co-movement with the market. Many researchers have found that there are influences other than the market that cause stocks to move together. Multi-index models attempt to identify and incorporate these non-market or extra-market factors that cause securities to move together also into the model. These extra-market factors are a set of economic factors that account for common movement in stock prices beyond that accounted for by the market index itself. Fundamental economic variables such as inflation, real economic growth, interest rates, exchange rates etc. would have a significant impact in determining security returns and hence, their co-movement.

A multi-index model augments the single index model by incorporating these extra market factors as additional independent variables. For example, a multi-index model incorporating the market effect and three extra-market effects takes the following form:

$$\bar{R}_i = \alpha_i + \beta_m R_m + \beta_1 R_1 + \beta_2 R_2 + \beta_3 R_3 + e_i$$

The model says that the return of an individual security is a function of four factors – the general market factor R_m and three extra-market factors R_1, R_2, R_3 . The beta coefficients attached to the four factors have the same meaning as in the single index model. They measure the sensitivity of the stock return to these factors. The alpha parameter α_i and the residual term e_i also have the same meaning as in the single index model.

Calculation of return and risk of individual securities as well as portfolio return and variance follows the same pattern as in the single index model. These values can then be used as inputs for portfolio analysis and selection.

A multi-index model is an alternative to the single index model. However, it is more complex and requires more data estimates for its application. Both the single index model and the multi-index model have helped to make portfolio analysis more practical.

SIMPLE SHARPE PORTFOLIO OPTIMIZATION

The construction of an optimal portfolio is simplified if there is a single number that measures the desirability of including a stock in the optimal portfolio. If we accept the single index model (Sharpe), such a number exists. In this case, the desirability of any stock is directly related to its excess return-to-beta ratio.

$$(R_i - R_F)/\beta_i$$

where:

R_i = expected return on stock i

R_F = return on a riskless asset

β_i = expected change in the rate of return on stock i associated with a 1 percent change in the market return

If stocks are ranked by excess return to beta (from highest to lowest), the ranking represents the desirability of any stock's inclusion in a portfolio. The number of stocks selected depends on a unique cutoff rate such that all stocks with higher ratios of $(R_i - R_F)/\beta_i$ will be included and all stocks with lower ratios excluded.

To determine which stocks are included in the optimum portfolio, the following steps are necessary:

1. Calculate the excess return-to-beta ratio for each stock under review and the rank from highest to lowest.
2. The optimum portfolio consists of investing in all stocks for which $(R_i - R_F)/\beta_i$ is greater than a particular cutoff point C .

Sharpe notes that proper diversification and the holding of a sufficient number of securities can reduce the unsystematic component of portfolio risk to zero by averaging out the unsystematic risk of individual stocks. What is left is systematic risk which, is determined by the market (index), cannot be eliminated through portfolio balancing. Thus, the Sharpe model attaches considerable significance to systematic risk and its most important measure, the beta coefficient (β).

According to the model, the risk contribution to a portfolio of an individual stock can be measured by the stock's beta coefficient. The market index will have a beta coefficient of +1.0. A stock with a beta of, for example, +2.0 indicates that it contributes far more risk to a portfolio than a stock with, say, a beta of +.05. Stocks with negative betas are to be coveted, since they help reduce risk beyond the unsystematic level.

Since efficient portfolios eliminate unsystematic risk, the riskiness of such portfolios is determined exclusively by market movements. Risk in an efficient portfolio is measured by the portfolio beta. The beta for the portfolio is simply the weighted average of the betas of the component securities. For example, an optimal portfolio which has a beta of 1.35, suggests that it has a sensitivity above the + 1.0 attributed to the market. If this portfolio is properly diversified (proper number of stocks and elimination of unsystematic risk), it should move up or down about one-third more than the market. Such a high beta suggests an aggressive portfolio. Should the market move up over the holding period, this portfolio will be expected to advance substantially. However, a market decline should find this portfolio falling considerably in value.

In this way, establishing efficient portfolios (minimum risk for a given expected return) comprising broad classes of assets (e.g., stocks, bonds, real estate) lends itself to the mean-variance methodology suggested by Markowitz. Determining efficient portfolios within an asset class (e.g., stocks) can be achieved with the single index (beta) model proposed by Sharpe.

RISK ADJUSTED MEASURE OF PERFORMANCE

Does the choice of risk-adjusted performance measure matter? This is the question the current discussion in academic literature revolves around. Risk-adjusted performance measures are an important tool for investment decisions. Whenever an investor evaluates the performance of an investment he will not only be interested in the achieved absolute return but also in the risk-adjusted return – i.e. in the risk which had to be taken to realize the profit.

The first ratio to measure risk-adjusted return was the Sharpe Ratio introduced by William F. Sharpe in 1966. It has been one of the most referenced risk/return measures used in finance, and much of this popularity can be attributed to its simplicity. The ratio's credibility was boosted further when Professor Sharpe won a Nobel Memorial Prize in Economic Sciences in 1990 for his work on the capital asset pricing model (CAPM).

The Ratio Defined

Most people with a financial background can quickly comprehend how the Sharpe ratio is calculated and what it represents. The ratio describes how much excess return you are receiving for the extra volatility that you endure for holding a riskier asset. Remember, you always need to be properly compensated for the additional risk you take for not holding a risk-free asset.

$$S(X) = (r_x - R_f) / \text{StdDev}(X)$$

where

- X is the investment
- r_x is the average rate of return of x
- R_f is the best available rate of return of a risk-free security (i.e. T-bills)
- $\text{StdDev}(X)$ is the standard deviation of x

Return (r_x)

The returns measured can be of any frequency (i.e. daily, weekly, monthly or annually), as long as they are normally distributed, as the returns can always be annualized. Herein lies the underlying weakness of the ratio - not all asset returns are normally distributed.

Abnormalities like kurtosis, fatter tails and higher peaks, or skewness on the distribution can be a problematic for the ratio, as standard deviation doesn't have the same effectiveness when these problems exist. Sometimes it can be downright dangerous to use this formula when returns are not normally distributed.

Risk-Free Rate of Return (r_f)

The risk-free rate of return is used to see if you are being properly compensated for the additional risk you are taking on with the risky asset. Traditionally, the risk-free rate of return is the shortest dated government T-bill. While this type of security will have the least volatility, some would argue that the risk-free security used should match the duration of the investment it is being compared against.

For example, equities are the longest duration asset available, so shouldn't they be compared with the longest duration risk-free asset available - government issued inflation-protected securities (IPS)?

Standard Deviation [StdDev(x)]

Now that we have calculated the excess return from subtracting the return of the risky asset from the risk-free rate of return, we need to divide this by the standard deviation of the risky asset being measured. As mentioned above, the higher the number, the better the investment looks from a risk/return perspective.

However, unless the standard deviation is very large, leverage may not affect the ratio. Both the numerator (return) and denominator (standard deviation) could be doubled with no problems. Only if the standard deviation gets too high do we start to see problems. For example, a stock that is leveraged 10 to 1 could easily see a price drop of 10%, which would translate to a 100% drop in the original capital and an early margin call.

Using the Sharpe Ratio

The Sharpe ratio is a risk-adjusted measure of return that is often used to evaluate the performance of a portfolio. The ratio helps to make the performance of one portfolio comparable to that of another portfolio by making an adjustment for risk.

For example, if manager A generates a return of 15% while manager B generates a return of 12%, it would appear that manager A is a better performer. However, if manager A, who produced the 15% return, took much larger risks than manager B, it may actually be the case that manager B has a better risk-adjusted return.

To continue with the example, say that the risk free-rate is 5%, and manager A's portfolio has a standard deviation of 8%, while manager B's portfolio has a standard deviation of 5%. The Sharpe ratio for manager A would be 1.25 while manager B's ratio would be 1.4, which is better than manager A. Based on these calculations, manager B was able to generate a higher return on a risk-adjusted basis.

To give you some insight, a ratio of 1 or better is considered good, 2 and better is very good, and 3 and better is considered excellent.

The Sharpe ratio is quite simple, which lends to its popularity. It's broken down into just three components: asset return, risk-free return and standard deviation of return. After calculating the excess return, it's divided by the standard deviation of the risky asset to get its Sharpe ratio. The idea of the ratio is to see how much additional return you are receiving for the additional volatility of holding the risky asset over a risk-free asset - the higher the better.

Example

A Portfolio Manager has invested in Blue Chip Funds which gives 19% return with a standard deviation of 3.5%. Calculate Sharpe Ratio if

- (a) Risk Free Return is 7%,
- (b) Return on Sensex is 18% with a standard deviation of 4%.

Answer

$$\text{Sharpe Ratio for Blue Chip Fund} = \frac{R_p - R_f}{\sigma_P} = \frac{19-7}{3.5} = 3.42\%$$

$$\text{Sharpe Ratio for Market} = \frac{R_m - R_f}{\sigma_M} = \frac{18-7}{4} = 2.75\%$$

Since Sharpe Ratio of Blue Chip Fund is Higher hence Fund has outperformed Market.

ECONOMIC VALUE ADDED

Adam Smith, one of the fathers of classical economic thought, observed that firms and resource suppliers, seeking to further their own self-interest and operating within the framework of a highly competitive market system, will promote the interest of the public, as though guided by an “invisible hand.” (Smith, 1776)

The market mechanism of supply and demand communicates the wants of consumers to businesses and through businesses to resource suppliers. Competition forces business and resource suppliers to make appropriate responses. The impact of an increase in consumer demand for some product will raise that goods price. The resulting economic profits signal other producers that society wants more of the product. Competition simultaneously brings an expansion of output and a lower price.

Profits cause resources to move from lower valued to higher valued uses. Prices and sales are dictated by the consumer. In the quest for higher profits, businesses will take resources out of areas with lower than normal returns and put them into areas in which there is an expectation of high profits.

Profits allocate resources

The primary objective of any business is to create wealth for its owners. If nothing else the organization must provide a growth dividend to those who have invested expecting a value reward for their investment. As companies generate value and grow, society also benefits. The quest for value directs scarce resources to their most promising uses and most productive uses. The more effectively resources are employed and managed, the more active economic growth and the rate of improvement in our standard of living as a society. Although there are exceptions to the rule relating to the value of economic wealth, most of the time there is a distinct harmony between creating increased share value of an organization and enhancing the quality of life of people in society.

In most companies today the search for value is being challenged by a seriously out of date financial management system. Often, the wrong financial focus, cash strategies, operating goals, and valuation processes are emphasized. Managers are often rewarded for the wrong achievements and in many cases they are not rewarded for the efforts that lead to real value. Balance sheets are often just the result of accounting rules rather than the focus of value enhancement. These problems beg for approaches to financial focus that are completely different from current approaches. New approaches must start nothing less than an evolution in thinking in the process of economic evaluation. One of the focuses that have proved to be incorrect in the valuation of economic worth is earnings per share (EPS). EPS has long been the hallmark of executives that appear in meetings of the shareholders, as the measure of their accomplishments. This, along with return on equity has long been thought of as the way to attract investment. There is nothing that points to EPS as anything more than a ratio that accounting has developed for management reporting. Many executives believe that the stock market wants earnings and that the future of the organization's stock depends on the current EPS, despite the fact that not one shred of convincing evidence to substantiate this claim has ever been produced. To satisfy the desire for reported profits, executives feel compelled to create earnings through creative accounting. Accounting tactics that could be employed to save taxes and increase value are avoided in favor of tactics that increase profit. Capital acquisitions are often not undertaken because they do not meet a hypothetical profit return. R&D and market expanding investments get only lip service. Often increased earnings growth is sustained by overzealous monetary support of businesses that are long past their value peak. We must ask then, what truly determines increased value in stock prices. Over and over again the evidence points to the cash flow of the organization, adjusted for time and risk that investors can expect to get back over the life of the business.

Economic Value Added (EVA) is a measurement tool that provides a clear picture of whether a business is creating or destroying shareholder wealth. EVA measures the firm's ability to earn more than the true cost of capital. EVA combines the concept of residual income with the idea that all capital has a cost, which means that it is a measure of the profit that remains after earning a required rate of return on capital. If a firm's earnings exceed the true cost

of capital it is creating wealth for its shareholders.

Definition of Economic Value Added

A discussion on Economic Value Added has to begin with the origin of the concept. EVA is based on the work of Professors Franco Modigliani and Merton H. Miller. In October, 1961, these two finance professors published “Dividend Policy, Growth and the Valuation of Shares”, in the Journal of Business. The ideas of free cash flow and the evaluation of business on a cash basis were developed in this article. These ideas were extended into the concept of EVA by Bennett Stewart and Joel Stern of Stern, Stewart & Company. Economic Value Added is defined as net operating profit after taxes and after the cost of capital. (Tully, 1993) Capital includes cash, inventory, and receivables (working capital), plus equipment, computers and real estate. The cost of capital is the rate of return required by the shareholders and lenders to finance the operations of the business. When revenue exceeds the cost of doing business and the cost of capital, the firm creates wealth for the shareholders.

$EVA = \text{Net Operating Profit} - \text{Taxes} - \text{Cost of Capital}$

Example

Say you made a ₹ 20,000 capital investment in your company. Your operating profit, after taxes, is ₹ 10,000. The opportunity cost of that investment is 10%.

In This case EVA would be Net Operating Profit after taxes – Cost of Capital

i.e. ₹ 10,000- 10% of ₹ 20,000 = ₹ 8,000.

The goal of EVA is to take into account the cost of capital invested in the company.

CASE STUDIES

Question No 1: The following table summarizes risk premiums for stocks relative to treasury bills and bonds, for different time periods:

Risk Premium for Equity

	Stocks - T. Bills		Stocks - T. Bonds	
	Arithmetic Average	Geometric Average	Arithmetic Average	Geometric Average
1926-2010	8.41%	6.41%	7.24%	5.50%
1962-2010	4.10%	2.95%	3.92%	3.25%
1981-2010	6.05%	5.38%	0.13%	0.19%

- What does this premium measure?
- Why is the geometric mean lower than the arithmetic mean for both bonds and bills?
- If you had to use a risk premium, would you use the most recent data (1981-2010), or would you use the longer periods? Explain your reasoning.

Solution 1

- It measures, on average, the premium earned by stocks over government securities. It is used as a measure of the expected risk premium in the future.
- The geometric mean allows for compounding, while the arithmetic mean does not. The compounding effect, in conjunction with the variability of returns, will lower the geometric mean relative to the arithmetic mean.

- C. The longer time period is most appropriate, because it covers more of the possible outcomes - crashes, booms, bull markets, bear markets. In contrast, a ten-year period can offer a slice of history that is not representative of all possible outcomes.

Question 2

You are an investor who is interested in the emerging markets of Asia. You are trying to value some stocks in Afghanistan, which does not have a long history of financial markets. During the last two years, the stock market has gone up 60% a year, while the government borrowing rate has been 15%, yielding an historical premium of 45%. Would you use this as your risk premium, looking into the future? If not, what would you base your estimate of the premium on?

Solution 2

Recent history is probably not an appropriate basis for estimating the premium, since this history can be skewed upward or downward by a couple of good or bad years. The premium should be based on the fundamentals driving the Afghanistan market, relative to other emerging and developed markets, and estimate a premium accordingly.

Question 3

The beta for Marathon Limited is 1.10. The current six-month treasury bill rate is 3.25%, while the thirty-year bond rate is 6.25%. Estimate the cost of equity for Marathon Limited, based upon

- (a) Using the treasury bill rate as your risk-free rate.
- (b) Using the treasury bond rate as your risk-free rate.

(Use the premiums in the table in question 1, if necessary.)

Which one of these estimates would you use in valuation? Why?

Solution 3

CAPM: using T.Bill rate = $3.25\% + 1.10 (8.41\%) = 12.50\%$

CAPM: using T.Bond rate = $6.25\% + 1.10 (5.50\%) = 12.30\%$

The long-term bond rate should be used as the risk-free rate, because valuation is based upon a long time horizon.

* 8.41% is the arithmetic mean average premium earned by stocks over treasury bills between 1926 and 2010.

** 5.50% is the geometric mean average premium earned by stocks over treasury bonds between 1926 and 2010.

Question 4

You have been asked to estimate the beta of a high-technology firm which has three divisions with the following characteristics

Division	Beta	Market Value
Personal Computers	1.60	₹ 100 million
Software	2.00	₹ 150 million
Computer Mainframes	1.20	₹ 250 million

- A. What is the beta of the equity of the firm?
- B. What would happen to the beta of equity if the firm divested itself of its software business?
- C. If you were asked to value the software business for the divestiture, which beta would you use in your valuation?

Solution 5

(A) What is the beta of the equity of the firm?

Division	Beta	Market Value (in Millions)	Weight	Weighted Beta
Personal Computers	1.60	100	20%	0.32
Software	2.00	150	30%	0.60
Computer Mainframes	1.20	250	50%	0.60
Company		500	100%	1.52

(B) What would happen to the beta of equity if the firm divested itself of its software business?

(i) If the cash from divestiture is distributed as dividend to shareholders

Division	Beta	Market Value (in Millions)	Weight	Weighted Beta
Personal Computers	1.60	100	29%	0.46
Software	2.00	0	0	0
Computer Mainframes	1.20	250	71%	0.86
Company		350	100%	1.31

(ii) if the cash from divestiture is retained in the firm

Division	Beta	Market Value (in Millions)	Weight	Weighted Beta
Personal Computers	1.60	100	20%	0.32
Software	2.00	150	0	0
Computer Mainframes	1.20	250	50%	0.60
Company		500	100%	0.92

(C) If you were asked to value the software business for the divestiture, which beta would you use in your valuation?

Use Beta = 2.0, the beta of the software division

Question No 5

Dhanpat, an investor, is seeking the price to pay for a security, whose standard deviation is 5%. The correlation coefficient for the security with the market is 0.75 and the market standard deviation is 4%. The return from risk-free securities is 6% and from the market portfolio is 11%. Dhanpat knows that only by calculating the required rate of return, he can determine the price to pay for the security. What is the required rate of return on the security?

Solution:

Calculation of beta coefficient

Standard deviation = 5%

Correlation coefficient = 0.75

Market Standard Deviation = 4%

Calculation of required rate of return on security –

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$$R_f = 6\%$$

$$R_m = 11\%$$

$$E(R_1) = R_f + \beta[R_m - R_f]$$

$$= 6.0 + 0.9375 [11.00 - 6.00]$$

$$= 6.0 + 0.9375 \times 5$$

$$= 6.0 + 4.6875$$

$$= 10.6875\%$$

Question No. 6: The market portfolio has a historically based expected return of 0.10 and a standard deviation of 0.04 during a period when risk-free assets yielded 0.03. The 0.07 risk premium is thought to be constant through time. Riskless investments may now be purchased to yield 0.09. A security has a standard deviation of 0.08 and a co-efficient of correlation with the market portfolio is 0.85. The market portfolio is now expected to have a standard deviation of 0.04. You are required to find —

- (i) market's return-risk trade-off;
- (ii) security beta; and
- (iii) equilibrium required expected return of the security

Solution:

(i) Market's Return – Risk Tradeoff

$$= \frac{R_m - R_F}{\sigma}$$

Where,

R_m = Market rate of return, i.e. 0.10

R_F = Risk free return, i.e. 0.03

σ = Standard deviation 0.04

$$= \frac{0.10 - 0.03}{0.04} = 1.75$$

(ii) Security Beta :

$$\beta_1 = \frac{\sigma_s}{\sigma_m} \times r_m$$

Where,

β_1 = Beta factor of investment

σ_s = Standard deviation of investment in security, i.e. 0.08

r_m = Co-efficient of Correlation with market portfolio, i.e. 0.85

σ_m = Market portfolio standard deviation, i.e. 0.04

$$\beta_1 = \frac{0.08}{0.04} \times 0.85$$

$$= 1.7$$

(iii) Equilibrium required for expected rate of return on the security :

$$E(R_1) = R_F + \beta_1 (R_M - R_F)$$

Where:

$E(R_1)$ = Expected rate of return on investment

R_F = Riskless investment yield = 0.09

R_M = Expected return on market portfolio

β_1 = Market sensitive index (Beta factor) of investment, i.e. 1.7

$$= 0.09 + 1.7 (0.10 - 0.03)$$

$$= 0.09 + 0.119$$

$$= 0.209$$

$$= 20.9\%$$

LESSON ROUND-UP

- Portfolio management refers to managing efficiently the investment in the securities by professionals for both small investors and corporate investors who may not have the time and skills to arrive at sound investment decisions.
- Portfolio Analysis seeks to analyze the pattern of return emanating from a portfolio of securities.
- Risk means that the return on investment would be less than the expected rate. Risk is a combination of possibilities because of which actual returns can be slightly different or greatly different from expected returns.
- Portfolio theory was originally proposed by Harry Markowitz in 1950s, and was the first formal attempt to quantify the risk of a portfolio and develop a methodology for determining the optimal portfolio.
- As per Markowitz Model, a portfolio is efficient when it yields highest return for a particular level of risk or minimizes risk for a specified level of expected return.
- Covariance and correlation are conceptually analogous in the sense that both of them reflect the degree of comovements between two variables.
- According to Sharpe Index Model, return on a security is correlated to an index of securities or an index or an economic indicator like GDP or prices and the return for each security can be given by:

$$R_i = \alpha_i + \beta_i R_M + e_i$$

- Capital Asset Pricing Model provides that if adding a stock to a portfolio increases its standard deviation, the stock adds to the risk of the portfolio. This risk is the un-diversified risk that can not be eliminated.
- Beta is the measure of the non- diversifiable or systematic risk of an asset relative to that of the market portfolio.

$$\text{Beta} = \frac{\text{Non- Diversifiable risk of asset or portfolio}}{\text{Risk of market portfolio}}$$

- The equation of the capital market line (connecting the riskless asset with risky portfolio) is

$$R_e = R_f + \frac{(R_M - R_F)}{\sigma_M} \cdot \sigma_e$$

- A security market line describes the expected return for all assets and portfolios of assets, efficient or not.
- The Sharpe ratio is a risk adjusted measure of return that is often used to evaluate the performance of a portfolio.
- EVA measures the firm's ability to earn more than the true cost of capital.
- EVA combines the concept of residual income with the idea that all capital has a cost, which means that it is a measure of the profit that remains after earning a required rate of return on capital.

TEST YOURSELF

(These are meant for re-capitulation only. Answers to these questions are not to be submitted for evaluation)

1. What is Portfolio Analysis? Why do we need to carry it out?
2. What is the expected return on the Portfolio of risky assets?
3. Describe the procedure developed by Markowitz for choosing optimal portfolio to risky assets.
4. What is an efficient portfolio?
5. Describe the Sharpe Index approach of Portfolio analysis.
6. Write a short note on expected return on a portfolio.
7. CAPM is a tool to work out cost of equity. Discuss.
8. Differentiate between:
 - (i) 'Markowitz model' and 'Sharpe index model'.
 - (ii) Efficient Portfolio and Optimal Portfolio
9. Mohan has a portfolio of 6 securities, each with a market value of 10,000. The current beta of the portfolio is 1.30 and beta of the riskiest security is 1.80. Mohan wishes to reduce his portfolio beta to 1.15 by selling the riskiest security and replacing it with another security with a lower beta. What must be the beta of the replacement security?
10. Excel Ltd. is considering investing in a risky project which would be added to an existing portfolio of investment projects, also subject to risk. It envisages six possible states of the economy for which it has estimated probabilities and outcome as follows :

State of Economy	Probability	Return on Existing Portfolio	Return on Proposed Projects
1	0.1	12%	8%
2	0.2	14%	10%
3	0.2	15%	12%
4	0.3	16%	10%
5	0.1	18%	14%
6	0.1	20%	6%

You are required to determine whether the project should be accepted. The risk-free rate of return is 6%.

Lesson 10

PRACTICAL QUESTIONS AND CASE STUDIES

CAPITAL BUDGETING

Question No. 1

Following data in respect of two machines namely 'A' and 'B' are detailed below. Depreciation has been charged on straight line basis and estimated life of both machines is five years.

(In ₹)

Item	Machine 'A'	Machine 'B'
Cost	56,125	56,125
Net income after depreciation and taxes:		
1st Year	3,375	11,375
2nd Year	5,375	9,375
3rd Year	7,375	7,375
4th Year	9,375	5,375
5th Year	11,375	3,375
	36,875	36,875

Find out –

- Average rate of return on 'A' and 'B' machines
- Which machine is better from the point of view of pay-back period and why?
- Calculate average rate of return when salvage value of machine 'A' turns out to be ₹ 3,000 and when 'B' machine has zero salvage value.

Answer to Question No. 1

- Average Rate of Return (ARR)

$$\text{ARR} = \frac{\text{Average net income after taxes}}{\text{Average investment}}$$

$$\text{Average income of machine 'A'} = \frac{\text{₹ } 36,875}{5} = \text{₹ } 7,375$$

$$\text{Average income of machine 'B'} = \frac{\text{₹ } 36,875}{5} = \text{₹ } 7,375$$

$$\text{Average investment} = \frac{1}{2} (\text{₹ } 56,125) = \text{₹ } 28,062.50$$

(Average investment of Machine A and Machine B is the same as the cost is same)

$$\text{ARR for Machine A} = \frac{7,375}{28,062.50} \times 100 = 26.28\%$$

$$\text{ARR for Machine B} = \frac{7,375}{28,062.50} \times 100 = 26.28\%$$

(b) From the Point of View of Pay-back Period

From this point of view, Machine B is better as the initial inflow is much higher compared to Machine A and hence Machine B provides large liquidity of funds.

(c) Average Rate of Return when Salvage Value of Machine A is ₹ 3,000

$$\begin{aligned} \text{Average Investment} &= ₹ 3,000 + 1/2 (\text{₹ } 56,125 - ₹ 3,000) \\ &= ₹ 3,000 + ₹ 26,563 \text{ (approximately)} \\ &= ₹ 29,563 \text{ (approximately)} \end{aligned}$$

$$\text{ARR} = \frac{\text{Average income}}{\text{Average investment}}$$

$$= \frac{7,375}{29,563} \times 100$$

$$= 24.95\%$$

$$\text{ARR of Machine A} = 24.95\%$$

As Machine B does not have any salvage value, the ARR for Machine B will remain the same, i.e. 26.28% (as calculated in (a) above).

Question No. 2

A Company is contemplating to purchase a machine. Two machines A and B are available, each costing ₹ 5,00,000. In comparing the profitability of the machines, a discounted rate of 10% is to be used. Earnings after taxation are expected as follows:

Year	CASH FLOW	
	Machine 'A' (₹)	Machine 'B' (₹)
I	1,50,000	50,000
II	2,00,000	1,50,000
III	2,50,000	2,00,000
IV	1,50,000	3,00,000
V	1,00,000	2,00,000

Indicate which of the machines would be profitable using the following methods of ranking investments proposals:

- (i) Pay back method
- (ii) Net present value method
- (iii) Post pay back profitability
- (iv) Average rate of return.

This discount factor at 10% is:

1st year — .9091

2nd year	—	.8264
3rd year	—	.7513
4th year	—	.6830
5th year	—	.6209

Answer to Question No. 2

(I) PAY BACK METHOD:

Pay back period for Machine 'A'

Year	Cash Flow (₹)	
	Total	Cumulative Cash flow
I	1,50,000	1,50,000
II	2,00,000	3,50,000
III	2,50,000	5,50,000
Investment	5,00,000	

Total pay back period : $2 \text{ year} + \left(\frac{1,50,000}{2,50,000} \right) \times 12 = 2 \text{ years } 7.2 \text{ months}$

Pay back period for Machine 'B'

Year	Cash Flow (₹)	
	Total	Cumulative Cash flow
I	50,000	50,000
II	1,50,000	2,00,000
III	2,00,000	4,00,000
IV	3,00,000	5,00,000
Investment	5,00,000	

Total pay back period : $3 \text{ year} + \left(\frac{1,00,000}{3,00,000} \right) \times 12 = 3 \text{ years } 4 \text{ months}$

Rankings:	Machine 'A'	Machine 'B'
	I	II

(II) NET PRESENT VALUE METHOD:

Calculation of Present Values of Cash Flows

Year	Cash Flow (₹)		Discount Factor @10%	Present Value (₹)	
	Machine 'A'	Machine 'B'		Machine 'A'	Machine 'B'
I	1,50,000	50,000	0.9091	1,36,365	45,455
II	2,00,000	1,50,000	0.8264	1,65,280	1,23,960

III	2,50,000	2,00,000	0.7513	1,87,825	1,50,260
IV	1,50,000	3,00,000	0.6830	1,02,450	2,04,900
V	1,00,000	2,00,000	0.6209	62,090	1,24,180
	Total Present Value			6,54,010	6,48,755
	Initial Investment			5,00,000	5,00,000
	Net Present Value			1,54,010	1,48,755

	Machine 'A'	Machine 'B'
Ranking	I	II

(iii) Post Pay Back Profitability:

	Machine 'A' ₹	Machine 'B' ₹
Total Actual Cash Flows	8,50,000	9,00,000
Less: Initial Investment (Recovered during pay-back)	5,00,000	5,00,000
Post Pay back Profitability	3,50,000	4,00,000
Ranking	II	I

(iv) Return on Investment Method:

$$\text{Return on Investment}^* = \frac{\text{Average Annual Cash Flow}}{\text{Initial Investment}} \times 100$$

	Machine 'A' ₹	Machine 'B' ₹
Total cash flows	8,50,000	9,00,000
(Less : Depreciation For 5 years)	5,00,000	5,00,000
Net earning after tax and depreciation	3,50,000	4,00,000
Life of Machine (yrs)	5	5
Average earning per year	70,000	80,000
Initial cost	5,00,000	5,00,000
ARR	$\left(\frac{70,000}{5,00,000} \times 100 \right)$ = 14%	$\left(\frac{80,000}{5,00,000} \times 100 \right)$ = 16%
Ranking	II	I

* Note: It may be calculated by using other methods also.

Question No. 3

Following are the details of three project A, B and C

	A	B	C
Cost (₹)	50,000	70,000	70,000
Life	10 years	12 years	14 years
Estimated scrap (₹)	5,000	10,000	7,000
Annual Profit Less Taxation (₹)	5,000	6,000	5,500

Select the best one using

- (i) Pay back period
- (ii) Surplus life over pay back period
- (iii) Surplus cash flow, as the decision criterion.

Answer to Question No. 3

- (a) Under pay-back method, the project which has the shortest pay-back period is selected. The pay-back period is the length of time required for recovering the initial investment out of the annual cash flow. In our question, the following are the pay-back periods of projects A, B and C.

$$\text{Project A} \quad 50,000/5,000 = 10 \text{ years}$$

$$\text{Project B} \quad 70,000/6,000 = 11.66 \text{ years}$$

$$\text{Project C} \quad 70,000/5,500 = 12.73 \text{ years}$$

- (b) From the above, one can simply say that, on the basis of surplus life over pay-back period, Project C is the best because, C has the longest surplus life of 1.27 years. (14 – 12.73). However, to be more scientific, the scrap value should be taken into account in this case, because if the full life is allowed to be run the scrap value will be realised. One way to do this would be to deduct scrap value from initial cost and calculate the time period required to cover this cost. The difference between the life of the project and the time required to cover this cost may then be taken to represent the surplus life. On this basis, the surplus life of our projects are:

$$\text{Project A:} \quad 10 \text{ years} \quad - \quad (45,000/5,000) \text{ years} \quad = 1 \text{ year}$$

$$\text{Project B:} \quad 12 \text{ years} \quad - \quad (60,000/6,000) \text{ years} \quad = 2 \text{ years}$$

$$\text{Project C:} \quad 14 \text{ years} \quad - \quad (63,000/5,500) \text{ years} \quad = 2.55 \text{ years}$$

So, Project 'C' is the best one.

- (c) In our question, time value of money has been ignored. As such, the calculation of surplus cash flow, thus becomes easier. The scrap value may be deducted from the initial cost to derive the actual cost. On this basis, the surplus cash flows from each project after the life of each project is over, are:

	A	B	C
	₹	₹	₹
Total cash flow: (Life x Annual Cash Flow)	50,000	72,000	77,000
Less: Initial cost: (Cost – Estimated Scrap Value)	45,000	60,000	63,000
Surplus Cash flow	5,000	12,000	14,000
Surplus Cash Flow (in %)	5,000/45,000x 100=11.11%	12,000/60,000 x100=20%	14,000/63,000 x100=22.22%
Life of the Project	10 years	12 years	14 years

Rate of Surplus Cash Flow per annum	11.11/10 =1.1%	20/12=1.67 Rounded off to 1.7	22.22/ 14=1.58 Rounded off to 1.6
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However, in order to select the best project we must see the highest rate of cash flow:

For Project A, the rate of surplus cash flow is 1.1 per cent per annum.

For Project B, the rate of surplus cash flow is 1.7 per cent per annum.

For Project B, the rate of surplus cash flow is 1.6 per cent per annum.

On the above basis, Project B yields the highest rate of surplus cash flow per annum and is the best.

Alternative Solution

Calculation of Depreciation

	A	B	C
Cost (₹)	50,000	70,000	70,000
Less: Scrap (₹)	5,000	10,000	7,000
	45,000	60,000	63,000
Life (years)	10	12	14
Depreciation p.a. (₹)	4,500	5,000	4,500

Pay Back Period:

Projects	A (₹)	B (₹)	C (₹)
Profits less Taxation	5,000	6,000	5,500
Depreciation	4,500	5,000	4,500
CFAT but before Depreciation	9,500	11,000	10,000
<i>Pay Back Period</i>	$\frac{50,000}{9,500}$ = 5.3 years	$\frac{70,000}{11,000}$ = 6.4 years	$\frac{70,000}{10,000}$ = 7 years
Rank	I	II	III
Life	10 years	12 years	14 years
<i>Profitable Period (Life – Pay Back Period)</i>	4.7 years	5.8 Years	7 years
Rank	III	II	I
Cash Flows over the profitable period Profitable period * CFATBD	₹ 44,650	₹ 63,800	₹ 70,000
Estimated Scrap	5,000	10,000	7,000
Surplus Cash Flow	49,650	73,800	77,000
Rank	III	II	I

Question No. 4

The particulars relating to two alternative Capital Projects are furnished below:

	PROJECT X	PROJECT Y
Life of Project	4 years	6 years
Estimated Cash Outflow (₹ in lakhs)	15	15
Estimated Cash Inflow (₹ in lakhs)		
1st Year	8	7
2nd Year	10	8
3rd Year	7	8
4th Year	3	6
5th Year	—	5
6th Year	—	4

Compute internal rate of return of Project X and Y and state which project you could recommend. You may use the present value tables given below:

PRESENT VALUE OF Re. 1

After	20%	25%	30%	35%	40%	45%	50%
1st	0.833	0.800	0.769	0.741	0.714	0.690	0.677
2nd	0.694	0.640	0.592	0.549	0.510	0.476	0.444
3rd	0.579	0.512	0.455	0.406	0.364	0.328	0.296
4th	0.482	0.410	0.350	0.301	0.260	0.226	0.198
5th	0.402	0.328	0.269	0.223	0.186	0.156	0.132
6th	0.335	0.262	0.207	0.165	0.133	0.108	0.088

Answer to Question No. 4

OUTFLOW: ₹ 15,00,000

Project X

Years	Cash Inflow	Discount Factor @ 25%	Present Value (₹)	Discount Factor @ 30%	Present Value (₹)
1st Year	8,00,000	.800	6,40,000	.769	6,15,200
2nd Year	10,00,000	.640	6,40,000	.592	5,92,000
3rd Year	7,00,000	.512	3,58,400	.455	3,18,500
4th Year	3,00,000	.410	1,23,000	.350	1,05,000
	Inflow	Discount Factor @ 35%		Discount Factor @ 40%	
1st Year	8,00,000	.741	5,92,800	.714	5,71,200
2nd Year	10,00,000	.549	5,49,000	.510	5,10,000

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3rd Year	7,00,000	.406	1,84,200	.364	2,54,800
4th Year	3,00,000	.301	96,300	.260	78,000
			15,16,300		14,14,000

PV required 15,00,000

PV at 35% 15,16,300

PV at 40% 14,14,000

Difference in Rate = 5%

Difference in inflow at 35% and 40% = 1,02,300

$$\text{IRR} = 35\% + \frac{16,300}{1,02,300} \times 5 = 35.8\%$$

Project Y

OUT FLOW: ₹ 15,00,000

Years	Cash Inflow	Discount Factor @ 30%	Present Value (₹)	Discount Factor @ 40%	Present Value (₹)
1	2	3	4	5	6
1	7,00,000	.741	5,18,700	.714	4,99,900
2	8,00,000	.549	4,39,200	.51	4,08,000
3	8,00,000	.406	3,24,800	.364	2,91,200
4	6,00,000	.301	1,80,600	.26	1,56,000
5	5,00,000	.223	1,11,500	.186	93,000
6	4,00,000	.165	66,000	.133	53,000
	Total		16,40,800		15,01,200
		Discount Factor @ 45%			
1	7,00,000	.69	4,83,000		
2	8,00,000	.476	3,80,800		
3	8,00,000	.328	2,62,400		
4	6,00,000	.226	1,35,600		
5	5,00,000	.156	78,000		
6	4,00,000	.106	43,200		
			13,83,000		

PV required: ₹15,00,000

PV at 40%: ₹15,01,200

PV at 45%: ₹ 13,83,000

Difference in Rate = 5%

Difference in inflow at 40% and 45% = 1,18,200

$$\text{IRR} = 40\% + \frac{1,200}{1,18,200} \times 5 = 40 + .05 = 40.05\%$$

The profitability statement of project X shows that at 35 per cent, trial cash inflows are marginally greater and therefore 35 per cent is the rate of return which equates the present value of inflows with outflows. After employing the interpolation techniques the true rate in case of project 'X' comes to be 35.8%. The profitability of project 'Y' shows that the rate of return is 40%. Using the rate of return method project 'Y' yields a rate of return of 40.05 per cent while project 'X' yields 35.8%. On this basis Project 'Y' is recommended.

Question No. 5

A company is faced with the Question of choosing between two mutually exclusive projects. Project A requires a cash outlay of ₹ 1,00,000 and cash running expenses of ₹ 35,000 per year. On the other hand, Project B will cost ₹ 1,50,000 and require cash running expenses of ₹ 20,000 per year. Both the projects have a eight-year life. Project A has a ₹ 4,000 salvage value and Project B has a ₹ 14,000 salvage value. The company's tax rate is 50% and rate of return is 10%. Assume depreciation on straight line basis. Which project should be accepted. Present value of Re. 1 at the end of each year at 10% for 8 years is equal to ₹ 5.335 and present value of Re. 1 at the end of 8th year at 10% is equal to Re. 0.467.

Answer to Question No. 5

	<i>Project A</i>	<i>Project B</i>	<i>Differential cash flow (B-A)</i>	<i>Differential net cash flow (B-A)</i>
	₹	₹	₹	₹
Cash Outlay	1,00,000	1,50,000	50,000	50,000
Cash running expenses before taxes	35,000	20,000	+15,000	—
Tax saving (@ 50%) on expenses	17,500	10,000	<u>7,500</u>	7,500
Net savings depreciation	12,000	17,000	+ 5,000	
Tax savings on depreciation	6,000	8,500	2,500	<u>2,500</u>
Net savings				10,000
Salvage (at the end of 8 years)	4,000	14,000	10,000	10,000

Thus, if Project B is chosen it would require an additional outlay of ₹ 50,000 but would save in terms of cash inflows ₹ 10,000 each year for eight years. This project should be accepted if it has a positive net present value at a 10% discount rate.

	₹
PV of ₹ 10,000 each for eight years @ 10% (10,000 x 5.335)	53,350
PV of ₹ 10,000 at the end of eight years @ 10% (10,000 x .467)	<u>4,670</u>
	58,020
Less: Cash outlay	<u>50,000</u>
Net present value	<u>8,020</u>

As Project B will offer whatever Project A offers and also helps in generating an additional net present value of ₹ 8,020 it should be preferred to Project A.

Question No. 6

The Klein & Co. is contemplating either of two mutually exclusive projects. The data with respect to each are given

below. The initial investment for both is equal to their depreciable value. Both will be depreciated straight line over a five-year life.

	Project A	Project B
	(₹)	(₹)
Initial Investment	1,00,000	1,40,000
Year		
Profits after taxes		
1	10,000	25,000
2	15,000	25,000
3	20,000	25,000
4	25,000	25,000
5	35,000	25,000

- (i) Calculate the 'net present value' and 'benefit-cost ratio' for each project.
- (ii) Evaluate the acceptability of each project on the basis of above mentioned two techniques.
- (iii) Select the best project, using NPV and benefit cost ratios and comment on the resulting rankings.
- (iv) Assume that the Klein Co. has an 11% cost of capital.
- (v) The following data relates to discounting factor:

Year	Discounting factor at 11%
1	.901
2	.812
3	.731
4	.659
5	.593

Further, discounting factor for present value of an annuity discounted at 11% for five years is 3.696.

Answer to Question No. 6

- (i) The NPV for project A can be calculated as follows:

Year	Cash inflow after tax but adding back depreciation (₹)	Present value interest factor at 11%	Present value (₹)
1	30,000	.901	27,030
2	35,000	.812	28,420
3	40,000	.731	29,240
4	45,000	.659	29,655
5	55,000	.593	2,515
		Total	1,46,600

For Project A, question provides data regarding profits after taxes. To obtain cash inflow, therefore, we have to add depreciation amount. Total project investment is ₹ 1,00,000. Life of the project is 5 years and it is depreciated at straight line method. Therefore, depreciation amount would be ₹ 20,000 each year which should be added to PAT to

obtain CI (Cash Inflow).

Similarly, for project B, the depreciation amount would be ₹ 28,000 per year, which should be added to PAT for obtaining Cash Inflow.

PV for inflow	:	(3.696) x (53,000)	=	₹ 1,95,888
NPV of Project B	=	1,95,888 – 1,40,000	=	₹ 55,888
NPV of Project A	=	1,46,960 – 1,00,000	=	₹ 46,960

Benefit Cost Ratio

The benefit-cost ratio (B/C) can easily be determined by dividing the present value of inflow by the initial investment in each case.

Project A	B/C	=	$\frac{1,46,960}{1,00,000}$	= 1.47
Project B	B/C	=	$\frac{1,95,888}{1,40,000}$	= 1.40

(ii) On the basis of both NPV and B/C ratios, both projects are acceptable because their NPVs are greater than zero and their B/Cs are greater than one respectively.

(iii) On the basis of NPV, project B is preferable to project A. On the basis of B/C ratios, project A is preferable to project B. If the firm is operating under capital rationing the B/C ratio approach would be best (i.e. project A preferred), while if the firm has unlimited funds, the NPV approach is best (i.e. project B preferred).

Question No. 7

M/s Lalvani & Co. has ₹ 2,00,000 to invest. The following proposal are under consideration. The cost of capital for the company is estimated to be 15 per cent.

Project	Initial Outlay ₹	Annual Cash Flow ₹	Life of Project (Years)
A	1,00,000	25,000	10
B	70,000	20,000	8
C	30,000	6,000	20
D	50,000	15,000	10
E	50,000	12,000	20

Rank the above projects on the basis of–

- (i) Pay-back method
- (ii) NPV method
- (iii) Profitability index method

Present value of annuity of Re. 1 received in steady stream discount at the rate of 15%

8 years	=	4.6586
10 years	=	5.1790
20 years	=	6.3345

Answer to Question No. 7

The ranking of various project under the various methods are shown below:

(i) Pay-Back Method:

$$\text{Pay back period} = \frac{\text{Initial Investment}}{\text{Annual cash flows}}$$

The project with the lowest pay-back period is to be ranked first.

Project	Initial Investment ₹	Annual Cash Flow ₹	Pay-back period(in years)	Ranking
A	1,00,000	25,000	4	3
B	70,000	20,000	3.5	2
C	30,000	6,000	5	5
D	50,000	15,000	3.33	1
E	50,000	12,000	4.17	4

(ii) Net Present Value Method: The project with the highest N.P.V. is to be ranked first.

Project	Initial investment (₹)	Annual Cash Flow (₹)	Life in years	PV Factor at 15%	PV₹	NPV (₹)	Ranking
A	1,00,000	25,000	10	5.1790	1,29,475	29,475	1
B	70,000	20,000	8	4.6586	93,172	23,172	4
C	30,000	6,000	20	6.3345	38,007	8,007	5
D	50,000	15,000	10	5.1790	77,685	27,685	2
E	50,000	12,000	20	6.3345	76,014	26,014	3

(iii) Profitability Index Method: The project which shows the highest profitability index is to be ranked first.

$$\text{Profitability Index} = \frac{\text{Total Present Value of Cash flows}}{\text{Initial Investment}}$$

Project	Initial investment (₹) (a)	Annual Cash Flow (₹)	Life in years	PV Factor at 15%	PV(₹) (b)	Profit-ability Index (a/b)	Ranking
A	1,00,000	25,000	10	5.1790	1,29,475	1.29	4
B	70,000	20,000	8	4.6586	93,172	1.33	3
C	30,000	6,000	20	6.3345	38,007	1.27	5
D	50,000	15,000	10	5.1790	77,685	1.55	1
E	50,000	12,000	20	6.3345	76,014	1.52	2

Question No. 8

Mohan & Co. is considering the purchase of a machine. Two machines X and Y each costing ₹ 50,000 are available. Earnings after taxation are expected to be as under:

Year	Machine X(₹)	Machine Y(₹)	Discount factor at 10%
1st	15,000	5,000	.9091
2nd	20,000	15,000	.8264
3rd	25,000	20,000	.7513
4th	15,000	30,000	.6830
5th	10,000	20,000	.6209

Estimate the two alternatives according to—

- (i) Payback method;
- (ii) Return on investment method;
- (iii) Net present value method – a discount rate of 10% is to be used.

Answer to Question No. 8

(i) Payback method:

Year	Earning Machine X(₹)	Earning Machine Y(₹)	Cumulative Earning Machine X (₹)	Cumulative Earning Machine Y (₹)
1st	15,000	5,000	15,000	5,000
2nd	20,000	15,000	35,000	20,000
3rd	25,000	20,000	60,000	40,000
4th	15,000	30,000	75,000	70,000
5th	10,000	20,000	85,000	90,000

$$\begin{aligned} \text{Pay back period for Machine X} &= 2 \text{ years} + \frac{15,000}{25,000} \times 12 \text{ year} \\ &= 2 \text{ years 7 months 6 days.} \end{aligned}$$

$$\begin{aligned} \text{Pay back period for Machine Y} &= 3 \text{ years} + \frac{10,000}{30,000} \times 12 \text{ year} \\ &= 3 \text{ years 4 months} \end{aligned}$$

(ii) Return on Investment Method:

PARTICULARS	MACHINE – X	MACHINE – Y
Total of Cash flows	₹ 85,000	₹ 90,000
Average Annual Cash flows	₹ 85,000/5	₹ 90,000/5
	= ₹ 17,000	= ₹ 18,000
Annual Depreciation (₹ 50,000/5)	₹ 10,000	₹ 10,000
Annual Net Cash Inflow	₹ 17,000 – 10,000	₹ 18,000 – 10,000
	= ₹ 7,000	= ₹ 8,000
Average Investment	₹ 50,000/2	₹ 50,000/2
	= ₹ 25,000	= ₹ 25,000

Return on Investment	=	$\frac{\text{Annual Net Cash Inflows}}{\text{Average Investment}} \times 100$	
	=	$\frac{7,000 \times 100}{25,000}$	= $\frac{8,000 \times 100}{25,000}$
	=	28%	= 32%

Note: In this case, Net cash flows after depreciation have been calculated for arriving at the ROI. The question can be solved with gross cash flows also.

(iii) Net present value method

Calculation of Present Value of Cash Flows

Year	Discount factor at 10%	Machine X		Machine Y	
		Cash flow	P.V.	Cash flow	P.V.
		₹	₹	₹	₹
1	.9091	15,000	13,636	5,000	4,545
2	.8264	20,000	16,528	15,000	12,396
3	.7513	25,000	18,782	20,000	15,026
4	.6832	15,000	10,245	30,000	20,490
5	.6209	10,000	6,209	20,000	12,418
		85,000	65,400	90,000	64,875

Net Present Value = Present value – Initial Investment

Net Present Value of Machine X = ₹ 65,400 – ₹ 50,000
= ₹ 15,400

Net Present Value of Machine Y = ₹ 64,875 – ₹ 50,000
= ₹ 14,875

It is evident from the above calculations that machine X would be preferred under the pay-back method and Net Present Value Method while machine Y would be preferred under the return on investment method. But NPV method is more scientific and therefore investment in Machine X will be more profitable while taking the time value of cash inflows into consideration.

Question No. 9

Calculate the payback period, accounting rate of return, net present value and internal rate of return for the following investment:

Year	Cashflow (₹)
0	(30,000)
1	4,000
2	10,000
3	20,000
4	11,000

The discount rate for discounted cashflow (DCF) calculation is 12 per cent. Accounting profits are the same as cashflow except that the initial expenditure should be depreciated over 4 years; there is no resale value at year 4.

Answer to Question No. 9

Calculation of Pay Back Period

Year (₹)	Cashflow Inflow (₹)	Cumulative Cash
0	(30,000)	—
1	4,000	4,000
2	10,000	14,000
3	20,000	34,000
4	11,000	45,000

Pay back period = 2 years + (16/20 x 12) = 2.8 years (app.)

Accounting Rate of Return

Annual depreciation = 30,000/4 = ₹ 7,500

Accounting profits/(losses) =

	In ₹	(₹)
Year 1	4,000 – 7,500	= (3,500)
Year 2	10,000 – 7,500	= 2,500
Year 3	20,000 – 7,500	= 12,500
Year 4	11,000 – 7,500	= 3,500
		15,000

Average profits = $\frac{₹15,000}{4}$ = ₹ 3,750

ARR = $\frac{₹3,750 \times 100}{₹30,000}$ = 12.5%

Net Present value

Year	Cashflow(₹)	DF@ 12%	PV (₹)
0	(30,000)	1.0	(30,000)
1	4,000	0.8929	3,572
2	10,000	0.7972	7,972
3	20,000	0.7118	14,236
4	11,000	0.6355	6,991
NPV			2,771

Internal Rate of return

Discount at 16% and use linear interpolation:

Year	Cashflow (₹)	DF@16%	PV (₹)
0	(30,000)	1.0	(30,000)
1	4,000	0.8621	3,448
2	10,000	0.7432	7,432
3	20,000	0.6407	12,814
4	11,000	0.5523	6,075
NPV = ₹ (231)			

$$\text{IRR} = 12\% + \left(\frac{2,771}{2,771 + 231} \times 4\% \right) = 15.7\%$$

Question No. 10

The management of a company has two alternative projects under consideration. Project A requires a capital outlay of ₹ 1,20,000 but Project B needs ₹ 1,80,000. Both are estimated to provide a cash flow for five years: A – ₹ 40,000 per year and B – ₹ 58,000 per year. The cost of capital is 10%. Show which of the two projects is preferable from the viewpoint of (i) Net Present Value; and (ii) Internal rate of Return.

Answer to Question No. 10**(i) Determination of NPV**

Years	CFAT Project in ₹		P.V. Factor	Total P.V. in ₹	
	A	B		A	B
1—5	40,000	58,000	3.791	₹ 1,51,640	2,19,878
Less: Cash Outlay				1,20,000	1,80,000
Net Present Value				31,640	39,878

In the above case, Project B is preferable as its NPV is more than that of A.

(ii) Determination of IRR

$$\text{Payback Period} = \frac{1,20,000}{40,000} = 3 \text{ years (Project A)}$$

$$= \frac{1,80,000}{58,000} = 3.1034 \text{ (Project B)}$$

Annuity Table indicates that closest factor to 3.0 against five years are 3.058 (19%) and 2.991 (20%).

By interpolation, we get

$$\begin{aligned} \text{IRR}_A &= r_1 + \frac{(PV_{\text{CFAT}} - PV_C) \times 1}{PV} \\ &= 19 + \frac{(1,22,320 - 1,20,000)}{2680} \times 1 \\ &= 19 + 0.86 \end{aligned}$$

= 19.86%

In case of Project B, Annuity Table indicates that closest factor to 3.0134 against five years are 3.127 (18%) and 3.058 (19%). By interpolation, we get

$$IRR_B = 18 + \frac{(1,81,366 - 1,80,000)}{4,002} \times 1$$

$$= 18 + \frac{(1,366)}{(4,002)} \times 1$$

= 18 + 0.34 = 18.34%

So project A is preferable as its IRR is greater than that of B.

Question No. 11

Andhra Pradesh Udyog is considering a new automatic blender. The new blender would last for 10 years and would be depreciated to zero over the 10 year period. The old blender would also last for 10 more years and would be depreciated to zero over the same 10 year period. The old blender has a book value of ₹ 20,000 but could be sold for ₹ 30,000 (the original cost was ₹ 40,000). The new blender would cost ₹ 1,00,000. It would reduce labour expense by ₹ 12,000 a year. The company is subject to a 50% tax rate on regular income and a 30% tax rate on capital gains. Their cost of capital is 8%. There is no investment tax credit in effect.

You are required to –

- (a) Identify all the relevant cash flows for this replacement decision.
- (b) Compute the present value, net present value and profitability index.
- (c) Find out whether this is an attractive project?

Answer to Question No. 11

(a) Tax on the sale of the old machine:

Original cost	₹ 40,000
Sale Price	₹ 30,000
Book value	₹ 20,000
Profit	₹ 10,000
Tax	50% of ₹ 10,000 = 5,000

After tax cash receipts from sale of old machine:

Sale Price	₹ 30,000
Taxes on sale	<u>5,000</u>
After-tax cash receipts	<u>₹ 25,000</u>

Net cash flow to replace old machine with new:

Cost of new machine	₹ 100,000	
After-tax receipt from sale of old machine	<u>₹ 25,000</u>	
Net cash flow to replace old machine with new	<u>₹ 75,000</u>	
Depreciation on new machine	= 1,00,000/10 =	₹ 10,000
Depreciation on old machine	= 20,000/10 =	₹ 2,000

	Book Value in ₹	Cash flow in ₹
Annual labour savings	12,000	12,000
Increased depreciation (₹ 10,000 – ₹ 2,000)		<u>8,000</u>
Increased earnings before tax		4,000
Increased tax	<u>2,000</u>	<u>2,000</u>
Increased earnings after tax		2,000
Increased after-tax cash flow		<u>10,000</u>

(b) Calculation of present value at 8% discount rate are tabulated below:

Year	Cash flow	Present value factor	Present value
1-10	₹ 10,000	6.710	₹ 67,100
Present value	=	₹ 67,100	
Net present value	=	₹ 67,100 – ₹ 75,000	= (-) ₹ 7,900
Profitability Index	=	₹ 67,100/₹ 75,000	= .895

(c) Since the net present value is negative and profitability index is less than one, the project is not an attractive project.

Question No. 12

A most profitable company in the country is faced with the prospect of having to replace a large stamping machine. Two machines currently being marketed will do the job satisfactorily. The Zenith Stamping machine costs ₹ 100,000 and will require cash running expenses of ₹ 40,000 per year. The Godrej Stamping machine costs ₹ 150,000 but running expenses are only expected to be ₹ 30,000 per year. Both machines have a ten-year useful life with no salvage value and would be depreciated on a straightline basis.

- (a) If the company pays a 50% tax rate and has 10% after-tax required rate of return, which machine should it purchase?
- (b) Would your answer be different if the required rate of return were 8%?

Answer to Question No. 12

	Godrej ₹	Zenith ₹	Differential ₹
Initial outlay	₹ 1,50,000	₹ 1,00,000	₹50,000
Operating expenses	30,000	40,000	10,000
Depreciation	15,000	10,000	5,000
Expenses savings-depreciation			5,000
Tax on the above			2,500
Cash flow (Expenses savings of ₹ 10,000 - tax)			7,500
Present value of Re. 1 received each year for 10 year	=	5.6502	
	7,500 x 5.65	=	42,376

Since the present value of the incremental cash flow benefits ₹ 42,376 is less than the differential cash outlay of ₹ 50,000, the additional cost of the Godrej machine cannot be justified. Thus, the Zenith machine should be purchase.

(b) Present value of Cash flow at 8% for 10 year = ₹ 7,500 x 6.7101 = ₹ 50,336

Since the present value of incremental benefits, ₹ 50,336 now exceeds ₹ 50,000 the Godrej machine should be purchased.

Question No. 13

Saroj & co. is considering purchase of a machine that will enable production to increase by 2.5% (from 40,000 units to 50,000 units). The machine costs Re. 1 lakh and has a useful life of 10 years with a salvage value of 5%. The company is eligible for investment allowance of 25%. There will be increased requirement of working capital to the extent of ₹ 20,000. The following additional information is also furnished to you :

Variable cost (per unit) — ₹ 5
 Fixed cost (per annum) — ₹ 1,00,000

The variable costs will remain the same but the fixed costs will increase by the amount of depreciation on the new machine. The current selling price is ₹ 10 per unit, which may have to be brought down by 50 paise in order to sell the entire production of 50,000 units.

The company adopts straight line method of depreciation, tax rate is 50% and the minimum required rate of return is 15%. P.V. factors at 15%.

- (i) Present value of an annuity of Re. 1 at the end of 9 years = 4.772
- (ii) Present value of Re. 1 receivable at the end of the 10 years = 0.247

Discuss if it would be advisable for the company to purchase the machine.

Answer to Question No. 13

1. Cash Outflows (Period):

	₹
Cost of new machine	1,00,000
Working capital increase	20,000
Tax saving on account of investment allowance* i.e. (25% of ₹ 1 lakhs x 50%)	<u>(12,500)</u>
Net cash outlay	<u>1,07,500</u>

*This could also be considered at year 1 end.

2. Cash inflows (year 1 to year 9):

	Existing ₹	Proposed ₹
Revenues:		
40,000 units @ ₹ 10	4,00,000	
50,000 units @ ₹ 9.50		4,75,000
Variable cost		
40,000 units @ ₹ 5	2,00,000	

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50,000 units @ ₹ 5	_____	<u>2,50,000</u>
Contribution margin	2,00,000	2,50,000
Fixed cost	<u>1,00,000</u>	<u>**1,09,500</u>
Surplus	1,00,000	1,15,500
Excess marginal contribution		15,500
Less: Tax @ 50%		<u>7,750</u>

Incremental Cash Flow from year 1 to 9 after tax (including depreciation) ₹ 7,750 + ₹ 9,500
= ₹ 17,250

3. Cash Inflow (10th year):

	₹
Annual incremental cash flow	17,250
Working capital recovered	20,000
5% salvage value of machine	<u>5,000</u>
	<u>42,250</u>

4. Present value of Cash Flows:

Year	Cash flow (₹)	P.V. at 15%	Total P.V. (₹)
1-9	17,250	4.772	82,317.00
10	42,250	0.247	10,435.75
		Total	92,752.75
	P.V. of outlays		1,07,500.00
	Net Present Value		(14,747.25)

The machine yields negative P.V. of (₹14,747.25) and hence should not be procured. Therefore, it would not be advisable for the company to purchase the machine.

****Note:** Depreciation = $\frac{\text{Cost} - \text{Salvage Value}}{\text{Useful life}}$

$$= \frac{\text{Rs. } 1,00,000 - \text{Rs. } 5,000}{10} = \text{Rs. } 9,500 \text{ p.a.}$$

Fixed cost = ₹ 1,00,000 + ₹ 9,500 = ₹ 1,09,500.

Question No. 14

Rama manufacturing company must choose between constructing a large or small factory to produce a new line of products. The large plant would be needed if the future brings a high demand for new products. But the large plant would have a net cash inflows below the ₹ 20,00,000 outlay, if demand for the product is medium or low. The present value of cash inflows are ₹ 28,00,000 with high demand, ₹ 18,00,000 with medium demand and ₹ 12,00,000 with low demand. The smaller plant produces a lower return if demand is high but has positive net present values at medium demand for the products. It would cost ₹ 4,00,000 as a cash outlay and would return a present value

inflow of ₹ 6,40,000 with high demand, ₹ 5,40,000 with medium demand and ₹ 3,60,000 with low demand. What is the net present value (NPV) of each alternative if there is 40% chance of each high and medium demand and 20% chance of low demand.

Answer to Question No. 14

Capital outlay for large project – ₹20,00,000

<i>Probabilities of demand for products</i>	<i>Present value of cash inflow (₹)</i>	<i>Expected Return (₹)</i>
1	2	3 = 1 x 2
High demand (.40)	28,00,000	11,20,000
Medium demand (.40)	18,00,000	7,20,000
Low demand (.20)	12,00,000	<u>2,40,000</u>
Total Expected Return		20,80,000
Less: Capital outlay		<u>20,00,000</u>
NPV		80,000

Capital outlay for small project – ₹ 4,00,000

<i>Probabilities of demand for products</i>	<i>Present value of cash inflow (₹)</i>	<i>Expected Return (₹)</i>
1	2	3 = 1 x 2
High demand (.40)	6,40,000	2,56,000
Medium demand (.40)	5,40,000	2,16,000
Low demand (.20)	3,60,000	<u>72,000</u>
Total Expected Return		5,44,000
Less: Capital outlay		<u>4,00,000</u>
NPV		1,44,000

From the above it is clear that the small factory is a better investment on NPV basis.

Question No. 15

A product is currently being manufactured on a machine that has a book value of ₹ 30,000. The machine was originally purchased for ₹ 60,000 ten years ago. The per unit costs of the product are: Direct labour ₹ 8.00; direct materials ₹ 10.00; variable overheads ₹ 5.00; fixed overheads ₹ 5.00; and total is ₹ 28.00. In the past year 6,000 units were produced and sold for ₹ 50.00 per unit. It is expected that the old machine can be used indefinitely in the future.

An equipment manufacturer has offered to accept the old machine at ₹ 20,000, a trade-in for a new version. The purchase price of the new machine is ₹ 1,00,000. The projected per unit costs associated with the new machine are: direct labour ₹ 4.00; direct materials ₹ 7.00; variable overheads ₹ 4.00; fixed overheads ₹ 7.00; and total is ₹ 22.00.

The management also expects that, if the new machine is purchased, the new working capital requirement of the company would be less by ₹ 10,000. The fixed overheads costs are allocations from other departments plus the depreciation of the equipment. The new machine has an expected life of ten years with no salvage value; the straight line method of depreciation is employed by the company. It is also expected that the future demand of

the product would remain at 6,000 units per year. Should the new equipment be acquired? Corporate tax is @ 50%.

Notes:

- (i) Present value of annuity of Re. 1.00 at 10% rate of discount for 9 years is 5.759.
 (ii) Present value of Re. 1.00 at 10% rate of discount, received at the end of 10th year is 0.386.

Answer to Question No. 15

Determination of Cash Outflows t = 0

	₹	₹
Cost of new machine		1,00,000
Less : (i) Sale value of old machine	20,000	
(ii) Tax saving due to direct loss on the sale of old machine @ 50% on ₹ 10,000 (i.e. 30,000 – 20,000)	5,000	
(iii) Release of working capital	<u>10,000</u>	<u>35,000</u>
Net cash outflows		<u>65,000</u>

Calculation of Cash Inflows:

	₹	₹
I. Cost saving after tax:		
Cost saving: 6,000 x 8*	48,000	
Less: Tax @ 50%	<u>24,000</u>	24,000
II. Tax saving on additional depreciation		
Depreciation on new machine	10,000	
Less: Depreciation on old machine	<u>3,000</u>	
Additional Depreciation	<u>7,000</u>	
Tax saving @ 50% on ₹ 7,000		<u>3,500</u>
Cash inflows after tax i.e. CFAT (t = 1 to 10)		27,500

Determination of Net Present Value:

Year	CFAT (A)	PV factor at 10% (B)	Total P.V. (A x B) (₹)
1–10	₹ 27,500	x 6.145 = (5.759 + 0.386)	1,68,987.50
Less: Present value of cash outlay			<u>65,000.00</u>
			<u>1,03,987.50</u>

Since NPV > 0 therefore, the new equipment should be acquired.

*Variable cost (i.e. cost saving per unit):

₹

Old machine	23
Less: New machine	(-) <u>15</u>
	<u>8</u>

Question No. 16

Apollo Ltd. manufactures a special chemical for sale at ₹ 30 per kg. The variable cost of manufacture is ₹ 15 per kg. Fixed cost excluding depreciation is ₹ 2,50,000. Apollo Ltd. is currently operating at 50% capacity. It can produce a maximum of 1,00,000 kgs. at full capacity.

The production manager suggests that if the existing machines are replaced, the company can achieve maximum capacity in the next 5 years gradually increasing the production by 10% a year.

The finance manager estimates that for each 10% increase in capacity, the additional increase in fixed cost will be ₹ 50,000. The existing machines with a current book value of ₹ 10,00,000 and remaining useful life of 5 years can be disposed of for ₹ 5,00,000. The vice-president (finance) is willing to replace the existing machines provided the NPV on replacement is ₹ 4,53,000 at 15% cost of capital.

- (a) You are required to compute the total value of machines necessary for replacement. For computations, you may assume the following:
 - (i) All the assets are in the same block. Depreciation will be on straight line basis and the same is allowed for tax purposes.
 - (ii) There will be no salvage value for the new machines. The entire cost of the assets will be depreciated over a five year period.
 - (iii) Tax rate is 46%.
 - (iv) Cash inflows will accrue at the end of the year.
 - (v) Replacement outflow will be at the beginning of the year (year 0).
- (b) On the basis of data given above, the managing director feels that the replacement, if carried out, would at least yield a post-tax return of 15% in three years provided the capacity build up is 60%, 80% and 100% respectively. Do you agree? Give reasons.

	Year 1	Year 2	Year 3	Year 4	Year 5
Present value factor at 15%	0.87	0.76	0.66	0.57	0.50
Present value annuity factor at 15%	0.87	1.63	2.29	2.86	3.36

Answer to Question No. 16

(a) Determination of total replacement value of machines

Incremental cash outflows:

Cost of replacement of new machines = ₹ X

Less: Disposal value of existing machines = ₹ 5,00,000

Cash outflows required = (X – ₹ 5,00,000)

Determination of cash flows after tax (CFAT) and Net Present Value (NPV) (excluding depreciation)

Years

	1	2	3	4	5
Increase Production and sales (kg) ... (I)	10,000	20,000	30,000	40,000	50,000
Contribution per unit (Sales Price – Variable Cost) i.e. ₹ 30 – ₹ 15) ... (II)	15	15	15	15	15
Incremental Contribution (I x II) ... (III)	1,50,000	3,00,000	4,50,000	6,00,000	7,50,000
Incremental fixed cost ... (IV)	50,000	1,00,000	1,50,000	2,00,000	2,50,000
Incremental profits (III – IV) ... (V)	1,00,000	2,00,000	3,00,000	4,00,000	5,00,000
Less: Taxes @ 46% (VI)	46,000	92,000	1,38,000	1,84,000	2,30,000
Earnings after taxes ... (V – VI)	54,000	1,08,000	1,62,000	2,16,000	2,70,000
PV Factor	0.87	0.76	0.66	0.57	0.50
Total Present Value (₹)	46,980	82,080	1,06,920	1,23,120	1,35,000
Total Present Value for 5 years (T = 1 – 5) ₹ 4,94,100 ..(A)					

Base for Incremental Depreciation

	₹
Current book value of existing machine	10,00,000
Add: Cost of new machines	X
Less: Sale proceeds of existing machine	5,00,000
Depreciation base of new machine	X + 5,00,000
Less: Depreciation base of existing machine	<u>10,00,000</u>
Base for Incremental Depreciation	<u>X – 5,00,000</u>

Calculation of Present Value of tax savings on Incremental Depreciation for years 1–5

$$\begin{aligned} \text{Incremental Depreciation per year} &= X - 5,00,000 / 5 \\ &= 0.20 X - 1,00,000 \end{aligned}$$

$$\text{Tax Rate} = 0.46$$

$$\text{Present Value Factor of annuity for 5 years} = 3.36$$

Present Value of tax savings on Incremental Depreciation for years 1 – 5 = Incremental Depreciation per year × Tax rate × PV of annuity for 5 years

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Less: Incremental Cash Outflows	= ₹ 59,489
Net Present Value	<u>₹ 3,01,344</u>

Hence, the assessment of the managing director is correct as the Net Present Value is positive.

Question No. 17

The management of Rohit Ltd. is considering the replacement of machine which has current written down value of ₹25,00,000 and a present sale value of ₹8,00,000. The machine is still usable for 5 years, but will have no scrap value at the end of 5 years.

A new machine having a useful life of 5 years and scrap value of ₹ 10,00,000 at the end of this is available for ₹ 1,00,00,000. The installation of the new machine, it is estimated, would result in saving of ₹ 20,00,000 per annum in operating cost at the present level of production. The capacity of new machine is more than that of old, and since sales are no Question, utilisation of additional capacity would bring in an additional contribution of ₹ 25,00,000 per annum (after meeting incremental costs of production and sale). This machine would be depreciated @ 25 per cent on written down basis.

The company has other assets in the block. Current income tax is 35 per cent. Considering the company's estimated cost of capital, it will not pay to purchase the new machine unless the net savings are 20% or more, on the added investment. Should the company replace the existing machine?

Answer to Question No. 17

Existing Machine	₹
Current Written Down Value of Machine	25,00,000
Present Sale Value of Machine	8,00,000
Life of Machine	5 years
Scrap Value after 5 years	0
New Machine	
Scrap Value	10,00,000
Cost Price	1,00,00,000
Life of Machine	5 years

Calculation of Cash Flows for 5 years

(₹)

	1	2	3	4	5
Saving in Operating Cost	20,00,000	20,00,000	20,00,000	20,00,000	20,00,000
Contribution	25,00,000	25,00,000	25,00,000	25,00,000	25,00,000
EBIT	45,00,000	45,00,000	45,00,000	45,00,000	45,00,000
Incremental Depreciation	16,75,000	12,56,250	9,42,187	7,06,641	5,29,980
EBIT	28,25,000	32,43,750	35,57,813	37,93,359	39,70,020
Less Tax (@ 35%)	9,88,750	11,35,313	12,45,235	13,27,676	13,89,507

PAT	18,36,250	21,08,438	23,12,578	24,65,683	25,80,513
PV factor @ 20%	0.8353	0.6944	0.5787	0.4823	0.4019
NPV	15,30,147	14,64,099	13,38,289	11,89,199	10,37,108
Total PV					65,58,842.3

As the Net Present cash inflow is negative, it is not advisable to purchase the machine.

Old Machine Cost	=	₹ 25,00,000
New Machine Cost	=	₹ 1,00,00,000 – ₹ 8,00,000
Sale Value of Machine	=	₹ 92,00,000

Calculation of Incremental Depreciation

(₹)

Year	Old machine	New machine	Incremental Depreciation
1	625000	2300000	16,75,000
2	468750	1725000	12,56,250
3	351563	1293750	9,42,187
4	263672	970313	7,06,641
5	197754	727734	5,29,980

Question No. 18

Strong Enterprises Ltd. is a manufacturer of high quality running shoes. Ms. Dazling, President, is considering computerising the company's ordering, inventory and billing procedures. She estimates that the annual savings from computerisation include a reduction of ten clerical employees with annual salaries of ₹15,000 each, ₹8,000 from reduced production delays caused by raw materials inventory ₹12,000 from lost sales due to inventory stockouts and ₹3,000 associated with timely billing procedures. The purchase price of the system is ₹2,00,000 and installation costs are ₹50,000. These outlays will be capitalised (depreciated) on a straight-line basis to a zero book salvage value which is also its market value at the end of five years. Operation of the new system requires two computer specialists with annual salaries of ₹40,000 per person. Also annual maintenance and operating cash expenses of ₹12,000 are estimated to be required. The company's tax rate is 40% and its required rate of return (cost of capital) for this project is 12%.

You are required to –

- find the project's initial net cash outlay.
- find the project's after tax profit and cash flows over its 5-year life.
- evaluate the project using Net Present Value (NPV) method.
- evaluate the project using Profitability Index (PI) method.
- calculate the project's payback period.
- find the project's cash flows and NPV [parts (a) through (c)] assuming that system can be sold for ₹25,000 at the end of five years even though the book salvage value will be zero.
- find the project's cash flows and NPV [parts (a) through (c)] assuming that the book salvage value of depreciation purposes is ₹20,000 even though the machine is worthless in terms of its resale value.

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NOTE:

- (i) Present value of annuity of Re. 1 at 12% rate of discount for 5 years is 3.605.
- (ii) Present value of Re. 1 at 12% rate of discount, received at the end of 5 years is 0.567.

Answer to Question No. 18

(a) Project's Initial cash outlay

	₹
Cost	2,00,000
Installation Expenses	<u>50,000</u>
Total Net Cash Outlay	<u>2,50,000</u>

(b) Project's after tax profit and cash inflows over its 5-year life

Savings	₹	₹
Reduction in clericals salaries	1,50,000	
Reduction in production delays	8,000	
Reduction in lost sales	12,000	
Gains due to timely production	<u>3,000</u>	1,73,000
Less: Expenses		
Depreciation	50,000	
Addl. employee's cost	80,000	
Maintenance cost	<u>12,000</u>	<u>1,42,000</u>
Profit before Tax		31,000
Less: Tax (40%)		<u>12,400</u>
Profit after Tax		<u>18,600</u>

Cash inflow = PAT + Depreciation
 = ₹ 18,600 + ₹ 50,000 = ₹ 68,600

The cash flow is the same for the years 1 to 5.

(c) Evaluation of the Profit by using NPV Method

Years	Cash inflow after tax (₹)	PV of Annuity of Re. 1 at 12% for five years	=	Total present value (₹)
(1 to 5)	68,600	3.605		2,47,303
		Less: total Initial Cash Outlay		<u>2,50,000</u>
		NPV	=	<u>(- ₹ 2,697)</u>

Since NPV is negative, the project is unviable.

(d) Evaluation of the Project by using PI Method

Profitability Index (PI) = PV of cash inflows/Initial outlay

$$= 2,47,303/2,50,000 = 0.989$$

Since PI is less than 1.0, the project is unviable.

(e) Calculation of the Projects' Payback Period

Year	Net cash inflow (₹)	Cumulative cash inflow (₹)
1	68,600	68,600
2	68,600	137,200
3	68,600	205,800
4	68,600	274,400
5	68,600	343,000

$$\text{Payback period} = 3 \text{ years} + \frac{(\text{₹ } 2,50,000 - \text{₹ } 2,05,800)}{68,600}$$

Therefore, the payback period is 3.64 years.

(f) Calculation of cash flows and NPV assuming when the system can be sold for ₹25,000 at the end of 5 years.

In case the project has a salvage of ₹ 25,000 at the end of five years, present value of the after tax salvage amount is required to be added to the current NPV.

Post tax salvage value in year 5 = ₹ 15,000.

Present value of ₹ 15,000 discounted at 12% is (₹ 15000 × 0.567) = ₹ 8,505 Previous NPV of the projects is – ₹ 2697. [see above] New NPV is ₹ 8,505 – ₹ 2,697 = ₹ 5,808, Since NPV > 0, the project is viable.

(g) Project's cash flow and NPV assuming that book salvage value for depreciation purposes is ₹20,000.

Depreciation = ₹ 2,50,000 – ₹ 20,000/5 = ₹ 46,000 per year

Cash flow for the years 1 to 5 are ₹ 67,000*.

In year 5, the firm get an additional tax credit on ₹ 20,000 book value, which is ₹ 8,000, the NPV of this additional tax credit and new cash flow is – ₹ 3,929**. Since NPV is negative the project is not viable.

₹

Working*

Saving [see (b) above]		1,73,000
Less : Expenses		
Depreciation	₹ 46,000	
Addl. employee's cost	₹ 80,000	
Maintenance cost	<u>₹ 12,000</u>	<u>1,38,000</u>
Profit before tax		35,000
Tax (40%)		<u>14,000</u>
Profit after tax		<u>21,000</u>

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Cash inflow = PAT + Depreciation = ₹ 21,000 + ₹ 46,000 = ₹ 67,000.

Working**

Years	Cash inflow (₹)	PV factor at 12%	Total present value (₹)
(1 to 5)	67,000	3.805 (Annuity)	2,41,535
Add. Tax Credit in 5th year	8,000	0.567	<u>4,536</u>
Total PV of cash inflow			2,46,071
Less: Total initial cash outlay			<u>2,50,000</u>
NPV			<u>(- ₹ 3,929)</u>

Question No. 19

P. Ltd. has a machine having an additional life of 5 years, which costs ₹10,00,000 and has a book value of ₹4,00,000. A new machine costing ₹20,00,000 is available. Though its capacity is the same as that of the old machine, it will mean a saving in variable costs to the extent of ₹7,00,000 per annum. The life of the machine will be 5 years at the end of which it will have a scrap value of ₹2,00,000. The rate of income-tax is 46% and P Ltd.'s policy is not to make an investment if the yield is less than 12% per annum. The old machine, if sold today, will realise ₹1,00,000; it will have no salvage value if sold at the end of 5th year. Advise P. Ltd. whether or not the old machine should be replaced. (Present value of Re. 1 receivable annually for 5 years at 12% = 3.605, present value of Re. 1 receivable at the end of 5 years at 12% per annum = 0.567). Capital gain is tax free. Ignore income-tax savings on depreciation as well as on loss due to sale of existing machine.

Answer to Question No. 19

Net Cash Outlay on New Machine

	₹
Purchase Price	20,00,000
Less: Realisation from sale of old machine	<u>1,00,000</u>
Net Initial Investment	19,00,000
<i>Cash Inflows</i>	
Annual saving in variable cost as a	
Result of purchase of New Machine	7,00,000
Tax = 46%	
Annual Saving in variable cost after tax = ₹ 7,00,000 (1 – 0.46) =	3,78,000
Present value for cash inflows annually	
for 5 years @ 12% per annum = 3,78,000 x 3.605 =	13,62,690
PV of Salvage value (2,00,000 x 0.567)	
at the end of 5 years @ 12% per annum	<u>1,13,400</u>
Total PV of Cash Inflows	14,76,090
Less: Initial Investment	<u>19,00,000</u>
Net Present Value	<u>-4,23,910</u>

Since NPV of new machine is negative, it is not profitable for the company to go for new machine. Therefore, the company should continue with the old machine.

Question No. 20

Norton Engineering company is considering the replacement of existing machine by a new one. The written down value of the existing machine is ₹ 1,50,000 and its cash salvage value is ₹ 40,000. The removal of this machine could cost ₹ 10,000 by way of labour charges etc. The purchase price of the new machine is ₹ 40 lakhs and its expected life is 10 years. The company follows straight line depreciation without considering scrap value. The other expenses associated with the new machine are carriage inward and installation charges ₹ 30,000, cost of training workers to handle the new machine ₹ 10,000, additional working capital ₹ 20,000 (which is assumed to be received back by sale of scraps in last year) and the fees paid to a consultant for his advice to buy a new machine ₹ 20,000. The annual savings (before tax) from the new machine would amount to ₹ 4,00,000. The income tax rate is 40%. The company's required rate of return is 12%. Should the company replace the existing machine?

Note: Present value of Re. 1 at 12% discount rate are as follows:

Year	1	2	3	4	5	6	7	8	9	10
P.V.	.893	.797	.712	.636	.567	.507	.452	.404	.361	.322

Answer to Question No. 20

Present Value of Cash Outflow:

		₹
Purchase Price of a new machine	40,00,000	
Carriage inward for installation	30,000	
Cost of Training to workers	10,000	
Fees Paid to consultant	<u>20,000</u>	
Total Investment on new machine	40,60,000	
Add: Working capital	<u>20,000</u>	
	40,80,000	
Less: Cash inflow at the start cash salvage value of old machine	40,000	
Less: Removal charges	<u>10,000</u>	30,000
Less: Tax benefit on the loss of old machine (40%)		<u>48,000</u>
		<u>78,000</u>
Total cash outflow		<u>40,02,000</u>
Annual Cash Inflow (New Machine):		
Annual saving before tax	4,00,000	
Less: Tax at 40%	<u>1,60,000</u>	
Annual Saving after tax	2,40,000	
Add: Depreciation (₹ 40,60,000 ÷ 10)	<u>4,06,000</u>	
Annual Cash inflow		<u>6,46,000</u>

Statement Showing NPV of Cash Flows

	Cash inflows	PV Factor 12%	Present value
	(₹)		(₹)
Annual Cash inflow for 10 years	6,46,000	5.650	36,49,900
Working capital received back after 10 years	20,000	0.322	<u>6,440</u>
Total Present Value of Cash-inflow in 10 years			36,56,340
Present value of cash outflows in 1st year			<u>40,02,000</u>
		NPV =	<u>(3,45,660)</u>

Recommendation: Since NPV is negative by ₹ 3,45,660, the company is advised not to buy the new machine.

		₹
@Written down value of the old machine		1,50,000
Salvage Value	40,000	
Less: Removal Charges	<u>10,000</u>	<u>30,000</u>
Loss on Salvaging the machine		1,20,000
Tax benefit due to loss on old machine (40%)		48,000

Note: Tax benefit has been presumed to have been realised at zero year. In practical life, tax benefit will be realised at the year-end over and if this presumption is taken then ₹ 48,000 will have to be discounted by the factor 0.893.

Question No. 21

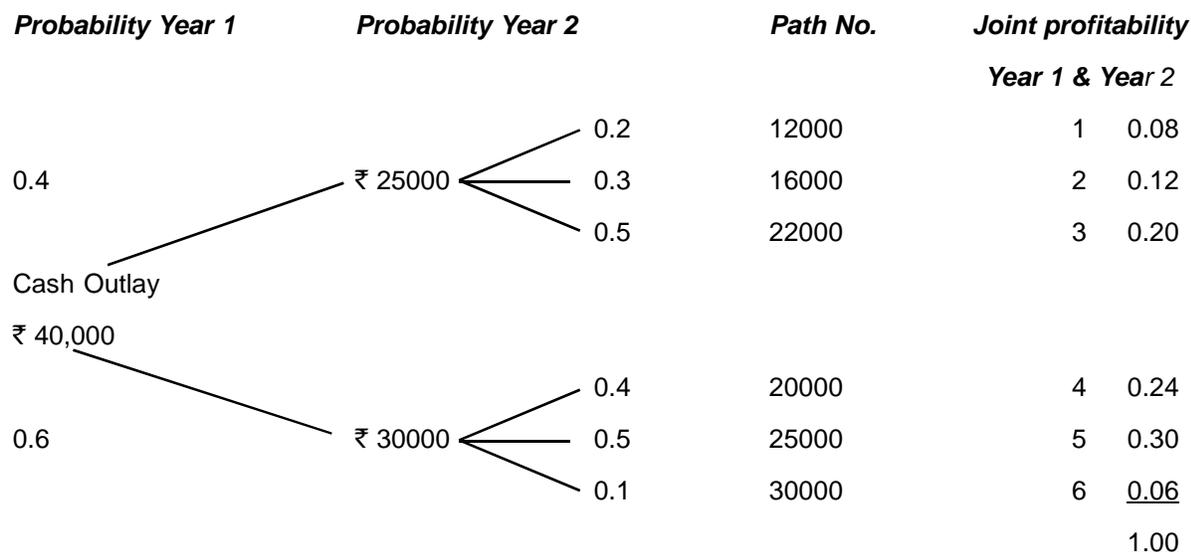
A firm has an investment proposal, requiring an outlay of ₹ 40,000. The investment proposal is expected to have 2 years' economic life with no salvage value. In year-1, there is a 0.4 probability that cash flow after tax (CFAT) will be ₹ 25,000 and 0.6 probability that CFAT will be ₹ 30,000. The probabilities assigned to CFAT for the year-2 are as follows:

<u>If CFAT = ₹ 25,000</u>		<u>If CFAT = ₹ 30,000</u>	
Amount	Probability	Amount	Probability
(₹)		(₹)	
12,000	0.2	20,000	0.4
16,000	0.3	25,000	0.5
22,000	0.5	30,000	0.1

The firm uses a 10% discount rate for this type of investment.

You are required to –

- (i) Present the above information in the form of a decision tree.
- (ii) Find out the NPV under (a) the worst outcome; and (b) under the best outcome.
- (iii) Find out the profitability or otherwise of the above investment proposal.

Answer to Question No. 21
(i) Decision Tree


The Decision Tree given above shows that there are six possible outcomes each represented by a path.

(ii) The Net Present Value (NPV) of each path at 10% discount rate is given below:

Path	(Cash inflow year 1 x Discount factor year 1)(a)	(Cash inflow year 2 x Discount factor year 2)(b)	Total Cash inflow (c) = (a)+(b)	Cash Outflow (d)	Net present value(e) = (c)-(d)
	₹	₹	₹	₹	₹
1.	(25,000 x 0.909) = 22,725	(12,000 x 0.826) = 9,912	32,637	40,000	-7,363
2.	(25,000 x 0.909) = 22,725	(16,000 x 0.826) = 13,216	35,941	40,000	-4,059
3.	(25,000 x 0.909) = 22,725	(22,000 x 0.826) = 18,172	40,897	40,000	897
4.	(30,000 x 0.909) = 27,270	(20,000 x 0.826) = 16,520	43,790	40,000	3,790
5.	(30,000 x 0.909) = 27,270	(25,000 x 0.826) = 20,650	47,920	40,000	7,920
6.	(30,000 x 0.909) = 27,270	(30,000 x 0.826) = 24,780	52,050	40,000	12,050

(a) If the worst outcome is realized, the Net Present Value which the project will yield in ₹ 7,363 (negative).

(b) The best outcome will be path 6 when Net Present Value is highest i.e. ₹ 12,050 (Positive).

(iii) Statement showing the Expected Net Present Value

Path	NPV @ 10% (a) ₹	Joint Probability (b) ₹	Expected PV(a) x (b) ₹
1	-7,363	0.08	-589.04
2	-4,059	0.12	-487.08
3	897	0.20	179.40
4	3,790	0.24	909.60

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5	7,920	0.30	2,376.00
6	12,050	0.06	723.00
		1.00	3,111.88

Yes, the project will be accepted since the Expected Net Present Value is positive.

Question No. 22

A product is currently manufactured on a machine that is not fully depreciated for tax purposes and has book value of ₹ 80,000. It was purchased for ₹ 2,40,000 twenty years ago. The costs of the product are as follows:

	<i>Unit Cost</i>
	(₹)
Direct labour	28.00
Indirect labour	14.00
Other variable overhead	10.50
Fixed overhead	<u>17.50</u>
	<u>70.00</u>

In the past year 10,000 units were produced. It is expected that with suitable repairs the old machine can be used indefinitely in future. The repairs are expected to average ₹ 75,000 per year.

An equipment manufacturer has offered to accept the old machine as trade-in for a new equipment. The new machine would cost ₹ 5,20,000 before allowing for ₹ 1,00,000 for the old equipment. The project costs associated with the new machine are follows:

	<i>Unit Cost</i>
	(₹)
Direct labour	14.00
Indirect labour	21.00
Other variable overhead	7.00
Fixed overhead	<u>22.75</u>
	<u>64.75</u>

The fixed overhead costs are allocations for other departments plus the depreciation of the equipment.

The old machine can be sold now for ₹ 60,000 in the open market. The new machine has an expected life of 10 years and salvage value of ₹ 20,000 at that time. The current corporate income tax rate is assumed to be 50%. For tax purpose cost of the new machine and the book value of the old machine may be depreciated in 10 years. The minimum required rate is 10%. It is expected that the future demand of the product will stay at 10,000 units per year. The present value of an annuity of Re. 1 for 9 years @ 10% discount factor is = 5.759. The present value of Re. 1 received at the end of 10th year @ 10% discount factor is = 0.386.

Should the new equipment be purchased? (Assume no capital gain taxes).

Answer to Question No. 22**Net Cash outlay on New Machine**

	₹	₹
Purchase Price		5,20,000
Less: Trade in value		<u>1,00,000</u>
		<u>4,20,000</u>
Depreciation:		
New Machine		50,000
Old Machine		<u>8,000</u>
Differential Depreciation per annum		<u>42,000</u>
Annual Cash Savings from New Machine		
Variable Cost of product on new machine (A) (10,000 units x ₹ 42)		4,20,000
Variable cost of product on old machine (B) (10,000 units x ₹ 52.50) + Annual Repair		5,25,000
		<u>75,000</u>
		<u>6,00,000</u>
Differential savings (₹ 6,00,000 – ₹ 4,20,000) per annum		1,80,000
Taxable Saving (₹ 1,80,000 – ₹ 42,000)		1,38,000
Less: Tax @ 50%		<u>69,000</u>
Income after tax		69,000
Add: Depreciation (Difference)		<u>42,000</u>
Cash flow per annum for 9 years		<u>1,11,000</u>
Cash flow for 10th year ₹ 1,11,000 + ₹ 20,000 salvage value		1,31,000
Present value of 1,11,000 annuity for 9 years		
(₹ 1,11,000 x 5.759)		6,39,249
Present value of ₹ 1,31,000 at the end of 10th year (₹ 1,31,000 x 0.386)		<u>50,566</u>
Present value of Total cash Inflow		6,89,815
Less: Cash outlay		<u>4,20,000</u>
Net Present Value		<u>2,69,815</u>

Recommendation: Since NPV is positive, new equipment should be purchased.

COST OF CAPITAL

Question No. 23

In considering the most desirable capital structure for a company, the following estimates of the cost of debt and equity capital (after tax) have been made at various levels of debt-equity mix:

<i>Debt as percentage of total capital employed</i>	<i>Cost of debt (%)</i>	<i>Cost of equity (%)</i>
10	7.0	15.0
20	7.0	15.0
30	7.5	16.0
40	8.0	17.0
50	8.5	19.0
60	9.5	20.0

You are required to determine the optimal debt-equity mix for the company by calculating composite cost of capital.

Answer to Question No. 23

Composite Cost of Capital

<i>Debt as % of total capital</i>	<i>Cost of debt %</i>	<i>Cost of equity %</i>	<i>Composite Cost of capital %</i>
0	7.0	15.0	$(7 \times 0) + (15 \times 1) = 15.0$
10	7.0	15.0	$(7 \times 0.10) + (15 \times 0.9) = 14.20$
20	7.0	15.5	$(7 \times 0.20) + (15.5 \times 0.80) = 13.80$
30	7.5	16.0	$(7.5 \times 0.30) + (16 \times 0.70) = 13.45$
40	8.0	17.0	$(8 \times 0.40) + (17 \times 0.60) = 13.40$
50	8.5	19.0	$(8.5 \times 0.50) + (19 \times 0.50) = 13.75$
60	9.5	20.0	$(9.5 \times 0.60) + (20 \times 0.40) = 13.70$

The optimal debt-equity mix for the company on the basis of composite cost of capital = 40 % debt

= 60 % Equity

When the composite cost of capital will be least i.e. 13.40.

Question No. 24

M/s Robert Cement Corporation has a financial structure of 30% debt and 70% equity. The company is considering various investment proposals costing less than ₹ 30 lakhs.

The corporation does not want to disturb its present capital structure.

The cost of raising the debt and equity are as follows:

Project Cost	Cost of debt	Cost of equity
Upto ₹ 5 lakhs	9%	13%
Above ₹ 5 lakhs and upto ₹ 20 lakhs	10%	14%
Above ₹ 20 lakhs and upto ₹ 40 lakhs	11%	15%
Above ₹ 40 lakhs and upto ₹ 1 crore	12%	15.5%

Assuming the tax rate of 50% you are required to calculate:

- (i) Cost of capital of two projects A and B whose funds requirements are ₹ 8 lakhs and ₹ 21 lakhs respectively, and
- (ii) If a project is expected to give after tax return of 11% determine under what conditions it would be acceptable.

Answer to Question No. 24

(i) Calculation of Weighted Average Cost of Capital

Project Financing		Prop. of capital structure	Cost before tax (%)	Cost after tax of Capital	Weighted cost of various sources of capital	Weighted cost of capital
Upto ₹ 5 lakhs	Debt	0.30	9.00	4.50	1.35	
Equity	Equity	0.70	13.00	13.00	9.10	10.45
Above ₹ 5 lakhs and upto ₹ 20 lakhs	Debt	0.30	10.00	5.00	1.50	
Equity	Equity	0.70	14.00	14.00	9.80	11.30
Above ₹ 20 lakhs and upto ₹ 40 lakhs	Debt	0.30	11.00	5.50	1.65	
Equity	Equity	0.70	15.00	15.00	10.50	12.15
Above ₹ 40 lakhs and upto ₹ 1 Crore	Debt	0.30	12.00	6.00	1.80	
Equity	Equity	0.70	15.50	15.50	10.85	12.65

- (i) Project A costs ₹ 8 lakhs. In the above table one can see that Project A lies in the range of ₹ 5 lakhs and ₹ 20 lakhs. So the weighted average cost of capital for this amount to the company will be 11.30 per cent. Similarly, for the project B which requires ₹ 21 lakhs and lies in the range of ₹ 20 lakhs and ₹ 40 lakhs the weighted average cost of capital will be 12.15 per cent.
- (ii) A company may accept a project which is expected to give after tax return of 11% if project cost is below ₹ 5 lakhs. The project which requires above ₹ 5 lakhs may not be accepted by the company because the expected rate of return on the project is low as against its cost of capital and thus acceptance of project will adversely affect the value of share of the company.

Question No. 25

Following are the details regarding capital structure of a company.

	Book value (₹)	Market value (₹)	Specific cost (%)
Debentures	80,000	76,000	5
Preference Capital	20,000	22,000	8
Equity Capital	1,20,000	2,40,000	13
Retained Earnings	<u>40,000</u>		9
	<u>2,60,000</u>	<u>3,38,000</u>	

You are required to calculate the weighted average cost of capital using (i) book value as weights (ii) market value as weights. Can you imagine a situation where weighted average cost of capital would be the same using either of the weights?

Answer to Question No. 25

(i) Calculation of the weighted average cost of capital using book value weights:

Source of Capital	Amount of Book value (W) (₹)	Specific Cost (X)(%)	Total cost (XW) (₹)
Debentures	80,000	5	4,000
Preference Capital	20,000	8	1,600
Equity Capital	1,20,000	13	15,600
Retained Earning	<u>40,000</u>	9	<u>3,600</u>
	<u>2,60,000</u>		<u>24,800</u>

$$\text{Weighted average cost of capital (K}_o\text{)} = \frac{\sum XW}{\sum W}$$

$$= \frac{\text{Total Costs}}{\text{Total Capital}} \times 100$$

$$\frac{\text{Rs. 24,800}}{\text{Rs. 2,60,000}} \times 100 = 9.54\% \quad \text{Approximately}$$

(ii) Calculation of the weighted average cost of capital using market value as weights:

Source of Capital	Market value (W)(Rs)	Specific Cost (X)(%)	Total cost (WX)(₹)
Debentures	76,000	5	3,800
Preference Capital	22,000	8	1,760
Equity Capital	1,80,000	13	23,400
Retained Earning	<u>60,000</u>	9	<u>5,400</u>
	<u>3,38,000</u>		<u>34,360</u>

$$K_o = \frac{\text{Rs. 34,360}}{\text{Rs. 3,38,000}} \times 100$$

$$= 10.17\%$$

In our question the market value of equity share and retained earnings is ₹ 2,40,000 as against their book value ₹ 1,60,000. In relative term we can say that every equity funds of rupees 2 at book value have market value of ₹ 3/- (₹ 2,40,000/₹ 1,60,000). On basis of this criteria, we may calculate the value of retained earning and that of equity shares as under.

$$\text{Value of retained earnings} = ₹ 40,000 \times \frac{3}{2} = ₹ 60,000$$

$$\text{Value of Equity Share} = ₹ 1,20,000 \times \frac{3}{2} = ₹ 18,0,000$$

The weighted average cost of capital computed on the basis of market value weight is higher than the weighted average cost of capital computed on the basis of book value weights as in our Question. Because market value of equity capital is higher than its book value.

The weighted average cost of capital would be the same under book value weights and market value weights provided there is no difference in value of securities under both the cases.

Question No. 26

The Novex company has the following capital structure on 31st March, 2013

	₹
Ordinary shares (4,00,000 shares)	80,00,000
10% Preference shares	20,00,000
14% Debentures	<u>60,00,000</u>
	<u>1,60,00,000</u>

The share of the company sells for ₹ 20. It is expected that company will pay next year a dividend of ₹ 2 per share which will grow at 7 per cent forever. Assume a 40 per cent tax rate.

You are required to:

- (a) Compute a weighted average cost of capital based on existing capital structure.
- (b) Compute the new weighted average cost of capital if the company raises an additional ₹ 40 lakh debt by issuing 15 per cent debenture. This would result in increasing the expected dividend to ₹ 3 and leave the growth rate unchanged, but the price of share will fall to ₹ 15 per share.
- (c) Compute the cost of capital if in (b) above growth rate increases to 10 per cent.

Answer to Question No. 26

(a) Weighted Average Cost of Capital – Existing Capital Structure

	Amount cost	After-tax (%)	Weights	Weighted cost (%)
Ordinary Shares	80,00,000	0.17	* 0.500	0.0850
10% Preference Shares	20,00,000	0.10	0.125	0.0125
14% Debentures	<u>60,00,000</u>	0.084	0.375	<u>0.0315</u>
Total	<u>1,60,00,000</u>			<u>0.1290</u>
Weighted Average Cost of Capital (WACC)				or 12.9%

$$\begin{aligned}
 \text{*Cost of Ordinary Share} \quad (K_e) &= \frac{D_1}{P_0} + g \\
 &= \frac{\text{Rs.2}}{\text{Rs.20}} + 0.07 \\
 &= 0.10 + 0.07 = 0.17
 \end{aligned}$$

(b) Weighted Average Cost of Capital—New Capital Structure

<i>Scripts</i>	<i>Amount (₹)</i>	<i>After-tax cost</i>	<i>Weights (%)</i>	<i>Weighted cost (%)</i>
Ordinary shares	80,00,000	0.27	**0.40	0.108
10% Preference shares	20,00,000	0.10	0.10	0.010
14% Debentures	60,00,000	0.084	0.30	0.025
15% Debentures	<u>40,00,000</u>	0.09	0.20	<u>0.018</u>
Total	<u>2,00,00,000</u>			<u>0.161</u>
Weighted Average Cost of Capital (WACC)				or 16.1%

$$\begin{aligned}
 \text{**Cost of ordinary share} \quad (K_e) &= \frac{D_1}{P_0} + g \\
 &= \frac{\text{Rs.3}}{\text{Rs.15}} + 0.07 \\
 &= 0.20 + 0.07 = 0.27
 \end{aligned}$$

(c) Weighted Average Cost of Capital—Changed Growth Rate

<i>Scripts</i>	<i>Amount (₹)</i>	<i>After-tax cost</i>	<i>Weights (%)</i>	<i>Weighted cost (%)</i>
Ordinary shares	80,00,000	0.30	*** 0.40	0.120
10% Preference shares	20,00,000	0.10	0.10	0.010
14% Debentures	60,00,000	0.084	0.30	0.025
15% Debentures	<u>40,00,000</u>	0.09	0.20	<u>0.018</u>
Total	<u>2,00,00,000</u>			<u>0.173</u>
Weighted Average Cost of Capital (WACC)				or 17.3%

$$\begin{aligned}
 \text{***Cost of ordinary share} \quad (K_e) &= \frac{D_1}{P_0} + g \\
 &= \frac{\text{Rs.3}}{\text{Rs.15}} + 0.10 \\
 &= 0.20 + 0.10 = 0.30
 \end{aligned}$$

Note: The book value weights have been used to calculate WACC in the above cases.

MANAGEMENT OF WORKING CAPITAL

Question No. 27

From the given information for Ajanta manufacturing company, prepare an estimate of the requirement of working capital.

Production	90,000 units
Selling Price per unit	₹ 5/-
Raw Materials	60% of selling price
Direct Wages	10% of selling price
Overheads	20% of selling price
Materials in hand	2 months requirements
Production time	1 month
Finished goods in stores	3 months
Credit for material	2 months
Credit allowed to customers	3 months
Average cash balance	₹ 30,000/-

Wages and overheads are paid at the beginning of the month following. In production all the required materials are charged in the initial stage and wages and overheads accrue evenly.

Answer to Question No. 27

Calculation of Working Capital Requirement

	<i>Amount in ₹</i>	<i>Amount in ₹</i>
Current assets (level of production 90,000 units)		
Current Assets:		
Materials (90,000 x ₹ 3 x 2/12)		45,000
Work in Progress:		
Materials (90,000 x ₹ 3 x 1/12)	22,500	
Labour (90,000 x ₹ 0.50 x 1/12 x 1/2)	1,875	
Overheads (90,000 x Re. 1 x 1/12 x 1/2)	<u>3,750</u>	28,125
Finished goods (90,000 x 90% x ₹ 5 x 3/12)		1,01,250
Debtors (90,000 x ₹ 5 x 3/12)		1,12,500
Cash		<u>30,000</u>
Total Current Assets (A)		<u>3,16,875</u>
Less: Current Liabilities		
Creditors (90,000 x ₹ 3 x 2/12)	45,000	
Outstanding wages (90,000 x Re. 0.50 x 1/12)	3,750	
Outstanding Overheads (90,000 x Re. 1 x 1/12)	<u>7,500</u>	
Total Current Liabilities (B)		<u>56,250</u>
Estimated Working Capital Requirements (A–B)		<u>2,60,625</u>

Question No. 28

The Management of Apollo Ltd. has called for a statement showing the working capital needed to finance a level of activity of 6,00,000 units of output for the year. The cost structure for the company's product, for the above mentioned level is given as under:

	Cost per unit (₹)
Raw materials	20
Direct labour	5
Overheads	<u>15</u>
Total cost	<u>40</u>
Profit	<u>10</u>
Selling price	<u>50</u>

Past trends indicate that raw materials are in stock on an average for two months.

Work in progress will approximate to half a months production. Finished goods remain in warehouse on an average for a month. Supplier of a materials extend a months credit.

Two months credit is normally allowed to debtors. A minimum cash balance of ₹60,000 is expected to be maintained. The production pattern is assumed to be even during the year. Prepare the statement of working capital determination.

Answer to Question No. 28**Statement showing Cost & Profit**

	Per unit (₹)	Amount for 6,00,000 Units of output (₹)
Raw materials	20.00	1,20,00,000
Direct labour	5.00	30,00,000
Overheads	<u>15.00</u>	<u>90,00,000</u>
Total cost	40.00	2,40,00,000
Profit	<u>10.00</u>	<u>60,00,000</u>
Sales	50.00	3,00,00,000

Calculation of working capital requirement

Raw materials (stock for two months) = $\frac{2}{12} \times 1,20,00,000$	₹ 20,00,000
Work in progress 1/2 months production i.e. 1/2 month total cost = $\frac{1}{24} \times 2,40,00,000$	10,00,000
Finished goods remain in warehouse for one month	
Total inventory one month's total cost = $\frac{1}{12} \times 2,40,00,000$	20,00,000

Debtor balances – 2 months sales = $\frac{2}{12} \times 3,00,00,000$	50,00,000
Cash balance (minimum as given in the question)	<u>60,000</u>
Total current assets	1,00,60,000
Less: Creditors = $\frac{1}{12} \times 1,20,00,000$	10,00,000
Working capital required	<u>90,60,000</u>

Question No. 29

M/s Kataria & Co. have approached their banker for their working capital requirement who have agreed to sanction the same by retaining the margins as under:

Raw material	15%
Stock in Progress	30%
Finished goods	20%
Debtors	10%

From the following projections for 2017-18 you are required to work out:

- (a) the working capital required by the company; and
- (b) the working capital limits likely to be approved by bankers.

<i>Estimates for 2017-18</i>	₹
Annual Sales	16,80,000
Cost of production	14,40,000
Raw material Purchases	8,15,000
Monthly Expenditure	45,000
Anticipated opening stock of raw materials	1,80,000
Anticipated closing stock of raw materials	1,55,000

Inventory Norms:

Raw material	2 months
Work in Progress	15 days
Finished goods	1 months

The firm enjoy a credit of 15 days on its purchases and allows 1 month credit on its supplies. On sales orders, the company has received an advance of ₹25,000. State your assumption if any.

Answer to Question No. 29**Calculation of Monthly consumption of raw materials, monthly sales and monthly cost of production***Raw materials*

Opening Stock + Purchases (₹ 8,15,000 + ₹ 1,80,000)	=	₹ 9,95,000
Less closing stock	=	<u>₹ 1,55,000</u>
Annual Consumption	=	₹ 8,40,000
Monthly Consumption = $\frac{\text{Rs. 8,40,000}}{12}$	=	₹ 70,000
Monthly Sales $\frac{\text{Annual Sales}}{12} = \frac{\text{Rs. 16,80,000}}{12}$	=	₹ 1,40,000
Monthly Cost of Production $\frac{\text{Cost of Production per year}}{12} = \frac{\text{Rs. 14,40,000}}{12}$	=	₹ 1,20,000

Calculation of Working capital required by Kataria & Co.

	₹
1. Raw materials — 2 months consumption [70,000 x 2]	1,40,000
2. Work in Progress — 15 days Cost of Production 1,20,000 / 2	60,000
3. Finished Goods — 1 month Cost of Production	1,20,000
4. Sundry debtor — 1 month sales	1,40,000
5. Expenses for — 1 month	<u>45,000</u>
	<u>5,05,000</u>

Less : (i) Creditors 15 days purchases $\left(\frac{8,15,000}{12} \times \frac{1}{2}\right)$	= 33,959	
(ii) Advance received on sales order	= <u>25,000</u>	<u>58,959</u>
Working capital required by the company		4,46,041

Working capital limits set by bankers

1. Raw materials — 2 months' consumption	1,40,000	
Less: 15% margin	<u>21,000</u>	1,19,000
2. Work in progress — 15 days' cost of production	60,000	
Less: 30% margin	18,000	42,000
3. Finished goods — 1 month cost of production	1,20,000	
Less: 20% margin	<u>24,000</u>	96,000
4. Sundry Debtors — 1 month sales	1,40,000	
Less: 10% margin	<u>14,000</u>	1,26,000
5. For expenses		<u>Nil</u>
Total limit likely to be approved by bank		<u>3,83,000</u>

Question No. 30

A company is floated to manufacture a new chemical called 'moin'. Currently 'moin' is imported in India at a landed cost of ₹ 8,500 per tonne. The following data have been collected regarding the project:

(i) Investment:

Land	= ₹ 1 lakh
Building	= ₹ 8 lakhs
Plant and machinery	= ₹ 12 lakhs

(ii) Cost of production:

Imported raw material	= ₹ 6,50,000
Local raw material	= ₹ 6,26,000
Salaries and wages	= ₹ 1,35,000
Repairs and maintenance:	5% on plant cost; and 2% on building cost
Depreciation:	7% on plant; and 2-1/2% on building
Administrative expenses	= ₹ 50,000
Steam requirement	= ₹ 7,000 tonnes at ₹ 16 per tone
Power	= ₹ 60,000
Packing drums	= ₹ 30 each per 500 kgs.

(iii) Working capital requirements:

Imported raw material stock	— 6 months
Local raw material stock	— 3 months
Packing material stock	— 3 months
Finished product stock	— 1 month
Credit to customers	— 1 month
Credit from suppliers	— 1 month
Cash expenses	— 1 month

(iv) Expected production — 250 M/T per annum.

- Calculate the total capital needed for the project.
- Assuming that the entire production can be sold at the imported price, calculate the percentage yield on the investment and profit on sales.
- Also calculate the rate of cash generation per annum before taxation.

Answer to Question No. 30**Working:**

Forecast Operating Statement	₹
Raw materials — imported	6,50,000
Raw materials — local	6,26,000
Packing material — 500 drums @ ₹ 30/- each	15,000
Salaries and wages	1,35,000
Repair and Maintenance: Plant	60,000
Building	16,000
Administrative expenses	50,000
Steam requirement	1,12,000
Power	60,000
Depreciation: Plant	84,000
Building	<u>20,000</u>
Total Cost	<u>18,28,000</u>
Production 250 M/T	
Cost per tonne (₹ 18,28,000 / 250)	7,312
Selling price	8,500
Profit	<u>1,188</u>
Total profit per annum [250 x 1188]	<u>2,97,000</u>
Investment	₹ in lakh
Fixed Assets	1.00
Land	8.00
Building	<u>12.00</u>
Total	<u>21.00</u>

(a) Working Capital

(i) Total Capital needed for the project

Investment in fixed Assets:

	(Amt. in ₹)	(Amt. in ₹)
Land	1,00,000	
Building	8,00,000	
P & M	12,00,050	<u>21,00,000</u>
Investment in working capital		
Imported Raw Material	(6,50,000 x 6/12)	3,25,000
Local Raw Material	(6,26,000 x 3/12)	1,56,000
Packing Drums Stock	(15,000 x 3/12)	3,750

Debtors (₹ 8,500 x 250)	(21,25,000 x 1/12)	1,77,083
Finish Goods Stock	(18,28,000 x 1/12)	1,52,333
Cash exp.	(4,48,000 x 1/12)	<u>37,334</u>
		<u>8,52,000</u>
<i>Creditors</i>		
Import	₹ 6,50,000	
Local	₹ 6,26,000	
	(12,76,000 x 1/12)	<u>1,06,333</u>
Working Capital		₹ 7,45,667
Total Capital Required = Fixed Capital + Working Capital		
(₹ 21,00,000 + ₹ 7,45,667)		= ₹ 28,45,667

(b) It has been assumed that no credit is available in respect of imported raw material.

(a) Total Capital requirement	₹/lakh
Investment	21.00
Working Capital	<u>7.97</u>
	<u>28.97</u>

(b) Percentage yield on total investment = $\frac{2,97,000 \times 100}{\text{Rs. } 28,97,000} = \text{Rs. } 10.25\%$

Profit on sales: $\frac{\text{Rs. } 1,188}{\text{Rs. } 8,500} \times 100 = 13.97\%$

(c) Cash generation per annum: Profit + Depreciation
 ₹ 2.97 lakhs + ₹ 1.04 lakhs
 = ₹ 4.01 lakhs

Question No. 31

PQR company is currently selling 2,00,000 units of its product @ ₹ 50 each. At the current level of production the cost per unit is ₹ 45, variable cost per unit is ₹ 40. The company is currently extending one month credit. The company is thinking of extending credit period to two months in the expectation that sales will increase by 20 per cent. If the required rate of return on firms investment is 25 per cent, is the new credit policy desirable for the company?

Answer to Question No. 31

Calculation of total cost at new Sales Level

	₹
Cost at present level of sales (2,00,000 x ₹ 45)	90,00,000
Cost of increased sales (2,00,000 x 20%) x 40	<u>16,00,000</u>
Cost of Sales of 2,40,000 units	1,06,00,000
Average cost per unit of sales at the new level of Sales is = $\frac{1,06,00,000}{2,40,000}$	44.16

Calculation of Profitability and required rate of return	
Profitability on additional sales [40,000 x (₹ 50 – ₹ 40)]	4,00,000
Present average investment in receivables = ₹ 90,00,000/12	7,50,000
Average investment in receivable after change in credit policy (₹ 1,06,00,000/6)	17,66,666
Additional investment in receivables (₹ 17,66,666 – ₹ 7,50,000)	10,16,666
Required rate of return on additional investment (₹ 10,16,666 x .25)	2,54,166

From above it is clear that the new credit policy is acceptable to the company because profit on account of additional sales is expected to increase by ₹ 4,00,000 as against the required rate of return of ₹ 2,54,166 on the additional investment in receivable.

- Assumptions : (1) All sales are on credit sales.
(2) Fixed cost does not change.

Question No. 32

Compute 'maximum bank borrowings' permissible under Method I, Method II and Method III of Tandon Committee norms from the following figures and comment on each method:

₹ (lakhs)		₹ (lakhs)	
Current Liabilities:		Current Assets:	
Creditors for purchases	400	Raw Materials	800
Other current liabilities	<u>200</u> 600	Work-in-process	80
Bank borrowings inclu		Finished goods	360
bills discounted		Receivables including bills with bankers	800
discounted with bankers	200	Other current assets	<u>40</u>
	<u>1,400</u>		<u>1,480</u>

Assume core current assets are ₹ 380 lakhs.

Answer to Question No. 32

Maximum bank borrowings permissible under different methods of Tandon Committee norms

Method I	(₹ in lakhs)
Total current assets	1480
Less: Current liabilities other than bank borrowings	<u>600</u>
Working capital gap	880
Less: Borrower's contribution of 25% of above from Long term sources	<u>220</u>
Maximum bank borrowings permissible	<u>660</u>
Excess borrowings (₹ 800 lakhs – ₹ 660 lakhs)	140
Method II	
Total current assets	1480

Less: Borrower's contribution of 25% of above from Long term sources	<u>370</u>
Less: Current liabilities other than bank borrowings	<u>600</u>
Maximum bank borrowings permissible	<u>510</u>
Excess borrowings (₹ 800 lakhs – ₹ 510 lakhs)	290
Method III	
Total current assets	1480
Less: Core current assets (100% Contribution)	<u>380</u>
Real current assets	1100
Less: Borrower's contribution of 25% of above from Long term sources	<u>275</u>
	825
Less: Current liabilities other than bank borrowings	<u>600</u>
Maximum bank borrowings permissible	<u>225</u>
Excess borrowings (₹ 800 lakhs – ₹ 225 lakhs)	575

Comments

Method I: According to Method I prescribed by Tandon Committee the maximum permissible limit of bank borrowings for the Company are ₹ 660 lakhs whereas actual bank borrowings are of ₹ 800 lakhs. Thus, there is excess amount of bank borrowing to the tune of ₹ 140 lakhs which may be converted into term loan to be paid out gradually.

Method II: According Method II, the Company has to get ₹ 290 lakhs converted into term loan to be phased out gradually.

Method III: As per Method III, excess borrowings of the Company from bank are ₹ 575 lakhs. Under this method, the borrower has to finance core current assets also from the long-term sources. Till the time the borrower is able to arrange for long-term funds, bank may convert the excess amount of borrowings into term loan to be phased out in future.

Question No. 33

X Public Limited Company has obtained the following data concerning the average working capital cycle for other components in the same industry.

	Day
Raw material stock turnover	20
Credit received	(40)
Work in progress turnover	15
Finished goods stock turnover	40
Debtors' collection period	<u>60</u>
	<u>95</u>

Using the following information, you are required to calculate the current working capital cycle for X Public Limited Co. and briefly comment on it.

	₹ ('000)
Sales	3,000
Cost of sales	2,100
Purchases	600
Average raw material stock	80
Average work-in-progress	85
Average finished goods stock	180
Average creditors	90
Average debtors	350

Answer to Question No. 33

Working capital cycle for X Public Ltd. Co. can be calculated in the following manner—

$$\text{Raw material stock} = \frac{\text{Average raw material stock}}{\text{Purchases}} \times 365$$

$$= \frac{80}{600} \times 365 = 49 \text{ days approx.}$$

$$\text{Less: Creditors} = \frac{\text{Average creditors}}{\text{Purchases}}$$

$$= \frac{90}{600} \times 365 = (55) \text{ days}$$

$$\text{Work in progress} = \frac{\text{Average work in Progress}}{\text{Cost of goods sold}} \times 365$$

$$= \frac{85}{2100} \times 365 = 15 \text{ days}$$

$$\text{Finished goods stock} = \frac{\text{Average finished goods stock}}{\text{Cost of goods sold}} \times 365$$

$$= \frac{180}{2100} \times 365 = 31 \text{ days}$$

$$\text{Debtors} = \frac{\text{Average debtors}}{\text{Sales}} \times 365$$

$$= \frac{350}{3000} \times 365 = 43 \text{ days}$$

Working capital cycle is 83 days = 49 – 55 + 15 + 31 + 43

Comments

Overall, the working capital cycle is below the industry average, indicating a lower investment in current assets. However, the following point should be noted about the individual elements of working capital:

- (a) The stock of raw material is considerably higher than the average. The stock control procedures should be reviewed since these could possibly be reduced.

- (b) The value of creditors is also above average. This indicates that X Ltd. Company is delaying the payment of creditors beyond the credit period. Although this is an additional source of finance, it may result in a higher cost of raw materials.
- (c) The finished goods stock is below average. This may be due to high demand for the firm's goods or to efficient stock control. A low finished goods stock can be however, reduce sales since it can cause delivery delays.
- (d) Debts are collected more quickly than average. The Company may employ good credit control procedures or may offer cash discount for early payment. This can, however, be done at the expense of profitability.

Question No. 34

Calculate the amount of working capital requirements for Jolly & Co. Ltd. from the following information :

	₹ (per unit)
Raw materials	160
Direct labour	60
Over heads	<u>120</u>
Total cost	340
Profit	<u>60</u>
Selling price	<u>400</u>

Raw materials are held in stock on an average for one month. Materials are in process on an average for half-a-month. Finished goods are in stock on an average for one month.

Credit allowed by suppliers is one month and credit allowed to debtors is two months. Time leg in payment of wages is 1-1/2 weeks. Time leg in payment of overhead expenses is one month. One fourth of the finished goods is sold against cash.

Cash in hand and at bank is expected to be ₹ 50,000 ; and expected level of production amounts to 1,04,000 units.

You may assume that production is carried on evenly throughout the year, wages is equivalent to a month.

Answer to Question No. 34

Total value method

Working:

1. **Raw material inventory:** Total cost of materials for the whole year (Fifty two weeks) is ₹ 1,66,40,000. The monthly (four weeks) consumption would be ₹ 12,80,000. Raw material requirement is for one month, hence raw materials in stock would be ₹ 12,80,000.
2. **Debtors:** The average credit sales (per week) is ₹ 6,00,000. Therefore, a sum of ₹ 48,00,000 is the amount of sundry debtors. 104000 units x Rs. 400 x 3/4 x 8/52. It is given in the question that 1/4th is a cash sale.
3. **Creditors:** Suppliers allow a one month credit period. Hence the average amount of creditors is ₹ 12,80,000 [1,04000 units x ₹ 160 x 4/52]. Besides wages and overhead payable are:

Wages (1-1/2 weeks) = ₹ 1,80,000

Overheads (4 weeks) = ₹ 9,60,000

4. **Work-in-process:**

	₹
(i) Raw materials in WIP	6,40,000
(ii) Labour cost 104000 units x ₹ 60 x 50% x 2/52	1,20,000
(iii) Overhead (104000 units)	<u>2,40,000</u>
Total WIP	<u>10,00,000</u>

Production is carried on evenly throughout the year and a time period of four weeks wages is equivalent to a month

5. Finished goods inventory:

One month cost of raw material	12,80,000
Labour	4,80,000
Overhead	<u>9,60,000</u>
	<u>27,20,000</u>

Working capital requirements :

Current Assets (A):

	₹	₹
Raw materials inventory	12,80,000	
Debtors	48,00,000	
Work-in-process	10,00,000	
Finished goods inventory	27,20,000	
Cash	<u>50,000</u>	98,50,000

Current liabilities (B):

Creditors	12,80,000	
Wages payable	1,80,000	
Overheads payable	<u>9,60,000</u>	<u>24,20,000</u>
		<u>74,30,000</u>

Alternate Cash Cost Method

Working capital requirements:

Current Assets	
Raw materials inventory	12,80,000
*Debtors	40,80,000
Work-in-progress	10,00,000
Finished goods inventory	27,20,000
Cash	50,000
Total	91,30,000

Current Liabilities:	
Creditors	12,80,000
Wages payable	1,80,000
Overhead payable	9,60,000
Estimated Working Capital requirement (Balancing figure)	67,10,000
Total	<u>91,30,000</u>

*Debtors: The average credit sales (per week) is ₹ 5,10,000 (1,500 units x ₹340).

Question No. 35

In order to increase sales from the normal level of ₹ 2.4 lakhs per annum, the marketing manager submits a proposal for liberalising credit policy as under :

Normal sales ₹ 2.4 lakhs

Normal credit period 30 days

Proposed increase in credit period beyond normal 30 days	Relevant increase over normal sales (₹)
15 days	12,000
30 days	18,000
45 days	21,000
60 days	24,000

The P.V. ratios of the company is 33-1/3%

The company expects a pre-tax return of 20% on investment. Evaluate the above four alternatives and advise the management. (Assume 360 days a year)

Answer to Question No. 35

Evaluation of Alternative

(₹ in lakhs)

1	Existing Credit Policy	Proposed Credit Policy			
	2	3	4	5	6
(i) Credit period days	30	45	60	75	90
(ii) Credit period year	1/12	1/8	1/6	1/4.8	1/4
(iii) Sales	2.4	2.52	2.58	2.61	2.64
(iv) Contribution					
(Sales x P/V ratio)	0.8	0.84	0.86	0.87	0.88
(v) Increase in contribution					

overexisting (a)	—	0.04	0.06	0.07	0.08
(vi) Debtors balances	0.2	0.315	0.43	0.54375	0.66
(Sales x Credit period)					
(vii) Required pre tax return on investment	0.04	0.063	0.086	0.10875	0.132
(viii) Increase in return on investment over existing (b)	—	0.023	0.046	0.06875	0.092
(ix) Excess (a – b)	—	0.017	0.014	0.00125	(0.012)

It will be seen from the above calculation that there is maximum return when the credit period is for 45 days. There is an excess of contribution over increase in return on investment. Therefore management is advised to extend the credit period to 45 days.

Note: Investment in debtors could be calculated on variable cost basis also.

Question No. 36

Taxes Manufacturing Company Ltd., is to start production on 1st January, 2019. The prime cost of a unit is expected to be ₹ 40 out of which ₹ 16 is for materials and ₹ 24 for labour. In addition variable expenses per unit are expected to be ₹ 8, and fixed expenses per month ₹ 30,000. Payment for materials is to be made in the month following the purchase. One-third of sales will be for cash and the rest on credit for settlement in the following month. Expenses are payable in the month in which they are incurred.

The selling price is fixed at ₹ 80 per units manufactured and sold are expected to be as under :

January	900	April	2,100
February	1,200	May	2,100
March	1,800	June	2,400

Draw up a statement showing requirements of working capital from month to month, ignoring the question of stocks.

Answer to Question No. 36

Statement showing requirements of Working Capital (Jan. to June 2019)

	January ₹	February ₹	March ₹	April ₹	May ₹	June ₹
Requirements:						
Wages	21,600	28,800	43,200	50,400	50,400	57,600
Materials	—	14,400	19,200	28,800	33,600	33,600
Expenses:						
Fixed	30,000	30,000	30,000	30,000	30,000	30,000
Variable	7,200	9,600	14,400	16,800	16,800	19,200
Total (i)	58,800	82,800	1,06,800	1,26,000	1,30,800	1,40,000
Receipts:						

Cash sales	24,000	32,000	48,000	56,000	56,000	64,000
Sundry Debtors						
(Credit Sales)	—	48,000	64,000	96,000	1,12,000	1,12,000
Total (ii)	24,000	80,000	1,12,000	1,52,000	1,68,000	1,76,000
<i>Cash required:</i>						
[(i)—(ii)]	34,800	2,800	—	—	—	—
Surplus (ii)—(i)	—	—	5,200	26,000	37,200	35,600
Cumulative requirement	34,800	37,600	32,400	6,400	—	—
Cumulative Surplus	—	—	—	—	30,800	66,400

Question No. 37

Estalla Garment Co. Ltd. is a famous manufacturer and exporter of garments to the European countries. The finance manager of the company is preparing its working capital forecast for the next year. After carefully screening all the documents, he collected the following information:

Production during the previous year was 15,00,000 units. The same level of activity is intended to be maintained during the current year.

The expected ratios of cost to selling price are:

Raw materials	40%
Direct wages	20%
Overheads	20%

The raw materials ordinarily remain in stores for 3 months before production. Every unit of production remains in the process for 2 months and is assumed to be consisting of 100% raw material, wages and overheads. Finished goods remain in warehouse for 3 months. Credit allowed by the creditors is 4 months from the date of the delivery of raw material and credit given to debtors is 3 months from the date of dispatch.

The estimated balance of cash to be held: ₹ 2,00,000

Lag in payment of wages: $\frac{1}{2}$ month

Lag in payment of expenses: $\frac{1}{2}$ month

Selling price is ₹ 10 per unit. Both production and sales are in a regular cycle. You are required to make a provision of 10% for contingency (except cash). Relevant assumptions may be made.

You have recently joined the company as an assistant finance manager. The job of preparing the forecast statement has been given to you. You are required to prepare the forecast statement. The finance manager is particularly interested in applying the quantitative techniques for forecasting the working capital needs of the company. You are also required to explain the approach in the brief note to be prepared by you.

Answer to Question No. 37**Forecast statement of Working Capital Requirement of Estalla Garment Co. Ltd.****A. Current Assets**

	₹
(i) Debtors $\left(1,50,00,000 \times \frac{80}{100} \times \frac{3}{12}\right)$	30,00,000
(ii) Finished goods $\left(1,50,00,000 \times \frac{80}{100} \times \frac{3}{12}\right)$	30,00,000
(iii) Work-in-progress $\left(1,50,00,000 \times \frac{80}{100} \times \frac{2}{12}\right)$	20,00,000
(iv) Raw materials $\left(1,50,00,000 \times \frac{40}{100} \times \frac{3}{12}\right)$	15,00,000
Total Current Assets (A)	<u><u>95,00,000</u></u>

B. Current Liabilities

	₹
(i) Creditors $\left(1,50,00,000 \times \frac{40}{100} \times \frac{4}{12}\right)$	20,00,000
(ii) Wages $\left(1,50,00,000 \times \frac{20}{100} \times \frac{1}{24}\right)$	1,25,000
(iii) Expenses $\left(1,50,00,000 \times \frac{20}{100} \times \frac{1}{24}\right)$	1,25,000
Total Current Liabilities (B)	<u><u>22,50,000</u></u>

Excess of current assets over current liabilities (A – B)	72,50,000
Add: Provision of 10% contingency	<u>7,25,000</u>
	79,75,000
Add: Balance of Cash available	<u>2,00,000</u>
Forecast of Working Capital Requirement	<u>81,75,000</u>

Working Notes:

Total sales of the company for the current year:

Total sales	=	Number of units sold x Price per unit
Total sales	=	15,00,000 x ₹ 10
	=	₹ 1,50,00,000

Assumptions:

- (i) All sales are made on credit basis.
- (ii) The working capital blocked in debtors, finished goods and work-in-progress is taken at cost i.e. 80% of selling price.

NOTE

Dated: 2.1.2018

From: Assistant Finance Manager

To: Finance Manager

Sir,

This has reference to your direction to prepare a brief note on application of quantitative techniques for forecasting the working capital. In this connection, I hereby submit as under:

Apart from the estimation of working capital, as per operating cycle method, the following quantitative techniques are also used for estimating the working capital needs of the company:

- (i) **Regression analysis method:** The regression analysis method is very useful statistical technique of forecasting working capital requirements. In the sphere of working capital management, it helps in making projections after establishing the average relationship in the past years between sales and the working capital and its various components. The analysis can be carried out through the graphic portrayals (scatter diagram) or through mathematical formulae. The relationship between sales and working capital may be simple and direct indicating complete linearity between the two or may be complex in differing degrees involving simple linear regression and multiple regression situations. This method is suitable for simple as well as complex situations.
- (ii) **Percent-of-sales method:** It is a traditional and simple method of determining the level of working capital and its components. In this method, working capital is determined on the basis of past experience. If over the years, the relationship between sales and working capital is found to be stable, then this relationship may be taken as base for determining the working capital for future. This method is simple, easy to understand and useful in forecasting of working capital. However, this method is criticised on the assumption of linear relationship, between sales and working capital. Therefore, this method is not universally applicable.

Submitted please.

XYZ

(Assistant Finance Manager)

Question No. 38

A dealer having annual sales of ₹ 50 lakh extends 30 days credit period to its debtors. The variable cost is estimated at 80% on sales and fixed costs are ₹ 6,00,000. The dealer intends to change the credit policy for which the following information is given:

Credit Policy Period (Days)	Average Collection (₹ in lakhs)	Annual Sales
A	45	56
B	60	60
C	75	62

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Rate of return (pre-tax) required on investment is 20%.

You are required to assess the most profitable policy with the help of incremental approach. Calculations may be restricted to two decimal places.

Answer to Question No. 38

Evaluation of Proposed Credit Policies

Amount in lakhs (₹)

Credit Policy	Present	A	B	C
Period (days)	30	45	60	75
Annual Sales	50	56	60	62
Variable Cost (80% on sales)	40	44.8	48	49.6
Fixed Cost	6	6	6	6
Total Cost	46	50.8	54	55.6
Profit (Annual Sales-Total Cost)	4.00	5.20	6.00	6.40
Incremental Profit (A)	—	1.20	2.00	2.40..(A)
Average Investment in Debtors				
46 x 30/365	3.78			
50.8 x 45/365		6.26		
54 x 60/365			8.88	
55.6 x 75/365				11.42
Incremental Investment in Debtors as compared to present level	—	2.48	5.10	7.64
<i>Required Return:</i>				
20% of incremental investment (B)	—	0.50	1.02	1.53
Excess return i.e. (A – B)	—	0.70	0.98	0.87

Policy B having Average Collection Period 60 day's yields the maximum profit and thus is most profitable.

Question No. 39

On 1st January, 2018, the Board of directors of Dowell Co. Ltd. wishes to know the amount of working capital that will be required to meet the programme of activity; they have planned for the year. The following information is available:

- (i) Issued and paid-up capital ₹ 2,00,000.
- (ii) 5% Debentures (secured on assets) ₹ 50,000.
- (iii) Fixed assets valued at ₹ 1,25,000 on 31.12.2018.
- (iv) Production during the previous year was 60,000 units. It is planned that this level of activity should be maintained during the present year.

- (v) The expected ratios of cost to selling price are – raw materials 60%, direct wages 10% and overheads 20%.
- (vi) Raw materials are expected to remain in stores for an average of two months before these are issued for production.
- (vii) Each unit of production is expected to be in process for one month.
- (viii) Finished goods will stay in warehouse for approximately three months.
- (ix) Creditors allow credit for 2 months from the date of delivery of raw materials.
- (x) Credit allowed to debtors is 3 months from the date of dispatch.
- (xi) Selling price per unit is ₹ 5.
- (xii) There is a regular production and sales cycle.

Prepare:

- (a) working capital requirement forecast; and
- (b) an estimated profit and loss account and balance sheet at the end of the year.

Answer to Question No. 39

(a) Forecast of Working Capital Requirements – of Dowell Co. Ltd.

	Holding Periods	₹
Current Assets:		
Raw Material	2 months	30,000
Work-in-progress	1 month	18,750
Finished goods	3 months	67,500
Debtors	3 months	<u>75,000</u>
Total Current Assets		1,91,250
Less: Current Liabilities – Creditors	2 months	<u>30,000</u>
Net Working Capital (CA – CL)		<u>1,61,250</u>

(b)(i)

Dowell Company Limited
Estimated Profit and Loss Account
for the year ending 31st December, 2018

	₹	₹
Sales 60,000 units @ ₹5		3,00,000
Less: Cost of Sales:		
Raw material @ 60%	1,80,000	
Direct Wages @ 10%	30,000	
Overheads @ 20%	<u>60,000</u>	<u>2,70,000</u>
Gross profit		30,000
Less: Debenture Interest @ 5% on 50,000		<u>2,500</u>
Net Profit		<u>27,500</u>

(ii)

Dowell Company Limited
Estimated Balance Sheet
for the end of 31st December, 2018

Liabilities	₹	Assets	₹
Share Capital	2,00,000	Fixed Assets	1,25,000
Reserve & Surplus (balance figure)	8,750	<i>Current Assets:</i>	
Profit & Loss A/c (Profit for the year)	27,500	Raw material	30,000
5% Debentures	50,000	Work-in-progress	18,750
Creditors	<u>30,000</u>	Finished goods	67,500
	<u>3,16,250</u>	Debtors (equivalent to 3 months sales)	<u>75,000</u>
			<u>3,16,250</u>

Working Notes:**(i) Computation of Cost and Sales:**

	Per unit	Total 60,000 units
	₹	₹
Selling price	<u>5.00</u>	<u>3,00,000</u>
Cost of Sales:		
Raw material	3.00	1,80,000
Direct Wages	0.50	30,000
Overheads	<u>1.00</u>	<u>60,000</u>
	<u>4.50</u>	<u>2,70,000</u>

(ii) Stock of Raw material:

$$2 \text{ month's consumption} \left(\frac{1,80,000 \times 2}{12} \right) = ₹ 30,000$$

(iii) Work in progress (1 month's production):

$$\text{Raw Material} \left(\text{Rs. } \frac{1,80,000}{12} \right) = ₹ 15,000$$

$$\text{Direct Wages} * \left(\frac{30,000}{12} \times \frac{1}{2} \right) = ₹ 1,250$$

$$\text{Overheads} * \left(\frac{60,000}{12} \times \frac{1}{2} \right) = ₹ 2,500 \quad ₹ 18,750$$

*Presumed to accrue evenly during the period

(iv) Finished goods (3 months' production)

$$\frac{\text{₹}2,70,000 \times 3}{12} = \text{₹}67,500$$

(v) Debtors (3 months cost of sales)

$$\frac{\text{₹}3,00,000 \times 3}{12} = \text{₹}75,000$$

(vi) Creditors (2 months consumption of raw materials)

$$\frac{\text{₹}1,80,000 \times 2}{12} = \text{₹}30,000$$

Question No. 40

Prepare working capital forecast and projected profit and loss account and balance sheet from the following information:

	₹
Issued equity share capital	50,00,000
Preference share capital	15,00,000
Fixed assets	30,66,667

Production during the previous year was 10,00,000 units which is expected to be maintained during the current year. The expected ratios of cost to selling price are?

Raw material	40%
Direct wages	20%
Overheads	20%

Raw material ordinarily remains in stock for 3 months before production. Every unit of production remains in process for 2 months. Finished goods remain in stock for 3 months. Creditors allow 3 months for payment and debtors are allowed 4 months credit. Estimated minimum cash to be held will be half a month. The selling price will be ₹ 8 per unit. The production is in continuous process and sales are in regular cycle.

Answer to Question No. 40

Total Production : 10,00,000 units

Sale Rate : ₹ 8/unit

Cost per unit of:

Raw Material = ₹ 8 x 40% = ₹ 3.20

Wages = ₹ 8 x 20% = ₹ 1.60

Overheads = ₹ 8 x 20% = ₹ 1.60

Current Assets

		(₹)
Cash		2,00,000
Raw Material $10,00,000 \times ₹ 3.20 \times 3/12$		8,00,000
Work-in-Progress $10,0,000 \times [₹ 3.20 + ₹ 0.80 + ₹ 0.80] \times 2/12$		8,00,000
Finished Goods $10,00,000 \times ₹ 6.40 \times 3/12$	16,00,000	
Debtors $10,00,000 \times ₹ 8 \times 4/12$		<u>26,66,667</u>
	Total :	60,66,667
Current Liabilities		
Creditors $10,00,000 \times ₹ 3.20 \times 3/12$	8,00,000	
Wages $10,00,000 \times ₹ 1.60 \times 1/24$	66,667	
Overheads $10,00,000 \times ₹ 1.60 / 1/24$	<u>66,667</u>	<u>9,33,334</u>
Working Capital required		<u>51,33,333</u>

It is assume that there is a lag of 1/2 months in payment of basis and overhead

Profit Statement

		(₹)
Sales		80,00,000
Less:		
Raw Material	32,00,000	
Wages	16,00,000	
Overheads	<u>16,00,000</u>	<u>64,00,000</u>
Profit		<u>16,00,000</u>

Balance Sheet as on.....

Liabilities	₹	Assets	₹
Capital	50,00,000	Fixed	30,66,667
Prof. Share Capital	15,00,000	Raw Material	8,00,000
<i>Profit: Previous Years</i>		Work-in-Progress	8,00,000
(Balance figure)	1,00,000	Finished Goods	16,00,000
Current Year	16,00,000	Debtors	26,66,667
Creditors	8,00,000	Cash	2,00,000
Wages Payable	66,667		
Overheads Payable	<u>66,667</u>		
	<u>91,33,334</u>		<u>91,33,334</u>

Question No. 41

The present credit terms of P Company are 1/10 net 30. Its annual sales are Rs. 80 lakhs, its average collection period is 20 days. Its variable cost and average total costs to sales are 0.85 and 0.95 respectively and its cost of capital is 10 per cent. The proportion of sales on which customers currently take discount is 0.5. P company is considering relaxing its discount terms to 2/10 net 30. Such relaxation is expected to increase sales by Rs. 5 lakhs, reduce the average collection period to 14 days and increase the proportion of discount sales to 0.8. What will be the effect of relaxing the discount policy on company's profit? Take year as 360 days.

Answer to Question No. 41

Evaluation of effect of relaxing the discount policy on company's profit

A. Incremental Revenue

Increase in contribution (Rs. 5,00,000 × 15%)
Rs.75,000

Reduction in investment in receivable × cost of capital

$$\text{Present: } \left[\frac{\text{Rs. 80 lacs} \times 0.95 \times 20 \text{ days}}{360 \text{ days}} \right] = \text{Rs. 4,22,222}$$

$$\text{Proposed: } \left[\frac{(\text{Rs. 80 lacs} \times 0.95 + \text{Rs. 5 lacs} \times 0.85) \times 14 \text{ days}}{360 \text{ days}} \right] = \text{Rs. 3,12,083}$$

Reduction in investment in receivable Rs. 1,10,139 (Rs.4,22,222 – Rs. 3,12,083)

Cost of savings on investment in receivable (Rs. 1,10,139 × 10%) 11,014
86,014

B. Incremental Cost

Increase in discount

Present: (Rs. 80 lacs × 1% × 0.5) = Rs. 40,000

Proposed : (Rs. 85 lacs × 2% × 0.8) = Rs. 1,36,000

Net increase in discount = Rs. 96,000

C. Net effect on profits (A–B) = Rs. 86,014 – Rs. 96,000

= (–) Rs. 9,986

Since, the proposed discount policy will reduce the profits of the company to the extent of Rs. 9,986. Therefore, it is not advisable for the company to relax the present discount policy.

Question No. 42

Radiance Garments Ltd. manufacturers readymade garments and sells them on credit basis through a network of dealers. Its present sale is Rs. 60 lakh per annum with 20 days credit period. The company is contemplating an increase in the credit period with a view to increasing sales. Present variable costs are 70% of sales and the total fixed costs Rs. 8 lakh per annum. The company expects pre-tax return on investment @ 25%. Some other details are given as under:

<i>Proposed Credit Policy</i>	<i>Average Collection Period (days)</i>	<i>Expected Annual Sales (Rs. Lakh)</i>
I	30	65
II	40	70
III	50	74
IV	60	75

Required: Which credit policy should the company adopt? Present your answer in a tabular form. Assume 360-days a year. Calculations should be made upto two digits after decimal.

Answer to Question No. 42

Statement showing Evaluation of the Proposed Credit Policies

(Amount Rs. In Lakhs)

	Credit policies				
	Present	I	II	III	IV
Average Collection Period (days)	(20 days)	(30 days)	(40 days)	(50 days)	(60 days)
Sales (Annual)	60.00	65.00	70.00	74.00	75.00
Less: Variable cost (70% of sales)	<u>42.00</u>	<u>45.50</u>	<u>49.00</u>	<u>51.80</u>	<u>52.50</u>
Contribution	18.00	19.50	21.00	22.20	22.50
Less: Fixed Costs	<u>8.00</u>	<u>8.00</u>	<u>8.00</u>	<u>8.00</u>	<u>8.00</u>
Profit	10.00	11.50	13.00	14.20	14.50
Increase in profit compared to present profit: (A)	-	1.50	3.00	4.20	4.50
Investments in debtors (Variable cost+ Fixed cost)	50.00	53.50	57.00	59.80	60.50
Debtors turnover (360 days/Average collection period)	18	12	9	7.2	6
Average investment in debtors (Investment in debtors/ Debtors turnover)	2.78	4.46	6.33	8.3	10.08
Additional investment in debtors compared to present level	-	1.68	3.55	5.52	7.30
Required return on additional investment (25%) : (B)	-	0.42	0.89	1.38	1.83
Incremental profit: (A)–(B)	-	1.08	2.11	2.82	2.67

Decision: The company should adopt the credit policy III (with collection period of 50 days) as it yields a maximum profit to the company.

Question No. 43

A bank is analysing the receivables of Jackson Company in order to identify acceptable collateral for a short-term loan. The company's credit policy is 2/10 net 30. The bank lends 80 percent on accounts where customers are not currently overdue and where the average payment period does not exceed 10 days past the net period. A schedule

of Jackson's receivables has been prepared. How much will the bank lend on pledge of receivables, if the bank uses a 10 per cent allowance for cash discount and returns?

<i>Account</i>	<i>Amount Rs.</i>	<i>Days Outstanding in days</i>	<i>Average Payment Period historically</i>
74	25,000	15	20
91	9,000	45	60
107	11,500	22	24
108	2,300	9	10
114	18,000	50	45
116	29,000	16	10
123	<u>14,000</u>	27	48
	<u>1,08,800</u>		

Answer to Question No. 43

Analysis of the receivables of Jackson Company by the bank in order to identify acceptable collateral for a short-term loan:

<i>Account No.</i>	<i>Amount</i>	<i>Allowance for cash discount and returns (10% x Col.2)</i>	<i>Net amount (Col.2 - Col.3)</i>	<i>Loan amount @ 80% amount (4)</i>
1	2	3	4	5
74	Rs 25,000	Rs 2,500	Rs 22,500	Rs 18,000
107	11,500	1,150	10,350	8,280
108	2,300	230	2,070	1,656
116	29,000	2,900	26,100	20,880
		Total loan amount		<u>48,816</u>

Working Notes

- Account numbers 91 and 114 are currently overdue by 15 and 20 days respectively, credit policy being 2/10 net 30 days. Also these accounts have average payment period of more than 40 days i.e., 10 days more than credit period allowed. Loan is not available on these accounts as per short-term loan policy of bank.
- Account number 123, though not currently overdue but has average payment period of more than 40 days. Hence, this account is not eligible for bank loan.

Question No. 44

The credit manager of XYZ Ltd. is reappraising the company's credit policy. The company sells the products on terms of net 30. Cost of goods sold is 85% of sales and fixed costs are further 5% of sales. XYZ classifies its customers on a scale of 1 to 4. During the past five years, the experience was as under:

<i>Classification</i>	<i>Default as a percentage of sales</i>	<i>Average collection period-in days for non-defaulting accounts</i>
1	0	45
2	2	42
3	10	40
4	20	80

The average rate of interest is 15%. What conclusions do you draw about the company's Credit Policy? What other factors should be taken into account before changing the present policy? Discuss.

Answer to Question No. 44

Since the amount of revenue generated from each category of customer is not given in the question. Let us consider Rs. 100 as the amount of revenue generated from each type of customer. Therefore, Rs. 100 shall be taken as the basis for reappraisal of Company's credit policy.

Classification	Gross profit @ 15%* (Rs.)	Bad debts (Rs.)	Interest Cost (Refer to Working note)(Rs.)	Total Cost (Rs.)	Net effect (Rs.)	Strategy
(i)	(ii)	(iii)	(iv)=(ii)+(iii)	(v)=(i)-(iv)		
1	15	Nil	1.57	1.57	13.43	Accept
2	15	2	1.47	3.47	11.53	Accept
3	15	10	1.40	11.40	3.60	Accept
4	15	20	2.80	22.80	(7.80)	Reject

*It is given the cost of goods sold is 85%. Therefore Gross Profit is 15% of sales.

The reappraisal of company's credit policy indicates that the company either follows a lenient credit policy or it is inefficient in collection of debts. Even though the company sells its products on terms of net 30 days, it allows average collection period for more than 30 to all categories of its customers. The net effect i.e. Gross Profit less Total Cost is favourable in respect of categories 1, 2 and 3 therefore these customers shall be taken into fold. For the customers covered in category 4 the net effect is unfavourable i.e. total cost is more than the gross profit. The company should try to reduce bad debt % for this category of customers at least by 7.8% (i.e. at 12.20%). If the company is able to do so, the company can allow the credit period of 80 days for at least increasing the market share.

The other factors to be taken into consideration before changing the present policy includes (i) past performance of the customers and (ii) their credit worthiness.

The information so required may be outsourced as well as insourced.

Working Note:

Computation of interest cost

Interest Cost=
$$\frac{\text{Average rate of interest} \times \text{Cost of goods sold} \times \text{Average collection period in days for non-defaulting accounts}}{365 \text{ days}}$$

$$\text{For Category 1} = \frac{15\% \times \text{Rs. } 85 \times 45 \text{ days}}{365 \text{ days}} = \text{Rs. } 1.57$$

$$\text{For Category 2} = \frac{15\% \times \text{Rs. } 85 \times 42 \text{ days}}{365 \text{ days}} = \text{Rs. } 1.47$$

$$\text{For Category 3} = \frac{15\% \times \text{Rs. } 85 \times 40 \text{ days}}{365 \text{ days}} = \text{Rs. } 1.40$$

$$\text{For Category 4} = \frac{15\% \times \text{Rs. } 85 \times 80 \text{ days}}{365 \text{ days}} = \text{Rs. } 2.80$$

Question No. 45

A company has prepared the following projections for a year:

Sales	21,000 units
Selling Price per unit	Rs. 40
Variable Costs per unit	Rs. 25
Total Costs per unit	Rs. 35
Credit period allowed	One month

The Company proposes to increase the credit period allowed to its customers from one month to two months. It is envisaged that the change in the policy as above will increase the sales by 8%. The company desires a return of 25% on its investment.

You are required to examine and advise whether the proposed Credit Policy should be implemented or not.

Answer to Question No. 45**Computation of contribution and extra funds blockage if the credit period allowed to customers is increased from one month to two months**

Increase in sales units	1,680
(8% × 21,000 units)	
Contribution per unit (Rs.)	15
Total contribution on increased sales units (Rs.) : (A)	25,200
(Rs.1,680 units × Rs.15)	
Total cost (Rs.)	7,35,000
21,000 units × Rs.35	
Additional variable cost of 1,680 units (Rs.)	<u>42,000</u>
(1,680 units × Rs.25)	
Total cost (Rs.)	7,77,000
Funds blocked for 2 months (Rs.)	1,29,500
(Rs.7,77,000 /12 months)× 2 month	
Less: Present blockage of funds for 1 month (Rs.)	61,250
(Rs.7,35,000 / 12 months) × 1 month	
Extra blockage of funds (Rs.) due to change in credit policy	<u>68,250</u>

$$\text{Return (due to change in credit policy)} = \frac{\text{Contribution on increased sales}}{\text{Extra funds blockage}} \times 100$$

$$= \frac{\text{Rs. 25,200}}{\text{Rs. 68,250}} \times 100 = 36.92\%$$

Advise: The return due to a change in the credit policy comes to 36.92%, which is more than the desired return of 25%. Hence, the proposal of increasing the credit period from one month to two months should be accepted.

PORTFOLIO MANAGEMENT

Question No. 46

During a 5 year period, the relevant results for the aggregate market are that the r_f (risk-free rate) is 8 percent and the r_m (return on market) is 14 percent. For that period, the results of four portfolio managers are as follows:

Portfolio Manager	Average Return (%)	Beta
A	13	0.80
B	14	1.05
C	17	1.25
D	13	0.90

Using CAPM model you are required to (a) Calculate the expected rate of return for each portfolio manager and compare the actual returns with the expected returns. (b) Based upon your calculations, select the manager with the best performance.

Answer to Question No. 46

(a) Use the CAMP equation :

The expected rates of return are as follows :

Portfolio Manager	Average Return (%)	Expected Return (%)	Actual Return (%)	Difference between Actual and Expected Returns (%)
A	13	$r_A = 8\% + 0.80 (14\% - 8\%) = 12.8$	13	+ 0.2
B	14	$r_B = 8\% + 1.05 (14\% - 8\%) = 14.3$	14	- 0.3
C	17	$r_C = 8\% + 1.25 (14\% - 8\%) = 15.5$	17	+ 1.5
D	13	$r_D = 8\% + 0.90 (14\% - 8\%) = 13.4$	13	- 0.4

(b) Portfolio Managers A and C did better than expected, since A exceeded the expected return by 1.56 percent (0.2% - 12.8%) and C bettered the expected return by 9.68 percent (1.5% - 15.5%). C therefore showed the best performance.

Note: Average return is the actual return.

Question No. 47

From the following information, calculate the expected rate of return of a portfolio:

Risk Free rate of interest	12%
Expected return of market portfolio	18%
Standard deviation of an asset	2.8%
Market standard deviation	2.3%
Co-relation co-efficient of portfolio with market	0.8%

Answer to Question No. 47

Calculation of Expected Rate of Return of a Portfolio

Expected Rate of Return of a portfolio can be worked by using following formula:

$$R_e + R_f + \beta_j(R_m - R_f) \dots(1)$$

Where R_e stands for expected rate of return of a portfolio

R_f = Risk free rate of interest or return

R_m = Expected return of market portfolio

β_j = Beta co-efficient of Security j.

Since in the question, information on β_j is not given, it is essential to find it. The formula to calculate β_j is

$$\frac{r_{sm} \times \sigma_s}{\sigma_m} \dots(2)$$

Where r_{sm} — Stands for correlation co-efficient of portfolio with market

σ_s — Standard deviation of an asset

σ_m — Market standard deviation

By substituting the available information in above formula, (2) we may get

$$\begin{aligned} \beta &= \frac{0.80 \times 0.028}{0.023} \\ &= 0.97 \end{aligned}$$

Now we may get expected rate of return by substituting available information in equation (1)

$$\begin{aligned} R_e &= 12 + 0.97 (18 - 12) \\ &= 17.82 \text{ per cent} \end{aligned}$$

Question No. 48

The following information is available in respect of Security-X and Security-Y:

Security	b	Expected Rate of Return
X	1.8	22.00%
Y	1.6	20.40%

Rate of return of market portfolio is 15.3%.

If risk-free rate of return is 7%, are these securities correctly priced? What would be the risk-free rate of return, if they are correctly period?

Answer to Question No. 48

If the two Securities X and Y are correctly priced, then the returns required, based on their levels of systematic risk and calculated from the CAPM, will be the same as their expected returns given. So, the required return can be ascertained with the help of CAPM equation as follows:

$$\text{Security X} = I_{RF} + (R_M - IRF) b$$

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$$\begin{aligned} &= 7\% + (15.3\% - 7\%) 1.8 \\ &= 7\% + (8.3\% \times 1.8) \\ &= 7\% + 14.94\% \\ &= 21.94\% \end{aligned}$$

This is less than the expected return of Security X i.e. 22%. Therefore, Security A is not correctly priced.

$$\begin{aligned} \text{Security Y} &= I_{RF} + (R_M - I_{RF}) \beta \\ &= 7\% + (15.3\% - 7\%) 1.6 \\ &= 7\% + (8.3\% \times 1.6) \\ &= 7\% + 13.28\% \\ &= 20.28\% \end{aligned}$$

Return of 20.28% is less than the expected return of 20.40%. Therefore, Security Y is not correctly priced.

In case, both securities are correctly priced, then they must offer same Reward to Risk Ratio. The risk free rate would have to be such that:

$$\begin{aligned} (22\% - I_{RF}) \div 1.8 &= (20.4\% - I_{RF}) \div 1.6 \\ (.22 - I_{RF}) \times 1.6 &= (.204 - I_{RF}) \times 1.8 \\ .352 - 1.6 I_{RF} &= .3672 - 1.8 I_{RF} \\ .2 I_{RF} &= 0.152 \\ I_{RF} &= 7.6\% \end{aligned}$$

So, both securities would have correctly priced if the risk free rate is 7.6%.

LEASING

Question No. 49

XYZ Ltd. Is considering to acquire an additional computer to supplement its time-share computer services to its clients. It has two options –

- (i) To purchase the computer for ₹ 22,00,000.
- (ii) To lease the computer for 3 years from a leasing company for ₹ 5,00,000 as annual lease rent plus 10% of gross time-share service revenue. The agreement also requires an additional payment of ₹ 6,00,000 at the end of the third year. Lease rent are payable at the year end, and the computer reverts to the lessor after the contract period.

The company estimates that the computer under review now will be worth ₹ 10 lakhs at the end of the third year. Forecast revenues are –

Year	₹
1	22,50,000
2	25,00,000
3	<u>27,50,000</u>

Annual operating costs (excluding depreciation/lease rent of computer) are estimated at ₹ 9,00,000 with an additional ₹ 1,00,000 for start-up and training costs at the beginning of the first year. These costs are to be borne by the lessee. XYZ Ltd. Will borrow at 16% interest to finance the acquisition of the computer; repayments are to be made according to the following schedule:

Year-end	Principal (₹)	Interest (₹)	Total (₹)
1	5,00,000	3,52,000	8,52,000
2	8,50,000	2,72,000	11,22,000
3	8,50,000	1,36,000	9,86,000

The company uses the straight line method to depreciate its assets and pays 50% tax on its income.

The management of XYZ Ltd. Approaches you, as a company secretary, for advice. Which alternative would you recommend and why?

Note: Present value factor at 8% and 16% rate of discount:

Year	8%	16%
1	0.926	0.862
2	0.857	0.743
3	0.794	0.641

Answer to Question No. 49

Present Value of Cash Outflows under Leasing Alternative

Year	Payment under lease contract (₹)			Total payment	Tax Shield @ 50% on lease	Net cash outflows	PV factor at 8%	Total PV
	Lease Rent	10% of gross revenue	Lump-sum payment					
	(₹)	(₹)	(₹)	(₹)	(₹)	(₹)		(₹)
1.	5,00,000	2,25,000	—	7,25,000	3,62,500	3,62,500	0.926	3,35,675
2.	5,00,000	2,50,000	—	7,50,000	3,75,000	3,75,000	0.857	3,21,375
3.	5,00,000	2,75,000	6,00,000	13,75,000	6,87,500	6,87,500	0.794	<u>5,45,875</u>
								<u>12,02,925</u>

Present Value of Cash Outflows under Buying/Borrowing Alternative

Year end	Instalment Payment			Tax advantage on		Net cash outflows Depreciation	PV factor at 8%	Total PV
	Principal	Interest @16%	Total	Interest Payment				
	(₹)	(₹)	(₹)	(₹)	(₹)	(₹)		(₹)
1.	5,00,000	3,52,000	8,52,000	1,76,000	2,00,000	4,76,000	0.926	4,40,776
2.	8,50,000	2,72,000	11,22,000	1,36,000	2,00,000	7,86,000	0.857	6,73,602
3.	8,50,000	1,36,000	9,86,000	68,000	2,00,000	7,18,000	0.794	5,70,092
		Salvage value				(10,00,000)	0.794	(7,94,000)
Total								<u>8,90,470</u>

Recommendation: Since the Present value of cash outflows under borrowing/buying alternative ₹ 8,90,470 is

less than Present value of cash outflow under lease alternative i.e. ₹ 12,02,925. Therefore, the Company is advised to buy the computer.

*Depreciation for 3 years = (₹ 22,00,000 – ₹ 10,00,000) = ₹ 12,00,000. Effective rate of interest or discount = 16% (1 – .50) = 8%.

NOTE: Since the annual operating costs and training costs are same under both the alternatives, so it is not included in the calculations of cash outflows.

Question No. 50

The Controller of Mahindra Electronic Corporation of India has been analysing the firm's policy regarding computers, which are now being leased on a yearly basis on rental amounting to ₹ 2,00,000 per year. The computer can be bought for ₹ 10,00,000. The purchase would be financed by 16% loan repayable in 4 equal annual instalments.

On account of rapid technological progress in the computer industry, it is suggested that a 4 year economic life should be used, instead of 10 years physical life. It is estimated that the computer could be sold for ₹ 4,00,000 at the end of 4 years.

The company uses the straight line method of depreciation. Corporate tax rate is 50%.

You are required to:

- Comment on whether the equipment should be bought or leased?
- Analyse the financial viability from the point of view of the lessor, assuming 14% cost of capital.
- Determine the minimum lease rent at which the lessor would break-even.
- Determine the lease rent which will yield on IRR of 16% to the lessor.

Answer to Question No. 50

(a) Present value of cash outflows under Leasing alternative

Year	Lease Rent after Taxes (₹)	PV factor at 8%	Total Present Value (₹)
1 – 4	1,00,000	3.312	3,31,200

Cash outflows under Buying alternative

Year end	Loan at the beginning of the year in ₹	Loan Instalment in ₹	Interest on Loan in ₹	Principal Repayment of the year in ₹	Principal outstanding at the end in ₹
1	10,00,000	3,57,398	1,60,000	1,97,398	8,02,602
2	8,02,602	3,57,398	1,28,416	2,28,982	5,73,620
3	5,73,620	3,57,398	91,779	2,65,619	3,08,001
4	3,08,001	3,57,398	49,397	3,08,001	—

*(₹ 10,00,000 / 2.798) Present value factor of annuity of Re. 1 at 16% for 4 years.

Present value of cash outflows under Buying alternative

Year	Loan Instalment	Tax advantage		Net Cash on	PV factor Outflows	Total PV at 8%
		Payment of Interest	Depre-ciation			
1	3,57,398	80,000	75,000	2,02,398	0.926	1,87,421
2	3,57,398	64,208	75,000	2,18,190	0.857	1,86,989
3	3,57,398	45,890	75,000	2,36,508	0.794	1,87,787

4	3,57,398	24,699	75,000	2,57,699	0.735	1,89,409
			Salvage value	(4,00,000)	0.735	(2,94,000)
						4,57,606

Recommendation: It may be noted from the above workings that leasing option is financially superior as against buying alternative because present value of cash outflow under leasing option is lower.

(b) (i) Viability from the lesser's point of view. at 14% cost of capital

Determination of CFAT

Lease rent received	2,00,000
Less: Depreciation	1,50,000
Earning before tax	50,000
Less: Taxes (50%)	25,000
Earning after tax	25,000
Add: Depreciation	1,50,000
CFAT	1,75,000

(ii) Determination of NPV

Year	CFAT (₹)	PV Factor at 14%	Total PV (₹)
1-4	1,75,000	2.914	5,09,950
4	4,00,000	0.592	<u>2,36,800</u>
			7,46,750
Less: Cost of computer			<u>10,00,000</u>
			(2,53,250)

Recommendation: The proposal is not financially viable to the lessor.

(c) Lease rent at which lessor would break even:

	₹
Cost of computers	10,00,000
Less: PV of salvage price of computer	<u>2,36,800</u>
Net cost to be covered	7,63,200
CFAT (Desired) (7,63,200 ÷ 2.914*)	2,61,908
Less: Depreciation	<u>1,50,000</u>
Earning after taxes	1,11,908
Add: Taxes @ 50%	<u>1,11,908</u>
Earning before tax	2,23,816
Add: Depreciation	<u>1,50,000</u>
Lease rent at which lessor would break-even	<u>3,73,816</u>

* Annuity factor at 14% for four years.

(d) Lease rent to yield 16% IRR

$$₹ 10,00,000 = \sum_{t=1}^4 \frac{X}{(1+0.16)^t} + \frac{Rs. 4,00,000}{(1+0.16)^4}$$

Where X = CFAT

$$₹ 10,00,000 - \frac{Rs. 4,00,000}{(1.16)^4} = \sum_{t=1}^4 \frac{X}{(1+0.16)^t}$$

Substituting (i) PV factor of annuity of Re. 1 at 16% for 4 years is 2.798 and

(ii) PV factor of Re. 1 at 16% in 4 years is 0.552.

$$₹ 10,00,000 - ₹ 4,00,000 \times .552 = 2.798X$$

$$₹ 10,00,000 - ₹ 2,20,800 = 2.798X$$

$$₹ \frac{779200}{2.798} = X$$

$$X = ₹ 2,78,485$$

	₹
CFAT desired	2,78,485
Less: Depreciation	<u>1,50,000</u>
Earning after taxes	1,28,485
Add: Taxes @ 50%	<u>1,28,485</u>
Earning before taxes	2,56,970
Add: Depreciation	<u>1,50,000</u>
Lease Rent Desired	<u>4,06,970</u>

Question No. 51

ABC Ltd. is considering to acquire an additional sophisticated computer to supplement its time-share computer services to its clients. It has two options:

- (i) To purchase the computer for ₹ 44,00,000.
- (ii) To lease the computer for 3 years from a leasing company for ₹ 10,00,000 as annual lease rent plus 10% of gross time share service revenue. The agreement also requires an additional payment of ₹ 12,00,000 at the end of the third year. Lease rents are payable at the year end, and the computer reverts back to the lessor after the contract period.

The company estimates that the computer under review now will be worth ₹ 20 lakhs at the end of the third year.

Year	₹
1	45,00,000
2	50,00,000
3	55,00,000

Annual operating costs (excluding depreciation/lease rent of computer) are estimated at ₹ 18,00,000 with an

additional cost of ₹ 2,00,000 for start-up and training at the beginning of the first year. These costs are to be borne by the lessee. ABC Ltd. will borrow 16% interest to finance the acquisition of the computer and the repayments are to be made according to the following schedule:

Year-end	Principal (₹)	Interest (₹)	Total (₹)
1	10,00,000	7,04,000	17,04,000
2	17,00,000	5,44,000	22,44,000
3	17,00,000	2,72,000	19,72,000

The company uses the straight line method to depreciate its assets and pays 50% tax on its income.

The management of ABC Ltd. approaches you, as a Company Secretary-cum-Finance Manager, for advice. Which alternative would you recommend and why?

Note: Present value factor at 8% and 16% rate of discount:

Year	8%	16%
1	0.926	0.862
2	0.857	0.743
3	0.794	0.641

Answer to Question No. 51

Present Value of Cash Outflows under Leasing Alternative

Year	Payment under lease contract (₹)			Total payment	Tax Shield @ 50% on lease	Net cash outflows	PV factor at 8%	Total PV
	Lease Rent	10% of gross revenue	Lump-sum payment					
	(₹)	(₹)	(₹)	(₹)	(₹)	(₹)		(₹)
1	10,00,000	4,50,000	—	14,50,000	7,25,000	7,25,000	0.926	6,71,350
2	10,00,000	5,00,000	—	15,00,000	7,50,000	7,50,000	0.857	6,42,750
3	10,00,000	5,50,000	12,00,000	27,50,000	13,75,000	13,75,000	0.794	10,91,750
							PV	24,05,850

Present Value of Cash Outflows under Buying/Borrowing Alternative

Year end	Instalment Payment			Tax advantage on		Net cash outflows Depreciation	PV factor at 8%	Total PV
	Principal	Interest @16%	Total	Interest payment				
	(₹)	(₹)	(₹)	(₹)	(₹)	(₹)		(₹)
1	10,00,000	7,04,000	17,04,000	3,52,000	4,00,000	9,52,000	0.926	8,81,552
2	17,00,000	5,44,000	22,44,000	2,72,000	4,00,000	15,72,000	0.857	13,47,204
3	17,00,000	2,72,000	19,72,000	1,36,000	4,00,000	14,36,000	0.794	11,40,184
		Salvage Value		(20,00,000)	0.794	(15,88,000)	PV	17,80,940

Recommendations: Since the Present value of cash outflows under borrowing/buying alternative ₹ 17,80,940 is less than Present value of cash outflow under lease alternative i.e. ₹ 24,05,580. Therefore, the Company is advised to buy the computer.

$$\begin{aligned} \text{Depreciation for 3 years} &= (\text{₹ } 44,00,000 - \text{₹ } 20,00,000) \\ &= \text{₹ } 24,00,000 / 3 = \text{₹ } 8,00,000. \end{aligned}$$

Effective rate of interest or discount = $16\% (1 - .50) = 8\%$.

Note: Since the annual operating costs and training costs are same under both the alternatives, these are not considered in the calculation of cash outflows.

FINANCIAL DECISIONS

Question No. 52

Sales and earnings before interest and taxes for the XYZ Company during 2012, were ₹ 17,50,000 and ₹ 4,50,000, respectively. During 2012, interest expense was ₹ 4,000 and preferred dividends were ₹ 10,000. These fixed charges are expected to continue during 2013. An expansion is planned, which will require ₹ 1,75,000 and is expected to increase EBIT by ₹ 1,00,000 to ₹ 5,50,000.

The firm is considering the following financing alternatives:

- Issue 5,000 shares of common stock to net the firm ₹ 35 per share. The firm currently has 40,000 shares of common stock outstanding.
- Issue ₹ 1,75,000 of fifteen-year bonds at 8%. Sinking fund payments on these bonds will commence in 2012.
- Issue ₹ 1,75,000 of 8.5% preferred stock.

Assume a 50% income tax rate.

- Calculate the EPS for 2013 at the expected earnings before interest and taxes level of ₹ 5,50,000 of each financing alternative.
- Calculate the equivalency level of earnings before interest and taxes between the debt and common stock alternatives.
- Calculate the equivalency level of earnings before interest and taxes between the preferred stock and common stock alternatives.
- Calculate Financial Break Even point for all the three alternatives.

Answer to Question No. 52

(i) Determination of EPS at EBIT of ₹ 5,50,000

Financial Plans

	(a) Equity shares	(b) Bonds	(c) Preference shares
	(₹)	(₹)	(₹)
EBIT	5,50,000	5,50,000	5,50,000
Less: interest	<u>4,000</u>	<u>18,000</u>	<u>4,000</u>
Taxable income	5,46,000	5,32,000	5,46,000
Less: Taxes 50%	<u>2,73,000</u>	<u>2,66,000</u>	<u>2,73,000</u>
Income after taxes	2,73,000	2,66,000	2,73,000
Less: Dividend on preference shares	<u>10,000</u>	<u>10,000</u>	<u>24,875</u>
Earnings available for equityholders	<u>2,63,000</u>	<u>2,56,000</u>	<u>2,48,125</u>
Number of equity shares	45,000	40,000	40,000
EPS	₹ 5.84	₹ 6.40	₹ 6.20

(ii) Equivalency level of earnings between equity and debt plan

$$\frac{(X - I_1)(1 - t) - P_1}{N_1} = \frac{(X - I_1 - I_2)(1 - t) - P_1}{N_2}$$

where I = Interest, t = tax rate

P = Dividend to Preference Share holders.

$$\text{or } \frac{(X - \text{Rs. } 4,000)0.5 - \text{Rs. } 10,000}{45,000} = \frac{(X - \text{Rs. } 4,000 - \text{Rs. } 14,000)0.5 - \text{Rs. } 10,000}{40,000}$$

$$\text{or } \frac{0.5X - \text{Rs. } 2,000 - \text{Rs. } 10,000}{45,000} = \frac{0.5X - \text{Rs. } 9,000 - \text{Rs. } 10,000}{45,000}$$

$$\text{or } \frac{0.5X - \text{Rs. } 12,000}{45,000} = \frac{0.5X - \text{Rs. } 19,000}{40,000}$$

Multiplying each side of the equation by 3,60,000

$$\begin{aligned} 8(0.5X - ₹ 12,000) &= 9(0.5X - ₹ 19,000) \\ 4X - ₹ 96,000 &= 4.5X - ₹ 1,71,000 \\ 75,000 &= 0.5X \\ ₹ 1,50,000 &= X \text{ (EBIT)} \end{aligned}$$

Verification table

	Equity plan (₹)	Debt plan (₹)
EBIT	1,50,000	1,50,000
Less: Interest	<u>4,000</u>	<u>18,000</u>
Taxable earnings	1,46,000	1,32,000
Less: Taxes 50%	<u>73,000</u>	<u>66,000</u>
Earnings after taxes	73,000	66,000
Less: Preference dividends	<u>10,000</u>	<u>10,000</u>
Earnings for equity holders	63,000	56,000
Number of equity shares	45,000	40,000
EPS	₹ 1.40	₹ 1.40

(iii) Equivalency level between the preferred stock and common stock alternatives

$$\frac{(X - I_1)(1 - t) - P_1 - P_2}{N_1} = \frac{(X - I_1)(1 - t) - P_1}{N_2}$$

$$\text{or } \frac{(X - \text{Rs. } 4,000)0.5 - \text{Rs. } 24,875}{40,000} = \frac{(X - \text{Rs. } 4,000)(0.5) - \text{Rs. } 10,000}{45,000}$$

$$\text{or } \frac{0.5X - \text{Rs. } 2,000 - \text{Rs. } 24,875}{40,000} = \frac{0.5X - \text{Rs. } 2,000 - \text{Rs. } 10,000}{45,000}$$

Multiplying both sides of the equation by 3,60,000

$$\begin{aligned} 9(0.5X - ₹ 26,875) &= 8(0.5X - ₹ 12,000) \\ 4.5X - ₹ 2,41,875 &= 4X - ₹ 96,000 \\ 0.5X &= ₹ 1,45,875 \\ X &= ₹ 2,91,750 \end{aligned}$$

	Equity	Bond	Preference Shares
Indifference Point= Interest + (Preference Dividend)/((1-t))	$= 4,000 + \frac{10,000}{(1-0.5)} =$ ₹ 24,000	$= 18,000 + \frac{10,000}{(1-0.5)} =$ ₹ 38,000	$= 4,000 + \frac{24,875}{(1-0.5)} =$ ₹ 53,750

	Equity	Bond	Preference Shares
EBIT	24,000	38,000	53,750
Less: Interest	(4,000)	(18,000)	(4,000)
Taxable earnings	20,000	20,000	49,750
Less: Taxes 50%	(10,000)	(10,000)	(24,875)
Earnings after taxes	10,000	10,000	24,875
Less: Preference dividends	(10,000)	(10,000)	(24,875)
Earnings for equity holders	0	0	0
Number of equity shares	45,000	40,000	40,000
EPS	0	0	0

Question No. 53

The balance sheet of XYZ Company is given as under:

Liabilities	₹	Assets	₹
Equity Capital (₹ 10 per share)	90,000	Net fixed assets	2,25,000
10% long term debt	1,20,000	Current Assets	75,000
Retained earning	30,000		
Current liabilities	<u>60,000</u>		
	<u>3,00,000</u>		<u>3,00,000</u>

The Company's total assets turnover ratio is 3.00, its fixed operating cost is ₹1,50,000 and its variable operating cost ratio is 50%. The income tax rate is 50%.

You are required to

- Calculate different type of leverages for the company.
- Determine the likely level of EBIT if EPS is (i) Re. 1 (ii) ₹ 2 (iii) Re. 0

Answer to Question No. 53**Income Statement of XYZ Company**

Sales Turnover ratio

$$= \frac{\text{Sales}}{\text{Total Assets}}$$

Let sales of the Company be X, then $3 = \left\{ \frac{X}{3,00,000} \right\}$ or ₹ 9,00,000

Less: Variable Cost (50% of sales) ₹ 4,50,000

Less: Fixed Cost ₹ 1,50,000 ₹ 6,00,000

Earning before Interest and Taxes (EBIT) ₹ 3,00,000

Less: Interest (10% of ₹ 1,20,000) ₹ 12,000

Earning before Taxes (EBT)	₹ 2,88,000
Less: Taxes (50% of Income)	<u>₹ 1,44,000</u>
Earning after Taxes (EAT)	₹ 1,44,000

Leverages

$$\begin{aligned} \text{(a)(i) operating leverages} &= \frac{\text{Contribution}}{\text{EBIT}} \\ &= \frac{\text{Rs. } 9,00,000 - \text{Rs. } 4,50,000}{\text{Rs. } 3,00,000} \\ &= \frac{₹4,50,000}{₹3,00,000} = 1.50 \end{aligned}$$

$$\begin{aligned} \text{(a)(ii) financial leverage} &= \frac{\text{EBIT}}{\text{EBT}} \\ &= \frac{₹3,00,000}{₹2,88,000} = 1.04 \end{aligned}$$

(a)(iii) combined leverage = operating leverage x financial leverage

$$\begin{aligned} &= \frac{\text{Contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{EBT}} \\ \text{Combined leverage} &= 1.50 \times 1.04 \\ &= 1.56 \end{aligned}$$

$$\text{EPS} = \frac{(\text{EBIT} - I)(1 - t)}{N}$$

where I stands for interest
t stands for taxes
N stands for number of shares

(b)(i) If EPS = Re. 1

$$\begin{aligned} \text{Re. 1} &= \frac{(\text{EBIT} - ₹12,000)(1 - .50)}{9,000} \\ ₹ 9,000 &= (\text{EBIT} - ₹ 12,000) (.50) \\ ₹ 9,000 &= .5 \text{ EBIT} - ₹ 6,000 \\ .5\text{EBIT} &= ₹ 9,000 + ₹ 6,000 \\ .5\text{EBIT} &= ₹ 15,000 \\ \text{EBIT} &= ₹ 15,000 \times 2 = ₹ 30,000 \end{aligned}$$

(b)(ii) If EPS = ₹ 2

$$\begin{aligned} ₹ 2 &= \frac{(\text{EBIT} - ₹12,000)(1 - .5)}{9,000} \\ ₹ 18,000 &= .5 \text{ EBIT} - ₹ 6,000 \end{aligned}$$

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.5EBIT	= ₹ 18,000 + ₹ 6,000
.5EBIT	= ₹ 24,000
EBIT	= ₹ 48,000

(b)(iii) If EPS = Re. 0

$$\text{Re. 0} = \frac{(\text{EBIT} - ₹12,000)(1 - .5)}{9,000}$$

.5EBIT – 6,000	= 0
.5EBIT	= ₹ 6,000
EBIT	= ₹ 12,000

Question No. 54

X & Co. needs ₹ 10,00,000 for construction of a new plant for which it has three financing plans. The company wants to maximise EPS. Currently, the equity share is selling for ₹ 30 per share. The EBIT resulting from the plant operations are expected to run about ₹ 1,80,000 per year. The company's marginal tax rate is 50%. Money can be borrowed at the rates indicated as under:

- Upto ₹ 1,00,000 at 10%
- Over ₹ 1,00,000 and upto ₹ 5,00,000 at 14%
- Over ₹ 5,00,000 at 18%

If fund is excess of ₹ 5,00,000 are borrowed, the company anticipates a drop in the price of equity to ₹ 25 per share. The three financing plans are as follows:

- Plan-A – Use ₹ 1,00,000 debt
- Plan-B – Use ₹ 3,00,000 debt
- Plan-C – Use ₹ 6,00,000 debt

You are required to determine the EPS for these three plans and indicate the financial plan which will result in the highest EPS.

Also Calculate Financial Break Even Point for all the options.

Answer to Question No. 54

Calculation of EPS under different plans			
	Plan - A	Plan - B	Plan - C
EBIT (₹)	1,80,000	1,80,000	1,80,000
Interest (₹)	<u>10,000</u>	<u>42,000</u>	<u>1,08,000</u>
EBT (₹)	1,70,000	1,38,000	72,000
Taxes (50%)	<u>85,000</u>	<u>69,000</u>	<u>36,000</u>
EAT	85,000	69,000	36,000
No. of shares	30,000	23,333	16,000
EPS (₹)	2.83	2.96	2.25

From the above it is clear that plan B gives highest earning per share i.e. ₹ 2.96 for the Company.

	<i>Plan A</i>	<i>Plan B</i>	<i>Plan C</i>
<i>Indifference Point</i> = Interest + (Preference Dividend)/((1-t))	= 10,000 + $\frac{0}{(1-0.5)}$ = Rs 10,000	= 42,000 + $\frac{0}{(1-0.5)}$ = Rs 42,000	= 1,08,000 + $\frac{0}{(1-0.5)}$ = Rs 1,08,000

	Equity	Bond	Preference Shares
EBIT	10,000	42,000	1,08,000
Less: Interest	10,000	42,000	1,08,000
Taxable earnings	0	0	0
Less: Taxes 50%	0	0	0
Earnings after taxes	0	0	0
Less: Preference dividends	0	0	0
Earnings for equity holders	0	0	0
Number of equity shares	30,000	23,333	16,000
EPS	0	0	0

Question No. 55

Sales and earnings before interest and taxes for the XYZ Ltd., during current year were ₹ 35,00,000 and ₹ 9,00,000, respectively. During the year interest expense was ₹ 8,000, and preference dividends were ₹ 10,000. These fixed charges are expected to continue for the next year.

An expansion is planned, which will require ₹ 3,50,000 and is expected to increase EBIT by ₹ 2,00,000 to ₹ 11,00,000.

The firm is considering the following financing alternatives:

- Issue 10,000 shares of common stock to net the firm ₹ 35 per share. The firm currently has 80,000 shares of common stock outstanding.
- Issue ₹ 3,50,000 of fifteen-year bonds at 15%. Sinking fund payments on these bonds will commence after 15 years.
- Issue ₹ 3,50,000 of 14% preference share.

Assume a 50% income tax rate:

- Calculate the EPS at the expected earnings before interest and taxes level of ₹11,00,000 for each financing alternative.
- Calculate the equivalency level of earnings before interest and taxes between the debt and common stock alternatives.
- Calculate the equivalency level of earnings before interest and taxes between the preference share and common stock alternatives.
- Calculate the financial Break Even Level of EBIT for all the options.

Answer to Question No. 55**(i) Determination of EPS at EBIT Level of ₹11,00,000**

	Financing Plan		
	(a)	(b)	(c)
	Equity Shares	Bond	Preference Shares
	₹	₹	₹
EBIT	11,00,000	11,00,000	11,00,000
Less: Interest	8,000	60,500	8,000
Taxable Income	10,92,000	10,39,500	10,92,000
Less: Taxes 50%	5,46,000	5,19,750	5,46,000
Income after taxes	5,46,000	5,19,750	5,46,000
Less: Dividend on Preference Shares	10,000	10,000	59,000
Earning available for equity holders	5,36,000	5,09,750	4,87,000
Number of Equity shares	90,000	80,000	80,000
EPS (₹)	5.96	6.37	6.09

(ii) Equivalency Level of Earnings between Equity and Debt Plan

$$\frac{(X - I_1)(1 - t) - P_1}{N_1} = \frac{(X - I_1 - I_2)(1 - t) - P_1}{N_2}$$

OR

$$\frac{(X - \text{Rs. } 8,000)0.5 - \text{Rs. } 10,000}{90,000} = \frac{(X - \text{Rs. } 8,000 - \text{Rs. } 52,500)0.5 - \text{Rs. } 10,000}{80,000}$$

$$\frac{0.5X - \text{Rs. } 4,000 - \text{Rs. } 10,000}{90,000} = \frac{0.5X - \text{Rs. } 30,250 - \text{Rs. } 10,000}{80,000}$$

The above equation can be simplified as under:

$$8(0.5X - ₹ 14,000) = 9(0.5X - ₹ 40,250)$$

$$4X - ₹ 1,12,000 = 4.5X - ₹ 3,62,250$$

$$4X - 4.5X - ₹ 3,62,250 + ₹ 1,12,000$$

$$-0.5X = -2,50,250$$

$$X = ₹ 5,00,500$$

Verification Table

	Equity Plan (₹)	Debt Plan (₹)
EBIT	5,00,500	5,00,500
Less: Interest	<u>8,000</u>	<u>60,500</u>
	4,92,500	4,40,000
Less: Taxes (50%)	<u>2,46,250</u>	<u>2,20,000</u>
EAT	2,46,250	2,20,000
Less: Pref. Dividend	<u>10,000</u>	<u>10,000</u>
Earnings for Equityholders	2,36,250	2,10,000
No. of Equity shares	90,000	80,000
EPS (₹)	2.625	2.625

(iii) Equivalency level between the Preferred stock and common stock alternatives

$$\frac{(X - I_1)(1 - t) - P_1 - P_2}{N_1} = \frac{(X - I_1)(1 - t) - P_1}{N_2}$$

OR

$$\frac{(X - \text{Rs. } 8,000)0.5 - \text{Rs. } 10,000 - \text{Rs. } 49,000}{80,000} = \frac{(X - \text{Rs. } 8,000)0.5 - \text{Rs. } 10,000}{90,000}$$

$$= \frac{0.5X - \text{Rs. } 4,000 - \text{Rs. } 59,000}{80,000} = \frac{0.5X - \text{Rs. } 4,000 - \text{Rs. } 10,000}{90,000}$$

OR

$$\Rightarrow \frac{0.5X - \text{Rs. } 63,000}{80,000} = \frac{0.5X - \text{Rs. } 14,000}{90,000}$$

By simplifying the above, we get:

$$\begin{aligned} \text{P} \quad & 9 (0.5X - ₹ 63,000) = 8 (0.5X - ₹ 14,000) \\ \text{P} \quad & 4.5X - ₹ 5,67,000 = 4X - ₹ 1,12,000 \\ \text{P} \quad & 4.5X - 4X = ₹ 5,67,000 - ₹ 1,12,000 \\ & 0.5X = ₹ 4,55,000 \end{aligned}$$

$$X = \frac{₹ 4,55,000}{.5} = ₹ 9,10,000$$

	Equity Shares	Bond	Preference Shares
Indifference Point= Interest + (Preference Dividend)/((1-t))	=8,000+ $\frac{10,000}{(1-0.5)}$ = ₹ 28,000	=60,500 + $\frac{10,000}{(1-0.5)}$ = ₹ 80,500	= 8,000 + $\frac{59,000}{(1-0.5)}$ = ₹ 1,26,000

	Equity	Bond	Preference Shares
EBIT	28,000	80,500	1,26,000
Less: Interest	(8,000)	(60,500)	(8,000)
Taxable earnings	20,000	20,000	1,18,000
Less: Taxes 50%	(10,000)	(10,000)	(59,000)
Earnings after taxes	10,000	10,000	59,000
Less: Preference dividends	(10,000)	(10,000)	(59,000)
Earnings for equity holders	0	0	0
Number of equity shares	90,000	80,000	80,000
EPS	0	0	0

Question No. 56

Two companies – P Ltd. and Q Ltd. belong to the equivalent risk group. The two companies are identical in every respect except that Q Ltd. is levered, while P Ltd. is unlevered. The outstanding amount of debt of the levered company is ₹6,00,000 in 10% debentures. The other information for the two companies are as follows:

	P Ltd.	Q Ltd.
Net operating income (EBIT) (₹)	1,50,000	1,50,000
Interest (₹)	—	60,000
Earnings to equity-holders (₹)	1,50,000	90,000
Equity capitalization rate, ke	0.15	0.20
Market value of equity (₹)	10,00,000	4,50,000
Market value of debt (₹)	—	6,00,000
Total value of firm (₹)	10,00,000	10,50,000
Overall capitalization rate, ko = EBIT/V	15.0%	14.3%
Debt-equity ratio	0	1.33

An investor owns 5% equity shares of Q Ltd. Show the process and the amount by which he could reduce his outlay through use of the arbitrage process. Is there any limit to the 'process'?

Answer to Question No. 56

Investor's current position (in Company Q)

Dividend income (5% of ₹ 90,000)	=	₹ 4,500
Market value of Investment (5% of ₹ 4,50,000)	=	₹ 22,500

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He sells his holdings in company Q for ₹ 22,500 and creates a personal leverage by borrowing ₹ 30,000 (5% of ₹ 6,00,000). The total amount with him is ₹ 52,500. He purchases 5% equity holdings of the Company P for ₹50,000 as the total value of the firm is ₹ 10,00,000. Further, his position with respect to income would be as follows:

	<i>Company P</i>	<i>Company Q</i>
Dividends (5% of profit)	₹ 7,500	₹ 4,500
Less: Interest (10% of ₹ 30,000)	<u>3,000</u>	—
Net Income	<u>4,500</u>	<u>4,500</u>

The investor, thus, can save an amount of ₹ 2,500 through the use of leverage and still continue to earn the same earnings of ₹ 4,500 as before.

There are limits to the arbitrage process and it will come to an end when the market values of both the companies are same.

Question No. 57

XYZ Corporation has plans for expansion which calls for 50% increase in assets. The alternatives before the corporation are issue of equity shares or debt at 14%. Its balance sheet and profit and loss accounts are as given below:

Balance sheet as at 31st December, 2012

<i>Liabilities</i>	₹ (in lakhs)	<i>Assets</i>	₹ (in lakhs)
12% debentures	25	Total assets	200
Ordinary shares – 10 lakhs shares of ₹ 10 each	100		
General reserve	<u>75</u>		—
	<u>200</u>		<u>200</u>

Profit & loss account for the year ending 31st December, 2012

	₹ (in lakhs)
Sales	750
Less: Total cost excluding interest	<u>675</u>
EBIT	75
Less: Interest on debentures	<u>3</u>
EBT	72
Less: Taxes	<u>36</u>
EAT	<u>36</u>
Earning per share (EPS) ₹ 36,00,000 ÷ 10,00,000	3.60
P/E ratio	5 times
Market price	18.00

If the corporation finances the expansion with debt, the incremental financing charges will be at 14% and P/E ratio is expected to be at 4 times. If the expansion is through equity, the P/E ratio will remain at 5 times. The company expects that its new issues will be subscribed to at a premium of 25%.

With the above information determine the following:

- (i) If the EBIT is 10% of sales, calculate EPS at sales levels of ₹ 4 crores, ₹8 crores and ₹ 10 crores.

- (ii) After expansion determine at what level of EBIT, EPS would remain the same, whether new funds are raised by equity or debt.
- (iii) Using P/E ratios calculate the market value per share at each sales level for both debt and equity financing.

Answer to Question No. 57

(i) ₹ 100 lakhs:

Sales	Sales Level					
	₹ 4 crores		₹ 8 crores		₹ 10 crores	
	₹ in lakh					
	Equity	Debt 14%	Equity	Debt 14%	Equity	Debt 14%
EBIT at 10%	40	40	80	80	100	100
Less: Interest	3	17 (3+14)	3	17 (3+14)	3	17 (3+14)
EBT	37	23	77	63	97	83
Less: Tax @ 50%	18.5	11.5	38.5	31.5	48.5	41.5
EAT	18.5	11.5	38.5	31.5	48.5	41.5
*No. of equity shares in lakhs	18	10	18	10	18	10
EPS (₹)	1.03	1.15	2.14	3.15	2.00	4.15

*Existing Shares 10,00,000

$$\text{New issue} = \left(\frac{\text{Rs. } 10,00,000 \times 10}{12.5} \right)$$

(if equity financing is resorted) (since shares are sold at a premium of 25%)

(ii) Let 'A' be the EBIT level at which EPS would be the same:

$$\frac{(A - I_1) \times .5}{18} = \frac{(A - I_1 - I_2) \times .5}{10} = \text{EBIT}$$

Where I_1 , is interest when additional funds are raised through equity and I_2 is incremental interest charges if financing is through debt.

i.e.
$$\frac{(A - 3) \times .5}{18} = \frac{(A - 3 - 14) \times .5}{10}$$

$$\frac{5A - 1.5}{18} = \frac{.5A - 8.5}{10}$$

By cross multiplication, we may get

$$\begin{aligned} 10 (.5A - 1.5) &= 18 (.5A - 8.5) \\ 5A - 15 &= 9A - 153 \\ -4A &= -138 \\ 4A &= 138 \\ A &= 138/4 \\ A &= 34.5 \end{aligned}$$

So solving for A, we get the EBIT as ₹ 34.5 lakhs.

Question No. 58

Triplex Company Limited is considering an expansion programme which is expected to cost ₹ 10,00,000. The company can finance it either through debt or through equity. Its current financing pattern is given as below:

	₹
Equity Capital (50,000 shares @ ₹ 10 each)	5,00,000
Reserves and Surplus	2,00,000
Debt (10%)	3,00,000
Total	10,00,000

The latest income statement reveals the following information:

	₹
Sales	64,00,000
Less: Total costs	<u>59,00,000</u>
EBIT	5,00,000
Less: Interest	<u>30,000</u>
EBT	4,70,000
Less: Income-tax @ 50%	<u>2,35,000</u>
EAT	<u>2,35,000</u>

The expansion programme is expected to generate additional sales of –

₹ 16,00,000 with a return of 15% on sale, before interest and taxes. If the expansion is financed through debt, the rate of new debt will be 12% and the price earning ratio will be 4 times. If the expansion programme is financed through equity shares i.e. the new shares can be sold at a price of ₹ 40 and the price to earning ratio will be 5 times. Which form of financing should the company choose if the objective of financial management in the company is maximisation of shareholders wealth.

Answer to Question No. 58

Statement Showing the Comparative Analysis of Alternative Financial Plan

	<i>Financial Plans</i>	
	<i>I</i>	<i>II</i>
	<i>Debt Issue</i>	<i>Equity Issue</i>
	(₹)	(₹)
Earnings Before Interest and Taxes (EBIT)		
(₹ 5,00,000 + 15% of 16,00,000)	7,40,000	7,40,000
Less: Interest	1,50,000	30,000
Earnings Before Taxes (EBT)	5,90,000	7,10,000
Less: Taxes @ 50%	2,95,000	3,55,000
Earnings After Taxes	2,95,000	3,55,000

No. of shares	50,000	75,000
EPS (EAT/No. of shares)	5.90	4.73
Price-Earning Ratio	4 times	5 times
Market value of share (EPS P/E ratio)	5.90 x 4 = ₹ 23.60	4.73 x 5 = ₹ 23.65

Decision: Though there is a marginal difference in the market value of shares under alternative financial plans but in view of higher EPS (₹ 5.90) and debt equity ratio with in acceptable norm, i.e., 2.1; Financial Plan I may be accepted.

DIVIDEND DECISIONS

Question No. 59

From the given details regarding three companies, you are required to (i) calculate the value of an equity share of each of these companies when dividend pay-out ratio is (a) 20% (b) 50% (c) 0% and (d) 100% (ii) Comment on the results drawn.

A Ltd.	B Ltd.	C Ltd.
R = 15%	R = 10%	R = 8%
$K_e = 10\%$	$K_e = 10\%$	$K_e = 10\%$
$E = ₹ 10$	$E = ₹ 10$	$E = ₹ 10$

Answer to Question No. 59

According to J. Walter, the price of a equity share in a company with no debt or taxes may determined by the following equations.

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

- Where P = Price per share
- D = Cash dividend per share
- E = Earnings per share
- r = Operating return on assets or internal rate of return
- K_e = Cost of equity capital or capitalisation rate.

Using the above mentioned formula, the price or value of an equity share can be calculated as under:

	A Ltd.	B Ltd.	C Ltd.
(i) When dividend pay out ratio is 20%	$2 + \frac{15\%(10 - 2)}{10\%}$ $= \frac{2 + \frac{(.15)(8)}{.10}}{.10}$ $= ₹ 140$	$2 + \frac{10\%(10 - 2)}{10\%}$ $= \frac{2 + 8}{.10}$ $= ₹ 100$	$2 + \frac{8\%(10 - 2)}{10\%}$ $= \frac{2 + \frac{.08 \times 8}{.10}}{.10}$ $= ₹ 84$

(ii) When dividend pay out ratio is 50%	$5 + \frac{.15(10 - 5)}{.10}$ $= \frac{5 + \frac{.15(10 - 5)}{.10}}{.10}$ $= ₹ 125$	$5 + \frac{.10(10 - 5)}{.10}$ $= \frac{5 + \frac{.10(10 - 5)}{.10}}{.10}$ $= ₹ 100$	$5 + \frac{.08(10 - 5)}{.10}$ $= \frac{5 + \frac{.08(10 - 5)}{.10}}{.10}$ $= ₹ 90$
(iii) When dividend pay out ratio is 0%	$0 + \frac{.15(10 - 0)}{.10}$ $= \frac{0 + \frac{.15(10 - 0)}{.10}}{.10}$ $= ₹ 150$	$0 + \frac{.10(10 - 0)}{.10}$ $= \frac{0 + \frac{.10(10 - 0)}{.10}}{.10}$ $= ₹ 100$	$0 + \frac{.08(10 - 0)}{.10}$ $= \frac{0 + \frac{.08(10 - 0)}{.10}}{.10}$ $= ₹ 80$
(iv) When dividend pay out ratio is 100%	$10 + \frac{.15(10 - 10)}{.10}$ $= \frac{10 + \frac{.15(10 - 10)}{.10}}{.10}$ $= ₹ 100$	$10 + \frac{.10(10 - 10)}{.10}$ $= \frac{10 + \frac{.10(10 - 10)}{.10}}{.10}$ $= ₹ 100$	$10 + \frac{.08(10 - 10)}{.10}$ $= \frac{10 + \frac{.08(10 - 10)}{.10}}{.10}$ $= ₹ 100$

Comments

1. Firm A is a growth firm because its internal rate of return ($r = 15\%$) is greater than the cost of capital ($K_e = 8\%$). This firm may re-invest its retained earnings at a rate which is higher than the rate expected by share holders. Firm A will maximise its share value when dividend pay out ratio is 0%. At this ratio, the value of share is ₹ 150. The market price of share increases as dividend pay out ratio declines and reverse otherwise. So optimum pay out ratio for growth firm A is zero.
2. Firm B is the normal firm because for this firm $r = K_e$ (i.e. 10%). The dividend pay out ratio for the firm is irrelevant as it does not affect the market price of its share. It is same i.e. ₹ 100 at different level of dividend pay out ratios.
3. Firm C is declining firm because the rate of return (i.e. 8%) on the investment for this firms is lower than the cost of capital (i.e. 10%). Investors of this firm would like earnings to be distributed to them so that they may either spend it or invest it elsewhere to get a rate higher than earned by this firm. The optimum pay out ratio for this firm is 100% because at this ratio market price of its share is maximum i.e. ₹ 100.

Question No. 60

Bajaj Auto Ltd. has outstanding 1,20,000 shares selling at ₹ 20 per share. The company hopes to make a net income of ₹ 3,50,000 during the year ending on March 2013. The company is thinking of paying a dividend of ₹ 2 per share at the end of current year. The capitalisation rate for risk class of this firm has been estimated to be 15%. Assuming no taxes, answer questions listed below on the basis of the Modigliani Miller dividend Valuation Model:

- (a) What will be the price of share at the end of March 31, 2013.
 - (i) If the dividend is paid and
 - (ii) If the dividend is not paid.
- (b) How many new shares must the company issue if the dividend is paid and company needs ₹ 7,40,000 for

an approved investment expenditure during the year.

Answer to Question No. 60

(i) Price of the share if the dividend is paid

$$P_0 = \frac{D_1 + P_1}{(1 + K_e)}$$

Where P_0 stands for prevailing market price of shares.

D_1 stands for dividend to be received at the end of period.

K_e stands for the cost of equity capital.

P_1 stands for market price of share at the end of period one.

$$₹ 20 = \frac{2 + P_1}{(1 + 0.15)}$$

$$₹ 20 (1 + 0.15) = (₹ 2 + P_1)$$

$$₹ 20 (1.15) = ₹ 2 + P_1$$

$$P_1 = ₹ 23 - ₹ 2 = ₹ 21.$$

(ii) Price of the share if dividends is not paid.

$$₹ 20 = \frac{0 + P_1}{(1 + .15)}$$

$$₹ 20 = \frac{0 + P_1}{(1.15)}$$

$$P_1 = ₹ 20 (1.15)$$

$$P_1 = ₹ 23$$

(iii) Number of new equity to be issued

$$\Delta N = \frac{I - (E - ND_1)}{P_1}$$

$$\Delta N = \frac{\text{Rs. } 7,40,000 - (\text{Rs. } 3,50,000 - 1,20,000 \times \text{Rs. } 2)}{\text{Rs. } 21}$$

$$= \frac{\text{Rs. } 7,40,000 - (\text{Rs. } 3,50,000 - 2,40,000)}{\text{Rs. } 21}$$

$$= \frac{\text{Rs. } 7,40,000 - \text{Rs. } 1,10,000}{\text{Rs. } 21}$$

$$= \frac{\text{Rs. } 6,30,000}{\text{Rs. } 21}$$

$$= 30,000 \text{ shares.}$$

Question No. 61

From the given information for Alpha & Company you are required to:

- (i) Find out whether the firm's dividend pay-out ratio is optimal according to Walters formula. The firm was starting a year before with equity capital of ₹ 40 lakhs.

Earnings of the firm	₹ 4,00,000
Dividend paid	₹ 3,20,000
Price earning ratio	12.5
Number of share outstanding	40,000 @ ₹ 100 each.

- (ii) Will the Company change its dividend policy if P/E ratio is 8 instead of 12.5?

Answer to Question No. 61

According to J. Walter, the price of share may be found out by using the following formula:

$$P = \frac{D + (E - D) \frac{r}{K_e}}{K_e}$$

- P — stands for price per equity shares.
 D — stands for dividend per share.
 E — stands for earnings per share.
 K_e — stands for cost of capital.
 r — stands for internal rate of return on investments.
 (E-D) — stands for retained earnings per share

Substitute the information in above formula we may get

$$P = \frac{8 + \frac{10\%}{8\%}(10 - 8)}{8\%}$$

$$P = \frac{8 + \frac{.10}{.08}(2)}{.08}$$

$$P = \frac{8 + \frac{20}{8}}{8/100}$$

$$P = \frac{64 + 20}{8/100}$$

$$P = \frac{84}{8} \times \frac{100}{8} = \frac{8400}{64}$$

$$P = \frac{2100}{16}$$

$$P = 131.25$$

Working Notes

Ke is the reciprocal of $1/12.5\% = 8\%$

$$\text{EPS} = \frac{\text{Total Earnings of the firm}}{\text{Number of shares}} = \frac{\text{₹}4,00,000}{\text{₹}40,000} = \text{Rs. } 10.00$$

$$D = \frac{\text{Amount of Dividend Paid}}{\text{Number of Shares}} = \frac{\text{₹}3,20,000}{\text{₹}40,000} = \text{Rs. } 8$$

$$r = \frac{\text{Total Earnings of the firm}}{\text{Total Equity Capital of the firm}} = \frac{\text{₹}4,00,000}{\text{₹}40,00,000} \times 100 = 10\%$$

At present, the firm pay out ratio which is 80% is not optimal. The zero dividend pay out ratio is considered maximum because at this point the price of share would be maximum.

It is evident from the following calculations.

$$P = \frac{0 + \frac{10\%}{8\%}(10 - 0)}{8\%}$$

$$= \frac{0 + \frac{.10}{.08}(10)}{.08}$$

$$= \frac{0 + 1.25 \times 10}{.08}$$

$$= \frac{12.5}{8} \times 100$$

$$= \text{₹ } 156.25$$

(ii) The firm will change its dividend policy if P/E ratio is 8. It is because at this level of P/E ratio, the value of Cost of Capital ($K_e = 12.5\%$) is greater than that of internal rate of return of investment ($r = 10\%$). The optimum dividend policy for company in this case is to go for 100% dividend pay out ratio. Since $K_e > r$, 100% dividend pay out ratio would maximise the value of share.

Question No. 62

Consider a common stock whose dividends are expected to grow at a 25 percent rate for 2 years, after which the growth rate is expected to fall to 5 percent. The dividend paid last period was ₹ 2. The investor desires a 12 per cent return. You are required to find the value of this stock.

Answer to Question No. 62

Compute the dividends during the supernormal growth period and find their present value. Assuming D_0 is ₹ 2, g is 15 per cent, and r is 12 percent :

$$D_1 = D_0 (1 + g) = \text{₹ } 2 (1 + 0.25) = \text{₹ } 2.50$$

$$D_2 = D_0 (1 + g)^2 = \text{₹ } 2 (1.563) = \text{₹ } 3.125 \text{ or}$$

$$D_2 = D_1 (1 + g) = \text{₹ } 2.50 (1.25) = \text{₹ } 3.125$$

$$\text{PV of dividends} = \frac{D_1}{(1 + r)^1} + \frac{D_2}{(1 + r)^2} = \frac{\text{₹ } 2.50}{(1 + 0.12)^1} + \frac{\text{₹ } 3.125}{(1 + 0.12)^2}$$

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$$\begin{aligned}
&= ₹ 2.50 \text{ (PVIF 12\%, 1)} + ₹ 3.125 \text{ (PVIF 12\%, .2)} \\
&= ₹ 2.50 (0.8929) + ₹ 3.125 (0.7972) \\
&= ₹ 2.23 + ₹ 2.49 = ₹ 4.72.
\end{aligned}$$

Find the price of the stock at the end of the supernormal growth period. The dividend for the third year

$$\begin{aligned}
D_3 &= D_2 (1 + g), \text{ where } g = 5\% \\
&= ₹ 3.125 (1 + 0.05) = ₹ 3.28
\end{aligned}$$

The price of the stock is therefore :

$$P_2 = \frac{D_3}{r - g} = \frac{\text{Rs. } 3.28}{0.12 - 0.05} = \text{Rs. } 46.86$$

$$\begin{aligned}
\text{PV of stock price} &= ₹ 46.86 \text{ (PVIF 12\% .2)} \\
&= ₹ 46.86 (0.7972) = ₹ 37.36.
\end{aligned}$$

Add the two PV figures obtained above to find the value of the stock

$$P_0 = ₹ 4.72 + ₹ 37.36 = ₹ 42.08$$

Question No. 63

Harish Engineering company has a cost of equity capital 15%. The current market value of the firm is ₹ 60,00,000 @ ₹ 30 per share. Assume value for I (New Investment) ₹ 18,00,000, E (Earnings) ₹ 10,00,000 and total dividends (D) ₹ 6,00,000. You are required to show that under the MM assumptions the payment of dividend does not affect the value of the firm.

Answer to Question No. 63**(a) Price of a share when dividend is declared**

$$P_0 = \frac{D_1 + P_1}{(1 + K_e)}$$

Where

- P_0 = Price of share at time period 0.
- D_1 = Dividend to be received at the end of time period 1.
- P_1 = Price of share at the end of time period 1.
- K_e = Cost of capital.

Substituting the values in the above formula, we may get

$$₹ 30 = \frac{₹ 3 + P_1}{1.15}$$

$$P_1 = ₹ 30 \times 1.15 - ₹ 3 = ₹ 31.50$$

Price of a share when dividend is not declared

$$₹ 30 = \frac{P_1}{1 + .15} = \frac{P_1}{1.15} \text{ or } P_1 = ₹ 34.50$$

Amount of New-Financing*(i) When dividend is declared*

$$I - (E - nD_1)$$

Where I = New Investment, E = Earnings of the Firm during the period

n = The Number of shares outstanding at the beginning of the year

D₁ = Dividend paid to the shareholder at the end of time period 1.

Substituting the value in above equation, we may get

$$= ₹ 18,00,000 - (₹ 10,00,000 - ₹ 6,00,000)$$

$$= ₹ 14,00,000$$

$$\Delta n = \frac{\text{Rs. } 14,00,000}{\text{Rs. } 31.50}$$

(Here D n = The change in the number of shares outstanding during the year)

(ii) When dividend is not declared

$$= I - E$$

$$= ₹ 18,00,000 - ₹ 10,00,000$$

$$= ₹ 8,00,000$$

New shares to be issued are

$$\Delta n = \frac{\text{Rs. } 8,00,000}{\text{Rs. } 34.50}$$

(b) (i) Value of Firm (V) when dividend is declared:

$$V = \frac{1}{(1 - K_e)} [nD_1 + (n + \Delta n)P_1 - I + E - nD_1]$$

$$= \frac{₹ 6,00,000 + \left(2,00,000 + \frac{14,00,000}{31.50}\right) \times ₹ 31.50 - ₹ 18,00,000 + ₹ 10,00,000 - ₹ 6,00,000}{1.15}$$

$$= \frac{₹ 6,00,000 + \left(\frac{63,00,000 + 14,00,000}{31.50}\right) \times ₹ 31.50 - ₹ 14,00,000}{1.15}$$

$$= \frac{₹ 6,00,000 + ₹ 77,00,000 - ₹ 14,00,000}{1.15} = \frac{₹ 69,00,000}{1.15}$$

$$= ₹ 60,00,000$$

(ii) Value of Firm (V) when dividend is not declared:

$$V = \frac{1}{(1 + K_e)} [(n + \Delta n)P_1 - I + E]$$

$$= \frac{\left[2,00,000 + \frac{8,00,000}{34.5}\right] \times ₹ 34.50 - ₹ 18,00,000 + ₹ 10,00,000}{1.15}$$

$$= \frac{[\text{₹ } 69,00,000 + \text{₹ } 8,00,000] \times 34.5 - \text{₹ } 8,00,000}{1.15}$$

$$= \frac{\text{₹ } 77,00,000 - \text{₹ } 8,00,000}{1.15} = \frac{\text{₹ } 69,00,000}{1.15}$$

$$= \text{₹ } 60,00,000$$

Thus, it is clear from above that under MM Hypothesis dividend payment does not affect the value of the firm.

Question No. 64

The shares of XYZ is presently at ₹ 50 and the company is currently paying dividend of ₹ 4 per share with a growth rate expected at 8 per cent per annum. It plans to raise fresh equity share capital. The merchant banker has suggested that an underprice of Rupee 1 is necessary, in pricing the new issue besides involving a cost of 50 paise per share on miscellaneous expenses. You are required to find out the cost of existing equity shares as well as the new equity given that the dividend rate and growth rate are not expected to change.

Answer to Question No. 64

Current Price Share

$$P_o = \text{₹ } 50$$

Current Dividend Payment

$$D_o = 4$$

Annual Growth Rate

$$g = 8\%$$

$$F = \text{₹ } 0.50 + \text{₹ } 1 = \text{₹ } 1.50$$

$$K_{\text{new}} = \frac{D_1}{(P_o - F)} + g = \frac{4(1.080)}{(50 - 1.50)} + 0.08 = 16.91\%$$

Question No. 65

The earning per share of a company is ₹ 10. It has an internal rate of return of 15 percent and the capitalization rate of risk class is 12.5 percent. If Walter's model is used:

- (i) What should be the optimum pay out ratio of the firm?
- (ii) What should be the price of share at this pay out?
- (iii) How shall the price of share be affected if different pay out were employed?

Answer to Question No. 65

According to Walter Model –

$$\text{Market Price per share} = \frac{\text{DPS} + (r/K_e)(\text{EPS} - \text{DPS})}{K_e}$$

Where, DPS = Dividend per share, EPS = Earning per share, r = return on Investment and K_e = Capitalization rate.

- (i) If $r/K_e > 1$, the value of the share of a firm will increase as EPS increases under this type of firm situation the has ample opportunities for investment and growth. The price of the share would be maximum when the firm retains all its earnings. Thus, the optimum payout ratio in this case is zero.
- (ii) When the optimum payout is zero, the price of the share of the firm is as under:

$$P = \frac{0 + (0.15 / 0.125)(10 - 0)}{0.125} = \frac{12}{0.125} = \text{Rs. } 96$$

- (iii) If the firm, under the condition $r/K_e > 1$, chooses a payout other than zero, the price of the share will fall. Suppose the firm has a payout of 20 per cent, the price of the share will be:

$$P = \frac{2 + (0.15 / 0.125)(10 - 2)}{0.125} = \frac{2 + (1.2)(8)}{0.125} = \frac{2 + 9.6}{0.125} = \frac{11.60}{0.125} = \text{Rs. } 92.80$$

Question No. 66

A closely-held toys manufacturing company has been following a dividend policy, which can maximise the market value of the company as per Walter's Model. Accordingly, each year at dividend time, the capital budget is reviewed in conjunction with the earnings for the period and alternative investment opportunities for the shareholders. In the current year, the company reports net profits of ₹ 10,00,000. It is estimated that the company can earn ₹ 2,50,000 if such profits are retained. The investors have alternative investment opportunities that will yield them 12%. The company has 1,00,000 shares outstanding. What would be the dividend payout ratio of the company, if it wishes to maximise the wealth of the shareholders?

Answer to Question No. 66

Divident Payout (DP) ratio of the company should be zero for miximising the wealth of shareholders. At this ratio, market price of the share would be the maximum as shown by the following calculation:

$$P = [D + (r/K_e)(E - D)]/K_e$$

$$R = (\text{₹ } 2,50,000 / \text{₹ } 10,00,000) \times 100 = 25\%$$

$$E = \text{₹ } 10,00,000 / 1,00,000 = \text{₹ } 10$$

$$P = [0 + 0.25/0.12 (\text{₹ } 10 - 0)]/0.12$$

$$= (2.083 \times 10)/0.12$$

$$= 20.83/0.12$$

$$= \text{₹ } 173.58$$

TABLE 1 : PRESENT VALUE OF RUPEE ONE

RATE	YEAR														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
5%	0.9524	0.9070	0.8638	0.8227	0.7835	0.7462	0.7107	0.6768	0.6446	0.6139	0.5847	0.5568	0.5303	0.5051	0.4810
6%	0.9534	0.8900	0.8396	0.7921	0.7473	0.7050	0.6651	0.6274	0.5919	0.5584	0.5268	0.4970	0.4688	0.4423	0.4173
7%	0.9346	0.8734	0.8163	0.7629	0.7130	0.6663	0.6227	0.5820	0.5439	0.5083	0.4751	0.4440	0.4150	0.3878	0.3624
8%	0.9259	0.8573	0.7938	0.7350	0.6806	0.6302	0.5835	0.5403	0.5002	0.4632	0.4289	0.3971	0.3677	0.3405	0.3152
9%	0.9174	0.8417	0.7722	0.7084	0.6499	0.5963	0.5470	0.5019	0.4604	0.4224	0.3875	0.3555	0.3262	0.2992	0.2745
10%	0.9091	0.8264	0.7513	0.6830	0.6209	0.5645	0.5132	0.4665	0.4241	0.3855	0.3505	0.3186	0.2897	0.2633	0.2394
11%	0.9009	0.8116	0.7312	0.6587	0.5935	0.5346	0.4817	0.4339	0.3909	0.3522	0.3173	0.2858	0.2575	0.2320	0.2090
12%	0.8929	0.7972	0.7118	0.6355	0.5674	0.5066	0.4523	0.4039	0.3606	0.3220	0.2875	0.2567	0.2292	0.2046	0.1827
13%	0.8850	0.7831	0.6931	0.6133	0.5428	0.4803	0.4251	0.3762	0.3329	0.2946	0.2607	0.2307	0.2042	0.1807	0.1599
14%	0.8772	0.7695	0.6750	0.5921	0.5194	0.4556	0.3996	0.3506	0.3075	0.2697	0.2366	0.2076	0.1821	0.1597	0.1401
15%	0.8696	0.7561	0.6575	0.5718	0.4972	0.4323	0.3759	0.3269	0.2843	0.2472	0.2149	0.1869	0.1625	0.1413	0.1229
16%	0.8621	0.7432	0.6407	0.5523	0.4761	0.4104	0.3538	0.3050	0.2630	0.2267	0.1954	0.1685	0.1452	0.1252	0.1079
17%	0.8547	0.7305	0.6244	0.5337	0.4561	0.3898	0.3332	0.2848	0.2434	0.2080	0.1778	0.1520	0.1299	0.1110	0.0949
18%	0.8475	0.7182	0.6086	0.5158	0.4371	0.3704	0.3139	0.2660	0.2255	0.1911	0.1619	0.1372	0.1163	0.0985	0.0835
19%	0.8403	0.7062	0.5934	0.4987	0.4190	0.3521	0.2959	0.2487	0.2090	0.1756	0.1476	0.1240	0.1042	0.0876	0.0736
20%	0.8333	0.6944	0.5787	0.4823	0.4019	0.3349	0.2791	0.2326	0.1938	0.1615	0.1346	0.1122	0.0935	0.0779	0.0649
21%	0.8264	0.6830	0.5645	0.4665	0.3855	0.3186	0.2633	0.2176	0.1799	0.1486	0.1228	0.1015	0.0839	0.0693	0.0573
22%	0.8197	0.6719	0.5507	0.4514	0.3700	0.3033	0.2486	0.2038	0.1670	0.1369	0.1122	0.0920	0.0754	0.0618	0.0507
23%	0.8130	0.6610	0.5374	0.4369	0.3552	0.2888	0.2348	0.1909	0.1552	0.1262	0.1026	0.0834	0.0678	0.0551	0.0448
24%	0.8065	0.6504	0.5245	0.4230	0.3411	0.2751	0.2218	0.1789	0.1443	0.1164	0.0938	0.0757	0.0610	0.0492	0.0397
25%	0.8000	0.6400	0.5120	0.4096	0.3277	0.2621	0.2097	0.1678	0.1342	0.1074	0.0859	0.0687	0.0550	0.0440	0.0352

TABLE 2 : PRESENT VALUE OF AN ANNUITY OF RUPEE ONE

RATE	YEAR														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
5%	0.9524	1.8594	2.7232	3.5460	4.3295	5.0757	5.7864	6.4632	7.1078	7.7217	8.3064	8.8633	9.3936	9.8986	10.3797
6%	0.9434	1.8334	2.6730	3.4651	4.2124	4.9173	5.5824	6.2098	6.8017	7.3601	7.8869	8.3838	8.8527	9.2950	9.7122
7%	0.9346	1.8080	2.6243	3.3872	4.1002	4.7665	5.3893	5.9713	6.5152	7.0236	7.4987	7.9427	8.3577	8.7455	9.1079
8%	0.9259	1.7833	2.5771	3.3121	3.9927	4.6229	5.2064	5.7466	6.2469	6.7101	7.1390	7.5361	7.9038	8.2442	8.5595
9%	0.9174	1.7591	2.5313	3.2397	3.8897	4.4859	5.0330	5.5348	5.9952	6.4177	6.8052	7.1607	7.4869	7.7862	8.0607
10%	0.9091	1.7355	2.4869	3.1699	3.7908	4.3553	4.8684	5.3349	5.7590	6.1446	6.4951	6.8137	7.1034	7.3667	7.6061
11%	0.9009	1.7125	2.4437	3.1024	3.6959	4.2305	4.7122	5.1461	5.5370	5.8892	6.2065	6.4924	6.7499	6.9819	7.1909
12%	0.8929	1.6901	2.4018	3.0373	3.6048	4.1114	4.5638	4.9676	5.3282	5.6502	5.9377	6.1944	6.4235	6.6282	6.8109
13%	0.8850	1.6681	2.3612	2.9745	3.5172	3.9975	4.4226	4.7988	5.1317	5.4262	5.6869	5.9176	6.1218	6.3025	6.4624
14%	0.8772	1.6467	2.3216	2.9137	3.4331	3.8887	4.2883	4.6389	4.9464	5.2161	5.4527	5.6603	5.8424	6.0021	6.1422
15%	0.8696	1.6257	2.2832	2.8550	3.3522	3.7845	4.1604	4.4873	4.7716	5.0188	5.2337	5.4206	5.5831	5.7245	5.8474
16%	0.8621	1.6052	2.2459	2.7982	3.2743	3.6847	4.0386	4.3436	4.6065	4.8332	5.0286	5.1971	5.3423	5.4675	5.5755
17%	0.8547	1.5852	2.2096	2.7432	3.1993	3.5892	3.9224	4.2072	4.4506	4.6586	4.8364	4.9884	5.1183	5.2293	5.3242
18%	0.8475	1.5656	2.1743	2.6901	3.1272	3.4976	3.8115	4.0776	4.3030	4.4941	4.6560	4.7932	4.9095	5.0081	5.0916
19%	0.8403	1.5465	2.1399	2.6386	3.0576	3.4098	3.7057	3.9544	4.1633	4.3389	4.4865	4.6105	4.7147	4.8023	4.8759
20%	0.8333	1.5278	2.1065	2.5887	2.9906	3.3255	3.6046	3.8372	4.0310	4.1925	4.3271	4.4392	4.5327	4.6106	4.6755
21%	0.8264	1.5095	2.0739	2.5404	2.9260	3.2446	3.5079	3.7256	3.9054	4.0541	4.1769	4.2784	4.3624	4.4317	4.4890
22%	0.8197	1.4915	2.0422	2.4936	2.8636	3.1669	3.4155	3.6193	3.7863	3.9232	4.0354	4.1274	4.2028	4.2646	4.3152
23%	0.8130	1.4740	2.0114	2.4483	2.8035	3.0923	3.3270	3.5179	3.6731	3.7993	3.9018	3.9852	4.0530	4.1082	4.1530
24%	0.8065	1.4568	1.9813	2.4043	2.7454	3.0205	3.2423	3.4212	3.5655	3.6819	3.7757	3.8514	3.9124	3.9616	4.0013
25%	0.8000	1.4400	1.9520	2.3616	2.6893	2.9514	3.1611	3.3289	3.4631	3.5705	3.6564	3.7251	3.7801	3.8241	3.8593

PART II – STRATEGIC MANAGEMENT

Lesson 11

Introduction to Management

LESSON OUTLINE

- Introduction to Management
- Concept of Management
- Characteristics of Management
- Theories on the Functions of Management
- The Five Functions of Management
 - Planning
 - Organizing
 - Staffing
 - Directing/Leading
 - Controlling
- LESSON ROUND UP
- TEST YOURSELF

LEARNING OBJECTIVES

Management is an indispensable facet of the economic life of all human beings and of every business organisation too. This is so because, it is concerned with leading and effective utilization of human, physical and financial resources of a business, so that the set objectives and goals may be accomplished in a desired manner.

The object of the chapter is to enable the students to understand:

- The concept of management
- Features of management
- Various theories propounded by management researchers from time to time
- Functions of management

CONCEPT OF MANAGEMENT

Management is a process containing a human element and makes most efficient use of resources through and with people for attaining defined organizational objectives by most economical and effective planning and execution. Therefore, management can be viewed as:

- A process of continuing and inter-related activities
- Concentrates on attaining organizational goals
- Focuses on working with and through human and other organizational resources



Definitions of Management

- Harold Koontz in his book “The Management Theory Jungle”, defined management as “the art of getting things done through and with people in formally organised groups.”
- Henri Fayol in his book “Industrial and General Administration”, defined management as “To manage is to forecast and to plan, to organise, to command, to co-ordinate and to control.”
- Similarly, Peter Drucker in his book “The Principles of Management” conceived management as “Management is a multi-purpose organ that manages business and manages managers and manages workers and work.”
- According to George R. Terry, “Management is distinct process consisting of planning, organizing, actuating and controlling performed to determine and accomplish the objectives by the use of people and resources.”
- According to American Management Association, “Management is getting things done through people.”
- According to Mary Parker Follet, “Management is the art of getting things done through people.”

Theories on the Functions of Management

Since, management is about getting the things done through and with people to attain the desired objectives by making best utilization of the resources. With the passing times, scholars began studying and theorizing the

essence of management, which gave birth to diverse ideas and concepts of management. Here are some of the most influential theories outlined about the ideas about the functions of management.

- Frederick W. Taylor's Scientific Management Theory.
- Henri Fayol's Administrative Theory
- Max Weber's Bureaucratic Theory
- Elton Mayo's Human Relations Theory
- Ludwig von Bertalanffy's Systems Theory
- Douglas McGregor's theory based on different types of workers.
- George R Terry propounded principles of management.
- Harold Kootz and Cyril O Donnel's systems and contingency analysis of management functions.

Let us briefly understand each of theories to have better understanding of functions of the management.

Scientific theory by Frederick W. Taylor

F. W. Taylor proposed scientific management theory, where various ways were devised to determine the most efficient and effective ways to get tasks done.

Taylor created four principles of his scientific management theory.

1. Each task should be studied to determine the most efficient way to do the task. Rule of thumb should be replaced by scientific analysis of work.
2. There should be complete harmony between workers and management towards each other. Both should realise the importance of each other and aim to increase profits of the organisation.
3. Third, workers should be monitored closely to ensure they only follow best working practices.
4. Fourth, managers should spend time training employees and planning for future needs.

Maximizing efficiency is a great idea but the major flaw in this theory is to de-emphasis on team work.

Classical theory by Henri Fayol

At the beginning of the last century (1916), the French engineer Henri Fayol shelled out the first ever 14 principles of 'classical management theory' formally. Henri Fayol is classified as 'the founding father' of a variety of concepts including the line and staff organization. Based on his experience as a thriving director of a mining company, he developed numerous theories which still find their relevance in contemporary times. At the time when Henry Fayol gave such principles, there was no formal training mechanism in existence for managers; therefore, Fayol principles were ground breaking. However, the growing complexity of organizations visibly generated a call for professional management.

Fayol's propounded the following 14 principles of management:-

- **Division of work** – Employees should have complementary skill sets that allow them to specialize in certain areas. This will increase efficiency.
- **Authority** – Management needs authority to give employees orders. This authority must be agreed upon. However, authority and responsibility must go together.
- **Discipline** – This gets to the idea of employees listening to commands and being disciplined in getting work done. If a manager sets a deadline, an employee should have the discipline to meet it.

- **Unity of command** – There has to be unity of command for each employee. Each employee should be under the command of the only one boss.
- **Unity of direction** – Teams should be striving for common goals. Teams with same objective should be under the direction of one manager.
- **Subordination of individual interests** – The team comes before the individual.
- **Remuneration** – There are monetary and non-monetary versions of remuneration. Both are needed to motivate employees.
- **Centralization** – There should be a balance between decision-making power. Employees should be closer to decision making process.
- **Scalar chain** – Each company should have clear hierarchical structures and that should be known to employees.
- **Order** – This refers mostly to cleanliness and organization within a workplace.
- **Equity** – Employees should be treated well.
- **Stability of tenure of personnel** – This principle suggests that businesses should try to limit turnover and keep employees around as they accumulate knowledge and improve. Proper personnel planning should be given priority.
- **Initiative** – Employees should share ideas and be rewarded for innovative thinking and taking on new tasks.
- **Esprit de corps** – Employee morale matters. This principle suggests that managers should work to keep employees engaged and interested and they should promote team spirit and unity.

While developing fourteen principles of management, Fayol also defined the five core functions of management, which are still used and form the basis of theories developed by other scholars later on.

The five functions are as follows:

- Forecasting
- Planning
- Organizing
- Commanding
- Controlling

As per Fayol, management is a process, which includes functions such as forecasting, planning, organizing, commanding and controlling. These functions are the fundamental foundation of setting the relationship between the subordinates and the superior in tune and the five core functions help the managers to solve troubles/ dilemmas in this relationship or within the organization in a creative and innovative manner.

Bureaucratic theory by Max Weber

Max Weber created the bureaucratic theory, which says an organization will be most efficient if it uses a bureaucratic structure. Weber's ideal business uses standard rules and procedures to organize itself. He believed this strategy was especially effective for large operations particularly governmental organisations.

The theory includes the following five principles:

- **Task specialization** – Weber stressed the importance of each employee fulfilling a specific role within a company.

- **Hierarchy** – Weber wanted each company to have a clear hierarchy within the organization.
- **Formal selection** – When selecting leaders, businesses view a person's qualifications. They should be appointed to certain roles based on qualifications, which means they won't be elected by vote.
- **Rules and requirements** – These ensure everyone knows what's expected of them. Weber wanted business to have uniform standards, and rules are essential to achieve this goal.
- **Impersonal** – The rules and regulations make a business structure impersonal. Promotions aren't about emotions or personal ties, but rather performance.

Human relations theory by Elton Mayo

In stark contrast to Weber's bureaucratic theory of management, the human relations theory emphasizes relationships. Mayo conducted a series of experiments known as Hawthorne Experiments, which focussed on the study of behaviour of people at work. Mayo believed that productivity increases when people feel like they are part of a team and valued by their co-workers.

Important features of Human Relations Theory are as follows:-

1. A manager must have basic understanding of human behaviour in the context of work groups and organisations.
2. The informal groups have significant influence on morale and productivity of works.
3. Workers are motivated not only by money alone but total work situation including recognition, participation etc.
4. Study of management must draw concepts and principles of behaviour sciences like Psychology, Sociology etc.

The human relations theory emphasizes praise and teamwork as motivational factors.

Systems Theory by Ludwig von Bertalanffy

The systems theory of management believes that each business is an open system, much like a living organism.

An open system interacts with its environment by way of inputs, throughputs and outputs. There are exchanges of energy, money, matter, people and information with external environment.

X&Y Theory by Douglas McGregor

The X&Y theory of management assumes there are two different types of workers. Theory X workers lack ambition and drive and need to be ordered around by bosses to do anything. Theory Y workers, on the other hand, enjoy work and strive for self-fulfillment.

George R. Terry

After Henry Fayol, the subject became a matter of interest for various theorists and which resulted in analysis of the functions of management from various viewpoints and many more ideas emerged which deviated only to some extent from Fayol's core functions of management. George R. Terry wrote a book Principles of Management in the year 1968 and elaborated his viewpoint. Terry believed that there are existed four core functions of management, each function addressing a specific problem/issue the management must solve. The question, the fundamental function and the resulting action are outlined in the below table :

The Question	The Function	The Result
What is the need?	Planning	Objectives, goals, policies, procedures and methods
Where should actions take place and who should do what work?	Organizing	Work division, work assignment, and authority utilization
Why and how should group members perform their tasks?	Actuating/Directing	Leadership, communication, development, and incentives
Are the actions being performed according to plan?	Controlling	Reports, comparisons, costs and budgets

Harold Koontz and Cyril O’Donnell

In the year 1976, Harold Koontz and Cyril O’Donnell published an essay ‘Management: A Systems and Contingency Analysis of Managerial Functions’. They were of the opinion that the preceding studies in the past have been successful in describing the functions of management, but, they were of viewpoint that the division of such functions needs to be more comprehensive. Koontz and O’Donnell believed that there ought to be five key functions of management:

- Planning
- Organizing
- Staffing
- Directing/Leading
- Controlling

These five functions of management have become perhaps the most cited ones and have been explained further in the following section:

THE FIVE FUNCTIONS OF MANAGEMENT

While there are slight variations in how the functions are named and the different management theories might combine or divide certain functions into smaller parts, the consensus points to five core functions.

• Planning

The first and foremost managerial function is ‘planning’. Planning means looking ahead and chalking out future courses of action to be followed. It is a preliminary step. The function aims at developing a comprehensive sketch for achieving a explicit organizational objective. Planning involves identification of tasks which are required to realize the desired goals, demarcation of how such tasks should be performed, chalking out who, when and where such task will be performed. A meticulous knowledge about vision and mission of the organisation forms the pre-requisite of short as well as long term success of planning.

It has been aptly said “well planned is half done”. Therefore, planning takes into consideration existing as

well as potential human and physical resources of the organization. It is the basic management function which includes formulation of one or more detailed plans to accomplish optimum balance of needs or demands with the available resources. According to Urwick, “Planning is a mental predisposition to do things in orderly way, to think before acting and to act in the light of facts rather than guesses”.

According to Koontz & O’Donell, “Planning is deciding in advance what to do, how to do and who is to do it. Planning bridges the gap between where we are to, where we want to go. It makes possible things to occur which would not otherwise occur”



An example of planning would be a situation where you have an objective, such as raising the profit by 25 per cent in the next quarter. There may exist various alternatives to realize this goal. This might include designing a attractive advertisement campaign which features some celebrity, diminution in price for enhancing the volume of the sales, cutting down futile expenditure, venturing in foreign markets or starting the manufacturing in a tax free zone. The manager’s role is to opt for the alternative which is most promising and organizing the same into a logical pattern. Further, the timeline for execution should also be planned.

Planning is an on-going and recurring function. Management will recurrently have to plan the future tasks and adjust the existing plans based on the organizational situation and the achievement of already set goals. Henri Fayol called the function as the most difficult to achieve as a lot of knowledge and flexibility.

Why is planning is significant?

Why planning occupies a significance? This is because, the planning provides the organization a better sense of what it wants to achieve and how to achieve this. In effect, planning ensures the proper utilization of the available resources and the capability to comprehend how these should be used in order to achieve the goal.

A key part of planning is also the vital role it plays in pacifying risks. When management plans for the tasks ahead, they are looking at the situation and detailing the probable difficulties ahead.

Steps in Planning Function

The Planning function involves the following sequence of steps:

1. Establishment of objectives

- Planning requires a systematic approach and starts with the setting of goals and objectives. The objectives provide a rationale for carrying out a range of activities as well as indicates the direction of the efforts of the team. Besides, the objectives also focus the attention of managers on the end results to be achieved.
- Objectives form nucleus of the planning process. Therefore, the objectives should be stated in

a clear, precise and explicit language. In the lack of this, the activities are bound to be futile and unproductive.

- As far as possible, the objectives should be stated in quantitative terms. For example, number of wage earners, per hour wages, number of units produced in each quarter, profit desired as a percentage of sales etc.
- The objectives should be practical, acceptable, feasible and realizable.

2. Establishment of planning premises

- Planning premises are the assumptions about the events in future and serve as a basis of planning.
- Establishment of planning premises is concerned with determining the possible deviations from the actual plans and reasons of such deviations. Establishment of planning premises is concerned to take such steps that avoid such obstacles to a great extent.
- Planning premises may be internal or external. Internal planning premises consist of capital investment policy, management labour relations, philosophy of management, etc. Whereas, external premises include socio- economic, political and economical changes. In terms of control, Internal premises are controllable whereas external are non- controllable.

3. Choice of alternative courses of action

- When forecast are available and premises are established, a number of alternative course of actions have to be considered. For this purpose, each and every alternative will be evaluated by weighing its pros and cons in the light of available resources and organisations requirements. The advantages, disadvantages as well as the consequences of each alternative must be thoroughly examined before making the final choice.
- After objective and systematic evaluation, the best alternative is chosen.
- The planners should take assistance of a number of quantitative techniques to judge the stability of an alternative.

4. Formulation of derivative plans

- Derivative plans are the sub plans or secondary plans which aid in the accomplishment of master plan.
- Secondary plans will flow from the master plan. These are supposed to be act as a support and accelerate the pace of attainment of basic plans. These detail plans include policies, procedures, rules, programmes, budgets, schedules, etc. For example, if profit maximization is the key aim of the enterprise, derivative plans will include sales maximization, production maximization, productivity and cost minimization.
- Derivative plans indicate time schedule and sequence of accomplishing a range of tasks.

5. Securing Co-operation

- After the plans have been determined, it is essential to take in confidence the subordinates or those who have to execute these plans. The rationale behind taking team into confidence are :-
 - Subordinates may feel motivated as they have a say in the decision making process.
 - Such involvement may result in valuable suggestions and improvement in formulation as well as implementation of plans.
 - The employees will be willingly ensuring that such plans see light of the day due to being

attached with these.

6. Follow up/Appraisal of plans

- After choosing a certain plan, it needs to be put into action and appraised for its effectiveness. Such an appraisal is done on the basis of feedback or information received those who are responsible for its execution.
- Feedback enables the management to take corrective actions for rectifying deviations.
- Follow up establishes a link between planning and controlling function.
- Execution and follow up must go side by side so that the planning exercise in the future may be made more realistic in the light of observations.

Organizing

Organizing is the function of the management which follows the first function of management i.e. planning. It is a function which brings together human, physical and financial resources of the organisation. The synchronization of all three resources is essential to derive the results. Therefore, the 'organization' function facilitates the achievement of results.

According to Chester Barnard, "Organizing is a function by which the concern is able to define the role positions, the jobs related and the co-ordination between authority and responsibility. Hence, a manager always has to organize in order to get results."



For example, if the task is to augment the sales volume, then a plan to increase such a sales volume will determine how to divide the resources to execute such plan. This can be about arranging the finances, ensuring the right plant and machinery is in place and deputation of the personnel to the specific tasks.

The objective of the manager is to arrange the concerned team or department which uses the resources to put the plan into reality. The organizing function is about the overall structure of the specific managerial level. Depending on the managerial level, managers will have different responsibilities and resources to organize.

Why is organizing essential?

(1) Benefits of Specialisation

While organising, every activity is subdivided into a host of sub-tasks. For performing these sub tasks, competent people are appointed who eventually convert in to experts by doing a specific job over and over. In this way, utmost work is accomplished in the least span of time and the organisation is the ultimate gainer of such specialisation.

(2) Clarity in Working Relationship

Organising makes a clear cut picture of the working relations among employees. It specifies a clear line of reporting. This in turn makes the communication clear, effective and productive. Moreover, such clarity in working relationship also helps in fixing accountability.

(3) Optimum Utilisation of Resources

Under the process of organising the whole work is divided into a variety of miniature activities. There is a certain employee deputed for performing a different job. By doing so, there is no possibility of an activity being left out or unnecessary duplicating. Consequently, there is best possible utilisation of all the existing resources (physical, financial as well as human) in the organisation.

(4) Adaptation to Change

Organising process makes the organisation capable of adapting to any change associated with the position of the employees. This becomes possible only because of the fact that there is a clear Scalar chain of authority for the manager's right from the top to the bottom. Whenever a managerial position falls vacant, it is straight away filled up by promotion. Since every subordinate is well aware of the working of his senior, there is no difficulty for his taking up the new position.

(5) Effective Administration

It has normally been observed that there is always a condition of doubt about the authority of the managers among themselves. The process of organising makes a clear mention of each and every activity of every manager and also of their extent of authority. One and all also knows to whom they are accountable. Consequently, efficient administration sees light of the day.

(6) Development of Personnel

Under the process of organising, delegation of authority is practiced. This is done not because of the restricted capacity of any individual, but also to realize new techniques of work. It provides opportunities of taking decisions for the subordinates. By taking advantage of this situation, they try to find out the latest techniques and implement them. Subsequently, it helps them to grow and develop and also in career and succession planning.

(7) Expansion and Growth

The process of organising allows the employees the freedom to take decisions which helps them to grow. They are relentlessly ready to face new challenges. This situation can aid in the development of the enterprise. This helps in escalating the earning capacity of the enterprise which in turn helps its growth and development.

Steps in organizing

When done efficiently, organizing tends to follow the pattern and steps outlined below:

- 1. Identification of activities** - All those activities which need to be performed in a concern shall have to be identified first. Prima facie, it is extremely important to prepare a list of tasks to be done. For example, preparation of accounts, making sales, record keeping, quality control, inventory control etc. All these activities have to be grouped and classified into units.
- 2. Departmentally organizing the activities** - In this step, the manager tries to combine and group similar and related activities into units, divisions or departments. This organization of dividing the whole concern into independent units and departments is called departmentation.

3. **Classifying the authority** - Once the departments are made, the manager likes to classify the powers and its extent to the managers. This activity of giving a rank in order to the managerial positions is called hierarchy. The top management is into formulation of policies, the middle level management into departmental supervision and lower level management into supervision of foremen. The clarification of authority help in bringing efficiency in the running of a concern. This helps in achieving efficiency in the running of a concern. This helps in avoiding wastage of time, money, effort, in avoidance of duplication or overlapping of efforts and this helps in bringing smoothness in a concern's working.
4. **Co-ordination between authority and responsibility** - Relationships are established among various groups to enable smooth interaction toward the achievement of the organizational goal. Each individual is made aware of his authority and he/she knows whom they have to take orders from and to whom they are accountable and to whom they have to report. A clear organizational structure is drawn and all the employees are made aware of it.

Staffing

Staffing is an occupying significance as a function of management. The managerial function of staffing involves manning the organization structure through proper and effective recruitment, selection, appraisal and development of the personnel to fill the roles assigned to the employers/workforce. It can be seen closely related to organizing, with both focused on ensuring the resources are directed to the right processes and tasks.

According to Theo Haimann, "Staffing pertains to recruitment, selection, development and compensation of subordinates."

The function aims to warrant the organization always has the right people in the right positions and the organizational structure isn't hindered by shortage and surplus of personnel.

The reason staffing is included as a separate function is a crucial part of management is due to the changing nature of the workforce and the organization. Today's companies are much more complex in terms environment in which they operate. Further, going beyond national boundaries and operating as a multinational has also enhanced such complexity. Management has also become more focused on the human behavioural aspect of leadership. Finding the right company fit, ensuring employees are satisfied, and guaranteeing emotional wellbeing as well as physical work safety have emphasized the importance of staffing as a function.

Why is staffing essential?

Staffing is essential to guarantee the operational functionality of the organization. Staffing also assures that the human resources available within the organisation are capable to perform the designated tasks and that they are satisfactorily supported in those roles. This will further lead to the organizational efficiency, since people are motivated and qualified to work towards the common goal. Furthermore, even the most qualified of employees need the occasional help and support. The staffing function helps create these development opportunities.

Nature of Staffing

- Staffing is an inseparable managerial function along with planning, organizing, directing and controlling. The operations of these four functions depend upon a strong team which is built through staffing function.
- Staffing is a pervasive activity and is carried out by all managers and in all types of organisations where business activities are carried out.
- Staffing is a continuous activity- It continues throughout the life of an organization.
- The basis of staffing function is efficient management of personnel- Human resources can be efficiently

managed by a system or proper procedure, that is, recruitment, selection, placement, training and development, providing remuneration, etc.

- Staffing helps in placing right men at the right job through proper recruitment procedures and then finally selecting the most suitable candidate as per the job requirements.
- Staffing is performed by all managers depending upon the nature of business, size of the company, qualifications and skills of managers, etc.

How to staff?

According to Koontz & O'Donell, staffing "involves manning the organisation structure through proper and effective selection, appraisal and development of personnel to fill the roles designed on the structure". It consists of a number of separate functions, which are:

- **Manpower requirements-** The foremost step in staffing is to plan the manpower inventory required by a concern in order to match them with the job requirements and demands. Therefore, it involves forecasting and determining the future manpower needs of the concern.
- **Recruitment-** After knowing the requirements, the organisation invites people to apply for jobs. The job requirement should unmistakably mention the desired candidate's profile, so that only eligible candidates apply for the job. Though hiring people through internal transfers and promotion is always the best way to go in terms of time and compensation; organizations usually have to work together with placement contractors, consultants, and employment exchanges to meet their needs. Organizations can also make use of media to advertise their job requirements.
- **Selection-** selection is the stage in staffing that can 'make or break' the entire process. Scanning candidates for the right skills, experience, and qualification needs the hiring manager to be at the best of his/her ability. Through test or interview or discussion, it may be judged that whether a candidate is a fit for the job or not. Sometimes, the right candidates would not consider the opportunity just because they didn't like the work environment. It's a two-way process, with both the company and the candidate having to be very careful in the way they come across to each other.
- **Orientation and Placement-** During orientation, new employees are introduced to the existing ones and are made to feel comfortable within the organization. It is an aspect of staffing with the basic objective of familiarizing the new employee with people, processes, and work space.
- **Training and Development-** Training is a part of incentives given to the workers in order to develop and grow them within the concern. Training is generally given according to the nature of activities and scope of expansion in it. Along with it, the workers are developed by providing them extra benefits of indepth knowledge of their functional areas. Development also includes giving them key and important jobs as a test or examination in order to analyse their performances.
- **Remuneration-** It is a kind of compensation provided monetarily to the employees for their work performances. This is given according to the nature of job- skilled or unskilled, physical or mental, etc. Remuneration forms an important monetary incentive for the employees.
- **Performance Evaluation-** In order to keep a track or record of the behaviour, attitudes as well as opinions of the workers towards their jobs. For this regular assessment is done to evaluate and supervise different work units in a concern. It is basically concerning to know the development cycle and growth patterns of the employees in a concern.
- **Promotion and transfer-** Promotion is said to be a non- monetary incentive in which the worker is shifted from a higher job demanding bigger responsibilities as well as shifting the workers and transferring them to different work units and branches of the same organization.

Directing

Directing is a process in which the managers instruct, guide and oversee the performance of the subordinates to achieve predetermined goals. Directing is said to be the heart of management process. Planning, organizing, staffing have got no importance if directing is not suitable.

Directing initiates action and is said to be consisting of human factors. In simple words, it can be described as providing guidance to team in doing work. In field of management, direction is said to be all those activities which are designed to encourage the subordinates to work effectively and efficiently.

According to Human, "Directing consists of process or technique by which instruction can be issued and operations can be carried out as originally planned"

Therefore, Directing is the function of guiding, inspiring, overseeing and instructing people towards accomplishment of organizational goals.

Direction has got following characteristics:

- **Pervasive Function** - Directing is required at all levels of organization. Every manager provides guidance and inspiration to his subordinates.
- **Continuous Activity** - Direction is a continuous activity as it continuous throughout the life of organization.
- **Human Factor** - Directing function is related to subordinates and therefore it is related to human factor. Since human factor is complex and behaviour is unpredictable, direction function becomes important.
- **Creative Activity** - Direction function helps in converting plans into performance. Without this function, people become inactive and physical resources are meaningless.
- **Executive Function** - Direction function is carried out by all managers and executives at all levels throughout the working of an enterprise, a subordinate receives instructions from his superior only.
- **Delegate Function** - Direction is supposed to be a function dealing with human beings. Human behaviour is unpredictable by nature and conditioning the people's behaviour towards the goals of the enterprise is what the executive does in this function. Therefore, it is termed as having delicacy in it to tackle human behaviour.

The function of directing has strong links leadership. A good manager will be able to inspire the workforce to work towards the goals not because they have to do it, but because they are driven to achieve these objectives. The manager's role is not just about ensuring the workplace has the right resources and employees know what they are doing; it's also imperative to create an amicable environment. With proper directing, you are able to set in motion the processes manager has prepared with the above three functions.

Why is directing essential?

Directing is important to strengthen the operational capability of the organization. Directing is a bridge between the operational needs and the human requirements of its employees. Since directing aims to improve productivity, you are strengthening how well the organisation succeeds.

Research has pointed out how important human-focused management is in today's organization. When objectives are approached from a human perspective that aims to ensure people's opinions are listened to, the goals are met faster than in task-oriented environments. The management's ability to listen to the workforce, support and inspire them will boost the productivity and profitability of the organization.

Scope of direction

You can direct and lead your team by utilizing four key methods based on the findings of human behavioral studies. These are:

(i) Supervision

Supervision is concerned with overseeing the subordinates at work and is done at all levels of management. It refers to the direct and immediate guidance and control of subordinates in the performance of their task. It is concerned with seeing that the subordinates are working according to plan, policy, programme, instruction and keeping up the time schedule. Supervision is inevitable at every level of management for putting the managerial plans and policies into action. It can be compared to the key that keeps the managerial train into motion.

(ii) Communication

It is the process of telling, listening, understanding or passing information from one person to another. A manager has always to tell the subordinates what they are required to do, how to do it and when to do it. He has to create an understanding in the minds of the people at work.

An organisation can't operate successfully without an effective system of communication. The process of communication can be carried through different Media's viz., telephone, intercom system, issuing letters and messengers etc.

(iii) Leadership

It can be defined as the process by which a manager guides and influences the work of his subordinates. It is concerned with influencing people for the achievement of common goals. An executive, as an effective leader, should consult his subordinates before starting any line of action to ensure their voluntary cooperation. The manager as a leader acts as a dynamo which charges a battery.



(iv) Motivation

Employees come forward to work in any enterprise in order to satisfy their needs. Past experience reveals that in most cases they do not contribute towards the organisational goals (as much as they can) because they are not adequately motivated.

Motivation relates to a conscious attempt made by the executive to influence the direction and role of individual and group behaviours. A manager should understand the process of human-behaviour while performing his managerial function of directing and leading.

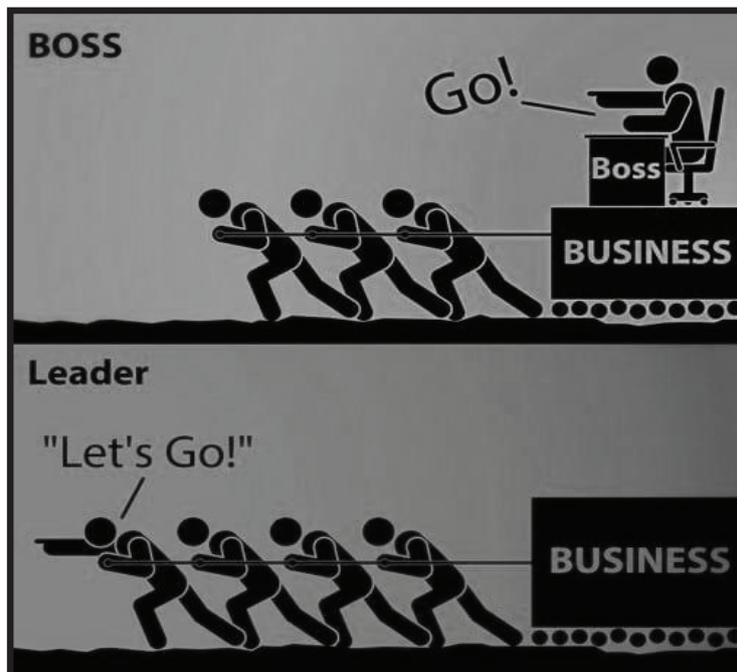
He can get things done through other people willingly by motivation. Motivation inspires the subordinates to work with zeal, willingness and initiates to achieve enterprise goals. It promotes team work. It can tap the human potential in the best possible manner.

Managers must continuously be in search of the causes that motivate employees and develop a motivational

system which may satisfy most of their needs. Otherwise, productivity will not increase. Leadership and motivation are thus the two wings of direction in the process of management.

(v) Commanding

Commanding refers to setting the business going to get the desired optimum results from the subordinates. Fayol conceived the function of command as the ‘operation of organisation.’ He emphasised that the managers must possess the requisite personal qualities and knowledge of the principles of management.



Controlling

Controlling consists of verifying whether everything occurs in conformities with the plans adopted, instructions issued and principles established. Controlling ensures that there is effective and efficient utilization of organizational resources so as to achieve the planned goals. Controlling measures the deviation of actual performance from the standard performance, discovers the causes of such deviations and helps in taking corrective actions

According to Brech

“Controlling is a systematic exercise which is called as a process of checking actual performance against the standards or plans with a view to ensure adequate progress and also recording such experience as is gained as a contribution to possible future needs.”

According to Donnell

“Just as a navigator continually takes reading to ensure whether he is relative to a planned action, so should a business manager continually take reading to assure himself that his enterprise is on right course.”

As Theo Haimann has put it, controlling is

“The process of checking whether or not proper progress is being made towards the objectives and goals and acting if necessary, to correct any deviation“.



Features of Controlling Function

Following are the characteristics of controlling function of management-

- Controlling is an end function- A function which comes once the performances are made in conformities with plans.
- Controlling is a pervasive function- which means it is performed by managers at all levels and in all type of concerns.
- Controlling is forward looking- because effective control is not possible without past being controlled. Controlling always look to future so that follow-up can be made whenever required.
- Controlling is a dynamic process- since controlling requires taking reviewal methods, changes have to be made wherever possible.
- Controlling is related with planning- Planning and Controlling are two inseperable functions of management. Without planning, controlling is a meaningless exercise and without controlling, planning is useless. Planning presupposes controlling and controlling succeeds planning.

Importance of Controlling

Controlling's most important function is the risk-reduction ability. Since you are essentially monitoring the performance of the team and comparing it against the objectives you've set, you can react to problems more easily. Instead of realizing at the end of the month that you've missed your sales target by a huge margin, you can keep on eye on the situation during the process.

If you notice the marketing campaign, for example, is not producing any new customers or leading to increased sales, you can re-tweak it to better attract customers. With the re-tweak, you might be able to change the campaign's attractiveness and recover the situation. This could end up guaranteeing you meet the sales target at the end of the month.

Even if you miss the target, you might not miss it by as much and you've at least had the chance of correcting the situation. With controlling, you are reducing the risk of failure and the impact of failing to meet your objectives. As mentioned, even if you happen to fail, you're prepared for it and you can start analyzing the reasons behind it immediately.

In the business world, measuring performance can be the difference between the successful and the failing companies. Think about a start-up. If the management doesn't have a set of standards to measure its

performance against, they don't have any idea what success or failure looks like. Even when they have a set of objectives and they know whether they met them or not, they don't have anymore information to go by.

Let's say they want to earn \$100,000 in the first three months. Without standards and proper control, after three months all they know is whether they earned it or not. They won't know the why. Was the success down to the product? Did the marketing help? How much did their social media strategy push sales? Was it all about the saving mechanisms they put in place? In the end, understanding the reasons behind success or failure will help the business perform better.

How to control?

For controlling to be effective, you need to take the four steps of this specific function of management:

Controlling as a management function involves following steps:

1. **Establishment of standards-** Standards are the plans or the targets which have to be achieved in the course of business function. They can also be called as the criteria for judging the performance. Standards generally are classified into two-
 - (a) **Measurable or tangible** - Those standards which can be measured and expressed are called as measurable standards. They can be in form of cost, output, expenditure, time, profit, etc.
 - (b) **Non-measurable or intangible-** There are standards which cannot be measured monetarily. For example- performance of a manager, deviation of workers, their attitudes towards a concern. These are called as intangible standards.

Controlling becomes easy through establishment of these standards because controlling is exercised on the basis of these standards.

2. **Measurement of performance-** The second major step in controlling is to measure the performance. Finding out deviations becomes easy through measuring the actual performance. Performance levels are sometimes easy to measure and sometimes difficult. Measurement of tangible standards is easy as it can be expressed in units, cost, money terms, etc. Quantitative measurement becomes difficult when performance of manager has to be measured. Performance of a manager cannot be measured in quantities. It can be measured only by-
 - (a) Attitude of the workers,
 - (b) Their morale to work,
 - (c) The development in the attitudes regarding the physical environment, and
 - (d) Their communication with the superiors.

It is also sometimes done through various reports like weekly, monthly, quarterly, yearly reports.

3. **Comparison of actual and standard performance-** Comparison of actual performance with the planned targets is very important. Deviation can be defined as the gap between actual performance and the planned targets. The manager has to find out two things here- extent of deviation and cause of deviation. Extent of deviation means that the manager has to find out whether the deviation is positive or negative or whether the actual performance is in conformity with the planned performance. The managers have to exercise control by exception. He has to find out those deviations which are critical and important for business. Minor deviations have to be ignored. Major deviations like replacement of machinery, appointment of workers, quality of raw material, rate of profits, etc. should be looked upon consciously. Therefore it is said, "If a manager controls everything, he ends up controlling nothing." For example, if stationery charges increase by a minor 5 to 10%, it can be called as a minor deviation. On the other hand, if monthly production decreases continuously, it is called as major deviation.

Once the deviation is identified, a manager has to think about various cause which has led to deviation. The causes can be-

- (a) Erroneous planning,
- (b) Co-ordination loosens,
- (c) Implementation of plans is defective, and
- (d) Supervision and communication is ineffective, etc.

4. Taking remedial actions- Once the causes and extent of deviations are known, the manager has to detect those errors and take remedial measures for it. There are two alternatives here-

- (a) Taking corrective measures for deviations which have occurred; and
- (b) After taking the corrective measures, if the actual performance is not in conformity with plans, the manager can revise the targets. It is here the controlling process comes to an end. Follow up is an important step because it is only through taking corrective measures, a manager can exercise controlling.

CONCLUSION

Henri Fayol developed his ideas regarding the functions of management and his theory has largely shaped the current understanding of the core elements any management would have to perform. The functions are key to management in all levels, from the entry positions to higher roles of management.

Furthermore, each five functions – planning, organizing, staffing, directing and controlling – are linked to each other. In order to use one function, you typically need to follow with another or have established one beforehand. While certain theorists and experts might disagree whether there are three, four, five or six functions, the consensus agrees on the detailed representations of the above skills, processes and structures.

The question is often more about how broadly you want to define each function. If one of the functions is missing, management is operating insufficiently and the organizational efficiency might suffer. A good manager has to be able to keep an eye on all of the five functions, often at the same time, to guarantee productivity and profitability.

The functions of management are crucial to understand if you want to succeed as a manager. Knowing the above will guide you as a manager to focus on the right aspects when doing the job and give you confidence in your ability. It also helps provide more clarity in terms of the skills and characteristics you need to possess to be a good manager.

By studying the above, you have hopefully identified the areas you need to develop and gain more knowledge. While your management style might differ from someone else's style, the above functions will be necessary in order for you to do a good job as a manager. Since management is a crucial part of any organization, emphasis and proper understanding of the above functions will boost the company's operational efficiency and therefore, its chances of success.

LESSON ROUND UP

- Management is a process containing a human element and makes most efficient use of resources through and with people.
- Management is a Process that comprises of four key functions, viz., Planning, Organising, Directing and Controlling.

- Be it home, business, educational, charitable and religious and other non-profit institutions, management is a must for all activities and organisations, and therefore, it is all pervasive.
- At the beginning of the last century (1916), the French engineer Henri Fayol shelled out the first ever 14 principles of 'classical management theory' formally. While developing fourteen principles of management, Fayol also defined the five core functions of management.
- The first and foremost managerial function is 'planning'. Planning means looking ahead and chalking out future courses of action to be followed.
- Organizing is the function of the management which follows the first function of management i.e. planning. It is a function which brings together human, physical and financial resources of the organisation.
- The managerial function of staffing involves manning the organization structure through proper and effective recruitment, selection, appraisal and development of the personnel to fill the roles assigned to the employers/workforce.
- In field of management, direction is said to be all those activities which are designed to encourage the subordinates to work effectively and efficiently.
- Controlling measures the deviation of actual performance from the standard performance, discovers the causes of such deviations and helps in taking corrective actions

TEST YOURSELF

1. Define management.
2. Discuss features of management.
3. Discuss functions of management in detail.
4. Define planning and its steps.
5. Why is organizing essential?
6. Discuss nature of staffing.
7. Define directing and its characteristics.
8. Discuss scope of directing.
9. Define controlling and its features.
10. Elaborate control process.

Lesson 12

Introduction to Strategic Management

LESSON OUTLINE

- Strategic Management: An Overview- Meaning & Process;
- Strategic Leadership;
- Functions and Importance for Professionals like Company Secretaries;
- Strategic Planning
- Porter's Five Force Model
- LESSON ROUND UP
- TEST YOURSELF

LEARNING OBJECTIVES

Strategic Management is a discipline that deals with long-term development of an organisation with a clear-cut vision about organisational purpose, scope of activities and objectives. It provides overall direction to the organisation and includes specifying the organization's objectives, developing policies and plans designed to accomplish these objectives, allocating resources for the implementation of such plans. The purpose of this chapter is to understand:

- The concept of Strategic management
- The four phases involved in strategic management process
- Manager's potential to articulate the strategic vision in the form of strategic leadership
- Functions performed by a strategic leader
- Environmental Influences of Business
- External and internal environment
- Porter's five forces model –the tool to determine the intensity of competition in an industry and its profitability level.

STRATEGIC MANAGEMENT : MEANING

Strategic Management is a discipline that deals with long-term development of an organisation with a clear-cut vision about organisational purpose, scope of activities and objectives.

Chandler describes strategic management as the “determination of the basic long-term goals and objectives of an enterprise and adoption of course of action and allocation of resources necessary to carry out these goals.”

As per Glueck “That set of decisions and actions which leads to the development of an effective strategy or strategies to help achieve corporate objectives.

According to Paine and Naumes, “Strategic management involves the decision-making and the activities in an organisation which (1) have wider ramifications, (2) have a long time perspective, and (3) use critical resources towards perceived opportunities or threats in a changing environment.”

Hambrick and Chen, “Strategic management is the formulation and implementation of the major goals and initiatives taken by a company’s top management on behalf of owners, based on consideration of resources and an assessment of the internal and external environments in which the organization competes.”

Therefore, it can be understood from the analysis of above definitions that strategic management provides overall direction to the organisation and includes specifying the organization’s objectives, developing policies and plans designed to accomplish these objectives, allocating resources for the implementation of such plans.

Michael Porter identifies three principles underlying strategy: creating a “unique and valuable [market] position”, making trade-offs by choosing “what not to do”, and creating “fit” by aligning company activities with one another to support the chosen strategy.

Strategic Management: Process

The strategic management process is defined as the process by which the managers’/decision makers’ are able to make a choice of a set of strategies for the organization that will enable it to accomplish improved performance. Strategic management is not a static but continuous process as it involves continuous appraisal of the micro and macro environment surrounding the organization and choosing between alternatives that meet the objectives and thereafter re-assessment of such strategy. The strategic management consists of different phases, which are sequential in nature.

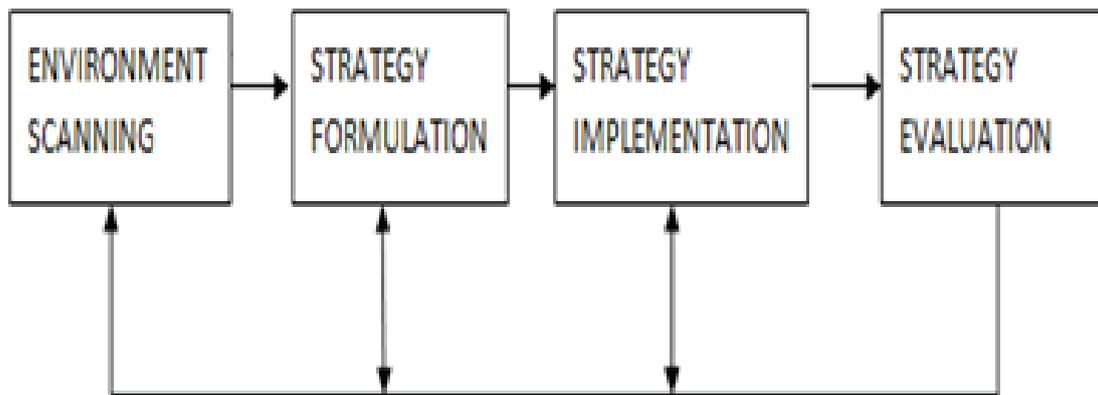
Four Phases of Strategic management process

There are four indispensable phases of every strategic management process. In diverse companies these phases may have altered nomenclatures and different sequences, nevertheless, the fundamental substance remains same. The four phases can be listed as below.

1. **Environmental Scanning-** The Board of Directors and the top management will have to review the current performance. To review, the organization will have to scan the internal environment for the strengths and weaknesses and the external environment for opportunities and threats. The internal and external scan helps in selecting the strategic factors. These have to be reviewed and redefined in relation to the mission and objectives. All the organizations have missions that define the significance of their existence.
2. **Strategy Formulation-** Strategy formulation is the process of deciding about the best course of action for accomplishing organizational objectives and therefore, attaining organizational purpose. After conducting environment scanning, managers formulate corporate, business and functional strategies.
3. **Strategy Implementation-** Strategy implementation implies putting the chosen strategy into action. Strategy implementation includes designing the organization’s structure, distributing resources, developing decision making process, and managing the human resources.

4. **Strategy Evaluation-** Strategy evaluation is the final step of strategy management process. The key strategy evaluation activities are: appraising internal and external factors that are the root of present strategies, measuring performance, and taking remedial/corrective actions. Evaluation ascertains that the organizational strategy as well as its implementation is in line with the organizational objectives.

These components are steps that are carried in sequential order, while creating a new strategic management plan. Present businesses that have already created a strategic management plan will revert to these steps as per the situation's requirement, so as to make essential changes.



Components of Strategic Management Process

Strategic Leadership

As per May, "Strategic Leadership is the ability to influence others to voluntarily make decisions that enhance the prospects for the organisation's long-term success while maintaining long-term financial stability. Different leadership approaches impact the vision and direction of growth and the potential success of an organization. To successfully deal with change, all executives need the skills and tools for both strategy formulation and implementation."

Strategic leadership refers to a manager's potential to articulate the strategic vision for the organization, and to motivate, guide and influence his subordinates to attain the objectives of that vision. Strategic leadership can also be defined as utilizing strategy in the management of employees. It is the ability to influence organizational members and to accomplish organizational change. Strategic leaders generate organizational structure, assign resources and communicate strategic vision. Strategic leaders have to work in an uncertain environment on various strategic issues.

The main purpose of strategic leadership is strategic productivity. Another aim of strategic leadership is to generate an environment in which employees match the organization's needs in context of their individual job. Strategic leaders instill confidence to the employees in an organization to follow their own ideas, yet, moving in the direction of organisation's overall goals. Strategic leaders make better use of reward and incentive system for encouraging productive and quality employees. Functional strategic leadership is about creativity, resourcefulness, and preparing to assist an individual in realizing his objectives and goals.

Functions and Importance of a Strategic Leader

Following are the nine key strategic leadership roles and brief definitions of each.

- **Navigator** – Clearly and quickly works through the complexity of key issues, problems and opportunities to affect actions (e.g., leverage opportunities and resolve issues).
- **Strategist** – Develops a long-range course of action or set of goals to align with the organization's vision.

- **Entrepreneur** – Identifies and exploits opportunities for new products, services, and markets.
- **Mobilizer** – Proactively builds and aligns stakeholders, capabilities, and resources for getting things done quickly and achieving complex objectives.
- **Talent Advocate** – Attracts, develops, and retains talent to ensure that people with the right skills and motivations to meet business needs are in the right place at the right time.
- **Captivator** – Builds passion and commitment toward a common goal.
- **Global Thinker** – Integrates information from all sources to develop a well-informed, diverse perspective that can be used to optimize organizational performance.
- **Change Driver** – Creates an environment that embraces change; makes change happen – even if the change is radical – and helps others to accept new ideas.
- **Enterprise Guardian** – Ensures shareholder value through courageous decision-making that supports enterprise – or unit-wide interests.

These nine roles are important at senior strategic levels because they help leaders understand what to do to be strategic. They address the broader challenges leaders face as they transition from managing more narrowly focused “silos,” to taking on the challenges of more enterprise-wide leadership.

Strategic Management: Functions and Importance for Professionals like Company Secretaries

A lot has changed since the passage of Indian Companies Act, 2013. A Company Secretary is no more a ‘Glorified Clerk’ now rather he is a Key Managerial Personnel and plays a pivotal role in ensuring best governance practices of the corporate world. In order to ensure that every activity of the business organization are conducted in the interests of the stakeholders, i.e. shareholders, employees, suppliers, government agencies etc. it is essential that a Company Secretary work as a strategist and not as a simple knowledge worker.

He is required to contemplate the future changes in the political, economic, social, technological and legal environment and its impact on the industry as well as the company per se. Further, the job of a company secretary is a balancing act, meaning that on the one hand he needs to take care of almost all the aspects of corporate affairs, i.e. acting as a mediator between the board and the shareholders, communicating with the outside world on various corporate issues, conducting of meetings and proper maintenance of its records etc. On the other hand, he needs to take care of a bigger but extremely important aspect, in absence of which, it may exert a debilitating impact on the business, i.e. Corporate Governance. At times, while performing his duties, he may find himself at a crossroad or a dilemma, where he needs to chose between the two, i.e. what is good for the company and what is ethically correct.

Due to higher degree of association with business matters, now a company secretary’s platter is full of various tasks. For instance, they interact with the top management on a continuous basis to apprise them of the latest developments taking place in the capital markets, corporate laws, securities laws and their impact on the organization and also communicating with different external agencies and regulatory authorities, thereby enlarging their role in the organization. Further, a company secretary has to take care of the following critical facets of the business, i.e. Risk management, assessing the sustainability of an organization, contribution towards corporate vision and mission, assessment of the magnitude of business competition, guiding the company on the path of corporate social responsibility etc. have enhanced the significance of a company secretary manifold.

Thus, it is clear that the role of a Company Secretary encompasses almost all the functions which a top management official needs to perform and in view of this, strategic management is of paramount significance for a company secretary.

The ensuing paragraph makes an attempt to comprehend how a company secretary is also a part and parcel of strategic management.

A company secretary in today's era while discharging his or her professional obligations has to perform several key roles which are also integral components of strategic management. A brief discussion on some of the roles is as follows:

- (1) *Advisory*: As an advisor to the Board Members, the Company Secretary must build a good relationship with them provide impartial or unbiased advice which is in the best interest of the company. He is required to offer necessary assistance to the Chairman with all development processes including board evaluation, induction and training. This involves implementation of a rigorous plan for the assessment of the performance of Directors and taking requisite measures based on the review report. Further, the company secretary should take the lead in developing tailored induction plans for new directors and devising a training plan for individual directors and the Board. Although these tasks are ultimately the responsibility of the chairman, the company secretary can add value by fulfilling, or procuring the fulfilment of, these best practice governance requirements on behalf of the chairman.
- (2) *Communication with Stakeholders*: The company secretary is a distinctive interface between the Board and management and as such they act as an important link between the Board and the business. Through effective communication they can coach management to understanding the expectations of, and value brought by the Board. The company secretary also has an important role in communicating with external stakeholders, such as investors, and is often the first point of contact for queries. The company secretary should work closely with the chairman and the Board to ensure that effective shareholder relations are maintained.
- (3) *Flawless Disclosure and Reporting*: In recent years there has been increased emphasis in the quality of corporate governance reporting and calls for increased transparency. The company secretary usually has responsibility for drafting the governance section of the company's annual report and ensuring that all reports are made available to shareholders according to the relevant regulatory or listing requirements.
- (4) *Management of Board Meetings and Committees*: The company secretary plays a leading role in good governance by helping the Board and its committees function effectively and in accordance with their terms of reference and best practice. Providing support goes beyond scheduling meetings to proactively managing the agenda and ensuring the presentation of high quality up-to-date information in advance of meetings. This should enable directors to contribute fully in board discussions and debate and to enhance the capability of the Board for good decision making. Following meetings the company secretary should pursue and manage follow up actions and report on matters arising.
- (5) *Compliances*: In current scenario a business has to adhere to various laws and regulations failing which may invite various legal hassles. A company secretary is required to ensure compliance with various laws and regulations and for doing so he / she should be conversant with the laws as well as the amendments that take place. For instance, in Indian context a company secretary has to ensure compliance of the following laws but not limited to- Companies Act; SEBI Act, Securities Contracts (Regulation) Act and rules and regulations made there under; Foreign Exchange Management Act; Consumer Protection Act; Depositories Act; Environment and Pollution Control Laws; Labour and Industrial Laws etc.
- (6) *Representation*: A Company Secretary has to represent before various tribunals and courts in order to present the legal issue of the company. In India, a company secretary appears before the following legal bodies- National Company Law Tribunal (NCLT); National Company Law Appellate Tribunal (NCLAT); Competition Commission of India (CCI); Registrar of Companies; Tax Tribunals etc.

Conclusion

World over, several committees and task forces have strongly advocated for corporate governance viz. Kumar Mangalam Birla Committee, Narayan Murthy Committee, Cadbury Committee etc. Some of the corporate governance practices would include independent oversight of management and accounts of the company, fair and equitable treatment for all the shareholders of the company, fair voting processes conducted by the company, prohibition of insider trading and abusive self-dealing, open and efficient markets, timely and effective disclosure of financial and operating results to the stakeholders of the company, foreseeable risk factors and matters related to corporate governance and regulation and legal recourse if principles of fair dealing are violated.

The company secretary being an important human capital of the management of the business organization should put all the efforts to ensure that through his roles the corporate governance prevails and the business is able to attain astral heights.

However, to be an effective player of strategic management, a company secretary needs to embrace the following core competencies:

- (a) Possessing a thorough knowledge of the company's business.
- (b) Sound knowledge of laws relating to company, capital markets, industry related etc.
- (c) Must have strong Communication and Professional Skills; Legal Skills; Management Skills and IT Skills.
- (d) Being intuitive and sensitive to the thoughts and feelings of board directors and the CEO.
- (e) Staying current with changes in corporate governance and giving the board and managers a "heads up" about new developments.
- (f) Being able to work and achieve a consensus within multidisciplinary settings.
- (g) Being flexible, creative and detailed.
- (h) Remaining calm under pressure and not losing sight of perspective

Strategic Planning

As per Allison and Kaye (2005), "Strategic planning is an organization's process of defining its strategy, or direction, and making decisions on allocating its resources to pursue this strategy. It may also extend to control mechanisms for guiding the implementation of the strategy."

The concept of Strategic planning gained prominent in strategic management in corporate sector in the 1960s and it has maintained its importance in contemporary times too. It follows a cycle that is interpreted below:

The Strategic Planning Cycle



Although, strategic planning process may be unique as per the specific requirements of any organisation, yet the Strategic Planning process is modelled in cycle shown above contains the steps most commonly followed by most of the organisations:

- Deliberating mission of the organisation
- Developing goals based on chosen mission
- Examining internal environment (strengths and weaknesses)
- Examine external environment (opportunities and threats)
- Summarize findings of SWOT analysis
- Formulate final strategy based on SWOT

Strategic planning is an iterative process; as a strategic planning process may begin with one mission and end with another depending on the outcomes of the process.

Benefits of Strategic Planning

Strategic planning can help your organization in a number of critical ways:

- Improved results and confidence: A proper plan may positively influence organizational performance and can contribute to a greater sense of purpose, progress and accountability among its team.
- Focus: Good strategic planning forces future thinking and can refocus and re-energise a disorientated

organization.

- Problem solving: Strategic planning focuses on an organization’s most critical problems, choices and opportunities.
- Teamwork: Strategic planning provides an excellent opportunity to build a sense of teamwork, to promote learning, and to build commitment across the organization.
- Communication: All stakeholders have an interest in knowing the direction in which organisation is heading and also how their contribution will fit in overall plan.
- Greater control: Strategic planning can provide an organisation greater control the environment inwhich it operates

Limitations of Strategic Planning

- Costs can outweigh benefits: Strategic planning can consume a lot of time and money. This can be wasteful if the strategic planning is not successful.
- Development of Poor plans: Faulty assumptions about the future, poor assessment of an organization’s capabilities, poor group dynamics and information overload can lead to the development of poor plans.

Implementation: if not implemented properly, whole planning exercise will go futile. Disillusionment,cynicism and feelings of powerlessness often result if people have contributed energy for development of a plan which is not implemented.

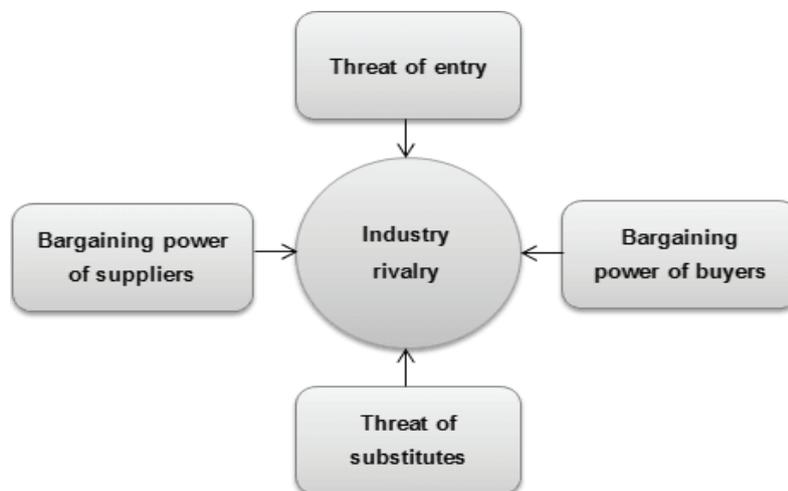
PORTER’S FIVE FORCES

Definition

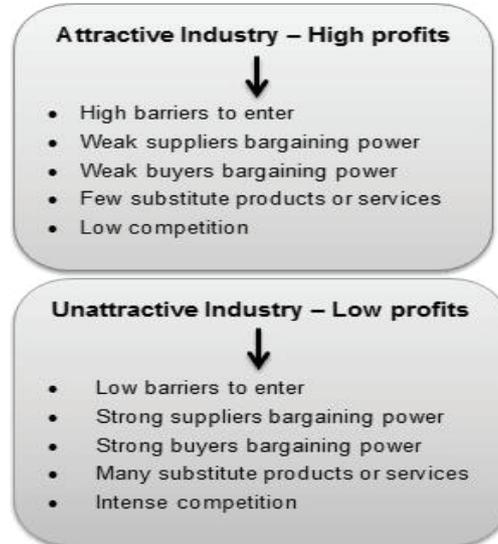
The tool was created by Harvard Business School professor Michael Porter. Porter’s five forces model is an analysis tool that uses five industry forces to determine the intensity of competition in an industry and its profitability level. Since its publication in 1979, it has turned into one of the most popular and highly regarded business strategy tools.

Porter was of the firm viewpoint that the organizations should keep a close watch on their rivals, but he also encouraged them to go beyond the boundaries of their competitors and make an assessment of other factors impacting the business environment. In this process, he identified five forces that build competitive environment, and have a take away its profitability.

The five forces identified are:



These five forces establish an industry structure and the level of competition in that industry. The stronger the competitive forces are in the industry, the less profitable it becomes ultimately. An industry with low barriers to enter, having not many buyers and suppliers but many substitute products and competitors will be viewed as highly competitive and thus, lesser attractive due to its low profitability.



It is every strategic leader's job to make an assessment of company's competitive position in the industry and to identify its strengths or weaknesses to make stronger that position. The model is very valuable in formulating firm's strategy as it reveals the strength of each of these five key forces.

- **Threat of new entrants:** This force determines the ease of new entrants to enter a particular industry. If an industry is profitable and there are hardly any barriers to enter, competition intensifies rapidly. Therefore, with the entry of more rivals, firms begin to compete for the fixed market share, profits start to decline. Hence, it is critical for existing organizations in the industry to build high barriers to enter to discourage new entrants. Threat of new entrants is high when:
 - Smaller capital is required to make an entry;
 - Existing companies are not influential/dominant to prevent new entrants;
 - Existing firms do not have patents, trademarks or do not strong brand value;
 - There is no/little government regulation;
 - Customer switching costs are low;
 - There is low customer loyalty;
 - Products are not being able to be differentiated; and
 - Economies of scale can be effortlessly acquired.
- **Bargaining power of suppliers:** This is determined by the power of the suppliers to raise their prices. It is also determined by the volume of potential suppliers in case existing supplier increase the price. Bargaining power will also be lower in case suppliers are not supplying identical product/service but a unique one. And the cost of switching from one supplier to another. Suppliers have dominant bargaining power when:
 - There are a small number of suppliers but plenty of buyers;
 - Suppliers are large in number and pose a threat to forward integrate;

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- There are not many substitutes of raw materials;
- Suppliers hold scarce/unique resources;
- Cost of switching supplier is relatively high.
- **Bargaining power of buyers:** Bargaining power of the buyers would depend on the number of the buyers and the volume of their order. It would also be a product of the cost of switching from company's products and services to products/services of the competitors. Buyers exert strong bargaining power when:
 - They buy in high volumes or control many access points to the final customer;
 - There are only few buyers in the market;
 - Switching costs to competitors are low;
 - They threaten to backward integrate;
 - There are many close substitutes;
 - Buyers are price sensitive.
- **Threat of substitutes:** This force is especially threatening when buyers can easily find substitute products with attractive prices or better quality and when buyers can switch from one product or service to another with little cost. For example, if a company supplies a unique software product that automates data related to human resource records, the buyer/client may substitute the software either by making the process manual or outsourcing it.
- **Rivalry among existing competitors:** it refers to the number and strength of competitors in the industry. How does the quality of their products and services compare with the company? Where rivalry is intense, companies can attract customers with aggressive price cuts and high-impact marketing campaigns. On the other hand, where competitive rivalry is minimal, and the product is differentiated, there will be high monopoly and steady profits for the company. This force is the major determinant on how competitive and profitable an industry is. In competitive industry, firms have to compete aggressively for a market share, which results in low profits. Rivalry among competitors is intense when:
 - There are several competitors;
 - Exit barriers are high;
 - Industry of growth is slow or negative;
 - Products are not differentiated
 - Products can be easily substituted;
 - Low customer loyalty.

Although, Porter originally introduced five forces affecting an industry, scholars have suggested including the sixth force: complements. Complements increase the demand of the primary product with which they are used, thus, increasing firm's and industry's profit potential. For example, Amazon Prime complements Amazon and Jio TV complements Jio telecom business. As a result, the sale of both products shot up as compared to competitors.

Implementing the model

The following steps are to be followed to implement the Porter's Model:

- Step 1. Gather the information on each of the five forces

- Step 2. Analyze the results and display them on a diagram
- Step 3. Formulate strategies based on the conclusions

Step 1. Gather the information on each of the five forces. What managers should do during this step is to gather information about their industry and to check it against each of the factors (such as “number of competitors in the industry”) influencing the force. We have already identified the most important factors in the table below.

Porter’s Five Forces Factors

Threat of new entry

- Amount of capital required
- Retaliation by existing companies
- Legal barriers (patents, copyrights, etc.)
- Brand reputation
- Product differentiation
- Access to suppliers and distributors
- Economies of scale
- Sunk costs
- Government regulation

Supplier power

- Number of suppliers
- Suppliers’ size
- Ability to find substitute materials
- Materials scarcity
- Cost of switching to alternative materials
- Threat of integrating forward

Buyer power

- Number of buyers
- Size of buyers
- Size of each order
- Buyers’ cost of switching suppliers
- There are many substitutes
- Price sensitivity
- Threat of integrating backward

Threat of substitutes

- Number of substitutes
- Performance of substitutes

- Cost of changing

Rivalry among existing competitors

- Number of competitors
- Cost of leaving an industry
- Industry growth rate and size
- Product differentiation
- Competitors' size
- Customer loyalty
- Threat of horizontal integration
- Level of advertising expense

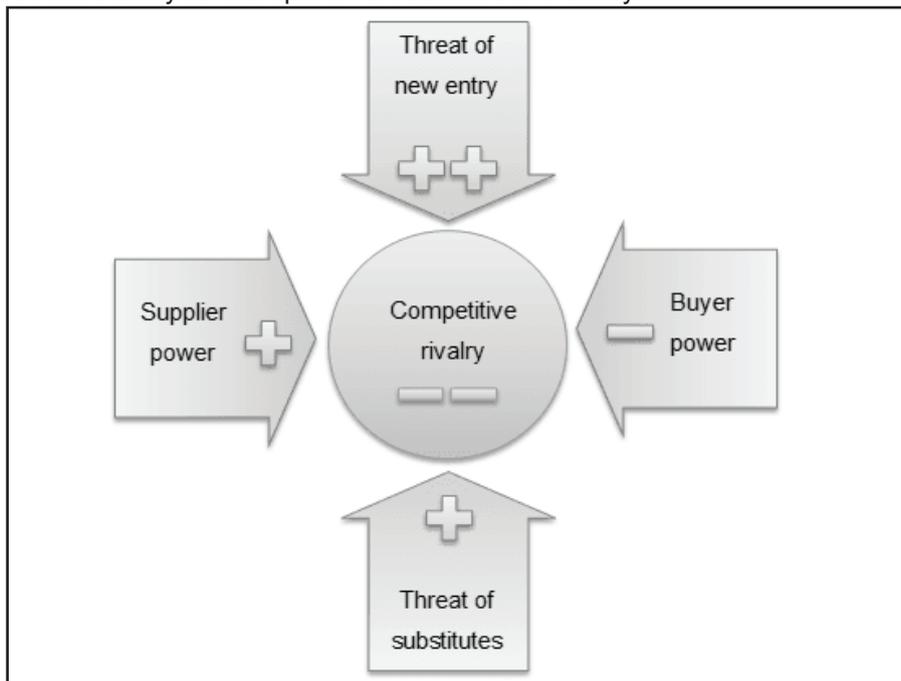
Step 2. Analyze the results and display them on a diagram. After gathering all the information, you should analyze it and determine how each force is affecting an industry. For example, if there are many companies of equal size operating in the slow growth industry, it means that rivalry between existing companies is strong. Remember that five forces affect different industries differently so don't use the same results of analysis for even similar industries!

Step 3. Formulate strategies based on the conclusions. At this stage, managers should formulate firm's strategies using the results of the analysis. For example, if it is hard to achieve economies of scale in the market, the company should pursue cost leadership strategy. Product development strategy should be used if the current market growth is slow and the market is saturated.

Although, Porter's five forces is a valuable tool to analyze industry's structure and to formulate firm's strategy, it has its limitations and requires supplementary analysis to be done, such as SWOT, PEST or Value Chain analysis.

Example

This is Porter's five forces analysis example for an automotive industry.



Porter's Five Forces Model – Pizza Hut Case study

Pizza Hut is world famous multinational fast food chain. It is a subsidiary of Yum! Brands (a Fortune 300 company), the world's largest restaurant company. It is an American restaurant chain with more than 6,000 Pizza Hut restaurants in the United States, and more than 5,600 store locations in 94 other countries and territories around the world. It offers a range of different styles of pizza along with other dishes such as salads, pastas, buffalo wings/potato rings, breadsticks, and garlic breads. It entered India in 1996, with its first branch in Bangalore and expanding all over thereafter, creating a large customer base for itself. The five force model for Pizza Hut may be drawn as under:

Competitive Rivalry (Very High)

- Pizza Hut competes with some other large global pizza chains, Domino's Pizza, and Papa John. They all are similar in many respects such as deal in many countries across Globe, fast food offerings, dine-in and delivery service, creating intense competition.
- Ferocious price discounting and coupons by these all rivals which creates intense competition.
- Except for those pizza companies, Pizza Inn competes with some small local pizza restaurants as well. They offer low price products and faster service, taking the competitive advantages of Pizza Inn.
- The pizza segment is made more challenging for traditional restaurants by other close substitutions, including supermarkets, which not only sell frozen pizzas, but ready to bake pizza, and warehouse clubs sell large size pizzas.

Threat of New Entrants (Low)

- Pizza chains are juggling with the side-effects of a deep recession, because of higher ingredient prices, the thin margins and elevated competition from non-traditional channels.
- Existing competitors keep lowering prices and discounting discounts, and expanding distribution channels creating barriers to new entrants.
- Existing competitors have first-mover advantages such as mature technology in specialty production, and a healthy relationship with distribution channels, therefore, second mover can hardly survive without innovation in the industry.

Threat of Substitutes (High)

- Pizza is a fast food product having plenty of substitutes.
- Competition from other fast food chains such as sandwich chains, chicken fast food chains, family owned local restaurants etc.
- Traditional food chains Bikano, Haldiram etc. offer customers' fast, convenient and cheap products and services that cater to Indian taste as well.
- Substitutes make price elasticity high since customers have more alternatives.

Power of Customers (Medium/Low)

- Being a large population fan of fast food, this makes bargaining power of customers.
- Every single customer is unlikely to purchase a large quantity of product, and it's not likely that each of them contributes a large proportion of sales.
- Fast food chains are in high demand in shopping centers, malls, residential areas, college campuses and offices. In addition, customers are fragmented, with no particular effect on product or price.

Therefore, they will not be hurt by losing a petite amount of customers.

- In the industry, customers are less sensitive to price fluctuations, which is relatively inelastic, so that providers have large price controlling power.

Power of Suppliers (Low)

- The major suppliers of the fast food industry are raw material suppliers. As raw material is common and available in plenty such as flour, cheese, vegetables, therefore, bargaining power of suppliers is low
- Raw material is perishable and cant be stored for long.
- The industry is labor intensive. Labor is in abundant in India.
- Suppliers tend to keep a long term relationship with the concentrated purchasers.
- Many big fast food chain companies are vertically integrated with the suppliers in order to maintain low costs and high quality products.

LESSON ROUND UP

- Strategic Management is a discipline that deals with long-term development of an organisation with a clear-cut vision about organisational purpose, scope of activities and objectives.
- The strategic management process is defined as the process by which the managers’/decision makers’ are able to make a choice of a set of strategies for the organization that will enable it to accomplish improved performance. There are four indispensable phases of every strategic management process.
- Strategic leadership refers to a manager’s potential to articulate the strategic vision for the organization, and to motivate, guide and influence his subordinates to attain the objectives of that vision.
- Strategic leadership refers to a manager’s potential to articulate the strategic vision for the organization, and to motivate, guide and influence his subordinates to attain the objectives of that vision.
- The internal strengths represent its internal environment. These consist of financial, physical, human and technological resources.
- Porter’s five forces model is an analysis tool that uses five industry forces to determine the intensity of competition in an industry and its profitability level.

TEST YOURSELF

1. Define strategic management.
2. Discuss four phases of strategic management process.
3. What is the concept of Strategic Leadership?
4. What are functions and importance of a Strategic Leader?
5. What are the functions and importance of strategic management for professionals like Company Secretaries?
6. What are environmental influences of business?
7. What are components of Business Environment?
8. What are Porter’s Five Forces?

Lesson 13

Business Policy and Formulation of Functional Strategy

LESSON OUTLINE

- Introduction to Business Policy
- Framework of Strategic Management
- Strategic Decision Model
- Vision
- Mission
- Objectives and Goals
- Strategic Levels of the Organization
- Formulation of Functional Strategy
- Formulation of Financial; Marketing Production; Human Resource and Logistics strategies.
- LESSON ROUND UP
- TEST YOURSELF

LEARNING OBJECTIVES

Business Policy is “The study of the functions and responsibilities of senior management, the crucial problems that affect success in the total enterprise and the decisions that determine the direction of the organisation and shape its future. The problems of policy in business, like those of policy in public affairs, have to do with the choice of purposes, the moldings of organizational identity and character, the continuous definition of what needs to be done, and the mobilization of resources for the attainment of goals in the face of competition or adverse circumstance”.

Business policy is the study of the roles and responsibilities of top level management, significant issues affecting organizational success and the decisions affecting organization in long-run. The objective of this chapter is to enable the students to understand:

- The concept and features of Business policy
- Evolution of business policy
- Evolution of business policy in India
- Role played by business policy
- Developing an understanding of framework of strategic management
- Practical understanding of concept of Vision and Mission with examples from corporate world
- Strategic levels in the organisation
 - Corporate
 - Business
 - Functional
- Formulation of Financial; Marketing; Production; Human Resource and Logistics strategies.

BUSINESS POLICY – INTRODUCTION

Business policies are the guidelines developed by an organization to govern the actions of those who are a part of it. They define the potential limits within which decisions must be made. Business policy also deals with acquisition of resources with which organizational goals can be achieved. Business Policy defines the scope within which decisions may be taken by the subordinates in an organization. It permits the lower level management to deal with the routine problems and issues on their own without reverting back to top management for the purpose of decision making.

Business policy is the study of the roles and responsibilities of top level management, significant issues affecting organizational success and the decisions affecting organization in long-run. The top management consists of those managers who are primarily responsible for long-term decisions and carry designations such as Chief Executive, President, General Manager, or Executive Director. These are the persons who are not concerned with the day-to-day problems but are expected to devote their time and energy for thinking and deciding about the future course of action.

Features of Business Policy

Business Policy is “the study of the functions and responsibilities of senior management, the crucial problems that affect success in the total enterprise and the decisions that determine the direction of the organisation and shape its future. The problems of policy in business, like those of policy in public affairs, have to do with the choice of purposes, the moldings of organizational identity and character, the continuous definition of what needs to be done, and the mobilization of resources for the attainment of goals in the face of competition or adverse circumstance”. An effective business policy must have following features-

1. *Specific* – Every policy must have a basic feature of being specific/definite. If it is uncertain, then its implementation will become difficult.
2. *Clear* – Policy must be unambiguous and as clear as possible in order to guide the subordinates effectively. It should avoid frequent use of jargons and connotations to create any chaos.
3. *Reliable and Uniform* – Policy must be uniform and reliable enough to be efficiently followed by the subordinates.
4. *Appropriate* – Policy should be appropriate to the represent the organizational goals.
5. *Simple* – A policy should be simple and easily understood by each and every person in the organization.
6. *Inclusive/Comprehensive* – In order to have a wide scope, a policy must be comprehensive.
7. *Flexible* – Policy should be flexible in application. It should be wide in scope so as to ensure that the line managers use them in repetitive/routine scenarios.
8. *Stable* – Policy should be stable so as to avoid the scope of any indecisiveness and uncertainty in minds of those who look into it for guidance.

Evolution of Business Policy

The origin of business policy can be traced back to the year 1911, when Harvard Business School introduced an integrative course in management aimed at the creation of general management capability. This course was based on some case studies which had been in use at the school for instructional purposes since 1908.

However, the real impetus for introducing business policy in the curriculum of business schools came with the publication of two reports in 1959. The Gordon and Howell report, sponsored by the Ford Foundation, recommended a capstone course of business policy “... which will give students an opportunity to pull together what they have learned in the separate business fields and utilize this knowledge in the analysis of complex

business problems. The Pierson report, sponsored by the Carnegie Foundation and published simultaneously, made a similar recommendation.

In 1969, the American Assembly of Collegiate Schools of Business, a regulatory body for business schools, made the course of business policy a mandatory requirement for the purpose of recognition. During the last four decades, business policy has become an integral part of management curriculum. From the US, the practice of including business policy in the management curriculum spread to other parts of the world.

• Evolution Based on Managerial Practices

The development in business policy as arising from the use of planning techniques by managers. Starting from day-to-day planning in earlier times, managers tried to anticipate the future through preparation of budgets and using control systems like capital budgeting and management by objectives. With the inability of these techniques to adequately emphasise the role of future, long-range planning came to be used. Soon, long-range planning was replaced by strategic planning, and later by strategic management: a term is currently used to describe the process of strategic decision – making. Strategic management is the theoretical framework for business policy courses today. Policy-making became the prime responsibility of erstwhile entrepreneurs who later assumed the role of senior management.

The Indian Scenario

Formal management education started in India in the late fifties and gained an impetus with the setting up of the Indian Institutes of Management (IIMs) and the Administrative Staff College of India in the early sixties. In the formative years of the IIMs, the curriculum and philosophy of management education "...were borrowed substantially from the American business schools". The IIM, Ahmedabad based its teaching methodology on the Harvard model of developing and using case studies as the major tool. With the setting up of three more IIMs at Bangalore, Calcutta and Lucknow and the creation of university departments, management education has experienced an unparalleled growth in the last three decades. Different nomenclature used for the course title include, besides business policy; corporate planning, corporate strategy and planning, management policy and, lately, strategic planning or strategic management.

Importance of Business Policy

Business policy is important as a course in management curriculum and as a component of executive development programmes for middle-level managers preparing to move up to the senior management level. A study of business policy fulfils the needs of management students as well as those of middle-level managers.

To highlight the importance of business policy, we consider four areas where this course proves to be beneficial.

• From the viewpoint of the Course itself

Business policy seeks to integrate knowledge and experience gained in various functional areas of management. It enables the learner to understand and make sense of the complex interaction that takes place between different functional area.

Business policy deals with the constraints and complexities of the real-life business. In contrast, the functional area courses are based on a structured, specialized and well-developed body of knowledge resulting from the simplification of the complexity of the overall tasks and responsibilities of management.

For the development of a theoretical structure of its own, business policy cuts across the narrow functional boundaries and draws upon a variety of sources; other courses in management curriculum and from a wide variety of disciplines like economics, sociology, psychology, demography, political science, etc. In doing so, business policy offers a very broad perspective to its learners.

Business policy makes the study and practice of management more meaningful as one can view business

decision-making in its proper perspective. For instance, in the context of business policy, a short-term gain for a department or a sub-unit is willingly sacrificed in the interest of the long-term benefit that may accrue to the organisation as a whole.

• For the Understanding of Business Environment

Regardless of the level of management where a person is, business policy creates an understanding of how policies are formulated. This helps in creating an appreciation of the complexities of the environment that the senior management faces in policy formulation.

By gaining an understanding of the business environment, managers become more receptive to the ideas and suggestions of the senior management. Such an attitude on the part of managers makes the task of policy implementation simpler.

By being able to relate the environmental changes to policy changes within the organisation, managers feel themselves to be a part of a greater design. This helps in reducing their feelings of isolation.

• For Understanding the Organisation

Business policy presents a basic framework for understanding strategic decision-making while a person is at the middle level of management. Such a framework, combined with the experience gained in working in a specialized functional area, enable a person to make preparations for handling general management responsibilities. This benefits the organisation in a variety of ways.

Business policy, like most other areas of management, brings to the organisation and also to its managers, the benefit of years of distilled experience in strategic decision-making. Case study, which is the most common pedagogical tool in business policy, provides illustrations of real-life business strategy formulation and implementation.

FRAMEWORK OF STRATEGIC MANAGEMENT

The Strategy Management Framework:



Vision

Vision serves the purpose of stating what an organization wishes to achieve in the long run. It articulates the position that the organisation would like to occupy in future. The vision is about looking forward and about formalizing where you, and the business, are going. It is a future aspiration that leads to an inspiration of being the best in one's business sphere. It creates a common identity and a shared sense of purpose.

A vision statement is a company's road map, indicating both what the company wants to become and guiding

transformational initiatives by setting a defined direction for the company's growth. Vision statements undergo minimal revisions during the life of a business, unlike operational goals which may be updated from year-to-year.

A consensus does not exist on the characteristics of a "good" or "bad" vision statement.

Features

- *Concise* : able to be easily remembered and repeated
- *Clear* : defines a prime goal
- *Time horizon* : defines a time horizon
- *Future-oriented* : describes where the company is going rather than the current state
- *Stable* : offers a long-term perspective and is unlikely to be impacted by market or technology changes
- *Challenging* : not something that can be easily met and discarded
- *Abstract* : general enough to encompass all of the organization's interests and strategic direction
- *Inspiring* : motivates employees and is something that employees view as desirable

Purpose

Vision statement may fill the following functions for a company:

- Serve as foundation for a broader strategic plan
- Motivate existing employees and attract potential employees by clearly categorizing the company's goals and attracting like-minded individuals
- Focus company efforts and facilitate the creation of core competencies by directing the company to only focus on strategic opportunities that advance the company's vision
- Help companies differentiate from competitors. For example, profit is a common business goal, and vision statements typically describe how a company will become profitable rather than list profit directly as the long-term vision.

MISSION

A mission statement defines the basic reason for the existence of that organization. Such a statement reflects the corporate philosophy, identity, character, and image of an organization. It may be defined explicitly or could be deduced from the management's actions, decisions, or the chief executive's press statements.

A mission statement is a short statement of an organization's purpose, identifying the goal of its operations: what kind of product or service it provides, its primary customers or market, and its geographical region of operation.

It communicates primarily to the people who make up the organization—its members or employees—giving them a shared understanding of the organization's intended direction.

There are no hard and fast rules to developing a mission - what matters most is that is generally be considered to be an accurate reflection and useful summary of UH Hilo and 'speaks' to our stakeholders.

What follows though are some general principles that we could bear-in-mind:

1. **Make it as succinct as possible.** A mission statement should be as short and snappy as possible - preferably brief enough to be printed on the back of a business card. The detail which underpins it should be mapped out elsewhere.

2. **Make it memorable.** Obviously partially linked to the above, but try to make it something that people will be able to remember the key elements of, even if not the exact wording
3. **Make it unique to you.** It's easy to fall into the 'motherhood and apple pie' trap with generic statements that could equally apply to any institution. Focus on what it is that you strive to do differently: how you achieve excellence, why you value your staff or what it is about the quality of the student experience that sets you apart from the rest.
4. **Make it realistic.** Remember, your mission statement is supposed to be a summary of why you exist and what you do. It is a description of the present, not a vision for the future. If it bears little or no resemblance to the organization that your staff know it will achieve little 5. Make sure it's current. Though it is not something which should be changed regularly, neither should it be set in stone.

Comparison Chart

Someone has rightly said, **“A man without eyes is blind, but a man without a vision is dead”**.

Comparison

Mission Statement versus Vision Statement

	Mission Statement	Vision Statement
About	A Mission statement talks about HOW you will get to where you want to be. Defines the purpose and primary objectives related to your customer needs and team values.	A Vision statement outlines WHERE you want to be. Communicates both the purpose and values of your business.
Answer	It answers the question, “What do we do? What makes us different?”	It answers the question, “Where do we aim to be?”
Time	A mission statement talks about the present leading to its future.	A vision statement talks about your future.
Function	It lists the broad goals for which the organization is formed. Its prime function is internal; to define the key measure or measures of the organization’s success and its prime audience is the leadership, team and stockholders.	It lists where you see yourself some years from now. It inspires you to give your best. It shapes your understanding of why you are working here.
Change	Your mission statement may change, but it should still tie back to your core values, customer needs and vision.	As your organization evolves, you might feel tempted to change your vision. However, mission or vision statements explain your organization’s foundation, so change should be kept to a minimum.
Developing a statement	What do we do today? For whom do we do it? What is the benefit? In other words, Why we do what we do? What, For Whom and Why?	Where do we want to be going forward? When do we want to reach that stage? How do we want to do it?
Features of an effective statement	Purpose and values of the organization: Who are the organization’s primary “clients” (stakeholders)? What are the responsibilities of the organization towards the clients?	Clarity and lack of ambiguity: Describing a bright future (hope); Memorable and engaging expression; realistic aspirations, achievable; alignment with organizational values and culture.

Vision and Mission Statements of Various Companies

Company: State bank of India

Vision: Be the bank of choice for a transforming India.

Mission: Committed to providing simple, responsive and innovative financial solutions



Company: Tesla

Mission: To accelerate the world's transition to sustainable energy.

Vision: To create the most compelling car company of the 21st century by driving the world's transition to electric vehicles.



Company: Amazon

Mission: We strive to offer our customers the lowest possible prices, the best available selection, and the utmost convenience.

Vision: To be Earth's most customer-centric company, where customers can find and discover anything they might want to buy online.



Company: TED

Mission: Spread ideas.

Vision: We believe passionately in the power of ideas to change attitudes, lives and, ultimately, the world.



Company: LinkedIn

Mission: To connect the world's professionals to make them more productive and successful.

Vision: To create economic opportunity for every member of the global workforce.



Company: Google

Mission: To organize the world's information and make it universally accessible and useful.

Vision: To provide access to the world's information in one click.



Company: Uber

Mission: Transportation as reliable as running water, everywhere for everyone.

Vision: Smarter transportation with fewer cars and greater access. Transportation that's safer, cheaper, and more reliable; transportation that creates more job opportunities and higher incomes for drivers.



Company: Intel

Mission: Utilize the power of Moore's Law to bring smart, connected devices to every person on earth.

Vision: If it is smart and connected, it is best with Intel.



Company: Ferrari

Mission: We build cars, symbols of Italian excellence the world over, and we do so to win on both road and track. Unique creations that fuel the Prancing Horse legend and generate a "World of Dreams and Emotions".

Vision: Ferrari, Italian Excellence that makes the world dream.



TOYOTA

Company: Toyota USA

Mission: To attract and attain customers with high-valued products and services and the most satisfying ownership experience in America.

Vision: To be the most successful and respected car company in America.

SAMSUNG

Company: Samsung

Mission: Become one of the world's top five brands by 2020.

Vision: Inspire the world. Create the future.



Company: Wikimedia

Mission: To empower and engage people around the world to collect and develop educational content under a free license or in the public domain, and to disseminate it effectively and globally.
Vision: Imagine a world in which every single human being can freely share in the sum of all knowledge. That's our commitment.



Company: Ebay

Mission: To be the world's favorite destination for discovering great value and unique selection.

Vision: Our vision for commerce is one that is enabled by people, powered by technology, and open to everyone.



Company: Cisco

Mission: Shape the future of the Internet by creating unprecedented value and opportunity for our customers, employees, investors, and ecosystem partners.

Vision: Changing the way we work, live, play, and learn.

SONY

Company: Sony

Mission: A company that inspires and fulfills your curiosity.

Vision: Using our unlimited passion for technology, content and services to deliver groundbreaking new excitement and entertainment, as only Sony can.



Company: Facebook

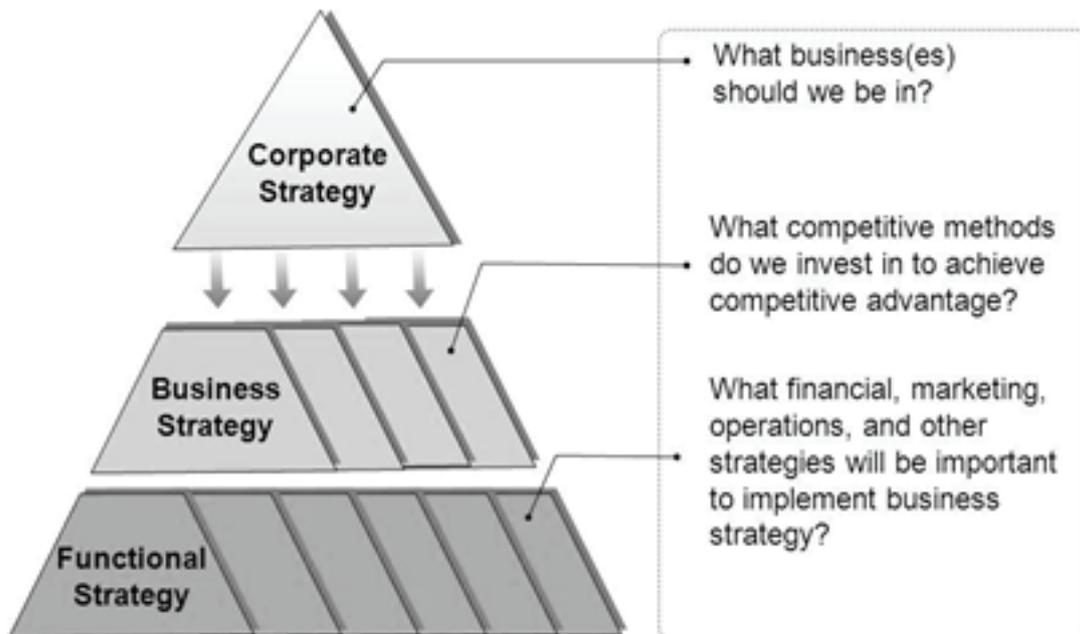
Mission: To give people the power to build community and bring the world closer together.

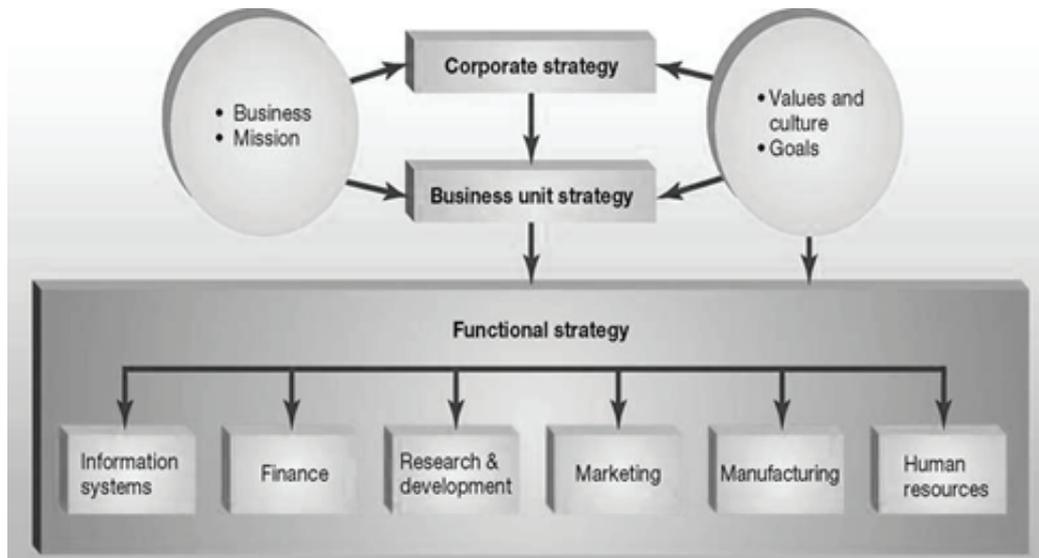
Vision: People use Facebook to stay connected with friends and family, to discover what's going on in the world, and to share and express what matters to them.

STRATEGIC LEVELS OF THE ORGANIZATION



The Relationship among Corporate, Business, and Functional Strategies





Corporate Level Strategy

Corporate Strategy is the essence of strategic planning process. It determines the growth objective of the company, i.e. direction, timing, extent and pace of the firm's growth. It highlights the pattern of business moves and goals concerning strategic interest, in different business units, product lines, customer groups, etc. It defines how the firm will remain sustainable in the long run.

Corporate level strategy occupies the highest level of strategic decision making and covers actions dealing with the objective of the firm, acquisition and allocation of resources and coordination of strategies of various SBUs for optimal performance.

Corporate Strategy can be explained as the management plan formulated by the highest level of organization echelon, to direct and operate the entire business organization. It alludes to the master plan that leads the firm towards the success. So the more the aptness in the degree of the corporate level strategy, the higher will be the chances of firm's success in the market.

According to Andrews: "the corporate strategy is the pattern of decisions in a company that determines and reveals its objectives, purposes or goals, produces the principal policies and plans for achieving those goals and defines the range of business the company pursues, the kind of economic and noneconomic contribution it intends to make for its shareholders, employees, customers and communities." (Andrews, 1997, p.245)

Johnson et al (2009), been describing corporate strategy, highlighted the choices of markets and products as a first step, and how a company is planning to operate on those markets or with particular products. They have also discussed the corporate strategy from overall scope of an organization and how value should be added to the different parts (business units) of an organization.

Business-Level Strategy

Business level strategy is applicable in those organizations, which have different businesses-and each business is treated as Strategic Business Unit (SBU). The fundamental concept in SBU is to identify the discrete independent product / market segments served by an organization.

Since each product/market segment has a distinct environment, a SBU is created for each such segment. For example, Reliance Industries Limited operates in textile fabrics, yarns, fibers, and a variety of petrochemical products. For each product group, the nature of market in terms of customers, competition, and marketing channel differs.

Therefore, it requires different strategies for its different product groups. Thus, where SBU concept is applied, each SBU sets its own strategies to make the best use of its resources (its strategic advantages) given the environment it faces. At such a level, strategy is a comprehensive plan providing objectives for SBUs, allocation of resources among functional areas and coordination between them for making optimal contribution to the achievement of corporate-level objectives.

Such strategies operate within the overall strategies of the organization. The corporate strategy sets the long-term objectives of the firm and the broad constraints and policies within which a SBU operates. The corporate level will help the SBU define its scope of operations and also limit or enhance the SBUs operations by the resources the corporate level assigns to it. There is a difference between corporate-level and business-level strategies.

For example, Andrews says that in an organization of any size or diversity, corporate strategy usually applies to the whole enterprise, while business strategy, less comprehensive, defines the choice of product or service and market of individual business within the firm. In other words, business strategy relates to the 'how' and corporate strategy to the 'what'. Corporate strategy defines the business in which a company will compete preferably in a way that focuses resources to convert distinctive competence into competitive advantage.'

Corporate strategy is not the sum total of business strategies of the corporation but it deals with different subject matter. While the corporation is concerned with and has impact on business strategy, the former is concerned with the shape and balancing of growth and renewal rather than in market execution.

Michael Porter (1998) has identified business-level strategies which are cost leadership, differentiation, and focus to achieve a sustainable competitive advantage. The strategy of cost leadership was common in 1970s. This strategy requires construction of efficient-scale facilities, cost reductions, control over expenses, and cost minimization etc. The low-cost strategy gives several advantages before rivals. It may be explained by the possibility to be more efficient than competitors. (Porter, 1998)

Hill and Jones (2007) have developed the curve which connects together the three issues in developing a successful business model.

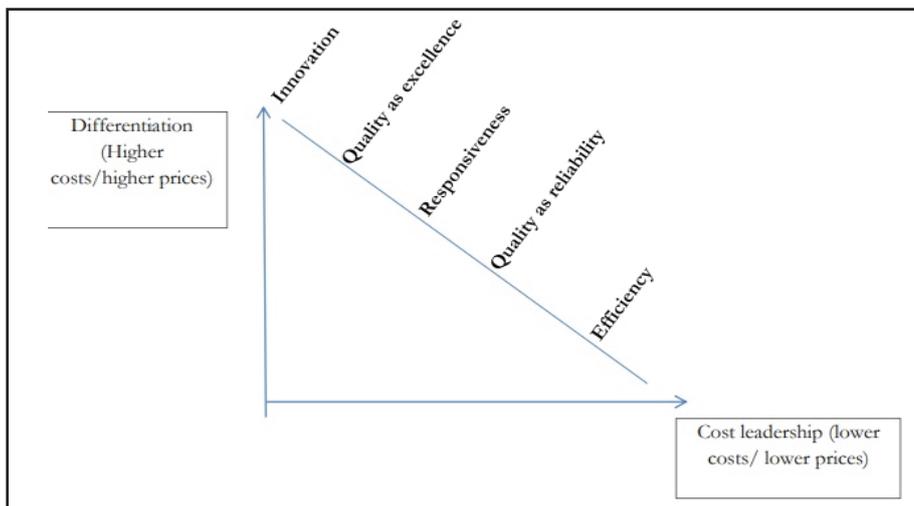


Figure 2-2 Competitive Positioning and the Value Creation Frontier (Hill and Jones, 2007, p.160)

Brown and Blackmon (2005) have defined business-unit strategy as a process of decision making at the strategic business unit (SBU) level. According to them, primarily it identifies how SBU supports organizational goals. Furthermore, business-unit strategy refers to aggregated strategies of single firms or SBU within one diversified corporation (Brown, Blackmon, 2005). While corporate strategy deals with the question in what businesses the company should compete in, business unit level strategy decides on how to compete in these particular businesses. (Beard, Dess, 1981)

Functional-Level Strategy

Functional strategy, as is suggested by the title, relates to a single functional operation and the activities involved therein. Decisions at this level within the organization are often described as tactical. Such decisions are guided and constrained by some overall strategic considerations.

Functional strategy deals with relatively restricted plan providing objectives for specific function, allocation of resources among different operations within that functional area and coordination between them for optimal contribution to the achievement of the SBU and corporate-level objectives.

Below the functional-level strategy, there may be operations level strategies as each function may be divided into several sub functions. For example, marketing strategy, a functional strategy, can be subdivided into promotion, sales, distribution, pricing strategies with each sub function strategy contributing to functional strategy.

Comparison Chart

BASIS FOR COMPARISON	BUSINESS STRATEGY	CORPORATE STRATEGY
Meaning	Business Strategy is the strategy framed by the business managers to strengthen the overall performance of the enterprise.	Corporate Strategy is stated in the mission statement, which explains the business type and ultimate goal of the firm.
Created by	Middle level management	Top level management
Nature	Executive and Governing	Decisive and Legislative
Relates to	Selection of plan to fulfill the objectives of organization.	Business selection in which the company should compete.
Deals with	Particular business unit or division	Entire business organization
Term	Short term strategy	Long term strategy
Focus	Competing successfully in the marketplace.	Maximizing profitability and business growth.
Approach	Introverted	Extroverted
Major strategies	Cost Leadership, Focus and Differentiation	Expansion, Stability and Retrenchment.

Key Differences between Business Strategy and Corporate Strategy

The fundamental differences between corporate and business strategy are explained in the points hereunder:

Business Strategy can be viewed as the strategy designed by the business managers to improve the overall performance of the firm. On the other hand, Corporate Strategy is the one expressed in the mission statement of the company, which describes the business type and ultimate goal of the organization.

Business Strategy is framed by middle-level management which comprises of division, unit or departmental managers. Conversely, corporate strategy is formulated by top level managers, i.e. board of directors, CEO, and managing director.

The nature of business strategy is executive and governing, whereas the corporate strategy is deterministic and legislative.

While the business strategy is a short term strategy, corporate strategy is a long term one.

The business strategies aim at selecting the business plan to fulfil the objectives of the organization. As against, the corporate strategy focuses on the business selection in which the company wants to compete in the marketplace.

Business strategy is concerned with a particular unit or division. Unlike corporate strategy which focuses on the entire organization, comprising of various business units or divisions.

The business strategy focuses on competing successfully in the market place with other firms. On the contrary, corporate strategy stresses on increasing profitability and business growth.

Business Strategy has an introverted approach, i.e. it is concerned with the internal working of the organization. In contrast, Corporate Strategy uses extroverted approach, which links the business with its environment.

At the business level, strategies which are employed by the organization includes, Cost Leadership, Focus and Differentiation. On the other hand, at the corporate level, the strategies used are Expansion, Stability and Retrenchment.

The strategy is the management's plan for improving the performance of the firm and gaining a competitive advantage. At the business level, the strategies are more about developing and sustaining competitive advantage for the products offered by the enterprise. It is concerned with positioning the business against competitors, in the marketplace.

Conversely, at the corporate level, the strategy is all about formulating strategies to maximizing profitability and exploring new business opportunities.

FORMULATION OF FUNCTIONAL STRATEGY

Finance Strategy

Financial metrics have long been the standard for assessing a firm's performance. Financial goals and metrics are established based on benchmarking the "best-in-industry" and include:

1. Free Cash Flow

This is a measure of the firm's financial soundness and shows how efficiently its financial resources are being utilized to generate additional cash for future investments. It represents the net cash available after deducting the investments and working capital increases from the firm's operating cash flow. Companies should utilize this metric when they anticipate substantial capital expenditures in the near future or follow-through for implemented projects.

2. Economic Value-Added

This is the bottom-line contribution on a risk-adjusted basis and helps management to make effective, timely decisions to expand businesses that increase the firm's economic value and to implement corrective actions in those that are destroying its value. It is determined by deducting the operating capital cost from the net income. Companies set economic value-added goals to effectively assess their businesses' value contributions and improve the resource allocation process.

3. Asset Management

This calls for the efficient management of current assets (cash, receivables, inventory) and current liabilities (payables, accruals) turnovers and the enhanced management of its working capital and cash conversion cycle. Companies must utilize this practice when their operating performance falls behind industry benchmarks or benchmarked companies.

4. Financing Decisions and Capital Structure

Here, financing is limited to the optimal capital structure (debt ratio or leverage), which is the level that minimizes

the firm's cost of capital. This optimal capital structure determines the firm's reserve borrowing capacity (short- and long-term) and the risk of potential financial distress. Companies establish this structure when their cost of capital rises above that of direct competitors and there is a lack of new investments.

5. Profitability Ratios

This is a measure of the operational efficiency of a firm. Profitability ratios also indicate inefficient areas that require corrective actions by management; they measure profit relationships with sales, total assets, and net worth. Companies must set profitability ratio goals when they need to operate more effectively and pursue improvements in their value-chain activities.

6. Growth Indices

Growth indices evaluate sales and market share growth and determine the acceptable trade-off of growth with respect to reductions in cash flows, profit margins, and returns on investment. Growth usually drains cash and reserve borrowing funds, and sometimes, aggressive asset management is required to ensure sufficient cash and limited borrowing. Companies must set growth index goals when growth rates have lagged behind the industry norms or when they have high operating leverage.

7. Risk Assessment and Management

A firm must address its key uncertainties by identifying, measuring, and controlling its existing risks in corporate governance and regulatory compliance, the likelihood of their occurrence, and their economic impact. Then, a process must be implemented to mitigate the causes and effects of those risks. Companies must make these assessments when they anticipate greater uncertainty in their business or when there is a need to enhance their risk culture.

8. Tax Optimization

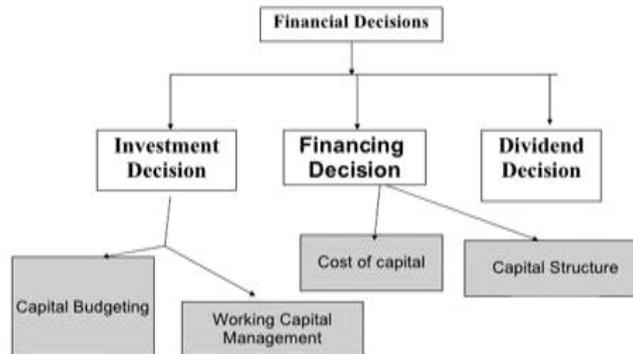
Many functional areas and business units need to manage the level of tax liability undertaken in conducting business and to understand that mitigating risk also reduces expected taxes. Moreover, new initiatives, acquisitions, and product development projects must be weighed against their tax implications and net after-tax contribution to the firm's value. In general, performance must, whenever possible, be measured on an after-tax basis. Global companies must adopt this measure when operating in different tax environments, where they are able to take advantage of inconsistencies in tax regulations.

The introduction of the balanced scorecard emphasized financial performance as one of the key indicators of a firm's success and helped to link strategic goals to performance and provide timely, useful information to facilitate strategic and operational control decisions. This has led to the role of finance in the strategic planning process becoming more relevant than ever.

Formulation of Finance Strategy

Strategic Financial Management (SFM): Strategic Financial Management (SFM) is concerned with development of a finance strategy by identification of some key strategic alternatives which are capable of maximizing entity's Net Present Value (NPV) and by allocation of scarce capital resources among the competing opportunities. It is concerned with taking these three key financial decisions:

Financial Strategy



INVESTMENT DECISION

It is the first and foremost important component of financial strategy. In the course of business, the available finance with business is usually limited but the opportunities to invest are plenty. Hence the finance manager is required to access the profitability or return of various individual investment decisions and choose a policy which ensures high liquidity, profitability of an organization. It includes short term investment decisions known as working capital management decisions and long term investment decisions known as capital budgeting decisions.

- *Capital Budgeting*:- It is the process of making investment decisions in capital expenditure, benefits of which are expected over a long period of time exceeding one year. Investment decision should be evaluated in the terms of expected profitability, costs involved and the risks associated. This decision is important for setting new units, expansion of present units, reallocation of funds etc.
- *Short Term Investment Decision*:- It relates to allocation of funds among cash and equivalents, receivables and inventories. Such decision is influenced by trade-off between liquidity and profitability. Proper working capital management policy ensures higher profitability, proper liquidity and sound structural health of the organization.

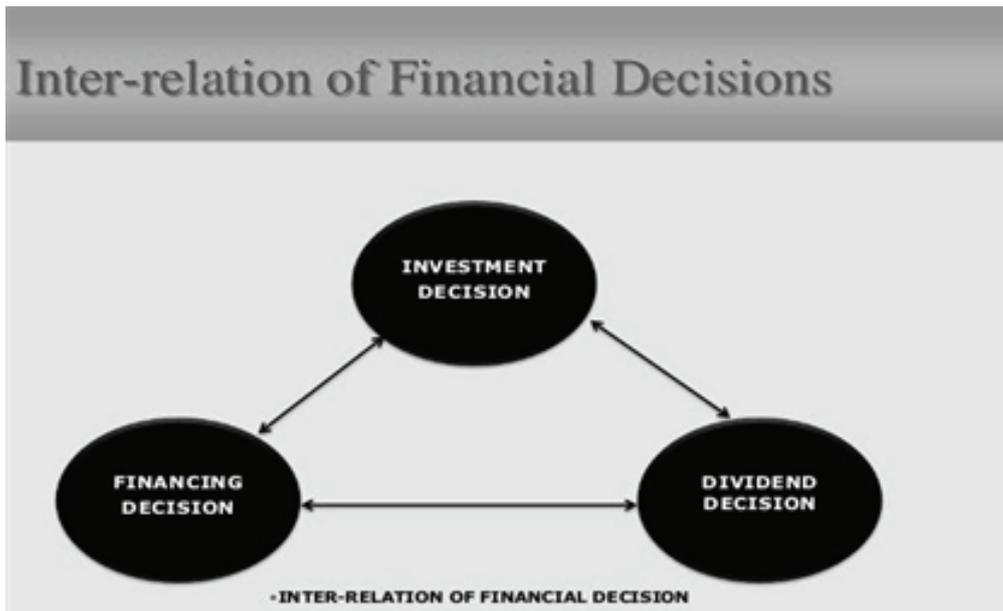
FINANCING DECISION

Once the requirement of funds has been estimated, the next important step is to determine the sources of finance. The manager should try to maintain a balance between debt and equity so as to ensure minimized risk and maximum profitability to business.

DIVIDEND DECISION

The third and last function of finance includes dividend decisions. Dividend is that part of profit, which is distributed to shareholders as a reward to high risk investment in business. It is basically concerned with deciding as to how much part of profit will be retained for the future investments and how much part of profit will be distributed among shareholders. High rate of dividend ensures higher wealth of shareholders and also increase market price of shares.

Influences on financial strategy: Businesses may be reluctant to obtain extra funds due to a variety of reasons such as fear of loss of control, fear of equity not getting subscribed, fear of inability to service its debts, tax shields, not having enough asset base to provide as security or to maintain good rating etc . Therefore, the manager must keep in mind such factors to make a trade-off for finance.



Although the basic decisions of finance includes three types of decisions i.e. investing, finance and dividend decisions but they are interlinked with each other in a way. This is so because:

The main aim of all three decisions is profit maximization and wealth maximization of shareholders.

In order to make investment decisions such as investing in some major projects, the first thing is the finance available to make investment.

Finance decision is also a function of dividend decision. The more the dividend distribution, the more the dependency on external sources to raise finance and vice versa.

Marketing Strategy

Formulation of marketing Strategic Marketing is the means by which a firm is effectively able to differentiate itself from its competitors by capitalising on its strengths (both existing as well as potential) to provide consistently better value to its customers than its competitors.

Marketing strategy is a long-term, forward-looking approach for attaining sustainable competitive advantage. It involves an analysis of the company's existing strategic situation before the formulation, evaluation and selection of market-oriented competitive position that contributes to the company's goals and marketing objectives.

Definitions of Marketing Strategy

Marketing Strategy is:

- "The marketing strategy lays out target markets and the value proposition that will be offered based on an analysis of the best market opportunities." (Philip Kotler & Kevin Keller)
- "An over-riding directional concept that sets out the planned path." (Aaker and Mills)
- "Essentially a formula for how a business is going to compete, what its goals should be and what policies will be needed to carry out these goals." (Michael Porter, *Competitive Strategy: Techniques for Analyzing Industries and Competitors*)

In short, the Strategic Marketing answers three 'W's:

1. Which markets to compete in
2. What is the basis of the firm's competitive, and
3. When to compete



STRATEGIC MARKETING PLANNING: AN OVERVIEW

The Strategic Gap

Marketing strategy involves mapping out the company's direction for the future, be it three, five or ten years. It involves carrying out a 360° review of the firm and its operating environment with a view to identify new business opportunities that the firm could potentially leverage for competitive advantage. Strategic planning may also reveal market threats that the firm may need to consider for long-term sustainability.

Strategic planning is concerned with identifying the business opportunities that are likely to be successful and evaluates the firm's capacity to leverage such opportunities. It seeks to identify the *strategic gap*; that is the difference between where a firm is currently situated where it should be situated for sustainable, long-term growth.

Market Position and Strategy

In terms of market position, firms may be classified as market leaders, market challengers, market followers or market nichers.

- **Market leader:** The market leader is the one who controls significant market share. The goal of a market leader is to reinforce their prominent position through the use of branding to develop and maintain their corporate image and to restrict the competitors brand. Market leaders may adopt unconventional or unexpected approaches to building growth and their tactical responses are likely to include: product proliferation; diversification; multi-branding; erecting barriers to entry; vertical and horizontal integration and corporate acquisitions.
- **Market challenger:** The market challenger holds the next highest market share in the industry, following closely the most dominant player. Their market posture is generally offensive because they have less to lose and more to gain by taking risks. They will compete 'neck to neck' with the market leader in an effort to grab their market share. Their overall strategy is to gain market share through product, packaging and service innovations; new market.
- **Market follower:** Followers are generally content by taking a backseat and follow the policy of wait and watch. They rarely invest in their own funds in R&D and sit and relax to watch market leaders to bring out novel and innovative products and afterwards adopt a "me-too" approach. Their strategy is to maintain their market position by preserving existing customer base. They strategy is to maintain steady profits by controlling costs.
- **Market nicher:** The market nicher occupies a small niche in the market in order to avoid 'neck to neck'

competition. Their objective is to build strong ties with the existing customer base and develop strong loyalty with them. Their strategy is to develop and build the smaller segment and protect it. Tactically, nichers are likely to improve the product or service offering, leverage cross-selling opportunities, offer value for money and build relationships through superior after sales service, service quality and other related value adding activities.

A key aspect of marketing strategy is to keep marketing consistent with a company's overarching mission statement. Strategies often specify how to adjust the marketing mix; firms can use tools such as Marketing Mix Modeling to help them decide how to allocate scarce resources, as well as how to allocate funds across a portfolio of brands. In addition, firms can conduct analyses of performance, customer analysis, competitor analysis, and target market analysis.

Entry strategies

Marketing strategies may differ depending on the unique situation of the individual business. According to Lieberman and Montgomery, every entrant into a market – whether it is new or not – is classified under a Market Pioneer, Close Follower or a Late follower

• *Pioneers*

Market pioneers are known for innovative product development, resulting into some early entry market-share advantages than the followers as they have the first-mover advantage, pioneers must ensure that they are having at least one or more of three primary sources: Technological Leadership, Pre-emption of assets or buyer switching costs.

Technological Leadership means gaining an advantage through either Research and Development or the “learning curve” for using the research and development as a key point of selling.

Pre-emption of Assets can help gain an advantage through acquiring scarce assets within a certain market, allowing the first-mover to be able to have control of existing assets rather than those that are created through new technology.

By being a first entrant, it is easy to avoid higher switching costs compared to later entrants. For example, those who enter later would have to invest more expenditure in order to encourage customers away from early entrants. It has been found that while Pioneers in both consumer goods and industrial markets have gained “significant sales advantages”, they are at a disadvantage in terms of cost.

• *Close followers*

If there is a profit potential in the innovation introduced by market pioneer, many businesses would step in offering the same product. Such people are more commonly known as Close Followers. These entrants into the market can also be seen as challengers to the Market Pioneers and the Late Followers. This is because early followers are more than likely to invest a significant amount in Product Research and Development than later entrants.

Due to the nature of early followers and the research time being later than Market Pioneers, different development strategies are used as opposed to those who entered the market in the beginning, and the same is applied to those who are Late Followers in the market. By having a different strategy, it allows the followers to create their own unique selling point and perhaps target a different audience in comparison to that of the Market Pioneers.

• *Late Entrants*

Those who follow after the Close Followers are known as the Late Entrants. Late entrant has certain advantages such as ability to learn from their early competitors and improving the benefits or reducing the total costs. This allows them to create a strategy that could essentially mean gaining market share and most importantly, staying in the market. In addition to this, markets evolve, leading to consumers wanting improvements and

advancements on products. Late Followers could have a cost advantage over early entrants due to the use of product imitation. Late Entry into a market does not necessarily mean there is a disadvantage when it comes to market share, it depends on how the marketing mix is adopted and the performance of the business.

The requirements of individual customer markets are unique, and their purchases sufficient to make viable the design of a new marketing mix for each customer. If a company adopts this type of market strategy, a separate marketing mix is to be designed for each customer. Specific marketing mixes can be developed to appeal to most of the segments when market segmentation reveals several potential targets.

FORMULATION OF HUMAN RESOURCE STRATEGIES

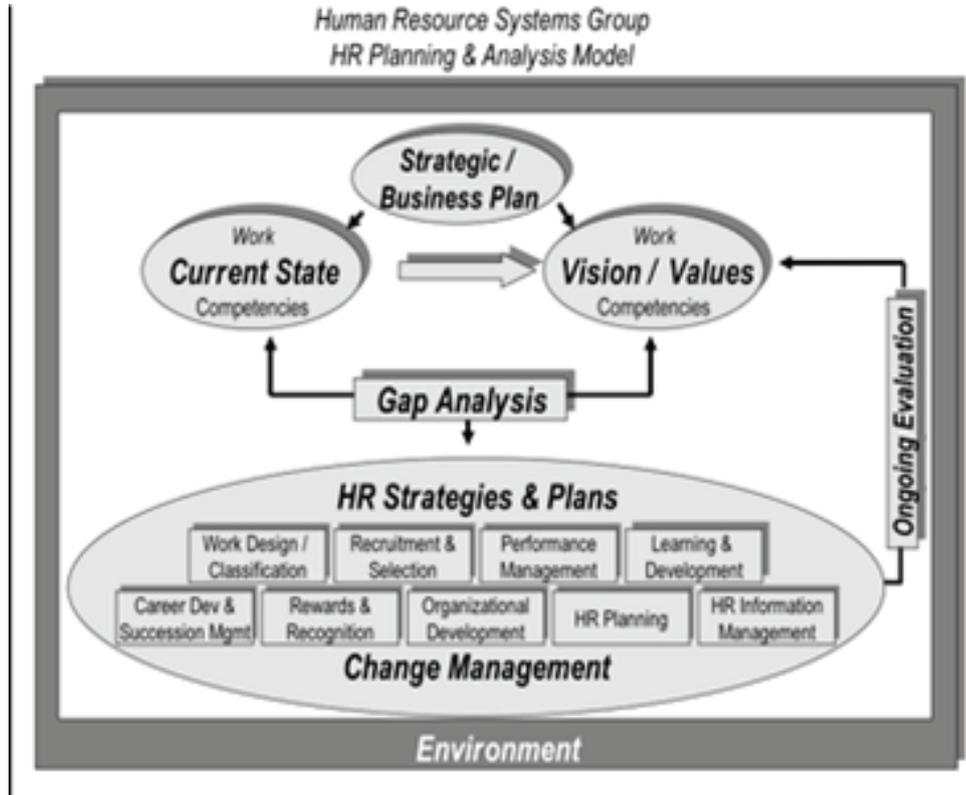
Human resource planning is a process that identifies current and future human resources needs for an organization to achieve its goals. Human resource planning should serve as a link between human resource management and the overall strategic plan of an organization. Ageing workers population in most western countries and growing demands for qualified workers in developing economies have underscored the importance of effective human resource planning.

As defined by Bulla and Scott, human resource planning is ‘the process for ensuring that the human resource requirements of an organization are identified and plans are made for satisfying those requirements’.

Human resource planning includes creating an employer brand, retention strategy, absence management strategy, flexibility strategy, (talent management) strategy, (recruitment) and selection strategy.

Reilly defined (workforce planning) as: ‘A process in which an organization attempts to estimate the demand for labour and evaluate the size, nature and sources of supply which will be required to meet the demand.’

This Strategic HR Planning and evaluation cycle is depicted in the diagram below



Human resource planning is the ongoing process of systematic planning to achieve the best use of an organisation’s most valuable asset – its human resources. The objective of human resource (HR) planning is

to ensure the best fit between employees and jobs, while avoiding workforce shortages or spares. The three key elements of the HR planning process are forecasting labour demand, analysing present labour supply, and balancing projected labour demand and supply.

IMPLEMENTING HR STRATEGY

1. Assessing the current HR capacity

This includes taking stock of the skills of the existing human resources of the organisation to have a clear understanding of the current skill set of the company. This will help in forecasting future HR requirements.

2. Forecasting HR requirements

This step includes projecting what the HR needs for the future will be based on the strategic goals of the organization and assessment of total skill set of existing human resources. Some questions to ask during this stage include:

- The positions to be filled in the future period
- The number of staff will be required to meet the strategic goals of the organization
- Effect of external environmental forces in getting new human resources

3. Gap analysis

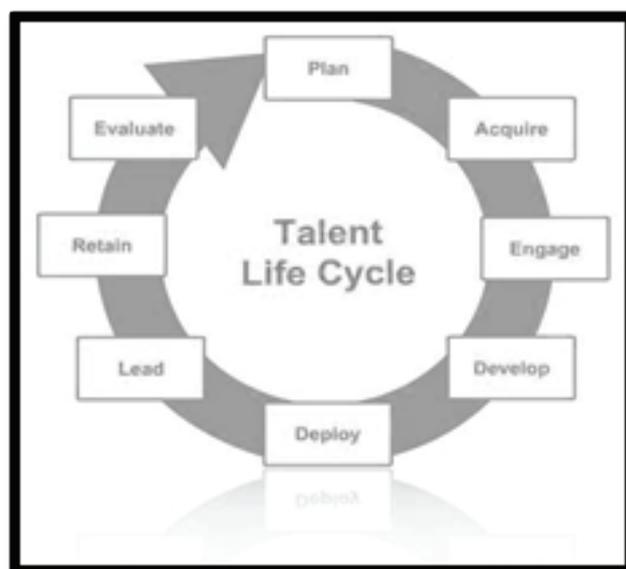
In this stage, one will make a comparison between existing and desired position of the organisation in terms of strategic. During this phase you should also review your current HR practices and if these require any amendments.

4. Developing HR strategies to support the strategies of the organization

The five HR strategies which may be adopted to attain the organizational goals are given hereunder:

- **Restructuring strategies**
This includes reducing staff, regrouping tasks to create well-designed jobs, and reorganizing work groups to perform more efficiently.
- **Training and development strategies**
This includes providing the current staff with training and development opportunities to encompass new roles in the organization
- **Recruitment strategies**
This includes recruiting new hires that already have the skills the organization will need in the future.
- **Outsourcing strategies**
This includes outreaching to external individuals or organizations to complete certain tasks.
- **Collaboration strategies**
This includes collaborating with other organizations to learn from how others do things, allow employees to gain skills and knowledge not previously available in their own organization.
- **Retention strategy**
Every area of the employer-employee relationship in your organization deserves your attention. Embrace these key strategies to improve your organization's employee retention and boost employee satisfaction:

- **Onboarding and orientation** – The job orientation is just one component of onboarding, aim to develop an onboarding process where new staff members not only learn about the job but also the company culture and how they can contribute and thrive, with ongoing discussions, goals and opportunities to address questions and issues as they arrive.
- **Mentorship programs** – Pairing a new employee with a mentor is a great for retention. New team members can learn from the experience of a senior.
- **Employee compensation** – the organisation should offer competitive compensation packages which include salaries, bonuses, paid time off, health benefits, retirement plans and all the other perks.
- **Recognition and rewards systems** – Every person wants to feel appreciated for what they do. When they go the extra mile, they should be recognized. Some companies set up rewards systems that incentivize great ideas and innovation.
- **Work-life balance** – A healthy work-life balance is essential. Companies should give a serious thought for offering telecommuting or flexible schedules to improve work-life balance for their employees.
- **Training and development** – Smart managers invest in their workers' professional development and seek opportunities for them to grow. Some companies pay for employees to attend conferences or industry events each year, or provide tuition reimbursement or continuing education training.
- **Communication and Feedback** – Lines of communication should be kept open for ensuring employee retention. Their ideas, questions and concerns must be welcomed.
- **Dealing with change** – If the organization is going through a merger, layoffs or other big changes, the employees must be taken into confidence beforehand to maintain their trust.
- **Fostering teamwork** – When people work together, they can achieve more than they would have individually. Foster a culture of collaboration by clarifying team objectives, business goals and roles, and encouraging everyone to contribute ideas and solutions.
- **Team celebration** – Celebrate major milestones for individuals and for the team. Whether the team just finished that huge quarterly project under budget or an employee brought home a new baby, seize the chance to celebrate together with a shared meal or group excursion.



Case Study: HR Strategy Adidas Group



Formulation of Production Strategy

The different types of production strategies are grouped, listed and explained under following three categories, viz.,



The types of production strategies under **Business Strategies** are as follows:

1. Differentiation strategy
2. Cost leadership strategy
3. Market segmentation strategy

The production strategies under **Competitive Priorities** are as follows:

1. Price or cost strategy
2. Quality strategy
3. Delivery strategy
4. Product mix or flexibility strategy
5. Service strategy
6. Eco-friendly products

The production strategies under **Competitive Advantages** are as follows

1. Flexible response strategy
2. Low cost strategy

The types of production strategies listed above are discussed as follows:

1. Differentiation strategy

Under a differentiation strategy, the company tries to make a product different and unique from that offered by its competitors in the market. Such a differentiation may be done in terms of enhanced quality, quantity, pricing, appearance, and after sales-service than its rivals. Such a uniqueness and divergence in its product quality and customer service may lead to fetching higher prices by the company in the same market.

2. Cost leadership strategy

Under a cost leadership strategy, the company tries to diminish its cost of production by reaping economies of the scale on a larger volume of production in a single batch. Higher the scale of production, lower will be the cost of production due to reduction in fixed costs per unit of production be it raw materials, labour, advertising, sales promotion, R & D, etc.

3. Market segmentation strategy

In market segmentation strategy, the company divides the market according to the type of customers it has to focus and target. It sells different products and services to different types of customers. To achieve this goal, it produces and sells goods and services as per the needs of the customers. Therefore, market segmentation strategy is also called **Focus Strategy**. For example, many detergent companies offer different variants of detergents with different price brackets.

4. Price or cost strategy

Under price or cost strategy, the company sells its product at a very small price. This strategy is used when the products are homogeneous in nature and company is not able to differentiate that. That is, when the customers cannot distinguish the company's product from the competitors' products. In this case, the company will fix a low price to fetch maximum market share. For example, match sticks; the customer will not care much about brand while buying this and will easily switch to other brand, if his current company tries to raise the price.

5. Quality strategy

Under quality strategy, the company produces and sells 'premium' goods and services. The prices of such goods and services are naturally very high such as luxury cars and bikes. However, this strategy attracts those customers who have huge incomes and therefore prefer top quality products as a status symbol and are ready to pay high prices intentionally. To gain success in the market, the company must smartly invest to make quality innovative products that are free from any defects.

6. Delivery strategy

Under delivery strategy, the company delivers its product and services to their customers as early as possible within a fixed time period. The company gives top priority to fast delivery of products and providing quickest accessibility of services. Speed delivery of products and fastest accessibility of services removes the problem of scarcity and unnecessary delays in the market. Delivery strategy is used as a selling tactic to fight cut-throat competition.

7. Product mix or flexibility strategy

Under this strategy, the company produces and sells a product mix. A product mix is a group of products, which are sold by the same company for example Hindustan Lever. Here, the company does not depend only on a single product for its survival and growth. It uses a product mix because it offers many advantages to the company. However, only large companies with huge production capacity can adopt this strategy.

8. Service strategy

Under this strategy, the company uses a service to attract the customers. It gives quicker and better after-sales service. It gives around the clock, i.e. 24-hour customer service. It may render this service directly via

the company or through the network of call centres. Service is required for both consumer goods as well as industrial goods.

9. Eco-friendly products

Under eco-friendly strategy, the company produces and sells environment-friendly products also called as **Green Products**. For e.g. producing and selling lead-free petrol to reduce pollution, manufacturing mercury-free television panels, etc., are some good steps to preserve nature. This is a new type of production strategy. It is used to reduce pollution and protect the biosphere. Companies may also recycle certain materials like plastic, metals and papers. The properly recycled products are later used for manufacturing new products and in packaging. Companies use biodegradable packing material to reduce the problem of waste disposal. Recycling reduces continuous demand cycle of natural resources and hence somewhat minimize the exploitation of environment. The company informs the public about their environment-friendly manufacturing approach through advertisements.

10. Flexible response strategy

Flexible response strategy is said to be used when a company makes required changes in its production plans in accordance with the emerging changes in the market. Here, focus is given to speed and reliability. That is, the company must make swift changes as per the emerging changes in the market demand. It must also give a regular supply of goods to its customers. There must not be any shortage of goods in the market. To achieve this, the company must follow a strict production schedule.

11. Low cost strategy

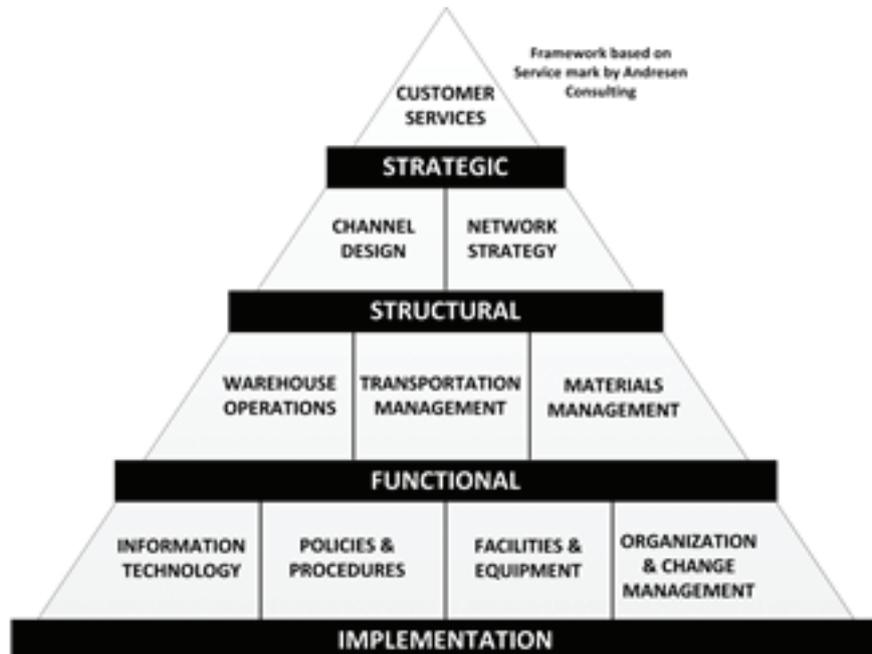
Under low cost strategy, the company fights massive market competition by selling its products at very lower prices. Simultaneously, it must also maintain the quality of its products. A company can only sell its goods at minimum prices if it maintains a low cost of production and distribution. This can be done by producing and distributing goods on a large scale. That is, company must take advantage of economies of large-scale production.

FORMULATION OF LOGISTICS STRATEGY

Logistics strategy is defined as “the set of guiding principles, driving forces and ingrained attitudes that help to coordinate goals, plans and policies between partners across a given supply chain.”

Logistics is not confined to tactical decisions about transportation and warehousing. Longer-term decisions are needed to put in place the capabilities that ensure that logistics plays a full role in supporting a company's products in the market place.

When a company creates a logistics strategy it is defining the service levels at which its logistics organization is at its most cost effective. Because supply chains are constantly changing and evolving, a company may develop a number of logistics strategies for specific product lines, specific countries, or specific customers.

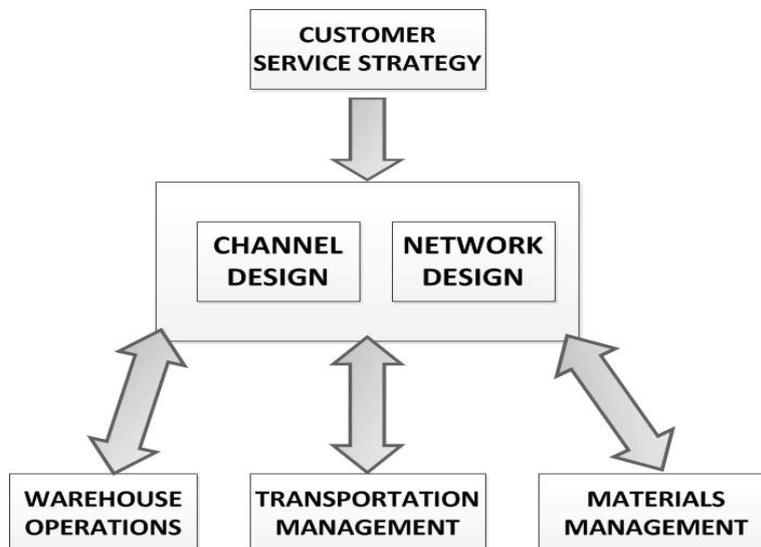


Strategic Level: By examining the company’s objectives and strategic supply chain decisions, the logistics strategy should review how the logistics organization contributes to those high-level objectives. The top level is the Strategic level that defines **Customer service strategy**. Customer service strategy is the driving force behind the design and operations of a company’s logistics supply chain. The key inputs that go into defining a customer service strategy are the company’s products, its markets and its customer service goals.

Structural and Functional Levels: In any Strategic planning exercise, there is an interplay between strategy and functional operations. In our logistics strategy framework, functional layers provides important inputs to finalize the Structural layer.

Channel Design: Pertains to activities and functions that need to be carried out to achieve the Customer service goal.

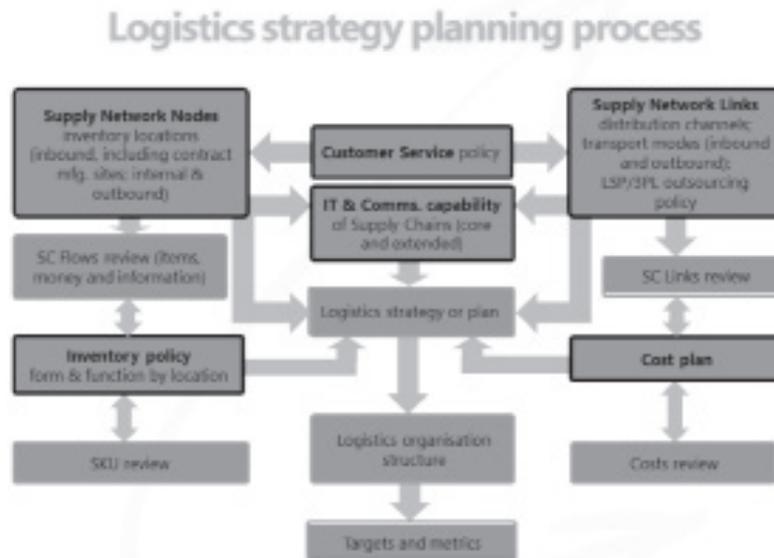
Network Strategy: Locations and missions of facilities and strategies for using these facilities to achieve the Customer service strategy.



The process of designing the Structural element of the strategy is integrated with the Functional elements of the strategy as well. Warehouse Operations, Transportation Management and Material management decisions are inputs to a detailed Structural strategy.

Implementation: In this final phase, people, business processes and IT come together to support and execute the Logistics Strategy. Implementation is one of the most important and challenging aspects of your Logistics strategy.

An example of one function is the Logistics Strategy plan:



Elements of the Logistics Strategy plan

The Logistics Strategy plan is then developed within eight elements:

1. *Customer service policy* – the appropriate level of service for customers, by product group or market segment; considering: order fulfilment requirements, enquiry and investigation capability and the available information. The customer service policy informs the nodes and links of the supply network
2. *Inventory location policy (Supply Network nodes)* – centralised or decentralised inventory; whether to differentiate facilities by fast and slow moving stock; location of sites; use of specific technologies and layouts; company-owned or contracted facilities
3. *Inventory policy* – form and function of inventory by location; the appropriate amount of stock to hold for various groups of inventory; planning structure that links outbound and inbound materials
4. *Cost plan* – trade-off analysis between cost and service level requirements; cost of Logistics operations
5. *Transport and distribution (Supply Network links) policy* – affected by whether enterprise imports or exports and the size and structure of conurbations being served. This incorporates transport modes, delivery pattern and storage location considerations, based on the time taken for deliveries.
6. *IT and Communications capability*: technologies (including software) that will be internally developed; buy planning and scheduling applications from single supplier or obtain ‘best of breed’ applications
7. *Logistics organisation structure*: function or flow based; allocation of responsibilities; managed or self-managed teams
8. *Logistics Targets and metrics*: measures of performance and achievement targets; operations improvements process and management

LESSON ROUND UP

- Business policies are the guidelines developed by an organization to govern the actions of those who are a part of it. They define the potential limits within which decisions must be made.
- The origins of business policy can be traced back to the year 1911, when Harvard Business School introduced an integrative course in management aimed at the creation of general management capability.
- Vision serves the purpose of stating what an organization wishes to achieve in the long run.
- A mission statement defines the basic reason for the existence of that organization. Such a statement reflects the corporate philosophy, identity, character, and image of an organization.
- Corporate Strategy highlights the pattern of business moves and goals concerning strategic interest, in different business units, product lines, customer groups, etc. It defines how the firm will remain sustainable in the long run.
- Where SBU concept is applied, each SBU sets its own strategies to make the best use of its resources (its strategic advantages) given the environment it faces.
- Functional strategy, relates to a single functional operation and the activities involved therein. Decisions at this level within the organization are often described as tactical.

TEST YOURSELF

1. What is Business Policy. Give its definition and features
2. Discuss features of Business Policy
3. Discuss the importance of Business Policy
4. Elaborate framework of Strategic Management
5. Discuss
 - Vision
 - Mission
 - Objectives
 - Goals
 - Purpose
 - Policy
 - Procedure
6. Formulation of Functional Strategy
7. Discuss tools and techniques of Strategic analysis
8. What are different types of production strategies

Lesson 14

Strategic Analysis and Planning

LESSON OUTLINE

- Situational Analysis,
- Strategic Choices-SWOT and TOWS Analysis;
- Programme Evaluation Review Technique and CPM (Critical Path Method);
- Portfolio analysis-Boston Consulting Group (BCG) growth share Matrix,
- Ansoff's Product Growth Matrix,
- ADL Matrix
- General Electric (GE) Model;
- Strategic Alternatives-Glueck and Jauch
- Michael Porter's Generic Strategies.
- Environmental Influences of Business
- Components of Business
- Environment
- Factors of Micro & Macro Environment of Business;
- Competitive Environment
- LESSON ROUND UP
- TEST YOURSELF

LEARNING OBJECTIVES

Strategic analysis and planning aims at providing overall direction to the organisation and specifying the organization's objectives, developing policies and plans designed to achieve these objectives, and then allocating resources to implement the plans. All this requires a careful analysis of the vision, mission, objectives, goals and resources of the organisation and in-depth analysis of the external environment.

A Situation Analysis paves the way for strategy development by identification of priorities by bringing out a clear, detailed and realistic picture of the opportunities, resources, challenges and barriers regarding a formulating a business plan.

The objective of this chapter is to assist the students to understand:

- The meaning and relevance of situation analysis
- Make use of a variety of tools and methods that includes SWOT and TOWS analysis with the aid of real life case studies
- Conducting portfolio analysis to determine internal capabilities of a company to compete in a market and fulfil customer expectations.
- Understanding strategic planning process
- Developing strategic alternatives
- Understanding combination strategies

STRATEGIC ANALYSIS AND PLANNING

Strategic analysis and planning involves careful formulation of the strategies and goals taken by a company's top management on behalf of the organization. It is based on deliberation of resources and an assessment of the internal and external environments in which the organization competes based on a variety of models. It aims at providing overall direction to the organisation and specifying the organization's objectives, developing policies and plans designed to achieve these objectives, and then allocating resources to implement the plans. All this requires a careful analysis of the vision, mission, objectives, goals and resources of the organisation and in-depth analysis of the external environment.

Situation Analysis

Before developing any strategy, the foremost requirement is carrying out a Situation Analysis. A **Situation analysis** or environmental analysis is an essential component of any strategy formulation and it has to be assured that such analysis is conducted periodically to keep the strategies up to date. A complete situation analysis focuses on four areas i.e.:

- The problem (its severity and its causes)
- The people (potential stakeholders)
- The broad context (in which the problem prevails)
- Factors (facilitating behavior change)

A situational analysis takes into account the internal and external environment of an entity or organization and clearly identifies its own capabilities, customers, potential customers, competitors and the business environment and the impact they are going to have on the entity or organization.

It can also help in identifying strengths, weakness, opportunities and threats to the organization or business which can help in forecasting the choices required to be made keeping in view the environmental developments.

Need of Situation Analysis

A **Situation Analysis** paves the way for strategy development by identification of priorities by bringing out a clear, detailed and realistic picture of the opportunities, resources, challenges and barriers regarding formulation of a business plan. The quality of the Situation Analysis will affect the success of the whole plan.

Suitability of Situation Analysis

A small, well knitted and focused team from different functional areas of the organisation should conduct the **situation analysis**. Throughout the data collection process, team members should also consider about engagement of concerned stakeholders including opinion leaders, service providers, policy makers, partners, and potential beneficiaries to reap maximum output. It may be done by conducting in-depth interviews, focus group discussions, community dialogues, small group meetings, taskforce engagements or participatory **stakeholder workshops**.

Timing of Conducting Situation Analysis

A **situation analysis** should be conducted at the beginning of any program or project but before developing a strategy.

Elements of Situation Analysis

- **Product Situation**

It relates with the products being offered by the business at present. It may further be sub-divided into

the core product and any secondary/ancillary or supporting products/services. While doing so, the needs of the customers should be taken into. This is so because, now a days, consumer is the king, therefore, everything needs to be tailor-made to the requirements of the customers.

- **Competitive situation**

This involves analysis of the competitive forces to identify the closest competitors. It involves finding out core competencies of the competitors as compared to our own organization and the areas in which they are have strong hold and the characteristics of the customers segment that are attracted by the competitors.

- **Distribution Situation**

Review your distribution and logistics network.

- **Environmental Factors**

The external and internal environmental factors which need to be taken into account. This includes economic or sociological factors that impact performance.

- **Opportunity and Issue Analysis**

Carrying out a SWOT analysis (Strengths, Weaknesses, Opportunity and Threats). Current opportunities available in the market, the main threats that business is facing and may face in the future, the strengths that the business can rely on and any weaknesses that may affect the business performance.

Effectiveness of Situation Analysis

The following questions may bring out the effectiveness of situation analysis:

- Is currently adopted situational analysis simple and practical to use?
- Is it easy and clear for even an outsider to understand?
- Is it focused on key factors that are impacting my business both internally and externally?
- Does it clearly identify future goals for the business?

SWOT/ TOWS ANALYSIS

Every manager is entrusted with the responsibility of setting up his/her organisation's mission and goals and creating a strategic plan that will guide the company to achieve its goals. For doing this, managers make use a variety of tools and methods to make a basis for decision making that includes SWOT and TOWS analysis, which are two closely related brainstorming exercises.

SWOT is a tool for strategic analysis of any organization, which takes into account both examination of the company's internal as well as of its external environment. It consists in recognition of key assets and weaknesses of the company and marching them to exploit future opportunities and combating threats. SWOT is quite helpful in formulating a company's strategy" (Ježerys, 2000).

SWOT may be expanded as:

S – Strengths

W – Weaknesses

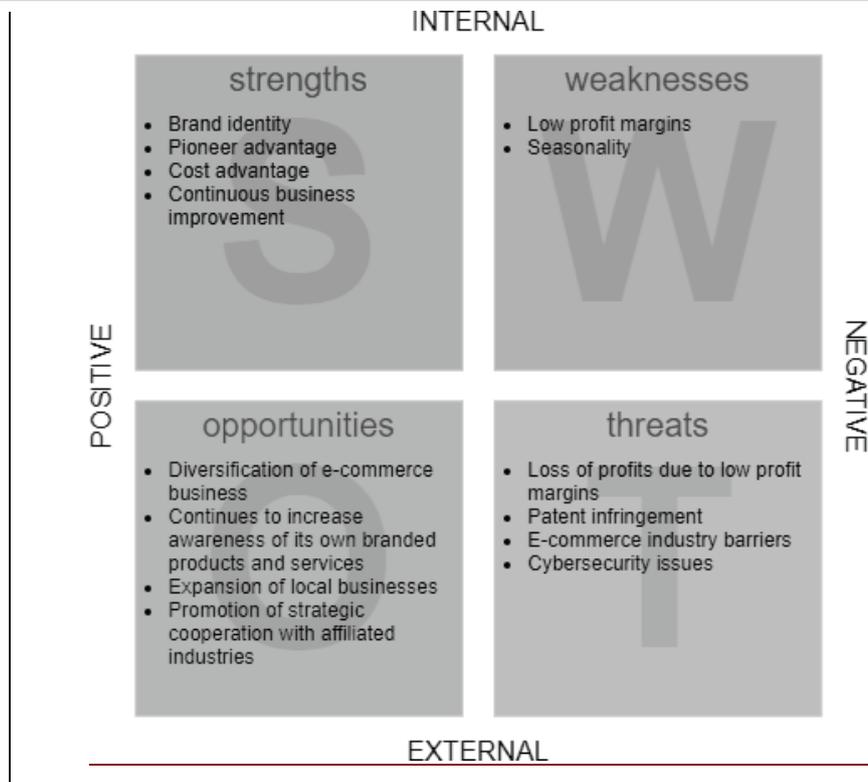
O – Opportunities

T – Threats.

The origin of the SWOT analysis is supposed to be rooted in the concept of 'Force Field Analysis' pronounced

by K. Levin in 1950s. However, 'Force Field Analysis' concept was too complex to be practically applied. Yet, it became a reference for scholars to develop some simpler methods, that included the SWOT analysis as well. It is noteworthy that SWOT may be successfully applied in any kind of organization, be it business or corporate sector, political party, public institutions, sport club, schools or universities etc.

1. Case Study 1: Amazon SWOT Analysis



Strength

- **Brand Identity:** Amazon Is Synonymous With Online Sales Services, And Amazon Focuses On Improving Customer Satisfaction During The Business Process.
- **Pioneer Advantage:** Amazon Is Undoubtedly The Leader In The Online Retail Industry.
- **Cost Structure:** Amazon Effectively Uses Its Cost Advantage, Operates On Thin Profits, And Is Still Profitable In Trading.
- **Business Development:** Amazon Continuously Improves Its Service Level And Provides Diversified Services.

Weakness

- **Low-Profit Margins:** Amazon Has A Very Thin Profit Margin To Maintain Its Cost-Leading Strategy. But Low-Profit Margins Make Companies Vulnerable To External Shocks And Crises, As Well As Other Market Changes.
- **Seasonality:** There Is A Seasonal Difference Between Amazon's Revenue And Business Scope, With Sales And Revenue Peaking In The Fourth Quarter Of Each Year.

Opportunity

- Today's Diversification Of E-Commerce Business

- Continues To Increase Awareness Of Its Own Branded Products And Services.
- Amazon Develops More Local Websites To Participate In The International Market. With The International Expansion Of Amazon, Some Local Businesses Have The Opportunity To Enter The International Market.
- Promoting The Strategic Cooperation Between Amazon E-Commerce And Its Related Affiliated Industries Will Drive Positive Development Of The Industry

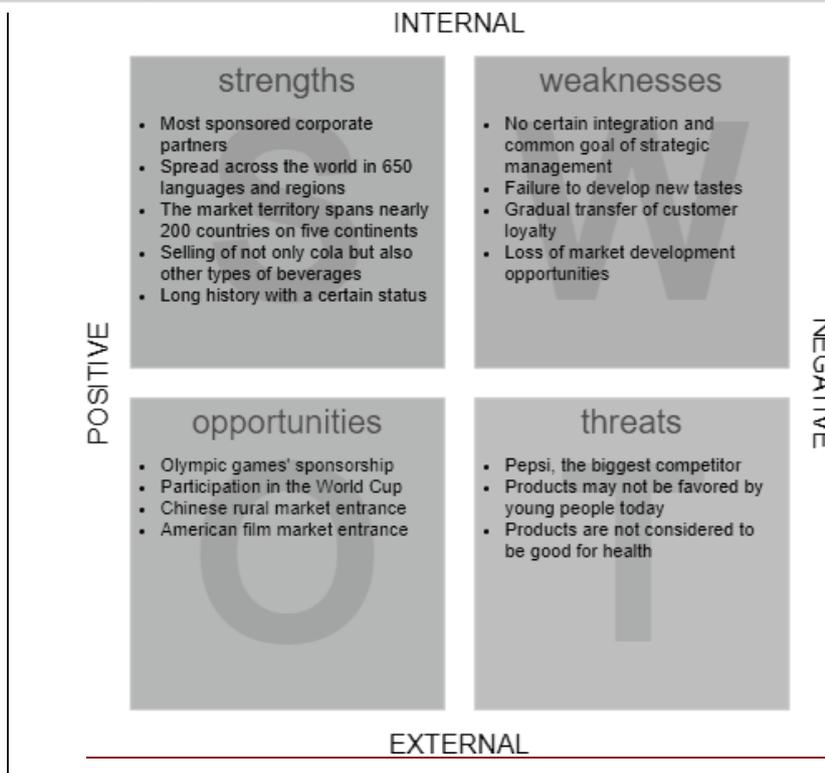
Threat

- Loss Of Profits Due To Low-Profit Margins
- Patent Infringement And Other Aspects Of Amazon’s Litigation
- E-Commerce Industry Barriers To Entry Barriers
- Cybersecurity Issues

Amazon – Recent Development

Amazon has seized the opportunity to successfully transform itself from an e-commerce company into a global leading technology company! When Amazon realized the limitations of the retail industry, it expanded its business boundaries promptly. In addition to cloud computing and smart voice, Amazon has also contacted third-party platforms such as logistics and suppliers, and even invested in the film and television industry, making its business model more diversify. In 2008, Amazon realized that content can attract and extend users’ time on the platform, and began to provide original content on Prime Instant Video, Amazon’s mainstream media video platform, and as part of the Prime membership service. Amazon’s ecology can be described as a rotating flywheel. This flywheel is centered on Prime’s membership system, and new interests have been added to it, gradually creating an all-encompassing ecology. While continuing to attract new users, it has promoted the development of Amazon’s e-commerce and other new businesses, and it will continue to do so.

2. Coca-Cola SWOT Analysis



Strength

1. Most sponsored corporate partners.
2. Spread across the world in 650 languages and regions.
3. The market territory spans nearly 200 countries on five continents.
4. To develop new products, the Coca-Cola Company not only sells cola but also other types of beverages.
5. Coca-Cola has a long history, so it has a certain status in the market.

Weaknesses

1. There is no certain integration and the common goal of strategic management.
2. The failure to develop new tastes.
3. The gradual transfer of customer loyalty.
4. Loss of market development opportunities.

Opportunity

1. Sponsor the Olympic Games, use this opportunity to replace their brands, products, and make advertisements, especially The Olympic Games is a worldwide movement that allows the world's population to recognize this product, expand its market reach, and raise awareness of its products.
2. Participate in the World Cup, take this world-wide activity to pave the way for your products and gain popularity.
3. Enter the Chinese rural market.
4. Enter the American film market.

Threat

1. Pepsi is Coca-Cola's biggest competitor
2. The products produced by the company may not be favored by young people today.
3. Coca-Cola is not considered to be good for health by many people

3. Skoda SWOT Analysis

Introduction

In 1895 in Czechoslovakia, two keen cyclists, Vaclav Laurin and Vaclav Klement, designed and produced their own bicycle. Their business became Skoda in 1925. Skoda went on to manufacture cycles, cars, farm ploughs and airplanes in Eastern Europe. Skoda overcame hard times over the next 65 years. These included war, economic depression and political change.

By 1990 the Czech management of Skoda was looking for a strong foreign partner. Volkswagen AG (VAG) was chosen because of its reputation for strength, quality and reliability. It is the largest car manufacturer in Europe providing an average of more than five million cars a year giving it a 12% share of the world car market.

Volkswagen AG comprises the Volkswagen, Audi, Skoda, SEAT, Volkswagen Commercial Vehicles, Lamborghini, Bentley and Bugatti brands. Each brand has its own specific character and is independent in the market. Skoda UK sells Skoda cars through its network of independent franchised dealers.

To improve its performance in the competitive car market, Skoda UK's management needed to assess its brand positioning. Brand positioning means establishing a distinctive image for the brand compared to competing brands. Only then could it grow from being a small player. To aid its decision-making, Skoda UK obtained market research data from internal and external strategic audits. This enabled it to take advantage of new opportunities and respond to threats.

The audit provided a summary of the business's overall strategic position by using a SWOT analysis. SWOT is an acronym which stands for:

- **Strengths** - the internal elements of the business that contribute to improvement and growth
- **Weaknesses** - the attributes that will hinder a business or make it vulnerable to failure
- **Opportunities** - the external conditions that could enable future growth
- **Threats** - the external factors which could negatively affect the business.

This case study focuses on how Skoda UK's management built on all the areas of the strategic audit. The outcome of the SWOT analysis was a strategy for effective competition in the car industry.

Strengths

To identify its strengths, Skoda UK carried out research. It asked customers directly for their opinions about its cars. It also used reliable independent surveys that tested customers' feelings.

For example, the annual JD Power customer satisfaction survey asks owners what they feel about cars they have owned for at least six months. JD Power surveys almost 20,000 car owners using detailed questionnaires. Skoda has been in the top five manufacturers in this survey for the past 13 years.

In Top Gear's 2007 customer satisfaction survey, 56,000 viewers gave their opinions on 152 models and voted Skoda the 'number 1 car maker'. Skoda's Octavia model has also won the 2008 *Auto Express* Driver Power 'Best Car'.

Skoda attributes these results to the business concentrating on owner experience rather than on sales. It has considered 'the human touch' from design through to sale. Skoda knows that 98% of its drivers would recommend Skoda to a friend. This is a clearly identifiable and quantifiable strength. Skoda uses this to guide its future strategic development and marketing of its brand image.

Strategic management guides a business so that it can compete and grow in its market. Skoda adopted a strategy focused on building cars that their owners would enjoy. This is different from simply maximising sales of a product. As a result, Skoda's biggest strength was the satisfaction of its customers. This means the brand is associated with a quality product and happy customers.

Weaknesses

A SWOT analysis identifies areas of weakness inside the business. Skoda UK's analysis showed that in order to grow it needed to address key questions about the brand position. Skoda has only 1.7% market share. This made it a very small player in the market for cars. The main issue it needed to address was: how did Skoda fit into this highly competitive, fragmented market?

a) **Perceptions of the brand:** This weakness was partly due to out-dated perceptions of the brand. These related to Skoda's eastern European origins. In the past the cars had an image of poor vehicle quality, design, assembly and materials. Crucially, this poor perception also affected Skoda owners. For many people, car ownership is all about image. If you are a Skoda driver, what do other people think?

From 1999 onwards, under Volkswagen AG ownership, Skoda changed this negative image. Skoda cars were

no longer seen as low-budget or low quality. However, a brand 'health check' in 2006 showed that Skoda still had a weak and neutral image in the mid-market range it occupies, compared to other players in this area, for example, Ford, Peugeot and Renault. This meant that, whilst the brand no longer had a poor image, it did not have a strong appeal either.

b) **Change of direction:** This understanding showed Skoda in which direction it needed to go. It needed to stop being defensive in promotional campaigns. The company had sought to correct old perceptions and demonstrate what Skoda cars were not. It realised it was now time to say what the brand does stand for. The marketing message for the change was simple: Skoda owners were known to be happy and contented with their cars. The car-buying public and the car industry as a whole needed convincing that Skoda cars were great to own and drive.

Opportunities

Opportunities occur in the external environment of a business. These include for example, gaps in the market for new products or services. In analysing the external market, Skoda noted that its competitors' marketing approaches focused on the product itself. Many brands place emphasis on the machine and the driving experience:

- Audi emphasises the technology through its strapline, 'Vorsprung Durch Technik' ('advantage through technology').
- BMW promotes 'the ultimate driving machine'.

Skoda UK discovered that its customers loved their cars more than owners of competitor brands, such as Renault or Ford.

Differentiation

Information from the SWOT analysis helped Skoda to differentiate its product range. Having a complete understanding of the brand's weaknesses allowed it to develop a strategy to strengthen the brand and take advantage of the opportunities in the market.

It focused on its existing strengths and provided cars focused on the customer experience. The focus on 'happy Skoda customers' is an opportunity. It enables Skoda to differentiate the Skoda brand to make it stand out from the competition. This is Skoda's unique selling proposition (USP) in the motor industry.

Threats

Threats come from outside of a business. These involve for example, a competitor launching cheaper products. A careful analysis of the nature, source and likelihood of these threats is a key part of the SWOT process.

The UK car market includes 50 different car makers selling 200 models. Within these there are over 2,000 model derivatives. Skoda UK needed to ensure that its messages were powerful enough for customers to hear within such a crowded and competitive environment. If not, potential buyers would overlook Skoda. This posed the threat of a further loss of market share. Skoda needed a strong product range to compete in the UK and globally.

In the UK the Skoda brand is represented by seven different cars. Each one is designed to appeal to different market segments. For example:

- the Skoda Fabia is sold as a basic but quality 'city car'
- the Skoda Superb offers a more luxurious, 'up-market' appeal

- the Skoda Octavia Estate provides a family with a fun drive but also a great big boot.

Pricing reflects the competitive nature of Skoda's market. Each model range is priced to appeal to different groups within the mainstream car market. The combination of a clear range with competitive pricing has overcome the threat of the crowded market.

Environmental constraints

The following example illustrates how Skoda responded to another of its threats, namely, the need to respond to EU legal and environmental regulations. Skoda responded by designing products that are environmentally friendly at every stage of their life cycle. For example:-

- recycling as much as possible. Skoda parts are marked for quick and easy identification when the car is taken apart.
- using the latest, most environmentally-friendly manufacturing technologies and facilities available. For instance, painting areas to protect against corrosion use lead-free, water based colours.
- designing processes to cut fuel consumption and emissions in petrol and diesel engines. These use lighter parts making vehicles as aerodynamic as possible to use less energy.
- using technology to design cars with lower noise levels and improved sound quality.

Outcomes and benefits of SWOT analysis

Skoda UK's SWOT analysis answered some key questions. It discovered that:

- Skoda car owners were happy about owning a Skoda
- the brand was no longer seen as a poorer version of competitors' cars.

However, the following observations were found:

- The brand was still very much within a niche market
- A change in public perception was vital for Skoda to compete and increase its market share of the mainstream car market.

The challenge was how to build on this and develop the brand so that it was viewed positively. It required a whole new marketing strategy.

Unique selling proposition

Skoda UK has responded with a new marketing strategy based on the confident slogan, 'the manufacturer of happy drivers'.

The campaign's promotional activities support the new brand position. The key messages for the campaign focus on the 'happy' customer experience and appeal at an emotional rather than a practical level. The campaign includes:

- The 'Fabia Cake' TV advert. This showed that the car was 'full of lovely stuff' with the happy music ('Favourite things') in the background.
- An improved and redesigned website which is easy and fun to use. This is to appeal to a young audience. It embodies the message 'experience the happiness of Skoda online'.

Customers are able to book test drives and order brochures online. The result is that potential customers will feel a Skoda is not only a reliable and sensible car to own, it is also 'lovely' to own.

Analysing the external opportunities and threats allows Skoda UK to pinpoint precisely how it should target its marketing messages. No other market player has 'driver happiness' as its USP.

By building on the understanding derived from the SWOT, Skoda UK has given new impetus to its campaign. At the same time, the campaign has addressed the threat of external competition by setting Skoda apart from its rivals.

TOWS

Wehrich developed TOWS Matrix in 1982, as the next step of SWOT Analysis in developing alternative strategies. TOWS Matrix is a conceptual framework for identifying and analyzing the threats (T) and opportunities (O) in the external environment and assessing the organization's weaknesses (W) and strengths (S). TOWS Matrix is an effective way of combining a) internal strengths with external opportunities and threats, and b) internal weaknesses with external opportunities and threats to develop a strategy.

1. The TOWS analysis starts with the external environment. Specifically, the listing of external threats (T) may be of immediate importance to the firm as some of these threats may seriously threaten the operation of the firm. These threats should be listed in quadrant T. Similarly, opportunities should be shown in quadrant O. Threats and opportunities may be found in different areas, but it is advisable to carefully look for the more common ones which may be categorized as economic, social, political and demographic factors, products and services, technology, markets and, of course, competition.
2. The firm's internal environment is assessed for its strengths (S) and weaknesses (W), and then listed in the respective quadrants. These factors may be found in management and organization, operations, finance, marketing and in other areas.

Though TOWS was created through rearrangement of the letters of SWOT analysis, yet, it may not be considered as just reversal of sequence of the SWOT analysis. This is so because, while in the SWOT analysis, one starts with evaluation of internal strengths and weaknesses and seeks the manner of their best application taking into account the external business environments, TOWS analysis scans opportunities and threats existing in external environment of any organization, and then generates, compares and selects strategies based on internal strengths and weakness to utilize such opportunities and reduce threats.

Michael Watkins of the "Harvard Business Review" says that focusing on threats and opportunities first helps lead to productive discussions about what is going on in the external environment rather than getting bogged down in abstract discussions about what a company is good at or bad at.

Therefore, it is not just reversal of letters of SWOT, but, a tool for strategy generation and selection. SWOT analysis is a tool for audit and analysis. One would use a SWOT at the beginning of the planning process, and a TOWS later as one decides upon ways forward.

• Who can use SWOT/TOWS

The SWOT/TOWS Matrix is not just meant for the top levels of management in an organisation. Rather, these two can be very useful tool for divisions, products, functions as well as departments. These can also be used for individual employees on an operational level. (Campbell, 2017).

• Why SWOT/TOWS

The SWOT/TOWS analysis is a very simple yet valuable technique which aids in identifying opportunities and threats from an external environment, and analyzing its own strengths and weakness. Such a review helps in establishing the relationship between threats, opportunities, weaknesses, and strengths for developing strategies and making decisions.

Further, use of TOWS by examining threats and opportunities before analyzing strengths and weaknesses can further allow for more productive analysis and interpretation of external environment leading to more informed decisions (Watkins, 2007). The TOWS Matrix also helps in brainstorming to bring out great ideas to generating effective strategies and tactics.

Four TOWS strategies: product of Trade-off between Internal and External factors

As said earlier, whereas SWOT Analysis starts with an internal analysis, the TOWS Matrix takes the other route, with an external environment analysis; the threats and opportunities are examined first. Then, in TOWS makes a trade-off between internal and external factors. As we know, Strengths and weaknesses are internal factors and opportunities and threats are external factors. This trade-off is the point where four potential strategies derive their importance, these are Strength/Opportunity (SO), Weakness/Opportunity (WO), Strength/Threat (ST) and Weakness/Threat (WT) as shown in matrix given below:

TOWS Analysis

INTERNAL FACTORS			
EXTERNAL FACTORS		Strengths (S)	Weaknesses (W)
	Opportunities (O)	Strengths/ Opportunities (SO)	Weaknesses/ Opportunities (WO)
	Threats (T)	Strengths/ Threats (ST)	Weaknesses/ Threats (WT)

www.marketingteacher.com/tows-analysis/

Strength/Opportunity (SO): Strengths of the companies are utilized to exploit the opportunities.

Weakness/Opportunity (WO): The organisation finds options that overcome weaknesses, and then take advantage of opportunities. Therefore, it mitigates weaknesses, to exploit opportunities.

Strength/Threat (ST): Exploiting strengths to overcome any potential threats.

Weakness/Threat (WT): With Weakness/Threat (WT) strategies one is attempting to minimise any weaknesses to avoid possible threat.

Strategies in TOWS

There are 4 types of strategies differentiated:

1. Aggressive strategy (maxi-maxi)
2. Conservative strategy (maxi-mini)
3. Competitive strategy (mini-maxi)
4. Defensive strategy (mini-mini)

	External Opportunities (O) 1. 2. 3.	External Threats (T) 1. 2. 3.
Internal Strengths (S) 1. 2. 3.	SO <i>'Maxi-Maxi' Strategy</i> Strategies that use strengths to maximise opportunities .	ST <i>'Maxi-Mini' Strategy</i> Strategies that use strengths to minimise threats .
Internal Weaknesses (W) 1. 2. 3.	WO <i>'Mini-Maxi' Strategy</i> Strategies that minimise weaknesses by taking advantage of opportunities .	WT <i>'Mini-Mini' Strategy</i> Strategies that minimise weaknesses and avoid threats .

Aggressive Strategy (maxi-maxi)

According to Krzysztof Oblój (2007) “the aggressive strategy (maxi-maxi) consists in maximum exploitation of the synergy effect present between the strong sides of the organization and opportunities generated by the environment. It is a strategy of strong expansion and diversified development (...)”.

Therefore, maxi-maxi refers to an organization, within which the synergy effect is present and opportunities are dominating in the environment. It consists in strong expansion and development, with maximum application of strengths and available opportunities.

The aggressive strategy embraces actions such as: capturing opportunities, strengthening position on the market, taking over organizations of the same profile, concentration of resources on competitive products. It is a strategy that exploits a synergy effect of company's strong sides and opportunities that appear in the environment (Klasik, 1993).

Conservative Strategy (maxi-mini)

It is present in an organization in a situation, when with high internal potential, it undergoes unfavorable system of external conditions or threats. The threats need to overcome with use of the strengths, e.g. the competitors should be bought and its shares taken over (Gierszewska I Romanowska, 2009).

The conservative strategy embraces such actions as: selection of products, market segmentation, reduction of costs, improvement of competitive products, development of new products, searching for new markets. It is a strategy, where success of an organization is mainly sought in its strong sides and reduction of threats (Klasik 1993).

Competitive Strategy (mini-maxi)

It is present in an organization, where weaknesses dominate over the strengths still there are opportunities prevailing in the environment. The competitive strategy consists in “(...) elimination of weak sides of company's operation and construction of its competitive strength through maximal exploitation of the existing opportunities that support development” (Oblój 2007).

The competitive strategy embrace such actions as: expansion of financial resources, improvement of commercial resources, improvement of a line of products, improvement of productivity, reduction of costs, maintenance of competitive advantage. It is a strategy that embraces construction of a competitive strength of an organization (Klasik, 1993).

Defensive Strategy (mini-mini)

This strategy enables survival in a situation, when an organization works in an unfavorable environment, it is deprived of strengths. It may lead to take maximal benefits from the company before its liquidation, or to combine it with another enterprise.

The defensive strategy encompasses such actions as: gradual withdrawal, reduction of costs, reduction of productive ability, ceasing the investment process. It is a strategy that provides survival, through counteracting weak sides and threats (Klasik, 1993).

CASE STUDY TOWS MATRIX FOR APPLE INC.

Strengths

- Market leader in an array of products and services
- Highly strong brand image
- Financial strength
- Innovative and highly sophisticated supply chain
- High profit margins
- Large and loyal customer base

Weaknesses:

- Products not priced competitively
- Thin product range in comparison to the competitors
- Products incompatible with the other brands

Opportunities

- Rising demand for the electronic gadgets
- Product diversification

Threats

- Elevated competition
- Rise in cost of inputs

Apple TOWS MATRIX

	Strengths (S)	Weaknesses (W)
Opportunities (O)	SO – Using strengths to capitalize on existing opportunities. Use brand image to diversify and develop partnership with other brands by introducing compatibility feature.	WO – Overcome weaknesses to capitalize on opportunities. Attract middle class customers by reducing price. Find new customer segments and introduce new products tailored for them.
Threats (T)	ST – Use strengths to combat threats. Control cost to beat competition. Focus on cultural change.	WT- Reduce weaknesses to combat threats. Exploit existing supply chain capabilities to reduce costs. Introduce competitively priced products.

Nike TOWS Matrix

Incorporated in 1967, Nike is known as a globally renowned brand in best sports shoe and apparels in the world and its main strategic suppliers for footwear are 127 footwear factories located in 15 countries. While it makes products mainly for athletic use, its products have also being liked in casual wear segment. Apart from a strong image and a market leading position, the brand is also known for its excellent marketing capabilities. However, that does not mean it does not have changes in its way. Currently, Nike has outsourced its supply chain operations entirely. It is focused on product innovation and extending its international presence. However, US is still its largest market. More points in the brief SWOT analysis below.

Strengths		Weaknesses	
<ul style="list-style-type: none"> • Brand Image • Excellent Marketing capabilities • Financial strength • International presence • huge well managed supply chain and distribution network 		<ul style="list-style-type: none"> • Over dependence on the US market • Increasing marketing and overhead operating expenses 	
Opportunities		Threats	
<ul style="list-style-type: none"> • Digitization and product innovation • Acquisitions • International expansion • Backward integration 		<ul style="list-style-type: none"> • Stronger US dollar hurting earnings • Increased competitive pressure • Growing HR and marketing expenses • Higher legal pressures 	
Strengths (S)		Weaknesses (W)	
Opportunities (O)	SO – Using strengths to capitalize on available opportunities. invest more in digitization and product innovation. Explore Asian markets. Take hold of supply chain.	WO	– Overcome weaknesses to capitalize on opportunities. expand faster in international markets by reducing dependence on US market alone. Controlling operational costs
Threats (T)	ST – Use strengths to avoid threats. use its marketing and innovation capabilities to keep the competitive pressure under control. keep investing in marketing, R&D as well as HR management. remain focused on compliance using internal compliance teams to control legal and regulatory pressures.	WT-	Reduce weaknesses to avoid threats. to invest more in marketing and grow its brand faster.

TOWS MATRIX OF PEPSI

We have discussed SWOT analysis of Pepsi-Co in our previous topic now here we are going to discuss the TOWS Matrix of Pepsi-Co, keeping in mind its SWOT analysis. Following is the detailed analysis of Pepsi-Cola TOWS matrix:

'WT' ANALYSIS

- One weakness that Pepsi possesses is that it has very strong taste it really feels that something highly toxic going inside the body, whereas the same product of the coke is not much strong.

- They also have a problem of imitators as receives complaints from customers that they find take product in disguised of Pepsi's product. During the last years, it was published in financial post that there has been big complaints from the customers with regard to the bad taste that they experienced during the span of six months. If they soon pay no attention towards that this will create a big problem for them.
- Large size may lead to conflicting interests.
- New one calorie products have no existing customer base; generic brands can make similar drinks – cheaper. It is also big threat for any company people may like or dislike new launching product.
- Such as in Pakistan, Hamayun Ahkhtar is its franchisee who has a strong political support from a political party which is in opposition. In; their era in government less taxes are imposed on them but relation increases as they come in opposition. So the selection is not appropriate as this thing is harmful to their image as well as the strategies. So this may become a big threat for the Pepsi.

'WO' ANALYSIS

- They have a lack of emphasis on this in their advertising such as currently when they losses the bid for official drink in the 96 cricket world cup. They started a campaign in which they highlight the factor such as “nothing official about it”. If they don't focus on sudden changing's in their advertising then they can convert this weakness into opportunity.
- They lack behind in catering the rural areas and just concentrating in the urban areas. They should try to increase their distributions and also focus on capturing rural areas; this will become a big opportunity for them.
- The other big weakness on Pepsi is that they don't pay any attention towards garments. They may enter in garments business in order to promote their brand name, by making sports cloths fro players which represent their name by wearing their clothes. That must increase the customer and income of the Pepsi.
- High expenses may have trouble balancing cash-flows of such a large operation. The staff may show dishonesty. They should try to pay much attention towards their cash flow, and audit there statements on regular basis.

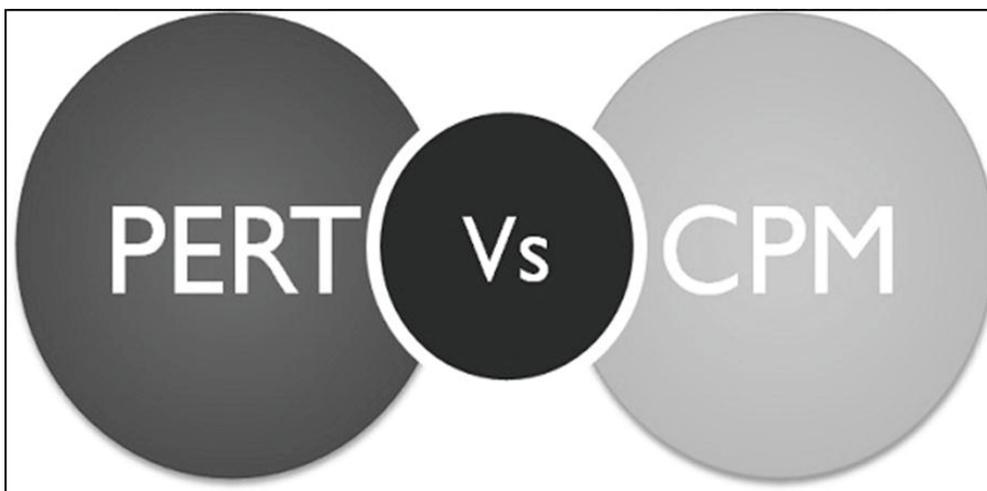
'ST' ANALYSIS

- In many countries Pepsi had more expensive products than Coke; such a high price may limit a lower income family from buying a Pepsi product, therefore which is a big threat for Pepsi that may Pepsi have to face in the future.
- In western countries, Pepsi have many branches with different flavors as compare to Asian countries, which has only 2 or 3 Pepsi products. Non-carbonated substitutes, such as juices and tea brands are maintaining a strong foothold in the market. Pepsi has a big threat from COKE, which are its main competitor from about 100 years.
- Pepsi is a multinational company therefore they have a big threat every time on them of Political instability and civil unrest.
- The whole culture and business operating environment at Pepsi-Cola-West Asia has quick access to a centralized database and they use computers as business tools for analysis and quick decision making. Computer breakdowns, viruses and hackers can reduce efficiency, and must constantly update products or other competitors will be more advanced.
- Continuous efforts to research trends an reinforce creativity, if they fail in their efforts then there is a big threat for the company. The competitors may get benefit by their plans.

'SO' ANALYSIS

- The whole culture and business operating environment at Pepsi-Cola-West Asia has quick access to a centralized database and they use computers as business tools for analysis and quick decision making. Internet promotion such as banner ads and keywords can increase their sales, and more computerized manufacturing and ordering processes can increase their efficiency and that will become such a big opportunity for Pepsi.
- Large No. of diversity businesses is also its main strength as it has diversity in many businesses such as Pepsi beverages, Pepsi foods, Pepsi Restaurants, and due to large number of diversity they can capture more customer, therefore it will become such a big opportunity for Pepsi.
- Pepsi is also a reputable organization, and is well known all over the world. Perception of producing a high quality product and strength can become a big opportunity for Pepsi if they use it in well arranged manner, such as advertising more and also by conducting concerts to attract more customers.
- They maintain a high quality as Pepsi Cola International collect sample from its different production facilities and send them for lab test in Tokyo, if they show test reports on label of there products this will also attract customers.
- They mainly use celebrities in their advertising campaigning like Imran Khan, Wasim Akram, and Waqar Younas etc. Also sponsor social activates programmed like music etc. this will become such a big opportunity to build such a large number of customers. So we can say that it is one of the big strength that may become a big opportunity for Pepsi.

Source: <http://stepheny.hubpages.com/hub/pepsi-swot-analysis-with-other-soft-drinks>

PERT (Programme evaluation Review Technique)and PM (Critical Path Method): Techniques of Project Management

One of the most challenging jobs that any manager can take on is the management of a large-scale project that requires coordinating numerous activities throughout the organization. A myriad of details must be considered in planning how to coordinate all these activities, in developing a realistic schedule, and then in monitoring the progress of the project. Therefore, the managers have to rely on Project management techniques to handle such large scale projects. Project Management is a systematic way of planning, scheduling, executing, monitoring, controlling the different aspects of the project, in order to attain the goal made at the time of project formulation.

PERT and CPM two complementary statistical techniques utilized in Project management. These two are network based scheduling methods that exhibit the flow and sequence of the activities and events. These techniques make heavy use of networks to help plan and display the coordination of all the activities.

First developed by the United States Navy in the 1950s to support the U.S. Navy's Polaris nuclear submarine project, PERT is commonly used in conjunction with the critical path method (CPM). After discovery by Navy, it found applications all over industry. DuPont's Critical Path Method was invented at roughly the same time as PERT. Today, PERT and CPM have been used for a variety of projects, including the following types.

- Construction of a new plant
- Research and development of a new product
- NASA space exploration projects
- Movie productions
- Building a ship
- Government-sponsored projects for developing a new weapons system
- Relocation of a major facility
- Maintenance of a nuclear reactor
- Installation of a management information system
- Conducting an advertising campaign

PERT/CPM identify the time required to complete the activities in a project, and the order of the steps. Each activity is assigned an earliest and latest start time and end time. Activities with no slack time are said to lie along the critical path—the path that must stay on time for the project to remain on schedule.

CPM: Key Points

The critical path method (CPM) is a project modeling technique developed in the late 1950s by Morgan R. Walker of DuPont and James E. Kelley Jr. of Remington Rand. CPM computes the longest path of planned jobs/activities to logical end points/the end of the project, and the earliest and latest time by which each activity can start and finish without making the project longer. This process determines the activities that are “critical” or on the longest path and having “total float” (i.e., can be delayed without making the project longer).

Critical Path Analysis is an effective and powerful method of assessing:

- What jobs/activities must be carried out.
- Where parallel activities can be performed.
- The shortest time to complete a project.
- Resources needed for a project.
- The sequence of activities, scheduling and timings.
- Task priorities.
- The most efficient way of shortening time on urgent projects.

An effective Critical Path Analysis can make the difference between success and failure on complex projects. It can be very useful for assessing the importance of problems faced during the implementation of the plan.

Steps in PERT and CPM

- (i) Each project consists of numerous independent jobs/activities. It is vital to identify and distinguish the various activities required for the completion of the project and list them separately.
- (ii) After listing, the order of precedence for these jobs needs to be determined. Certain jobs will have to be

done first. Therefore, jobs have to be completed before others should be determined. Also, a number of jobs may be carried out simultaneously. All such these relationships between the different jobs need to be clearly laid down.

- (iii) Then, a picture/graph portraying each of these jobs should be drawn showing the predecessor and successor relations among them. This graph shows the time required for completion of each job. This is known as the project graph or the arrow diagram.

The three steps given above can be understood with the help of an example. Suppose, a manger wishes to draw a project graph for preparing a operating budget for a manufacturing firm. To accomplish this project, the company salesmen must provide sales estimates in units for the period to the sales manager who would consolidate it and provide it to the production manager. He would also estimate market prices of the sale and give the total value of sales of the units to be produced and assign machines for their manufacture. He would also plan the requirements of labour and other inputs and give all these schedules together with the number of units to be produced to the accounts manager who would provide cost of production data to the budget officer.

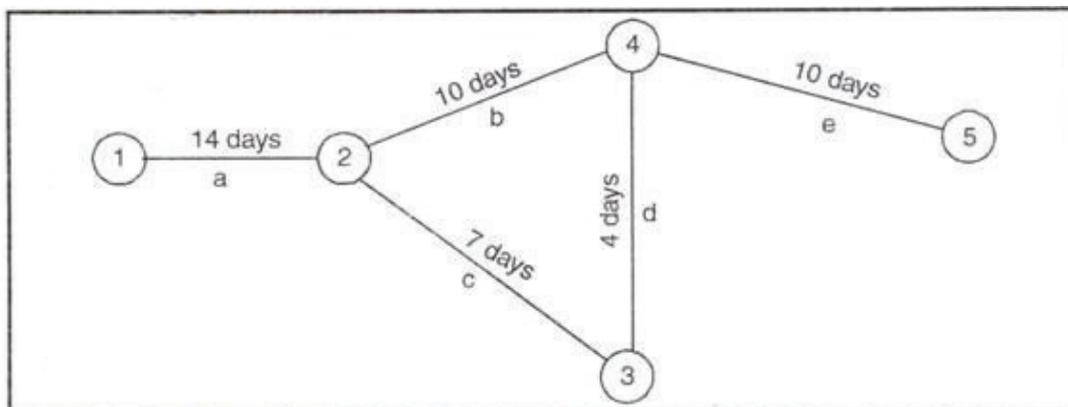
Using the information provided by the sales, production and accounting departments, and the budget officer would make the necessary arrangements for internal financing and prepare the budget. We have seen that the project of preparing the budget involves a number of activities.

These activities listed in the order of precedence are given below:

TABLE 1. The project of budgeting for company A

Job identification	Alternate	description	Deptt.	Time of performing the Job
a	(1,2)	Forecasting units of sale	Sales	14 days
b	(2,4)	Pricing sales	Sales	10 days
c	(2,3)	Preparing production schedules	Production	7 days
d	(3,4)	Costing the production	Accounting	4 days
e	(4,5)	Preparing the budget	Budget	10 days
				45 days

In this graph jobs are shown as arrows leading from one circle on the graph to another. Thus, the arrow connecting the two circles represents a job. Circle one and two represent job a i.e. forecasting of units sale which would take 14 days.

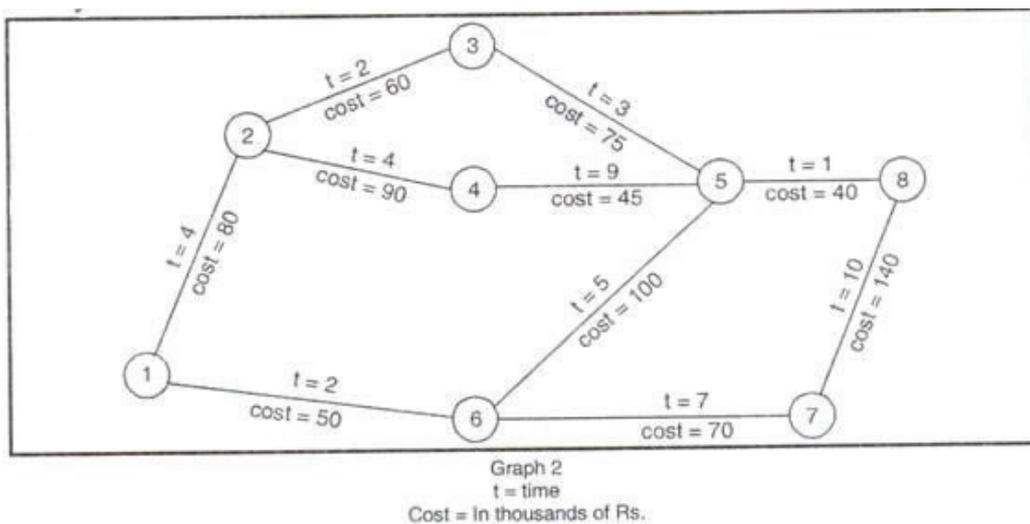


Graph 1

Path	No of Days Required	
1 - 2 - 4 - 5	14 + 10 + 10 = 34 Days	
1 - 2 - 3 - 4 - 5	14 + 7 + 4 + 10 = 35 Days	Critical Path being the longest duration.

Circles 2 and 4 represent job b which will take ten days and so on. It would be seen that job c is not dependent upon job b and therefore, the two jobs can be done simultaneously. Once we reduce the project to network of activities and events and we estimate activity durations, we are in a position to determine the minimum time required for completion of the whole project. To do so, one must find the longest path or sequence connecting the activities through the network. This is called the 'critical path' of the project. In ongoing example, there are two paths. One is connecting circle numbers 1, 2, 4 and 5. This path will take 14+10 + 10 = 34 days. The other path, is connecting circles 1,2,3,4 and 5, this path will takes 14 + 7 + 4 + 10 = 35 days. Clearly, the 2nd path is the critical path. It may, however, be noticed that this time is shorter than the total time listed under Table 1 which will be 45 days. This is because jobs b and c can be done simultaneously.

This technique is very useful in case of projects which involve a large number of activities. It makes the project manager list out all the possible activities, their relationships, find out which activities can be performed first, which next and which can be performed simultaneously so as to find out the best possible manner of completing the project.



In the above diagram the project has the following paths

Path	No of Days Required	
1 - 2 - 3 - 5 - 8	4 + 2 + 3 + 1 = 10 Days	
1 - 2 - 4 - 5 - 8	4 + 4 + 9 + 1 = 18 Days	
1 - 6 - 5 - 8	2 + 5 + 1 = 8 Days	
1 - 6 - 7 - 8	2 + 7 + 10 = 19 Days	Critical Path being the longest duration

Advantages of PERT

1. Compels managers to plan their projects critically in considerable detail from beginning to the end and analyse all factors affecting the progress of the plan.

2. Provides management a tool for forecasting the impact of schedule changes. The likely trouble spots are located early enough to take preventive measures or corrective actions.
3. A considerable amount of data may be presented in a precise manner. The task relationships are presented graphically for easier evaluation.
4. The PERT time is based upon 3-way estimate and hence is the most objective time in the light of uncertainties and results in greater degree of accuracy in time forecasting.
5. Results in improved communication with all concerned parties such as designers, contractors, project managers etc. The network will highlight areas that require attention of higher priority to the key jobs without ignoring the lower priority tasks.

Limitations of PERT

1. Uncertainty about the estimate of time and resources due to being based on assumptions.
2. The costs may be higher than the conventional methods of planning and as it needs a high degree of planning skill and minute details resulting in rise in time and manpower resources.
3. Not suitable for relatively simple and repetitive processes such as assembly line work which are fixed-sequence jobs.

Comparison Chart

BASIS FOR COMPARISON	PERT	CPM
Meaning	PERT is a project management technique, used to manage uncertain activities of a project.	CPM is a statistical technique of project management that manages well defined activities of a project.
What is it?	A technique of planning and control of time.	A method to control cost and time.
Orientation	Event-oriented	Activity-oriented
Evolution	Evolved as Research & Development project	Evolved as Construction project
Model	Probabilistic Model	Deterministic Model
Focuses on	Time	Time-cost trade-off
Appropriate for	High precision time estimate	Reasonable time estimate
Management of	Unpredictable Activities	Predictable activities
Nature of jobs	Non-repetitive nature	Repetitive nature
Critical and Non-critical activities	No differentiation	Differentiated
Suitable for	Research and Development Project	Non-research projects like civil construction, ship building etc.

PORTFOLIO ANALYSIS

Majority of business organisations have a portfolio of products on offer to their customers, rather than individual

products or brands, and will in many cases have branded products which complement each other in some way. Analysis of such portfolio becomes a necessity as the strengths and weaknesses of a company in such portfolio determine its internal capabilities to compete in a market and fulfil customer expectations. The tool to identify the strengths and weaknesses of a company is a Product Portfolio Analysis. The Product Portfolio Analysis was proposed in 1973 by Peter Drucker as a way to classify current and expected profitability. Drucker classified the offerings of a particular company into seven categories i.e. Today's Breadwinners, Tomorrow's Breadwinners, Yesterday's Breadwinners, Developments, Sleepers, Investments in Managerial Ego, and Failures. He classified products in the first three categories, "Today's Breadwinners," "Tomorrow's Breadwinners," and "Yesterday's Breadwinners," as strengths of the company while those in the last two categories, "Investments in Managerial Ego" and "Failures," as weaknesses. Then such portfolio analysis was made by other renowned entities also. The most quoted ones are:

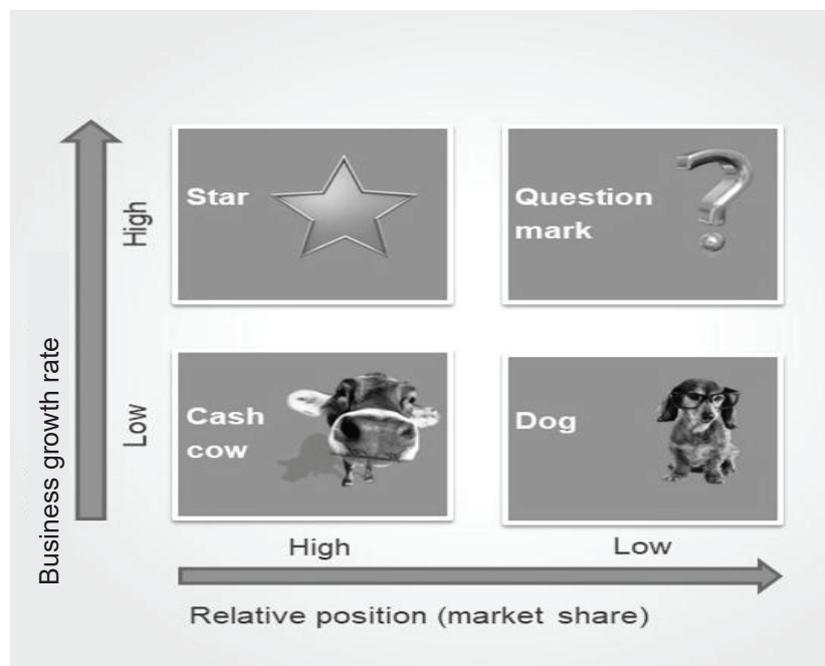
BCG MATRIX

"A company should have a portfolio of products with different growth rates and different market shares. The portfolio composition is a function of the balance between cash flows... Margins and cash generated are a function of market share."—Bruce Henderson, "The Product Portfolio," 1970.

The BCG Matrix was developed by the Boston Consulting Group (BCG) and is used for the evaluation of the organization's product portfolio in marketing and sales planning. BCG analysis is mainly used for Multi-Category/ Multi Product companies. All categories and products together are said to be the part of a Business portfolio. It aims to evaluate each product, i.e. the goods and services of the business in two dimensions:

- Market growth
- Market share

The combination of both dimensions creates a matrix into which the products from the portfolio are placed:



1) Cash Cows

Cash cows are products which have a high market share in a low growing market (see diagram above). As the business growth rate of market is low, cash cow gains the maximum advantage by generating maximum

revenue due to its higher market share. Therefore, for any company, the cash cows is the category of products which require minimal investment but ensure higher returns. These higher returns raise the level of overall profitability of the firm because such excess revenue generation can be used in other businesses which carry products falling in the category of Stars, Dogs or Question marks.

Strategies for cash cow – Cash cows are the most stable product/service line for any business and hence the strategy includes retention of the market share for such category. As the market growth rate is low and acquisition is less and customer retention is higher. Thus, customer satisfaction programs, loyalty programs and other such promotional methods form the core of the marketing plan for a cash cow product.

2) Stars

The products/services falling in this category are best products/services in the product portfolio of any company. This is so because, for such category of products, both market share as well as growth rate is high. Unlike cash cows, Stars cannot be complacent when they are top on because they can immediately be overtaken by another company which capitalizes on the market growth rate. However, if the strategies are successful, a Star can become a cash cow in the long run.

Strategies for Stars – All types of marketing, sales promotion and advertising strategies are used for Stars. Similarly in Stars, because of the high competition and rising market share, the concentration and investment needs to be high in marketing activities so as to increase and retain market share.

3) Question Marks

Several times, a company might come up with an innovative product which immediately gains good growth rate. However the market share of such a product is unknown. The product might lose customer interest and might not be bought anymore in which case it will not gain market share, the growth rate will go down and it will ultimately become a Dog.

On the other hand, the product might increase customer interest and more and more people might buy the product thus making the product a high market share product. From here the product can move on to be a Cash Cow as it has lower competition and high market share. Thus Question marks are products which may give high returns but at the same time may also flop and may have to be taken out of the market. This uncertainty gives the quadrant the name “Question Mark”. The major problem associated with having Question marks is the amount of investment which it might need and whether the investment will give returns in the end or whether it will be completely wasted.

Strategies for Question marks – As they are new entry products with high growth rate, the growth rate needs to be capitalized in such a manner that question marks turn into high market share products. New Customer acquisition strategies are the best strategies for converting Question marks to Stars or Cash cows. Furthermore, time to time market research also helps in determining consumer psychology for the product as well as the possible future of the product and a hard decision might have to be taken if the product goes into negative profitability.

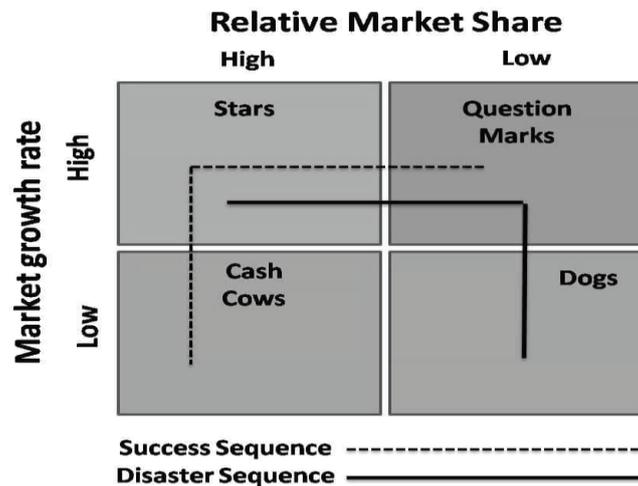
4) Dogs

Products are classified as dogs when they have low market share and low growth rate. Thus these products neither generate high amount of cash nor require higher investments. However, they are considered as negative profitability products mainly because the money already invested in the product can be used somewhere else. Thus over here businesses have to take a decision whether they should divest these products or they can revamp them and thereby make them saleable again which will subsequently increase the market share of the product.

Strategies for Dogs – Depending on the amount of cash which is already invested in this quadrant, the

company can either divest the product altogether or it can revamp the product through rebranding / innovation / adding features etc. However, moving a dog towards a star or a cash cow is very difficult. It can be moved only to the question mark region where again the future of the product is unknown. Thus in cases of Dog products, divestment strategy is used.

Sequences in BCG Matrix



Success Sequence in BCG Matrix – The Success sequence of BCG matrix happens when a question mark becomes a Star and finally it becomes a cash cow. This is the best sequence which really give a boost to the companies profits and growth. The success sequence unlike the disaster sequence is entirely dependent on the *right decision making*.

Disaster sequence in BCG Matrix – Disaster sequence of BCG matrix happens when a product which is a star, due to competitive pressure might be moved to a question mark. It fails out from the competition and it is moved to a dog and finally it may have to be divested because of its low market share and low growth rate. Thus the disaster sequence might happen because of wrong decision making. This sequence affects the company as a lot of investments are lost to the divested product. Along with this the money coming in from the cash cow which is used for other products too is lost..

Steps in BCG Matrix

BCG matrix is a framework to help understand, which brands the firm should invest in and which ones should be divested. Following are the steps involved:

- Step 1. Choose the unit
- Step 2. Define the market
- Step 3. Calculate relative market share
- Step 4. Find out market growth rate
- Step 5. Draw the circles on a matrix

Step 1. Choose the unit. BCG matrix can be used to analyze SBUs, separate brands, products or a firm as a unit itself. Which unit will be chosen will have an impact on the whole analysis. Therefore, it is essential to define the unit for which you'll do the analysis.

Step 2. Define the market. Defining the market is one of the most important things to do in this analysis. This is because incorrectly defined market may lead to poor classification. For example, if we would do the analysis for the Daimler's Mercedes-Benz car brand in the passenger vehicle market it would end up as a dog (it holds less

than 20% relative market share), but it would be a cash cow in the luxury car market. It is important to clearly define the market to better understand firm's portfolio position.

Step 3. Calculate relative market share. Relative market share can be calculated in terms of revenues or market share. It is calculated by dividing your own brand's market share (revenues) by the market share (or revenues) of your largest competitor in that industry. For example, if your competitor's market share in refrigerator's industry was 25% and your firm's brand market share was 10% in the same year, your relative market share would be only 0.4. Relative market share is given on x-axis. It's top left corner is set at 1, midpoint at 0.5 and top right corner at 0 (see the example below for this).

$$\text{Relative Market Share} = \frac{\text{Your firm's market share (or revenues)}}{\text{Largest competitor's market share (or revenues)}}$$

Step 4. Find out market growth rate. The industry growth rate can be found in industry reports, which are usually available online for free. It can also be calculated by looking at average revenue growth of the leading industry firms. Market growth rate is measured in percentage terms. The midpoint of the y-axis is usually set at 10% growth rate, but this can vary. Some industries grow for years but at average rate of 1 or 2% per year. Therefore, when doing the analysis you should find out what growth rate is seen as significant (midpoint) to separate cash cows from stars and question marks from dogs.

Step 5. Draw the circles on a matrix. After calculating all the measures, you should be able to plot your brands on the matrix. You should do this by drawing a circle for each brand. The size of the circle should correspond to the proportion of business revenue generated by that brand.

Strategies based on the BCG Matrix.

There are four strategies possible for any product / SBU and these are the strategies which are used after the BCG analysis. These strategies are

- 1) **Build** – By increasing investment, the product is given an impetus such that the product increases its market share. Example – Pushing a Question mark into a Star and finally a cash cow (Success sequence)
- 2) **Hold** – The company cannot invest or it has other investment commitments due to which it holds the product in the same quadrant. Example – Holding a star there itself as higher investment to move a star into cash cow is currently not possible.
- 3) **Harvest** – Best observed in the Cash cow scenario, wherein the company reduces the amount of investment and tries to take out maximum cash flow from the said product which increases the overall profitability.
- 4) **Divest** – Best observed in case of Dog quadrant products which are generally divested to release the amount of money already stuck in the business.

Thus the BCG matrix is the best way for a business portfolio analysis. The strategies recommended after BCG analysis help the firm decide on the right line of action and help them implement the same.

THE ORIGINAL BCG MATRIX

At the height of its success, in the late 1970s and early 1980s, the growth share matrix (or approaches based on it) was used by about half of all Fortune 500 companies, according to estimates.

The matrix helped companies decide which markets and business units to invest in on the basis of two factors—company competitiveness and market attractiveness—with the underlying drivers for these factors being relative market share and growth rate, respectively. The logic was that market leadership, expressed through

high relative share, resulted in sustainably superior returns. In the long run, the market leader obtained a self-reinforcing cost advantage through scale and experience that competitors found difficult to replicate. High growth rates signaled the markets in which leadership could be most easily built.

Putting these drivers in a matrix revealed four quadrants, each with a specific strategic imperative. Low-growth, high-share “cash cows” should be milked for cash to reinvest in high-growth, high-share “stars” with high future potential. High-growth, low-share “question marks” should be invested in or discarded, depending on their chances of becoming stars. Low-share, low-growth “pets” are essentially worthless and should be liquidated, divested, or repositioned given that their current positioning is unlikely to ever generate cash.

The utility of the matrix in practice was two fold:

- The matrix provided conglomerates and diversified industrial companies with a logic to redeploy cash from cash cows to business units with higher growth potential. This came at a time when units often kept and reinvested their own cash—which in some cases had the effect of continuously decreasing returns on investment. Conglomerates that allocated cash smartly gained an advantage.
- It also provided companies with a simple but powerful tool for maximizing the competitiveness, value, and sustainability of their business by allowing them to strike the right balance between the exploitation of mature businesses and the exploration of new businesses to secure future growth.

Criticism of the BCG Matrix

The BCG Matrix has lost some of its popularity following the development of other models, and drawn criticism for making some false suppositions such as:

- It assumes that a business unit with a higher market share will generate more cash. While it has been observed that a unit that has a high market share needs to keep investing in itself to sustain this share and, therefore, may absorb cash instead of generating it.
- Also, the matrix seems to ignore interdependencies among a corporation’s business units. A dog, for example, may be helping a question mark or a star with cash.
- The matrix also seems to use broad definitions of market share and market growth overlooking niche market — a unit that makes scooter tyres, for instance, may have a big market share in this niche segment, but only a minuscule share of the overall tyre market. The corporation that owns this unit may be using it as a cash cow for the benefit of a “star” or a “question mark” in its portfolio.
- The matrix has also been criticised for suggesting that all corporations will identify units or products in the four quadrants, and that units or products will travel through all the four quadrants in their life cycles.
- market growth rate is only one factor that makes an industry attractive. Similarly, relative market share is only one factor that gives a unit a competitive advantage. According to critics, the matrix ignores other factors that determine profitability. At least some critics suggest the use of the GE/McKinsey Matrix.
- The market share of the matrix does not guarantee profitability.
- The BCG matrix does not consider decreasing markets enough; Cash Cows could disappear without reason.
- Both axes have been assigned the same value. In practice, this value can depend on the strategy.
- The coherence as regards content between products and product groups is not incorporated.
- The BCG matrix does not show what the competition is doing.
- The BCG matrix may oversimplify the assessments of the facts.

BCG's Response to Criticism : Matrix 2.0

In a paper published in 2014, the BCG, while defending the basic principles of the matrix, acknowledges that the business world and the distribution of companies across the matrix have changed.

It recommends “strategic experimentation [with the original matrix] to allow adaptation to an increasingly unpredictable business environment.”

The paper admits that in the modern business environment, the matrix needs “a new measure of competitiveness to replace its horizontal axis,” as market share cannot be relied upon as a strong pointer to performance anymore.

It says companies need to look at new markets and products to renew their advantage and desist from wasting resources. They need to invest in more question marks to help the promising ones grow into stars.

Responding to the marketplace, they should also cash out stars, retire cows, and maximize the information value of pets.

The BCG gives the example of Google, with its portfolio of AdWords, AdSense, Android, and other products, and says that at that company, portfolio management is “embedded in organizational abilities that facilitate strategic experimentation.”

At Google, questions marks are generated, and a few are selected and tried out before they are scaled up.

Making suggestions for using “BCG Matrix 2.0,” the paper puts forward “four practical imperatives” that businesses can use in strategic experimentation.

ANSOFF GROWTH MATRIX – FOUR WAYS TO GROW A BUSINESS

This matrix is also known as the **Ansoff Product-Market Growth matrix** or the Four Ways To Grow A Business model.

What is the Ansoff Growth Matrix?

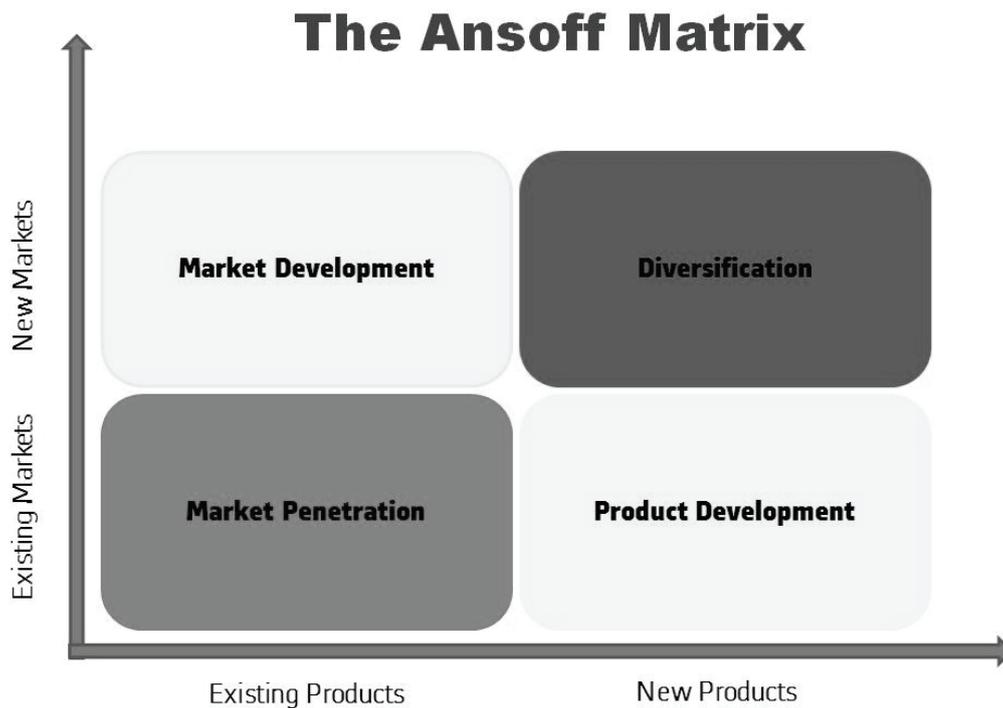
It first appeared in the Harvard Business Review in 1957 and was created by strategist Igor Ansoff to help management teams to focus on the options for business growth. In common with other popular strategy models, it is build around a two by two matrix.

- current products or new products
- current markets or new markets

The Four Growth Options of The Ansoff Growth Matrix

- Market penetration strategy – current products and current markets
- Product development strategy – new products and current markets
- Market development strategy – current products and new markets
- Diversification – new products and new markets

These are best seen in a diagram.



Option 1 Market Penetration

Market penetration strategy is the preferred route to growth for many businesses because its focus is on selling more of the existing products to:

- Current customers
- Customers similar to current customer base but who are buying competitors products
- Customers similar to current customer base who have need of product but aren't buying it yet.

The emphasis is on escalating market share by making some rigorous marketing promotions, or by creating more customer value.

The market penetration option within Ansoff's growth matrix uses existing resources and capabilities and can be thought of as "business as usual but on steroids".

The downsides of the market penetration strategy are:

- If a firm has already high market share, the opportunities for growth may be limited. Some markets logically limit the share of the leading player because they feature the concentration of market power.
- Aggressive market penetration strategies will add to competitive rivalries in the industry and may provoke a price war which shrinks industry profitability. To make significant increases in market share, the business must be willing to throw the competitors out of the market.
- Increasing exposure to one product-market segment can make the business more susceptible to future changes in competition by keeping "all the eggs in one basket".

Option 2 Product Development

In product development, businesses continue to focus on the needs of existing customer base and also the wider customer market they represent but they seek to understand their underlying needs so they can see opportunities for new products:

- To replace present product profile with new and better products.
- To provide products which complement the main product sold by the business.
- To provide “one stop shop” by adding new products to value chain to strengthen or leverage the relationship and to provide added convenience.

You may attract new competitors into your market as a respond to you offering the products they traditionally sell. Competition has shifted up a level from coexistence selling your specific products to active competition selling the same broader range.

Option 3 In the Ansoff Growth Strategy Matrix – Market Development

The third option suggested by Ansoff is to take the current products and find new markets for them.

There are different ways to do this

- Opening up previously excluded market segments through pricing policies e.g. discounts for students and old age pensioners at theatres.
- New marketing and distribution channels. Making a product available on the Internet with the necessary search engine optimisation means that anyone looking can find it, rather than rely on your marketing message to reach them by convention means. The supermarkets sell financial services to people who wouldn't contact a broker or agent.
- Entering new geographic markets by moving from local to regional to national and finally international. This may require the business to acquire new capabilities including exporting, understanding different cultures and language skills.

The strength of this option from the Ansoff Growth matrix is that it puts the pressure on the marketing and sales functions of the business and leaves the operations/supply side to concentrate on what it does best.

Some product development may be inevitable as there are few global products that don't make any concessions to local market needs. Success depends on being able to identify the best markets to develop which offer a genuine opportunity and where you have an effective competitive advantage. It also requires knowing which markets to avoid either because they are too difficult, too different or risk competitive reaction.

Again your action to expand your market may attract the attention of competitors who currently only trade in zones where you don't.

Option 4 In The Ansoff Growth Matrix – Diversification

This option is the most controversial since diversification involves taking new products to new customers.

There are three levels of diversification:

- Diversification into related markets – while the customers and products are both new, there is a logic about the move that makes sense to the outside world.
- Diversification into unrelated markets using existing resources and capabilities – while the customers and products are different, they all rely on the existing strengths of the business. Metal fabricators and plastic extrusion manufacturers are able to move across markets and produce custom designed products relatively easily because customers are buying access to the core competences.
- Diversification into unrelated markets which require new resources and capabilities.
- Diversification is the most risky growth strategy in Ansoff's growth matrix and especially if it requires the development of new resources and capabilities. It has even been referred to as the “suicide cell”.

The big advantage of diversification is that while each move is risky, if it is successful it reduces the overall risk of the business to factors outside of the control of the business like the wider economic environment, climate change etc. It may also make the business much less seasonal – think bikinis and other swimwear for the summer, umbrellas for the spring and autumn and heavy overcoats for the winter.

It may also help the business to move away from industries that are unattractive because they are super-competitive or in long term decline to fast growing, new markets.

How to Use Ansoff Growth Matrix

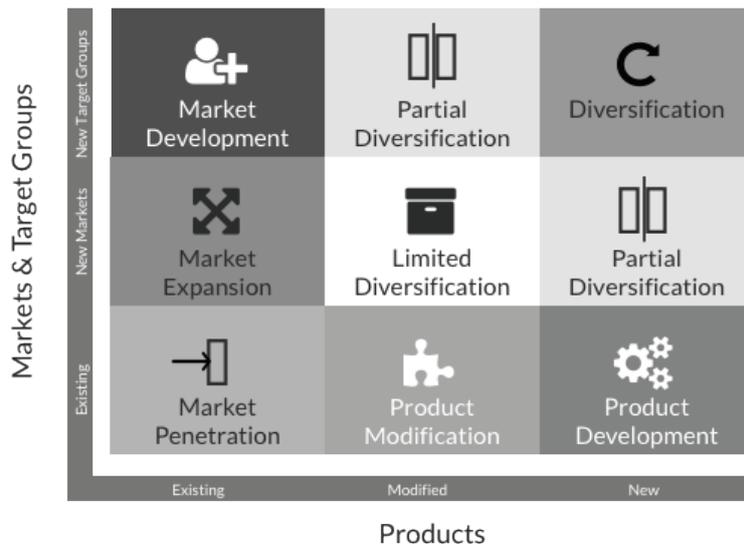
There are two ways to use the Ansoff Growth Matrix

1. As a tool for brainstorming to help identify possible strategic options.
2. As a tool for assessing preferred strategic options to check for some kind of balance. there aren't right or wrong answers but you might be shocked to discover that all six growth strategies you intend to follow fall into the diversification box.

Developments to the Ansoff Growth Matrix

The original matrix developed by Ansoff was the simple 2 x 2 matrix presented above.

Ansoff later refined the matrix into a 3 dimensional version which is placed below.



Others have turned the matrix from 2x2 into 3x3 by introducing middle categories for expanded markets and modified products to give more flexibility to the tool. This allows shading from “a little different” to “very different”.

ADL MATRIX

The Arthur D. Little provides with the ADL matrix that is a portfolio management method based on thought of product life cycle. The ADL portfolio management involves the dimensions of environmental assessment and business strength assessment. The environmental assessment approaches to industry maturity whereas business strength assessment leads to competitive position. In determining both assessments, the matrix helps out the firms in analyzing their business role in the market place (Porter, 2008).

ADL Matrix (Portfolio Management)

		Industry Life Cycle Stage			
		Embryonic	Growth	Mature	Aging
Competitive Position	Dominant	All out push for share. Hold Position.	Hold Position. Hold Share.	Hold Position. Grow with Industry.	Hold Position.
	Strong	Attempt to improve position. All out push for share.	Attempt to improve position. Push for share.	Hold Position. Grow with Industry.	Hold position or Harvest
	Favorable	Selective or all out push for share. Selectively attempt to improve position.	Attempt to improve position. Push for share.	Custodial or maintenance. Find niche and attempt to protect it.	Harvest, or phase out withdrawal.
	Tenable	Selectively push for position.	Find niche and protect it.	Find niche and hang on, or phased out withdrawal.	Phased out withdrawal, or abandon.
	Weak	Up or out	Turnaround or abandon.	Turnaround, orphaned out withdrawal.	Abandon

Industry Maturity or Life Cycle stage

In ADL portfolio management, industry maturity is very close to the product life cycle or it could be renamed as industry life cycle, though with the industry segments are also considered. Industry maturity is classified in four following divisions;

- **Embryonic:** It involves the introduction stage by following rapid market growth, no or little competition, high prices and investments and new technology.
- **Growth:** In this stage, market is strengthening as the sales increases, few competitors make an appearance and company achieves excellence in bringing up a new product.
- **Mature:** At maturity stage the market is completely stable with well established base of customers and market shares are also stable. Customers are making repeated orders, but, with a lot of competitors, the company has to make efforts in differentiating their product from competitors.
- **Aging:** The last stage of the market in which market volume shrinks as the demand declines, snatching market shares from the competitors becomes difficult, then company requires innovating or modifying the product or to make an exit.

The assessments of the industry life cycle are based on the facts like business market share, investment, profitability and cash flow.

Competitive Position

Competitive position is derived from different segments in which Strategic Business Unit operates. It is more

focused on the organization's competitive position which involves the strong strength of the product and the dispersed geographical factors means that it works in the area of product and place (Peter, 2008). Competitive position comprises of five categories that are:

Dominant: this is a rare phenomenon, as it is a near monopoly situation, appears in results of innovative out of the box product/technology is introduced in the market by a very strong brand

Strong: market share is higher as the position of company is comparably powerful although the competitors are working aggressively.

Favorable: Company has an strong edge in certain limited segments of its competitive strengths. Strength of the product and geographical advantages are taken into consideration at this stage and need to be constantly protected.

Tenable: - The company keeps strong position in small niche, specific geographic location or very focused product differences. The force of competitors strengthens and causes difficulties for the company.

Weak: The profitability is not satisfactory making position of the company unattractive, the market share is declining though they have opportunities in order to enhance their position in the market and becoming favorable.

How to use ADL Matrix?

Following are the steps that are involved in using the ADL Matrix (Herman, 2006);

- Identify the industry maturity category
- Determining competitive position
- Plot the position of the matrix

GE McKinsey Matrix

GE McKinsey Matrix is a strategy tool for a multi business corporation used in brand marketing and product management that assists a company to decide about the products to be added to its portfolio and opportunities to be prioritized in the market for investment. It is a framework that evaluates business portfolio, provides further strategic implications and helps to prioritize the investment needed for each business unit (BU).

Though it is conceptually similar to BCG analysis, but somewhat more complicated than BCG Matrix. This is so because, in BCG analysis, a two-dimensional portfolio matrix is created, while, with the GE model the dimensions are multi-factorial. One dimension comprises industry attractiveness measures; the other comprises of internal business strength measures. The GE matrix helps a strategic business unit (SBU) to evaluate its overall strength.

Understanding the tool

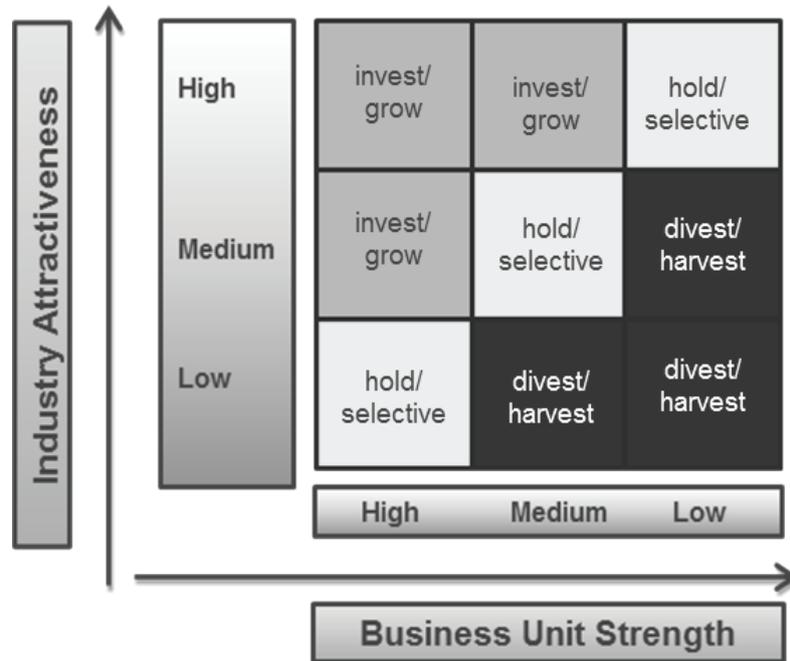
In the practical business world, the problem of resource scarcity has a bearing on the decisions made by any business organisation. Among such limited resources, as there are plenty of avenues to use such resources for many opportunities available, the crucial question remains how to use their cash best. Such a tussle takes place at every level in the company i.e. between teams, functional departments, divisions or business units.

This decision of resource allocation becomes even more crucial for a diversified businesses which are supposed to manage complex business portfolios involving as much as 50 to 100 products and services simultaneously. The products or business units are diverse in characteristics and future prospects. This makes it a tough decision to choose products/services for allocating resources.

Keeping this in mind, the BCG matrix and its improved version GE-McKinsey matrix was developed. In 1970s, General Electric was managing a huge and complex portfolio of unrelated products and was unsatisfied about

the returns from its investments in the products. At the time, companies usually relied on projections of future cash flows, future market growth or some other future projections to make investment decisions, which was an unreliable method to allocate the resources. Therefore, GE consulted the McKinsey & Company and designed the nine-box framework.

The nine-box matrix plots the Business Units on 9 cells that indicate whether the company should invest in a product, harvest/divest it or do a further research on the product and invest in it if there're still some resources left. Both these tools have served the purpose by comparing the business units and dividing them in suitable groups as per their worth.



Industry Attractiveness

Industry attractiveness indicates how hard or easy it will be for a company to compete in the market and earn profits. The more profitable the industry is the more attractive it becomes. When evaluating the industry attractiveness, analysts should look how an industry will change in the long run rather than in the near future, because the investments needed for the product usually require long lasting commitment.

Industry attractiveness consists of many factors that collectively determine the competition level in it. There's no definite list of which factors should be included to determine industry attractiveness, but the following are the most common :

- Long run growth rate
- Industry size
- Industry profitability (by using Porter's Five Forces)
- Industry structure (by using Structure-Conduct-Performance framework)
- Product life cycle changes
- Changes in demand
- Trend of prices
- Macro environment factors (through use of PEST or PESTEL)

- Seasonality
- Availability of labor
- Market segmentation

Competitive strength of a Strategic business unit or a product

Along the X axis, the matrix measures how strong, in terms of competition, a particular business unit is against its rivals. In other words, managers try to determine whether a business unit has a sustainable competitive advantage (or at least temporary competitive advantage) or not. If the company has a sustainable competitive advantage, the next question is: “For how long it will be sustained?”

The following factors determine the competitive strength of a business unit:

- Total market share
- Market share growth compared to rivals
- Brand strength
- Profitability of the company
- Customer loyalty
- VRIO (Value, Rareness, Imitability, Organization) resources or capabilities
- business unit strength in meeting industry’s critical success factors
- Strength of a value chain
- Level of product differentiation
- Production flexibility

Using the tool

There are no established processes or models that managers could use when performing the analysis. Therefore, we designed the following steps to facilitate the process:

Step 1. Determine industry attractiveness of each business unit

- Make a list of factors. The first thing you’ll need to do is to identify, which factors to include when measuring industry attractiveness. We’ve provided the list of the most common factors, but you should include the factors that are the most appropriate to your industries.
- Assign weights. Weights indicate how important a factor is to industry’s attractiveness. A number from 0.01 (not important) to 1.0 (very important) should be assigned to each factor. The sum of all weights should equal to 1.0.
- Rate the factors. The next thing you need to do is to rate each factor for each of your product or business unit. Choose the values between ‘1-5’ or ‘1-10’, where ‘1’ indicates the low industry attractiveness and ‘5’ or ‘10’ high industry attractiveness.
- Calculate the total scores. Total score is the sum of all weighted scores for each business unit. Weighted scores are calculated by multiplying weights and ratings. Total scores allow comparing industry attractiveness for each business unit.

This is a tough task and one that usually requires involving a consultant who is an expert of the industries in question. The consultant will help you to determine the weights and to rate them properly so the analysis is as accurate as possible.

Step 2. Determine the competitive strength of each business unit

'Step 2' is the same as 'Step 1' only this time, instead of industry attractiveness, the competitive strength of a business unit is evaluated.

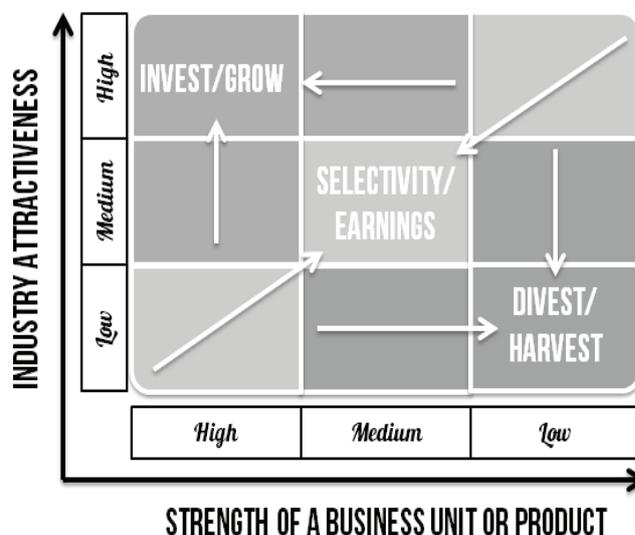
- Make a list of factors. Choose the competitive strength factors from our list or add your own factors.
- Assign weights. Weights indicate how important a factor is in achieving sustainable competitive advantage. A number from 0.01 (not important) to 1.0 (very important) should be assigned to each factor. The sum of all weights should equal to 1.0.
- Rate the factors. Rate each factor for each of your product or business unit. Choose the values between '1-5' or '1-10', where '1' indicates the weak strength and '5' or '10' powerful strength.
- Calculate the total scores. See 'Step 1'.

Step 3. Plot the business units on a matrix

With all the evaluations and scores in place, we can plot the business units on the matrix. Each business unit is represented as a circle. The size of the circle should correspond to the proportion of the business revenue generated by that business unit. For example, 'Business unit 1' generates 20% revenue and 'Business unit 2' generates 40% revenue for the company. The size of a circle for 'Business unit 1' will be half the size of a circle for 'Business unit 2'.

Step 4. Analyze the information

GE-MCKINSEY MATRIX INVESTMENT IMPLICATIONS



There are different investment implications you should follow, depending on which boxes your business units have been plotted. There are 3 groups of boxes: investment/grow, selectivity/earnings and harvest/divest boxes. Each group of boxes indicates what you should do with your investments.

Invest/Grow box. Companies should invest into the business units that fall into these boxes as they promise the highest returns in the future. These business units will require a lot of cash because they'll be operating in growing industries and will have to maintain or grow their market share. It is essential to provide as much resources as possible for BUs so there would be no constraints for them to grow. The investments should be provided for R&D, advertising, acquisitions and to increase the production capacity to meet the demand in the future.

Selectivity/Earnings box. You should invest into these BUs only if you have the money left over the investments in invest/grow business units group and if you believe that BUs will generate cash in the future. These business units are often considered last as there's a lot of uncertainty with them. The general rule should be to invest in business units which operate in huge markets and there are not many dominant players in the market, so the investments would help to easily win larger market share.

Harvest/Divest box. The business units that are operating in unattractive industries, don't have sustainable competitive advantages or are incapable of achieving it and are performing relatively poorly fall into harvest/divest boxes. What should companies do with these business units?

First, if the business unit generates surplus cash, companies should treat them the same as the business units that fall into 'cash cows' box in the BCG matrix. This means that the companies should invest into these business units just enough to keep them operating and collect all the cash generated by it. In other words, it's worth to invest into such business as long as investments into it doesn't exceed the cash generated from it.

Second, the business units that only make losses should be divested. If that's impossible and there's no way to turn the losses into profits, the company should liquidate the business unit.

Step 5. Identify the future direction of each business unit

The GE McKinsey matrix only provides the current picture of industry attractiveness and the competitive strength of a business unit and doesn't consider how they may change in the future. Further analysis may reveal that investments into some of the business units can considerably improve their competitive positions or that the industry may experience major growth in the future. This affects the decisions we make about our investments into one or another business unit.

For example, our previous evaluations show that the 'Business Unit 1' belongs to invest/grow box, but further analysis of an industry reveals that it's going to shrink substantially in the near future. Therefore, in the near future, the business unit will be in harvest/divest group rather than invest/grow box. Would you still invest as much in 'Business Unit 1' as you would have invested initially? The answer is no and the matrix should take that into consideration.

How to do that? Well, the company should consult with the industry analysts to determine whether the industry attractiveness will grow, stay the same or decrease in the future. You should also discuss with your managers whether your business unit competitive strength will likely increase or decrease in the near future. When all the information is collected you should include it to your existing matrix, by adding the arrows to the circles. The arrows should point to the future position of a business unit.

Step 6. Prioritize your investments

The last step is to decide where and how to invest the company's money. While the matrix makes it easier by evaluating the business units and identifying the best ones to invest in, it still doesn't answer some very important questions:

- Is it really worth investing into some business units?
- How much exactly to invest in?
- Where to invest into business units (more to R&D, marketing, value chain?) to improve their performance?

Doing the GE McKinsey matrix and answering all the questions takes time, effort and money, but it's still one of the most important product portfolio management tools that significantly facilitate investment decisions.

Advantages

- Helps to prioritize the limited resources in order to achieve the best returns.
- Managers become more aware of how their products or business units perform.

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- It's more sophisticated business portfolio framework than the BCG matrix.
- Identifies the strategic steps the company needs to make to improve the performance of its business portfolio.

Disadvantages

- Requires a consultant or a highly experienced person to determine industry's attractiveness and business unit strength as accurately as possible.
- It is costly to conduct.
- It doesn't take into account the synergies that could exist between two or more business units.

STRATEGIC ALTERNATIVES

There are many strategic alternatives that can be adopted by an organisation to attain its objectives. The most famous ones are Glueck & Jauch Generic Strategic Alternative and Porter's Generic Strategies as discussed hereunder:

GLUECK & JAUCH GENERIC STRATEGIC ALTERNATIVE

While developing generic strategic taxonomies, the work of Glueck and Jauch (1984) is widely referred to. These authors developed a complex matrix involving expansion/retrenchment and stability aspects across products/markets and functions. Using this matrix, Hitt et al. (1982) and Pearce et al. (1987) postulate that there exist four grand strategic alternatives:

- Stability;
- Internal growth;
- External acquisitive growth;
- Retrenchment.

Stability

The stability strategy involves the maintenance of the current business definition by safeguarding the existing interests and strengths. It continues to peruse its well established and tested objectives and goals and optimizes the resources committed to attain such goals. It may also change the pace of effort within its stable business definition in order to become more efficient or effective (Glueck and Jauch, 1984). Pearce et al. (1987) operationalise the stability strategy along four dimensions:

- Implemented wherein few functional changes are made in the products/markets
- A business continues to serve existing customers in the same or similar market segment with same portfolio of products
- Instead of a "do nothing" strategy, it is a "do nothing new" strategy
- It has its sharp focus on incremental improvement of functional performance;
- It continues to pursue same set of objectives and goals; and
- The business adjusts the level of improvement he equivalent proportion every year.
- Involves keeping track of new developments to ensure that strategy continues to make sense

The strategy is a substitute to growth or retrenchment strategy as goals (such as profit or growth) are not dumped, rather, returns can actually be increased, for instance by improving efficiency.

An internal growth (expansion) strategy

An internal growth strategy involves re-defining of business definition by substantially scaling the level of operations through internal development and not taking help of other corporations or businesses. Market penetration, market development and product development are emphasised to develop new products, enter new markets and embracing new technology.

- Implemented by redefining the business by adding business scope substantially, which increases the efforts of current business
- Promising and famous strategy, which may take company along relatively less risky untraveled paths
- Includes diversification, acquisition and mergers

External expansion

Glueck and Jauch (1984) note that there are a number of terms used for external expansion. These include acquisitions, mergers (one business loses its identity), consolidations (both businesses lose their identity, and a new business arises) and joint ventures. The distinguishing feature of all external growth strategies, though, is that they involve another company or business.

Retrenchment

Pearce *et al.* (1987) operationalise a retrenchment strategy along three dimensions: improvement in performance by scaling down the level and/or scope of product/market objectives; cut back in costs; and reduction of the scale of operations through the divestment of some units or divisions. Glueck and Jauch (1984) also suggest that retrenchment also involves a reduction in functions. Internal retrenchment is, labelled as an operating turnaround strategy where the emphasis is on reducing costs, increasing revenues, reducing assets, and reorganising products and/or markets to achieve greater efficiency. External retrenchment constitutes a more serious form of strategic turnaround, including such measures as divestiture and liquidation. Glueck and Jauch's (1984) typology introduces the concepts of stability and external versus internal aspects of growth and retrenchment.

- Redefinition of business by divesting a major product line/market
- Not always bad proposition as it saves organisation's vital interests, minimise certain adverse effects, regroup resources before launching a rise on growth ladder
- For temporary setbacks, cut on its capital & revenue expenditure, advertising, executive perks, employee welfare subsidies, community development projects
- In second stage, cut on inventory levels, manpower, dividend, interest on deposits
- In third stage, withdraw marginal markets, some brands, product sizes, etc.
- In fourth stage, go for sale of some manufacturing facilities, product divisions, retirement either from production or marketing stage, may offer itself for take over
- At last option, organisation may seek for liquidation which means corporate death.

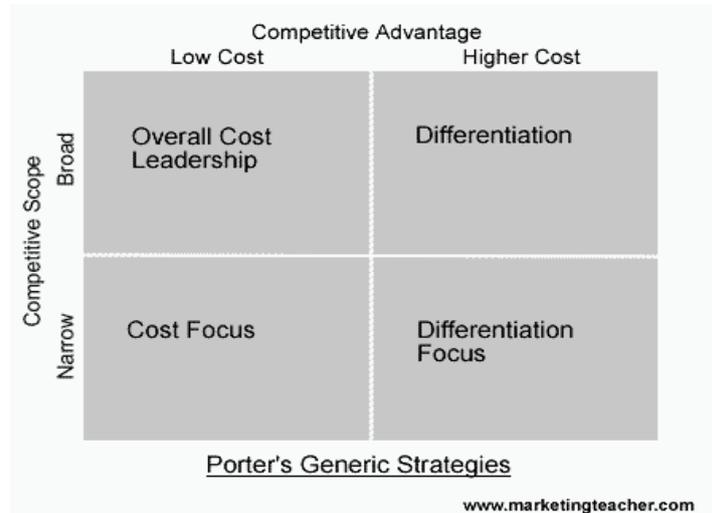
Combination Strategies

The above discussed strategies are not mutually exclusive but can be used in a combination to suit the needs of the organisation.

PORTER'S GENERIC STRATEGIES

In 1985, in his book "Competitive Advantage: Creating and Sustaining Superior Performance" Michael Porter

pronounced the three generic strategies namely “Cost Leadership” (no frills), “Differentiation” (creating uniquely desirable products and services) and “Focus” (offering a specialized service in a niche market). Thereafter, he then subdivided the ‘Focus’ strategy into two parts: “Cost Focus” and “Differentiation Focus.” These are shown in Figure 1 below:



The Cost Leadership Strategy

This strategy also involves the firm winning market share by appealing to cost-conscious or price-sensitive customers. This is achieved by having the lowest prices in the target market segment, or at least the lowest price to value ratio (price compared to what customers receive). To succeed at offering the lowest price while still achieving profitability and a high return on investment, the firm must be able to operate at a lower cost than its rivals. There are three main ways to achieve this:

The first approach is achieving higher asset utilization. In manufacturing, it will involve production of high volumes of output. These approaches mean fixed costs are spread over a larger number of units of the product or service, resulting in a lower unit cost, i.e. the firm hopes to take advantage of economies of scale and experience curve effects.

The second dimension is achieving low direct and indirect operating costs. This is achieved by offering high volumes of standardized products, offering basic no-frills products and limiting customization and personalization of service.

The third dimension is control over the value chain including all functional groups (finance, supply/procurement, marketing, inventory, information technology etc.) to ensure low costs. Wal-Mart is known for squeezing its suppliers to price its products reasonably low.

The greatest risk in pursuing a Cost Leadership strategy is that the competitors may follow the same cost reduction strategies, therefore, the company has always to be on its toes to continuously reduce its cost. This can be done by adopting the Japanese Kaizen philosophy of “continuous improvement” among other techniques of reducing cost.

The Differentiation Strategy

A differentiation strategy is appropriate where the target customer segment is not price-sensitive, the market is competitive or saturated, customers have very specific needs which are possibly under-served, and the firm has unique resources and capabilities which enable it to satisfy these needs in ways that are difficult to copy.

Differentiation is deemed to be successful when a company is able to fetch a premium price for its products or services, has increased revenue per unit, or is able to retain loyalty of its customers. Differentiation drives profitability when the added price of the product outweighs the added expense to acquire the product or service. It can be achieved by excellent brand management which creates uniqueness in the image of the product/service even when the actual product is the identical to competitors. Adopting this strategy, Apple could brand its i-phones, computers and i-pads; Mercedes-Benz C-Class could sell its cars as most expensive ones, Café Coffee Day could differentiate its coffee, and Nike could brand sports clothing and shoes. Fashion brands and multinational companies have to depend greatly on this strategy. However, this is not an apt strategy as it is not suitable for smaller companies but for big brands.

However, for ensuring success of its Differentiation strategy, a company must:

- Undertake high-quality research, development and innovation.
- Be able to deliver premium products/services.
- Rigorous branding and marketing about differentiated offerings.
- Need to stay agile with their new product development processes.

The Focus Strategy

The focus strategy is also known as 'niche' strategy. This is so because, companies adopting focus strategies focus on niche markets and, by get hold of the dynamics of such niche market and unique requirements of its customers. Based on such understanding, they develop exclusively low-cost products particularly for such niche market. Due to this, a strong brand loyalty is developed with its customers making it difficult for competitors to enter. Such a strategy is often used by small firms/companies.

Further, such companies may either use a 'cost focus' or a 'differentiation focus'. While cost focus makes the firm the lowest cost producer in such niche or segment, differentiation focus creates competitive advantage through differentiation within the niche or segment.

Environmental Influences of Business

The term environment in context of business refers to all external forces or factors having a direct or indirect bearing on events related to functioning of business. Business helps a country to accomplish economic growth, generates employment opportunities and makes available various types of goods and services for human consumption. A business organisation does not exist in a vacuum but has to take into account external and internal environment. Business environment may offer opportunities for any firm or pose threats to the firm. A business firm is also affected by a number of internal factors, which are forces inside the business organisation. While the policy makers and the managers on the top are concerned with the external environment, the middle level and lower level management are more concerned with the internal environment.

According to Keith Davis, "Business environment is aggregate of all conditions, events and influences that surround and affect the business".

Bayard O. Wheeler defines business environment as "the total of all the things, external to a business firm, which affect the organisation and its operations".

As per Arthur M. Weimer, "Business environment encompasses the climate or set of conditions- economic, social, political, or institutional- in which business is conducted".

Therefore, business environment may be defined as:

“The sum total of all individuals, institutions and other forces that are outside the control of a business enterprise but the business still depends upon them as they affect the overall performance and sustainability of the business.”

The forces which compose the business environment are its suppliers, competitors, consumers, government, bankers, customers, economic conditions, market conditions, investors, technologies, political parties, international institutions and multiple other institutions working externally of a business constitute its business environment. These forces influence the business even though they are outside the business boundaries.

For example, changes in income tax rate by the government while announcing the budget may make the customers reduce their consumption expenditure and reduce quantity of products purchased earlier from the company. Due to this macro level change, the business will need to re-work with its pricing policy to adapt to the tax rate change. Here, even though the business had no participation in initiating the tax rate change, still had to adapt to this change by re-working its pricing policy to maintain its previous profits.

Importance of Environmental Study

The benefits of studying business environment are as follows:

- Development of strategies and long-term policies and objectives of the firm.
- Development of action plans to deal with changes in environment.
- To forecast the consequences of socio-economic changes at the national and global levels on the company's stability.
- Analysis of competitor's strategies and formulation of effectual countermeasures.
- To keep the business dynamic and up-to-date.

Characteristics and Components of Business Environment

The various components of business environment are—

- (i) External Environment
- (ii) Internal Environment

EXTERNAL ENVIRONMENT

External environment consists of all those factors that affect a business enterprise from outside its boundaries. It consists of shareholders, legal, competitors, customers, society, government rules and regulations, policies and technology etc. These are uncontrollable factors and firms have to adapt to the components of this environment.

External environment is can be sub-divided into micro environment and macro environment. Different players in the micro environment normally do not affect all firms of a particular industry equally. However, sometimes micro environment of the various businesses may remain more or less same.

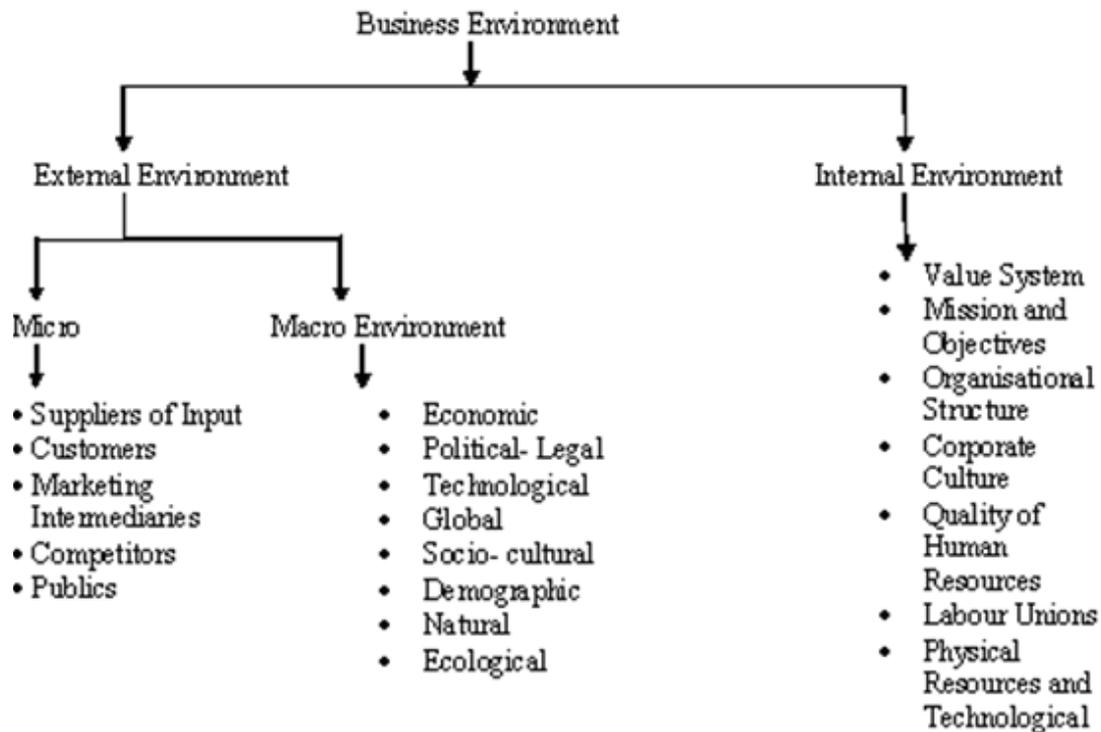


Fig: Components of Business Environment

A. External Micro- Environment

“The micro environment consists of factors in the company’s immediate environment”. Micro environment includes those players whose decisions and actions have a direct bearing on the company. Production and sale of goods are the two important aspects of modern business. The various constituents of micro environment are as under:

- (a) **Suppliers:** These supply of resources (finances, raw materials, fuel, power and other factors of production) and pave the way for smooth conduct of the business. Firms should keep themselves updated about the policies of suppliers as rise in the cost of inputs will influence their sales volume and profitability. The scarcity of inputs also have a bearing on the production schedules. For smooth production and sales, the business should have more than one supplier in their list to have an unhampered production schedules.
- (b) **Customers:** The people who buy and use products and services of business and are an important part of external micro environment. A business may have diverse customers such as households, producers, retailers, Government and foreign buyers on its portfolio. Since sales of a product or service is critical for a firm’s survival and growth, it is necessary to keep the customers satisfied.
- (c) **Marketing intermediaries:** In the firm’s external micro environment, marketing intermediaries play an essential role of selling and distributing its products to the final customers. They are the physical distribution firms (transport firm), service agencies (media firms), financial intermediaries (banks, insurance companies) etc. that assist in production, marketing and insurance of the goods against loss of theft, fire etc. Business has to maintain healthy relations with them to carry their activities smoothly. All these factors are largely controllable by the firms but they operate in the larger macro environment beyond their control.

- (d) **Competitors:** Different firms in an industry compete with each other for sale of their products. This competition may be on the basis of pricing of their products and also non-price competition through competitive advertising such as sponsoring some events to promote the sale of different varieties and models of their products. They constantly watch competitors' policies and adjust their policies to gain customer confidence.
- (e) **Public:** Finally, publics are an important force in external micro environment. Public, according to Philip Kotler, "is any group that has an actual or potential interest in or impact on the company's ability to achieve its objective." A public is any group that has an actual or potential interest in or impact on an organisation's ability to achieve its interest. Environmentalists, media groups, women's associations, consumer protection groups, local groups, citizens association are some important examples of publics which have an important bearing on the business decisions of the firm. Companies observe the behaviour of these groups to make functional policies.

B. External Macro Environment

Apart from micro environment, business firms also come across some other external environmental forces which are beyond their control and operate at macro level. Because of the uncontrollable nature of such macro forces, a firm has to adjust or adapt itself to harness the opportunities thrown by such forces and mitigate the threats. These factors are:

- (a) **Economic Environment:** Economic environment includes all those forces which have an economic impact on business. Accordingly, total economic environment consists of agriculture, industrial production, infrastructure, and planning, basic economic philosophy, stages of economic development, trade cycles, national income, per capita income, savings, money supply, price level, fiscal and monetary policies and population.

The economic environment has definitely an impact on the activities of business enterprises. In the capitalist economies, the economic decisions concerning investment, production and sale are driven by profit motives. While in socialist economies, such decisions are taken by the public sector and driven by social welfare motive rather than profit maximisation. In a mixed economy, public and private sectors have a co-existence and they may individually or jointly own the factors of production.

Choice of alternatives regarding allocation of resources such as what to produce, how to produce and for whom to produce; nature of technology and the techniques of production, timing of production etc. will be different in capitalist, social and mixed economies, therefore, the business firm has to keep in mind the economic environment in which it operates.

- (b) **Political-legal Environment:** The political- legal environment includes the activities of three political institutions, namely, legislature, executive and judiciary which usually play a useful role in shaping, directing, developing and controlling business activities. In order to attain a meaningful business growth, a stable and dynamic political-legal environment is very important. Legal environment is also significant for functioning of the business as various laws are in force to regulate the operations of the business enterprises. They relate to standard of products, packaging, protection of environment and ecological balance, ban on advertisement of (alcohol and medicines), advertisement of certain products with statutory warning (cigarette) etc. Laws also exist to prevent restrictive trade practices (RTP) and monopoly.
- (c) **Technological Environment:** Technology implies systematic application of scientific or other organised knowledge to practical tasks or activities. It includes innovations too. As technology is changing fast, businessmen should keep a close look on those technological changes for its adaptation in their business activities. Not adopting technological changes and imitating innovation is not possible as technical threats from external environment have to be converted into opportunities and gainfully employed in business operations.

- (d) **Global or International Environment:** The Global environment or 'border less world' plays an important role in shaping business activity. With the liberalisation and globalisation of the Indian economy in 1991, there have been significant economic and political changes and increasing role for the private sector to play since then. The global business environment is radically affected by the principles and agreements of World Trade Organisation (WTO) as it keeps a watch and regulates the business transacted in the international environment.
- (e) **Socio-cultural Environment:** The social environment consists of the social values; concern for social problems like protection of environment against pollution, providing employment opportunities, health care for the aged and old etc.; consumerism (indulging in fair trade practices) to satisfy human wants.
- The cultural environment represents values and beliefs, norms and ethics of the society. The buying habits, buying capacities, tastes, preferences and many other factors are dependent on the cultural environment. For example, in India, beef is not eaten by a majority of people as it is not part of their culture. Similarly, white wedding dress is very less preferred in Hindu weddings. Therefore, business has to offer socially acceptable goods to maintain its positive business image and survive competition. Every business has to keep in mind that the business operations successfully meet the ethical and value system of the society and if not, making necessary changes?
- (f) **Demographic environment:** The demographic environment includes the gender ratio, size and growth of population, life expectancy of the people, rural-urban distribution of population, the technological skills and educational levels, language skills of labour force. All these demographic features have an important bearing on the functioning of business firms. For example, huge populated countries such as Indian and China can adopt labour-intensive technologies than capital intensive ones to give employment to its labour force. Similarly, the population of kids will decide product range and space for such products to be offered in a mall while planning logistics.
- (g) **Natural Environment:** The natural environment is the ultimate source of many inputs such as raw materials and energy, which firms use in their productive activity. The natural environment which includes geographical and ecological factors such as minerals and oil reserves, water and forest resources, weather and climatic conditions and port facilities are all highly significant for various business activities. For example, steel producing industries are set up near the coal mines to save cost of transportation to distant locations. The natural environment also affects the demand for goods. For example, places with hot temperatures will have high demand for air conditioners. Areas which are highly polluted will have more scope of selling air-purifiers. Similarly, weather and climatic conditions influence the demand pattern for clothing, building materials for housing etc. Natural calamities like floods, droughts, earthquake etc. are devastating for business activities.
- (h) **Ecological environment:** Though natural resources such as air, water and solar energy can be replenished, yet, business organisation are polluting these resources by dumping chemical industrial wastes in water and affecting the ozone layer. The environment damage to water, earth and air caused by industrial activity of mankind is harmful for future generations. Business enterprises should understand their social responsibility and use these resources meticulously. Legislative measures are also brought in by the Government (Pollution Control Board) to protect the natural environment. Even, as a part of self-accountability, the renewable resources should be used wisely so that rate of consumption does not exceed the rate of replenishment.

INTERNAL ENVIRONMENT

Survival and growth of a business depends upon its strengths and adaptability to the external environment. The internal strengths represent its internal environment. These consist of financial, physical, human and technological resources. The factors in internal environment of business are to a certain extent controllable

because the firm can change or modify these factors to improve its efficiency. However, the firm may not be able to transform all the factors. The various internal factors are:

- (a) Value system : The value system of an organisation means the ethical beliefs that guide the organisation in achieving its mission and objectives. The value system of a business organisation also determines its behaviour towards its employees, customers and society at large. The value system of a business organisation makes an important contribution to its success and its prestige in the world of business. For instance, the value system of J.R.D. Tata, the founder of Tata group of industries, was its self-imposed moral obligation to adopt morally just and fair business policies and practices which promote the interests of consumers, employees, shareholders and society at large. This value system of J.R.D. Tata was voluntarily incorporated in the articles of association of TISCO, a premier Tata company.

Infosys Technologies which won the first national corporate governance award in 1999 attributes its success to its high value system which guides its corporate culture. To quote one of its reports, “our corporate culture is to achieve our objectives in environment of fairness, honesty, transparency and courtesy towards our customers, employees, vendors and society at large” Thus value system of a business firm has an important bearing on its corporate culture and determines its behaviour towards its employees, shareholders and society as a whole.

- (b) Mission and objectives: The business domain of the company, direction of development, business philosophy, business policy etc are guided by the mission and objectives of the company. The objective of all firms is assumed to be maximisation of profit. Mission is defined as the overall purpose or reason for its existence which guides and influences its business decision and economic activities. The Mission, vision and values of Reliance are as under:

Mission

To provide the best and most value-adding advice within investor relations, financial communications, media relations, crisis communications, issues management and CSR reporting

- To be an independent sparring-partner and to provide excellent advice for our clients in connection with IPOs, ECM and M&A transactions, corporate governance-related issues as well as in connection with preparations of contingency communications plans regarding public takeovers

Reliance’s activities shall be of benefit for both our clients, collaboration partners, employees and shareholders

Vision

- To be our clients’ ‘first call’ and preferred collaboration partner within our business areas
- To consistently exceed our clients’ expectations for professional and value-adding advice Our objective is long-standing and trustful client relationships created via excellent advice and service

Values

Reliance is governed by our fundamental values:

- Quality: We do not compromise – we have a passion for the best quality
 - Innovation: We are innovative and wish to enthuse our clients
- (c) Organisation structure: The organisational structure, the composition of the board of directors, the professionalism of management etc are important factors influencing business decisions. An efficient working of a business organisation requires that the organisation structure should be conducive for quick decision-making. The board of directors is the highest decision making body in a business organisation.

For efficient and transparent working of the board of directors in India it has been suggested that the number of independent directors be increased.

- (d) Corporate culture: Corporate culture and style of functioning of top managers is important factor for determining the internal environment of a company. Corporate culture is an important factor for determining the internal environment of any company. In a closed and threatening type of corporate culture the business decisions are taken by top level managers while the middle level and lower level managers have no say in business decision making. This leads to lack of trust and confidence among subordinate officials of the company. In an open and participating culture, business decisions are taken by the lower level managers and top management has a high degree of confidence in the subordinates. Free communication between the top level management and lower-level managers is the rule in this open and participatory type of corporate culture.
- (e) Quality of human resources: Quality of employees that is of human resources of a firm is an important factor of internal environment of a firm. The characteristics of the human resources like skill, quality, capabilities, attitude and commitment of its employees etc could contribute to the strength and weaknesses of an organisation. It is difficult for the top management to deal directly with all the employees of the business firm. Therefore, for efficient management of human resources, employees are divided into different groups. The manager may pay little attention to the technical details of the job done by a group and encourage group cooperation in the interests of a company.
- (f) Labour unions: Labour unions collectively bargains with the managers for better wages and better working conditions of the different categories of workers etc. For the smooth working of a business firm good relations between management and labour unions is required.
- (g) Physical resources and technological capabilities: Physical resources such as plant and equipment and technological capabilities of a firm determine its competitive strength which is an important factor for determining its efficiency and unit cost of production. Research and development capabilities of a company determine its ability to introduce innovations which enhances productivity of workers.

Sources

- Porter, M.E. (2008). The Five Competitive Forces That Shape Strategy. Harvard Business Review. Available at: <http://hbr.org/2008/01/the-five-competitive-forces-that-shape-strategy/>
- Wikipedia (2013). Porter's Five Forces. Available at: http://en.wikipedia.org/wiki/Porter_five_forces_analysis
- Michael Allison and Jude Kaye (2005). Strategic Planning for Nonprofit Organizations. Second Edition. John Wiley and Sons.
- Hambrick, D. C., MacMillan, I. C., & Day, D. L. (1982). *The product portfolio and profitability—a PIMS-based analysis of industrial-product businesses*. Academy of Management Journal, 25(4), 733-755.
- Henderson, B. D. (1973). *The experience curve—reviewed. IV. The growth share matrix of the product portfolio*. Perspectives.
- Smith, M. (2002). *Derrick's Ice-Cream Company: applying the BCG matrix in customer profitability analysis*. Accounting Education, 11(4), 365-375.
- Thompson, A. A., Strickland, A. J., Gamble, J. E., & Zeng'an Gao. (2008). *Crafting and executing strategy: The quest for competitive advantage: Concepts and cases*. McGraw-Hill.
- Wikipedia (2013). Growth-share matrix. Available at: http://en.wikipedia.org/wiki/Growth-share_matrix
- Costa, C. (2012). Evaluating Product Lines Using the BCG Matrix (VIDEO). Available at: <http://www.youtube.com/watch?v=Uuuxs9gO8C0>

- McKinsey & Company (2008). Enduring Ideas: The GE–McKinsey nine-box matrix. Available at: http://www.mckinsey.com/insights/strategy/enduring_ideas_the_ge_and_mckinsey_nine-box_matrix
- David, F.R. (2009). Strategic Management: Concepts and Cases. 12th ed. FT Prentice Hall
- Wiki (2008). BCG Matrix & GE/McKinsey Matrix. Available at: http://wiki.telfer.uottawa.ca/ci-wiki/index.php/BCG_Matrix_%26_GE/McKinsey_Matrix

LESSON ROUND UP

- Strategic analysis and planning involves careful formulation of the strategies and goals taken by a company's top management on behalf of the organization.
- A situational analysis takes into account the internal and external environment of an entity or organization and clearly identifies its own capabilities, customers, potential customers, competitors and the business environment and the impact they are going to have on the entity or organization.
- SWOT is a tool for strategic analysis of any organization, which takes into account both examination of the company's internal as well as of its external environment.
- TOWS analysis scans opportunities and threats existing in external environment of any organization, and then generates, compares and selects strategies based on internal strengths and weakness to utilize such opportunities and reduce threats.
- PERT and CPM two complementary statistical techniques utilized in Project management. These two are network based scheduling methods that exhibit the flow and sequence of the activities and events.
- The tool to identify the strengths and weaknesses of a company is a Product Portfolio Analysis.
- The BCG Matrix was developed by the Boston Consulting Group (BCG) and is used for the evaluation of the organization's product portfolio in marketing and sales planning.
- GE McKinsey Matrix is conceptually similar to BCG analysis, but somewhat more complicated than BCG Matrix as in BCG analysis, a two-dimensional portfolio matrix is created, while, with the GE model the dimensions are multi-factorial.
- Strategic planning is an organization's process of defining its strategy, or direction, and making decisions on allocating its resources to pursue this strategy.
- There are many strategic alternatives that can be adopted by an organisation to attain its objectives. The most famous ones are Glueck & Jauch Generic Strategic Alternative and Porter's Generic Strategies.

TEST YOURSELF

1. What is situation analysis? What is the need and timeline?
2. What are the elements of situation analysis?
3. Define SWOT.
4. Define TOWS.
5. Discuss TOWS strategies in detail.
6. What is PERT and CPM? What is the difference between the two?
7. Discuss steps in PERT/CPM.

Lesson 15

Strategic Implementation and Control

LESSON OUTLINE

- Issues in Strategy Implementation
- Various Organizational Structures and Strategy Implementation
- Leadership and its forms
- Strategic Change and Control
- Balance Score Card
- LESSON ROUND UP
- TEST YOURSELF

LEARNING OBJECTIVES

The implementation of policies and strategies is concerned with the design and management of systems to achieve the best integration of people, structures, processes and resources in reaching organization objectives. Strategy implementation may also consist of securing resources, organizing these resources and directing the use of these resources within and outside the organization.

A good strategy without effective implementation can hardly be expected to succeed in the performance. Implementation of strategy in an organization covers a number of inter-related decisions, choices, and a broad range of activities such as the commitments and cooperation of all units, sections and departments.

The objective of this chapter is to assist the students to understand:

- Issues in Strategy Implementation;
- Various Organizational Structures and Strategy Implementation;
- Leadership and its forms ;
- Strategic Change and Control.

STRATEGIC IMPLEMENTATION CONCEPT

Strategy implementation is a process through which a strategy is put into action. Strategies are only 'means' to an 'end' i.e. accomplishment of organization's objectives which have to be activated through implementation. This is because both strategic formulation and strategic implementation process are intervened in real life situation. While strategic formulation is largely an intellectual process, strategic implementation is more of operational nature. A good strategy without effective implementation is futile for success of an organization.

The implementation of policies and strategies is concerned with the design and management of systems to achieve the best integration of people, structures, processes and resources in reaching organization objectives. Strategy implementation may also consist of securing resources, organizing these resources and directing the use of these resources within and outside the organization. In an action, the strategy chosen is a promise and implementation is to turn the promise into performance. These tasks of transformation warrant structural and administrative mechanism which can be compatible and workable to be established to reinforce the chosen strategic direction for action. Once the strategy has been determined; it is the job of the management to ensure that the strategy is implemented. The major task of implementation strategy is to create a fit between the company goals and its other activities. Generally two types of fits needs to be created—

- (i) fits between the strategy and functional policies; and
- (ii) fits between the strategy and the organizational structure, process and systems.

Developing alternative strategy and making the strategic choice constitute important steps in the process of strategic management. Implementation of the strategy is a vital step in the process. A good strategy without effective implementation can hardly be expected to succeed in the performance. Implementation of strategy in an organization covers a number of inter-related decisions, choices, and a broad range of activities such as the commitments and cooperation of all units, sections and departments. There are two inter-related tasks involved in the process, i.e. differentiation and integration.

STRATEGY FORMULATION AND IMPLEMENTATION

Strategy formulation is largely an intellectual process whereas strategy implementation is more operational in character. Strategy formulation requires good conceptual, integrative and analytical skills but strategy implementation requires special skills in motivating and managing others. Strategy formulation occurs primarily at the corporate level of an organization while strategy implementation permeates all hierarchy levels. In fact, they are not supplanting each other but supplementing each other. In other words, they are not conflicting but contemporary to each other. The relation between strategy formulation and implementation can be best understood by their inter-dependence. There are two types of linkages between strategy formulation and implementation i.e. forward linkage and backward linkage.

Forward linkage is concerned with the influence of the formulation on implementation. Strategy formulation has forward linkage with implementation in the sense that total implementation activities are geared according to strategy chosen for implementation. The nature and type of organizational processes and systems are conditioned by the strategy for its successful implementation. Thus, implementation is dependent upon formulation.

Backward linkage, on the other hand, deals with the influence in the opposite direction. Strategy formulation has backward linkage with implementation as organization tends to adopt those strategies which can be implemented with the help of existing structure of resources joined with some additional efforts. The strategy is formulated in a particular environment which is dynamic. The feedback from operations, a result of strategy implementation gives notices of the changing environmental factors to which strategy should be seen in continuity rather than in discrete form.

The inter-dependence of formulation and implementation of strategy does not mean that managers are not to

distinguish between the two. While interdependence helps management to take corrective action in the light of the feedback given by the implementation, the distinction between the two helps in putting right perspective on organizational resources both human and physical. When the strategy is put into action through the process of developing internal plans, the feedback mechanism stress the need to continually assess implementation of strategy and organizational performance in order to determine any change in the strategy. Thus, those who are responsible for strategy formulation are also responsible for its implementation.

Strategy Implementation – Supporting Factors

The development and selection of strategies to pursue in an organization is considered easier and less time consuming than implementing these strategies once they have been chosen. An effective implementation of strategy in an organization needs multiple supporting factors. Some of these factors include the following:

(i) Action Planning

Organizations to be successful in strategy implementation need to develop a detailed action plan i.e., chronological lists of action steps (tactics) which add the necessary detail to strategies and assign responsibility to specific individual or group for accomplishing those actions. They should also set a due date and estimate the resources required to accomplish each of their action steps. Thus, they translate their broad strategy statement into a number of specific work assignments.

(ii) Organizational Structure

Successful strategists should also give proper thought to their organizational structure and see whether the current structure is appropriate for their intended strategy because different structures suit the implementation of different strategies

(iii) Human Resource Factors

Human Resource factors through framing strategic plan play a vital role in successful implementation of strategies in an organization. Strategist realize that the human resource issue is really a two part story. The consideration of human resources requires the management to think about the organization's communication needs. Further, managers successful at implementation are aware of the effects each new strategy will have on their human resource needs.

(iv) Annual Business Plan

Organizations successful at implementation are well aware of their need to fund their intended strategies. They think about necessary financial commitment in the planning process. For firming up their commitments to strategic plans, companies monetize their strategy. That way, they link their strategic plan to their annual business plan.

(v) Monitoring and Control

Monitoring and controlling the plan covers a list of options to get back on course if company should veer off. Those options include changing the schedule, changing the action steps, changing the strategy or changing the objective.

Developing an effective strategic plan is only half the battle. Getting it implemented is the other half – completing the tactics to accomplish the strategies and objectives within the plan. Monitoring the implementation of strategic plan is justified on the following grounds:

- (i) It helps to assure the organization efforts conform to the plan.
- (ii) It enables the organization to ensure that the results achieved correspond to our quantified objectives.

- (iii) Further monitoring allows for corrective action.
- (iv) Since monitoring is part of control process, it encourages improved performance.
- (v) Monitoring provides the essential link between the written plan and the day-to-day operation of the business.

It demonstrates to all that organization is really managing the business according to its strategic plan.

To set functional area goals, the following steps should be taken:

1. For each functional area, compare present functional goals with new enterprise, corporate and business-level goals.
2. Decide what new goal areas (functional variables) are needed for each function.
3. Set new goal levels (values for each functional area's variables).

Issues in Strategy Implementation

An organization is confronted with a number of issues in the process of strategy implementation. Some of the important issues are discussed as follows:

(i) Project implementation

Project is a highly specific program for which time schedule and specific cause are determined in advance. Projects create all necessary conditions and facilities required for the strategy implementation, the discipline of project management. A project basically passes through various phases which are given below before a set of task can be accomplished:

- (a) Detailed planning related to different aspects of projects such as infrastructure design, schedules, budgets etc., has to be completed.
- (b) Ideas generated during the process of strategic alternatives and choice consideration form the core of the future projects that may be undertaken by the organization.
- (c) After a set of projects have been identified and arranged according to the priority, they have to be subjected to preliminary project analysis pertaining to technical, financial, marketing and economic aspects. After the screening, the viable projects are taken up and feasibility studies are conducted.
- (d) Detailed engineering, awarding contracts, civil and other types of construction etc., are to be undertaken during the implementation phase leading to the testing trail and commissioning of the plant.
- (e) The final phase deals with disbanding the project.

(ii) Procedural implementation

Strategy implementation also requires executing the strategy based on the rules, regulations and procedures formulated by the Government. Though many procedures are simplified with the liberalization, privatization, and globalization of the Indian economy, certain procedures are still applicable in the process of strategic implementation such as, licensing requirements, Foreign Exchange Management Act requirements, collaboration procedures, import and export requirements, incentives and benefits, requirements of Labour Laws and other Legislations.

(iii) Organisational Structure and Strategies

Organizational structure is a means for achieving organization mission and objectives. Thus, it is an important source of strategic implementation. Organizational structure refers to the method of allocating duties and

responsibilities to individuals, and the ways these individuals are grouped together into units, departments and divisions. Companies form structures for their organizations based on their strategies. There are number of methods in which the organizations can be structured. A simple strategy requires simple structure where as the growth strategies require a flexible structure and complex strategies necessarily influence to build the matrix structures.

(iv) Resource Allocation

Resource allocation involves the process of allocating organizational resources to various divisions, departments and strategic business units. It deals with the procurement, commitment and financing the physical and the human resources required to accomplish strategic tasks for the achievement of organizational objectives.

(v) Functional Policies

Functional policies describes functional guidelines to operating managers so that coordination across functional units can take place. Once the strategy of the companies is decided, modificational functional policies may become necessary to meet the demands of the new business.

(vi) Communication Strategy

Communication strategy covering the mission, objectives, market scope, technology and all the issues related to implementation, to different levels in the organization is very important for its success. This is because strategy is implemented through people who ought to be clear about their roles they have to play in relation to each other.

(vii) Leadership

Appropriate leadership is necessary for developing effective structure and systems for the success of strategy. Leadership is the key factor for developing and maintaining right culture and climate in the organization.

(viii) Challenges to Change

The strategy implementation process generally involves a change. The change can be minor or major. The process of change may cover in freezing, moving and refreezing.

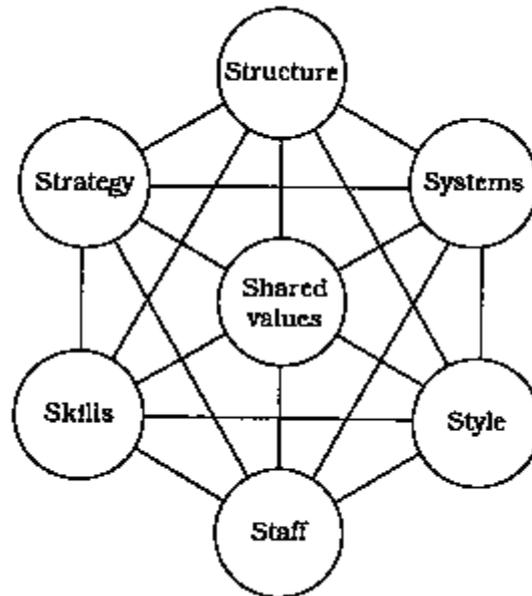
(ix) Pre-implementation Evaluation Strategy

Before the implementation of the strategy, it is advisable to go for a final scrutiny so as to avoid failure due to weaknesses in the analysis, if any and to ensure that the strategy decided for the organization is optimum.

MCKINSEYS 7-S FRAMEWORK

McKinsey developed the 7-S framework management model which organize seven factors to organize a company in an holistic and effective way with the objective to diagnose the causes of organization problem and formulate program for improvement due to the implementation of the strategy which are associated with change in the organization.

The organizational change is not simply a matter of structure although the structure is a significant variable in the management change. Effective organizational change may be understood to be a complex relationship between the 7-S i.e. strategy, structure, systems, style, skills, staff and shared values (super ordinate goals). The relationship is diagrammatically presented as follows:



McKinsey 7 Framework

The above framework shows that there is a multiplicity of factors which influence an organization's ability to change and understand as to how the 7-S model mechanism works. It is imperative to know what each 'S' means and what is its implication. The 3S's across the top of the model are described as Hard S's and 4S's across the bottom of the model are less tangible, more cultural in nature and some time neglected in major change efforts and mergers and were termed as soft Ss by McKinsey.

(i) Strategy

Strategy means to achieve objectives. It provides the direction and the scope of the organization over the long-term. Strategy refers to actions the organization plans or undertakes in response to or in anticipation of external environment. It includes purposes, missions, objectives, goals and major action plans and policies. A strategy targets at gaining competitive advantage over rivals.

(ii) Structure

It is a basic framework to designate responsibilities and functions. Organization structures prefers relatively more durable organizational arrangements and relationship. It prescribes the formal relationship among various positions and activities. Organizational structure performs the following functions:

- (a) Dividing the whole organization into activities, departments, setting division of labour and delegation of authority.
- (b) Facilitating coordination and control of various activities in the framework of organizational mission, purposes and goals.
- (c) Reduction of uncertainty through forecasting research and planning in the organization.
- (d) Prediction of future and designing the future course of action.

(iii) System

It is, management tool for planning, decision-making, communication control and the procedures and processes regularly followed by an organization. Systems in the 7-S framework signifies all the rules and

regulations, procedures both formal and informal that complement the organizational structure. It includes production, planning and control system, budgeting and budgetary control system, financial and cost account system, training and development system, performance evaluation system and so on. Change in a strategy is implemented through changes in the system.

(iv) Style

Style stands for the patterns of behaviour and managerial style of top management over a period of time. It is visible through relationship among the three levels of management or managers, organizational culture which is a reflection of value system. The style has to change with the change in strategy, system and structure.

(v) Staff

It is the human resources of the organization i.e., the kind of specialties or professions represented in an organization such as engineers, specialist in different areas: finance, personnel, legal etc. Staffing is the process of recruiting and selecting persons for the organization, training and developing them, placing them in their post so as to reap the potential from each of them. According to 7-S framework the term 'staff' refers to the way organizations introduce young recruits into the main streams of their activities and the manner in which they manage their careers as the new entrants develop into future managers.

(vi) Skills

It means organization and individual capabilities. Skill is an ability or proficiency in performing a particular task. It includes those characteristics which most people use to describe a company. Skills are developed over a period of time and as a result of interaction of a number of factors, performing certain tasks successfully over a period of time, kind of people in the organization, top management style, the organizational structure, the external influences etc. Skills are the dominant capabilities and competencies possessed by the organization through its people.

(vii) Shared Values (Super Ordinate Goals)

Super ordinate goals stands for company's mission, vision, values, philosophy in the backdrop of which organizational goals and objectives are set and strategies are formulated. It's a set of values and aspirations that goes beyond a conventional formal statement of corporate objectives. These are essential as they inspire the members of the organization and provide a definite direction to its operations.

Some of the important benefits of McKinsey's 7-S Framework Model are as follows:

- (i) It is a diagnostic tool for understanding the organization which are non-effective.
- (ii) It helps to guide organization change.
- (iii) It combines rational and hard elements with emotional and soft elements;
- (iv) Managers must act on all Ss in parallel and all S's are interrelated.

ACTIVATING STRATEGY

Activation is the process of stimulating an activity so that it can be performed successfully. Activation of strategy is required because only a small number of people are involved in the strategy formulation while its implementation involves a good number of people within the organization. Activation of strategies requires the performance of the following activities:

(i) Institutionalization of strategy

Strategists role in the implementation of strategy is its institutionalization. A successful implementation of strategy

requires that the manager should act as its promoter or defender. Institutionalization of strategy involves the following two elements:

- (a) *Strategy Communication*: The role of the strategists is to make the fundamental, analytical and entrepreneurial decisions and present these to the members of the organization to bring their support. Therefore, in order to get the strategy accepted and consequently effectively implemented requires proper communication. The form of communication may be oral through interaction among strategists and other persons. However, in large organizations oral communication may not be adequate. Hence, a well documented written form of communication is followed.
- (b) *Strategy Acceptance*: Strategy acceptance makes organizational members to develop a positive attitude towards the strategy. This facilitates them to make commitment to strategy by treating it as their own strategy than imposed by others. Creation of such feeling is essential for the effective implementation of the strategy.

(ii) Formulation of Action Plans and Programs

Once the strategy is institutionalized, the organization may proceed to formulate action plans and programs. Action plans are the targets for the effective utilization of resources in an organization so as to achieve the set objectives. It may be plan for procuring a new plant, developing a new product, etc. The action plans to be formulated in the organization depend upon the nature of the strategy under implementation. Against action plans, a program is a single use plan which covers relatively a large set of activities and specifies major steps, in their order and timing, and responsibility for each step. Programs are generally supported by necessary capital and operating budgets. Since there may be various programs involved in the implementation of strategy, these should be coordinated so that each of them contributes positively to others.

(iii) Translating General Objectives into Specific Objectives

Some times objectives are too general and intangible to be transformed into action. In order to make these objectives operational, managers determine specific objective within the framework of general objectives which the organization and its various departments will seek to achieve within a particular period. A specific objective provides focus on the activities that may be undertaken to achieve the overall growth of the organization. Translation of general objectives in the specific and operative objectives must fulfill the following criteria:

- It should be tangible, meaningful and easily measurable as organizational performance; and
- It should contribute to the achievement of the general objectives.

(iv) Resource Mobilization and Allocation

In order to implement a strategy, an organization should have resources i.e., financial or human and these resources should be committed and allocated to various units to have maximum utilization. Financial resources are the means by which an organization produces goods and services. These resources are used to procure various physical resources such as land, building, machinery, raw material, etc. An organization should concentrate on mobilization of the required resources and their allocation among various units and departments.

Resource mobilization process involves procurement of resources which may be required to implement a strategy. The amount of resources are determined on the basis of nature and type of strategy. An organization's capacity to mobilize resources has inverse relationship with strategy. A strategy determines what type of resources will be required while resource mobilization capacity determines what type of strategy will be selected. Resources can be owned, leased or rented. Once the resources are mobilized, resource allocation of activity is undertaken. It involves allocation of different resources, financial and human among various organization units and departments. Resource allocation implies that when resources are committed to a unit or a project, the organization takes a risk which depends upon the time taken to recover the cost of resources.

Some of the problems which are encountered in the process of resource allocation are as follows:

- (i) *Power play*: In an organization each and every department tries to have larger share of the resources at its disposal. The department feels relatively stronger than others if it has more resources than other departments. Further, each department wants to have more flexibility in operations in order to hide its inefficiency.
- (ii) *Commitments of past*: Past commitment on the part of the organization with regard to resource which acts as a hurdle in the optimal resource allocation, unless it is not sorted out and settled. The managers in-charge of departments where the resources are not used properly opposes the transfer of resources as they feel that they are neglected.
- (iii) *Resistance to changes*: The organization may turn resistance to change even though it is a loser under changing circumstances because of false ideology. The organization put best managers to manage a product which are fast declining because of false prestige and sentimental ways of approach. Sometimes organizations want to capitalize on the past glory and their hold over larger resources even though other areas are much more profitable.

STRUCTURAL IMPLEMENTATION

Structural implementation involves the designing of organizational structure and interlinking various departments and units of the organization created as a result of the organizational structure. Organizational structure is a pattern in which the various parts of the organization are interrelated or interconnected. It involves how the organization will be divided and assigned among various positions, groups, departments, divisions etc., and the coordination necessary to accomplish organizational objectives. The structure defines the framework within which the activities work. When structuring an organization, the management needs to consider such aspects as departmentalization, level of authority, specialization, supervision, centralization, decentralization, size of departments, grouping of activities, extent and nature of delegation etc. There are two aspects of organization design i.e.:

- (i) differentiation; and (ii) integration.

There should be close relationship between an organization strategy and its structure. The organization structure is designed according to the needs of the strategy. Relationship between strategy and structure can be related in terms of utilizing structure for strategy implementation as structure is a means to an end and not an end in itself. Recognition of interaction between strategy and structure is crucial for a complete understanding of the criteria which underlie the structural design. It becomes clear that a top management's perspective in structural design is necessary when one understands that such a design is a result of overall strategy and the success of the strategy is also dependent on that desire. Organization's structure must be flexible and capable of quick adjustments in case of environment changes.

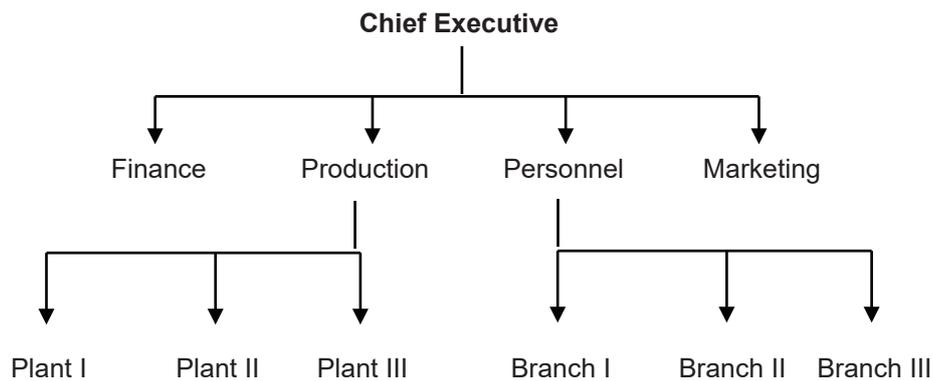
Structure of an organization can influence its strategy formulation process. It is because organization's structural form (line and staff, matrix, market or product differentiation etc.) can affect internal communication, interpersonal relations and other strategic perspectives. Companies with organization system based on advanced information technology can use the latest IT trends to support and hence influence the strategy formulation.

FORMS OF ORGANISATION STRUCTURE

There are two basic forms of organization structures available for large organizations i.e. functional structure and divisional structure. These forms can further be supplemented by additional prescriptions which may result in the form of matrix organization, free-form organization, etc.

Functional Structure

Functional structure is created by grouping the activities on the basis of functions required for implementing strategy. The basic functions are those which are essential for the strategy and their operations contribute to organizational efficiency which includes production, marketing, finance, personnel, etc. When the departments are created on the basis of basic functions and the manager feels that this span of management is too wide to manage effectively which invariably happens in large organizations, several departments are created on the basis of dividing a basic function into sub functions. For example a marketing department may be classified into advertising, sales, research etc. Thus, the process of functional differentiation would continue through successive levels in the hierarchy. Following is a form of functional structure:



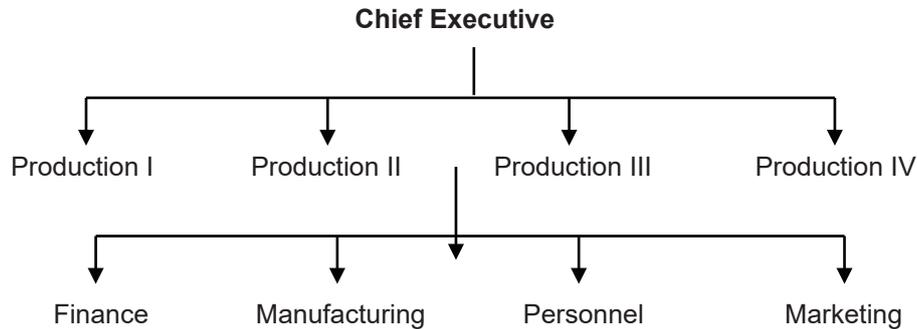
The functional structure is based on specialization of functions. This leads to economies of scale and specialization which increases operational efficiency and organization efficiency, economic flexibility and greater motivation to the people having attached to their area of speciality. The structure is suitable to firms operating single or related business. There are certain limitations of this form of organization structure due to the following reasons:

- (i) *Lack of responsibility*: No one in the organization is responsible for the project cost and profit. There is always lack of coordination and control because functional department managers are expected to discharge their responsibility within the budget.
- (ii) *Complex activity*: Complex and different activity in the organization require faster decision-making due to time factor which is of prime importance. Functional structure provides slow decision making process because the problem requiring a decision has to pass through various departments and all of them may have a divergent view on the matter. This process often delays important decisions and thus organization has to incur additional cost or loose the opportunity.
- (iii) *Lack of responsiveness*: Functional structure lacks responsiveness necessary to cope with new and rapidly changing work requirements.
- (iv) *Line and staff conflicts*: Functional structure suffers from usual line and staff conflicts, interdepartmental conflicts and other weaknesses emerging from such a structure. The degree of such conflicts is positive; they may often be affected specially in the absence of proper coordination.

(ii) Divisional Structure

In divisional structure, the activities are grouped according to the types of products manufactured or different market territories as the organizations began to grow by expanding variety of functions performed. The organizational units so structured are treated as autonomous segments of the business and the managers heading these segments or divisions are the functional authority in relation to all the matters pertaining to divisions. The divisional head is responsible to control and coordinate the functional units created to meet the requirements of a division. In other words, each, division becomes a self-contained block, that each division has

a separate set-off functional departments. The format of a divisional structure is as follows:



Bases of Divisionalisation: There are different bases on which various divisions in an organization can be created. The two traditional bases are product and territory. Later, many organizations have moved from these bases to strategic business units. In product divisionalisation, each major product or product line is organized as a separate unit. Each unit has its own functional structure for various activities necessary for the product. Multi-product organizations use these bases of divisionalisation. This is suitable when each product is relatively complex and large amount of capital is required for each product. The product requires different functions in terms of production, marketing, finance, etc. In territorial divisionalisation, regional offices are established as separate units. Each regional office has its own set of functional departments and operates under the strategic policies and guidelines established by a management. It is useful in those organizations where activities are geographically spread such as transport, insurance, banking, etc. In multi product or multi geographical area companies, divisions are created in the form of various strategic business units (SBUs). The fundamental concept of strategic business unit is to identify the independent product/market segments served by an organization. Since each independent product/market has a distinct environment, a strategic business unit should be created for each such segment. Thus, different strategic business units are involved in distinct strategic business areas with each area serving the distinct segment of the environment. A divisional structure has its own advantages and disadvantages.

Divisional structure offers the following advantages to an organization:

- (i) **Strict financial control:** Under this form of structure, there is strict finance control in the sense each division is a self-contained block generating a sense of competitive performance making everyone to contribute to profitability.
- (ii) **Management by exception:** It enables to apply management by exception as each division has the full freedom. There is good scope for its growth and expansion.
- (iii) **Enhancement of morale:** It also enhances employees' morale because they enjoy full freedom to work hard which leads to their empowerment and development.
- (iv) **Care for strategic task:** It enables the senior managers' to use their energy on strategic decision making and not waste their valuable time on day to day matters or decisions.
- (v) **High efficiency level:** It brings high level of efficiency since each functional manager and his team have full liberty and they work together for each function/each division as inter-dependent department which raises the efficiency in the division and for the entire organization.

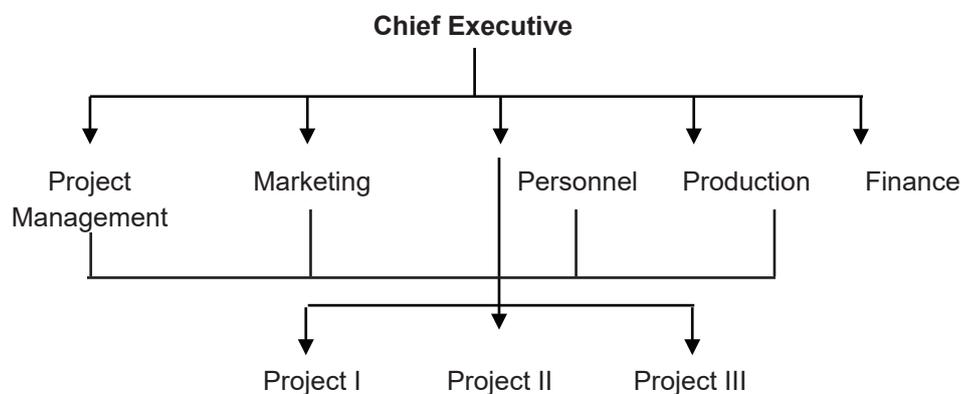
Despite various advantages, divisional structure form of organization has certain disadvantages also. Some of them are discussed as under:

- (i) **Costly affair:** It incurs extra costs since each division has its own set of functional departments and attached staff.

- (ii) *Competition between divisions:* Divisionalisation and compartmentalization leads each division to compete for more resources leading to competition among the divisions due to which one department suffers at the cost of another.
- (iii) *Coordination problem:* It becomes proposition to manage as a result of more divisions and departments
- (iv) *Change of priorities:* The service departments such as research and development in order to get higher and quick returns on investments.

(iii) Matrix Organization Structure

Matrix structure is one where each project and product becomes strategic. It is the realization of two dimensional structure which emanates from two dimensions authority i.e. pure project structure and functional structure. Authority flows vertically within functional department while authority of project manager flows horizontally crossing the vertical lines. The matrix structure configures as under:



This organizational structure is based on dual channels of authority and accountability and therefore, uses two forms of horizontal differentiations i.e. on vertical axis, the grouping of activities on the basis of functions and on horizontal axis on the basis of products and projects. Further, under this structure, people have to report to two bosses, one being the functional head of the department in which they are working and other being the leader or co-ordinator of the project on which they are working.

A matrix organization structure offers following advantages:

1. *Direct relations:* It enhances the direct relationship because matrix organization structure makes use of dual authority and accountability.
2. *Quality decision:* The quality of decisions undergoes a change for better as there is interrelation of line and functional officers.
3. *Participative management:* It encourages empowerment which results in high morale and motivation adding to quality decisions and implementation.

A matrix organization structure has following disadvantages:

1. *Conflicts and confusions:* Under this form of organization structure the principle of unity of command is violated. This leads to confusion and conflicts for the smooth working of managers. A conflict of loyalty also emerges between the line managers and project managers over the allocation of resources.
2. *Delayed decisions:* Dual reporting system results in uncertainty with regard to accountability. Further there is participative decision making which is time consuming.
3. *High degree of integration:* The coordination is the biggest problem in this type of organization structure because of duality in responsibility and accountability which is inherent in this form of corporate

structure.

(iv) Free Form Organization

The free-form of organization model is based on the premise that the organization is an open system and basic task of the manager is to facilitate the change in the organization. This requires greater organizational flexibility and adaptability. Free form organization is a rapidly changing, adaptive, temporary system organized around problems to be solved by groups of relative strangers with diverse professional skills. This form of organization reduces the emphasis on positions, departments, and other formal units and on the organizational hierarchy. In this the traditional man boss relationship disappears. This form of organization is suitable for those industries which have to work in highly dynamic environments. Such environments are characterized by high flexibility and ever changing character.

From above, it is clear, that there does not exist best form of organization structure. Any organization structure is considered best which fits in organizations environment and internal characteristics which are affected by strategy.

Functional structure is generally suitable for stable environments which place less demand on inter-departmental coordination and innovation whereas divisional structure is more appropriate for dynamic environments, which require faster response, better coordination, communication and innovation. In case of strategy is to achieve expansion through merger or acquisition, then increase in size will require a changed structure. Structure does not impose restrictions on strategy. However, if there are major strategic changes which influence environment and internal variables in the organization, then structural changes becomes unavoidable. Thus, the organizations implement, most strategies retaining the old structure and fine tune it as per requirements.

PROCEDURAL IMPLEMENTATION

A procedure refers to series of related task which make-up a chronological sequence. It is an established way of performing the work to be accomplished. Procedural implementation level concerned with completion of all statutory and other formalities which have been prescribed by the Government both at Central and State. The major procedural requirements involved in the strategy implementation process are discussed as under:

(i) Licensing Requirements

The licensing provisions have been provided under the Industries (Development and Regulation) Act, 1951. In many industries industrial license is required particularly in those industries which are perceived to be injurious to public health.

(ii) FEMA Requirements

Under the provisions of FEMA, all companies registered under the Companies Act, 1956 having foreign shareholding in excess of 50% and all foreign companies are required to obtain permission from Reserve Bank of India, regarding different activities like, fresh investments, issue of shares and debentures, acquisition of an Indian business unit, etc.

(iii) Foreign Collaboration Procedures

The emergence of joint venture projects with foreign collaborators brings technology and participation in equity. Besides, joint ventures, Indian companies may enter technology agreements for the import of technical know-how. In the case of joint venture and technology agreement prior approval has to be received from the Central Government.

(iv) Capital Issue Requirements

Under the provisions of Securities Exchange and Board of India Act, 1992, SEBI exercises some controls over capital issues to the public in the form of adherence to disclosure norms. For this purpose, SEBI scrutinizes the prospectus of the company intending to enter the capital market to ensure that relevant information has been provided in the prospectus on the basis of which the public can analyze the worth of issue of shares or debentures. For raising funds from abroad by way of Global Depository Receipts, American Depository Receipts, and long term loans, prior permission of the Central Government is required.

(v) Import and Export Requirements

Import and Export requirements differ in two types of goods i.e. which are under the list of open general license and those under restrictive list. There is less requirements for items falling under open general license except that the companies going for import/exports have to inform the Reserve Bank of India. However, import and export license is required to be procured from the Ministry of Commerce in the case of items falling under restrictive list.

BEHAVIOURAL IMPLEMENTATION

Strategic choice is influenced by various subjective factors such as decision styles, attitude to risk and internal power play between the strategists. The strategy implementation process is also influenced by the behaviour and attitude of the strategist along with organizational factors such as corporate culture, corporate values, ethics and organization sense of social responsibility.

Behavioural implementation is concerned with those aspects of strategy implementation which have influence on the behaviour of the people in the organization. Since the organization is basically a deliberate creation of human beings for certain specified objectives, the activities and behavior of its members need to be directed in certain way. Some of the issues which are relevant for behavioural implementation of strategy in an organization are discussed as under:

(i) Leadership

Leaders are the vital aspect of an organization which helps to cope the change by ensuring that plans and policies formulation are implemented as planned. Leadership is basically the ability to persuade others to achieve the defined objectives willingly and enthusiastically. A strategic leadership involves the process of transforming an organization with the help of its people so as to put it in a unique position. Thus, strategic leadership transforms the organization which involves changing all faces that is size, management practices, culture and values etc. Further, it emphasizes people because they are the source for transforming various physical and financial resources of the organization into outputs that are relevant to the society. Thus, the elements of strategic leadership may be summarized as under:

- (i) It deals with vision keeping the mission insight and with effectiveness and results.
- (ii) It emphasises on transformational aspects which leads to emergence of leaders in the organization.
- (iii) It inspires and motivates people to work together with a common vision and purpose.
- (iv) Strategic leadership has external focus rather than internal focus which helps the organization to relate it with its environment.

A leader initiates the actions for putting a strategy into operation. Strategist's leadership role in strategy implementation is as important as his role of architect of strategy. A leader should adopt the following initiative for implementing the leadership strategy:

- (a) Developing new qualities to perform effectively

- (b) Be a visionary, willing to take task and highly adaptable to change
- (c) Exemplifying the values, culture and goals of the organization
- (d) Paying attention to strategic thinking and intellectual activities
- (e) Adopting a collective view of leadership in which the leaders' role is highlighted at all levels of the organization
- (f) Empowering others and emphasising on statesmanship
- (g) Adopting a perspective to build subordinate skills and confidence to make them change agents
- (h) Delegating authority and emphasizing on innovation.

Merely understanding the role of leadership in strategy implementation is not enough. The leader should match his styles according to the requirements of the strategy. Leadership styles are the pattern of behavior which a leader adopts in influencing the behavior of his subordinates in the organizational context. There are various dimensions for describing leadership styles such as use of power in influencing the behavior, employee task orientation and emphasis on reward or punishment in influencing the behavior. Each of these dimensions have varying degrees of orientation. There are different types of leadership styles and their suitability depends on the nature of environment. Therefore, the most appropriate style of leadership should be adopted for the strategy implementation.

Thus, for an effective and successful implementation of chosen strategy in the organization, there is a need to ensure the selection of the right strategist in the right place at the right time.

(ii) Organizational Culture

Organizational culture affects strategy implementation as it provides a framework within which the behavior of the members takes place. It is defined as a set of assumptions, beliefs, values and norms which are shared by people and groups in the organization and control the way they interact with each other and with stakeholder outside the organization. There are two types of elements which define the culture of an organization i.e. (i) abstract elements and (ii) material elements. Abstract elements are internally oriented and include values, attitudes, beliefs and feelings. Material elements are extremely focused and include building, personnel dresses, products etc.

(iv) Values and Ethics

Values are convictions and a framework of philosophy of an individual on the basis of which he judges what is good or bad. Business ethics generates from: (a) value forming institutions; (b) organizational values and goals; (c) colleagues; and (d) professional code of conduct.

Strategy implementation is, thus, mostly affected by instrumental values of people in the organization. From strategic management point of view, people in the organization are divided into—Board of Directors, Chief Executives, managers and corporate planning staff. Of these groups, Chief Executive and managers under him are mostly responsible for strategy implementation. However, values are held by individuals which are part of their personality. Therefore, it is quite likely that values of different individuals do not match each other. Thus, in actual practice, the relationship between organizational values and personal values exists in the organisation.

FUNCTIONAL IMPLEMENTATION

The implementation of strategy also requires development of functional policies which provide the direction to middle management on how to make the optimal use of allocated resources. They guide the middle level executives in framing operational plans and tactics to make strategy implementable. Policies are basically general guidelines to help executives to make certain choices. They are developed in order to ensure that

strategic decisions are implemented.

In order to formulate plans at the functional level, the strategist has only to decide which functional area goals (or set of related goals) for which it is necessary to formulate action plans. A single goal may require action plans at several functional areas such as marketing, finance, research and development, personnel, production and external relations.

STRATEGIC CONTROL

Strategic control is concerned with that aspect of strategic management through which an organization ensures whether it is achieving its objectives contemplated in the strategic action. Strategic control involves the monitoring and evaluation of plans, activities, and results with a view towards future action, providing a warning signal through diagnosis of data, and triggering appropriate intervention, be they tactical adjustments or strategic re-orientation. Strategic management is basically divided into two distinct part i.e. strategic evaluation and strategic control. However, because of the nature of strategic evaluation and strategic control both these are intertwined. Therefore, the term strategic control includes evaluative aspect also.

Application of Strategic Control

Strategic control processes should ensure that strategic aims are translated into action plans designed to achieve these aims, and that the effectiveness of these plans is monitored. An effective strategic control process should ensure that an organization is setting out to achieve the right things, and that the methods being used to achieve these things are working. Within this arena, there has been emphasis on strategic planning activities. But operational management control systems have reduced the need for strategic planning. Indeed it has been long argued that distinct planning activities are not required at all. The function of control now becomes closely linked with planning, and it serves little purpose to conceive them as separate functions.

This implies that a strategic control process should set the agenda/goals for management processes, and monitor the operational activities delivering the result. Accordingly, an effective strategic control process needs both to communicate information about what outcomes need to be achieved, and be able to monitor how well these activities are working to achieve the strategic aims of the organisation.

Role of Strategic Control

When strategic control is undertaken properly, it contributes to the following specific areas:

- (i) *Measurement of Organizational Progress:* Strategic control determines organizational progress towards achievement of its objectives. When a strategy is chosen, it specifies the likely outcomes which are significant for achieving the organizational objectives. Measuring the success of strategy implementation is a prime concern for every strategist. The measurement of organizational progress is undertaken during the process of strategy implementation as well as after the implementation to ensure that remedial actions are taken at appropriate time.
- (ii) *Feedback for Future Actions:* Strategic control activities are undertaken in the light of criteria set by a strategic plan. But at the same time control provides inputs either for adjusting the same strategic plan or taking future strategic plan. The organizations take a strategic action implemented and observe its results. The results are in line with what was planned, similar types of strategic actions will be taken in future.
- (iii) *Linking Performance and Rewards:* Many organizations fail in linking performance and rewards. Linking performance and rewards is a big strategic issue. If taken objectively, control provides inputs for relating performance and rewards. Linking performance rewards is very important for motivating people in the organization so that the human talent can be reaped. A performance based motivations system works in a better way than one which considers factors other than performance.

Role of Organisational Systems in Strategic Control

Strategic control operates in the context of various organizational systems. It is observed that an organization develops various systems which help in integrating various parts of the organisation. The following are the major organizational systems:

- (i) *Information System*: Management information and control systems are closely interrelated, the information system is designed on the basis of control system. Every manager in the organization should have sufficient information about his performance, standards and his contribution for achieving the organizational objectives. Information system initiates that every manager is getting the required information. Broadly speaking, the manager should be supplied with the information for taking appropriate action. For taking corrective steps for the deviations, if any, the manager must have the information at proper time and covering the functioning of a period which is subject to control.
- (ii) *Planning System*: Planning provides the entire spectrum on which control function is based. Control function emphasizes that there is a plan which directs the behaviour and activities in the organisation. Control measures these behaviour and activities and suggests measures to overcome the deviations if any. Since planning and control system are closely interlinked there should be proper integration of the two. These integration can be achieved by developing consistency of strategic objectives and performance measures.
- (iii) *Development System*: Development system is concerned with developing personnel to perform better in their existing position and likely future positions that they are expected to occupy. The system aims at increasing organization capability through people to achieve better results and later on these results becomes the basis for control.
- (iv) *Appraisal System*: Performance appraisal system involves systematic evaluation of the individual with regard to his performance and his potential for development. For evaluating an individual his performance along with his abilities and potential is taken into consideration.
- (v) *Motivation System*: Since the basic objective of the control is to ensure that organizational objectives are achieved, motivation plays crucial role in the control process. It energizes the managers and the other employees in the organization to perform better which is the key for organizational success.

Control Process

The control process consists of the following steps:

- (i) *Setting Performance Standards*: All functions in the organization begin with plans which specify the objectives and goals to be achieved. Based on this, standards are established which are criteria against which actual results are measured. For setting standards for control purpose it is necessary to identify clearly and precisely the results which are to be attained. After setting the standards it is also necessary to decide about the level of performance.
- (ii) *Measuring Actual Performance*: The next stage in control process is the measurement of actual performance against the standards already set. This involves measuring the performance in respect of a work in terms of control standards. The measurement of performance against its standards would be on a continuous basis so that deviations may be ascertained in advance of their actual performance and avoided by appropriate actions. Measurement of actual performance becomes an easy task if the standards are properly determined and the methods of measuring performance can be expressed explicitly.
- (iii) *Comparison of Actual Performance against Standards*: This stage involves measuring actual key variable performance, comparing results against standards, and informing the appropriate people so that deviations can be detected and corrections made or reinforcement given. Financial or management

accounting systems are usually relied on for measuring actual performance. However, many other measurement methods are also available, including product sampling, various predictions, observation by managers, meetings, and conferences. Whatever measurement methods are selected, they should be timely, accurate, and cost effective. The need to inform people of measurement results necessitates a system of reporting.

- (iv) *Analysing Variance:* Analysis of variance involves finding out the extent of variations and identifying the causes of such variations. When adequate standards are developed and actual performance is measured correctly the variations, if any, can be clearly identified. In case the standards are achieved no further managerial action is necessary and control process is complete. However, in many cases the actual performance achieved may vary from the standards fixed and variations may differ from case to case. When the variation between standard and actual performance is exceeded the prescribed level, an evaluation is made to find out the causes of such variations.
- (v) *Re-enforcement of Corrective Action:* This step in the control process requires that action should be taken to maintain the decided degree of control into system or operation. The following actions are taken to maintain the control system:
 - (a) Improvement in the performance by taking suitable measures if the result is not upto the desired level.
 - (b) Resetting the standard of performance, if the standards are too high and unrealistic.
 - (c) Change the strategies, objectives and plans, if they are not suitable.

Detection of negative deviations from standards usually leads to analysis of problems, decisions about how to correct them, and adjust to operations. Sometimes a control report will precipitate starting a new strategic management cycle. This new cycle may lead to the reformulation of goals or action plans, or both. Usually, however, strategies remain intact while operations are adjusted. The control process should be continuous so that control information is constantly fed back to the goal and action plan formulation stage. Deviations, therefore, should prompt immediate analysis so that a timely decision can be made about whether to change goals or action plans or operational management. It is also important to note that the performance which exceeds standards be reinforced. Too often management focuses attention only on negative deviations from expectations.

STRATEGIC CONTROL TECHNIQUES

Strategy formulation is based on certain assumptions. In fact, there is a time gap between strategy formulation and its implementation. Sometimes the strategy formulated may not work effectively as devised by the strategists. In order to overcome this situation the following strategic control techniques are followed:

1. *Premise Control:* Premise control is designed to check systematically whether the assumptions set during strategy formulation and implementation process are still valid. Premises include assumptions or forecast of the future and known conditions that effect the operations of a strategy. Premises are usually concerned with environmental and industry factors. Environmental factors are—economic, political – legal, technological, socio-culture and global, which affect the operation of business organization. Any major change in these factors between the time of strategy formulation and its implementation necessitates a change in strategy. An industry factor affects the operation of business directly while formulating a strategy. So every organization makes assumptions about industry structure and the nature of competition it faces.

For effective premise control an organization may take into account the following measures such as:

- (i) Identify the key premises which are vital to strategy implementation.
- (ii) People in the organization who are likely to have access to the relevant information about the premises

should be entrusted the responsibility for monitoring premises.

(iii) Identify the trigger points at which a change in strategy is required.

2. *Strategic Momentum Control*: These techniques are suitable for organizations working in a relatively stable environment. The major assumptions made at the time of strategic formulation remain valid for quite long time. There may be change in the environmental factors but such change is gradual and on predicted lines. There are three approaches for strategic momentum control as under:

- (a) *Responsibility Control Centers*: Responsibility control centers are created on the basis of control criteria used and termed as revenue centers, expense centers, profit centers and investment centers.
- (b) *Underlying Success Factors*: The organization can achieve its objectives by focusing continuously on the success factors.
- (c) *Generic Strategies*: Generic strategic approach to strategic control is based on the assumption that an organization's strategy should be comparable with others in the same industry. Based on this, the organization can adjust its strategy.

3. *Strategic Leap Control*: Strategic leap control enables the organizations operating in a relatively unstable and turbulent environment in defining new strategic requirements and to cope with environmental realities. The following techniques are generally used for exercising strategic leap control.

- (a) *Strategic Issue Management*: It involves identifying strategy issues and assessing their impact on the organization. By managing strategic issues in time, the organization can avoid the adverse impact on environmental surprises.
- (b) *Strategic Fied Analysis*: It involves examining the nature and extent of synergies that can be developed in changing environment.
- (c) *Systems Modeling*: It refers to simulated technique of decision making in which various organizational features and environmental scenarios are analyzed on simulated basis.

4. *Implementation Control*: This is designed to assess whether the overall strategy should be changed in the light of unfolding events and the results associated with incremental steps and actions to implement the overall strategy. In designing implementation control, the following two aspects are taken in to consideration:

- (a) *Monitoring Strategic Thrusts*: For the implementation of strategy, actions are divided into different identifiable new thrusts. These thrusts provide information which can be used as basis for subsequent actions.
- (b) *Milestone Review*: It is an identifiable segment of a strategy which may be in the form of crucial events, major resource allocation over a passage of certain time. Each milestone requires critical assessment in terms of time and cost.

5. *Strategic Surveillance*: This is a non-focused control and is designed to monitor a broad range of events inside and outside the organization which are likely to threaten the course of strategy. The idea behind the strategy surveillance is that some form of general monitoring of multiple information sources should be encouraged with the objective to reveal unanticipated situations.

6. *Special Alert Control*: This measure is undertaken to asses the impact of any major environmental events such as technological invention, regional disturbance between countries affecting the business, strategic actions taken by a country or countries together in controlling some critical issues. For example, a sudden increase in critical resources may invite an immediate reassessment of the organization strategy.

Employees Responses to Control

Control systems themselves can trigger an array of human behaviors, some of which are positive in their impact on the organization and some of which are negative. Positive reactions such as voluntary compliance or even active acceptance can be expected when control criteria demonstrate relevance through operational significance and lead to results that can be: (i) affected by employees, and (ii) directly measured. Further, positive reactions to control can be precipitated by employee participation in the process of setting standards, especially when standards are perceived as achievable but not challenging.

Negative reactions to controls can take several forms. Employees can resort to fudging records or even sabotage in order to distort performance measurements favorably. This results from lack of participation in the process of developing standards as well as misunderstanding of the importance of control.

A control system that emphasizes short-term results can jeopardize achievement of long-term goals. Failure to replace obsolete machinery may not only prevent short-term declines in return on assets but may also reduce long-term profitability. Absenteeism and turnover can be manifestations of tension and pressure caused by an overly strict control system.

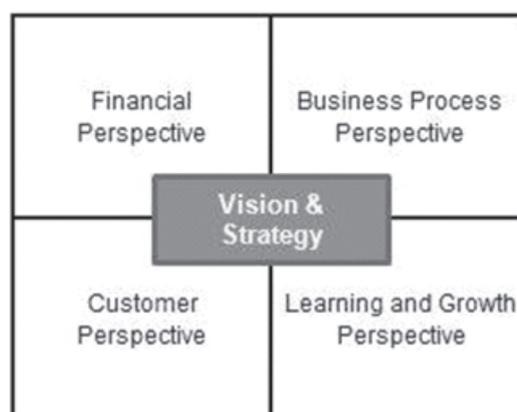
Balance Scorecard

The balance scorecard is used as a strategic planning and a management technique. This is widely used in many organizations, regardless of their scale, to align the organization's performance to its vision and objectives.

The scorecard is also used as a tool, which improves the communication and feedback process between the employees and management and to monitor performance of the organizational objectives. As the name depicts, the balanced scorecard concept was developed not only to evaluate the financial performance of a business organization, but also to address customer concerns, business process optimization, and enhancement of learning tools and mechanisms.

The Basics of Balanced Scorecard

Following is the simplest illustration of the concept of balanced scorecard. The four boxes represent the main areas of consideration under balanced scorecard. All four main areas of consideration are bound by the business organization's vision and strategy.



The balanced scorecard is divided into four main areas and a successful organization is one that finds the right balance between these areas.

Each area (perspective) represents a different aspect of the business organization in order to operate at optimal capacity.

- Financial Perspective - This consists of costs or measurement involved, in terms of rate of return on capital (ROI) employed and operating income of the organization.
- Customer Perspective - Measures the level of customer satisfaction, customer retention and market share held by the organization.
- Business Process Perspective - This consists of measures such as cost and quality related to the business processes.
- Learning and Growth Perspective - Consists of measures such as employee satisfaction, employee retention and knowledge management.

The four perspectives are interrelated. Therefore, they do not function independently. In real-world situations, organizations need one or more perspectives combined together to achieve its business objectives.

For example, Customer Perspective is needed to determine the Financial Perspective, which in turn can be used to improve the Learning and Growth Perspective.

Features of Balanced Scorecard

From the above diagram, you will see that there are four perspectives on a balanced scorecard. Each of these four perspectives should be considered with respect to the following factors.

When it comes to defining and assessing the four perspectives, following factors are used:

- Objectives - This reflects the organization's objectives such as profitability or market share.
- Measures - Based on the objectives, measures will be put in place to gauge the progress of achieving objectives.
- Targets - This could be department based or overall as a company. There will be specific targets that have been set to achieve the measures.
- Initiatives - These could be classified as actions that are taken to meet the objectives.\

A Tool of Strategic Management

The objective of the balanced scorecard was to create a system, which could measure the performance of an organization and to improve any back lags that occur.

The popularity of the balanced scorecard increased over time due to its logical process and methods. Hence, it became a management strategy, which could be used across various functions within an organization.

The balanced scorecard helped the management to understand its objectives and roles in the bigger picture. It also helps management team to measure the performance in terms of quantity. The balanced scorecard also plays a vital role when it comes to communication of strategic objectives.

One of the main reasons for many organizations to be unsuccessful is that they fail to understand and adhere to the objectives that have been set for the organization.

The balanced scorecard provides a solution for this by breaking down objectives and making it easier for management and employees to understand.

Planning, setting targets and aligning strategy are two of the key areas where the balanced scorecard can contribute. Targets are set out for each of the four perspectives in terms of long-term objectives. However, these targets are mostly achievable even in the short run. Measures are taken in align with achieving the targets.

Strategic feedback and learning is the next area, where the balanced scorecard plays a role. In strategic feedback and learning, the management gets up-to-date reviews regarding the success of the plan and the

performance of the strategy.

The Need for a Balanced Scorecard

Following are some of the points that describe the need for implementing a balanced scorecard:

- Increases the focus on the business strategy and its outcomes.
- Leads to improvised organizational performance through measurements.
- Align the workforce to meet the organization's strategy on a day-to-day basis.
- Targeting the key determinants or drivers of future performance.
- Improves the level of communication in relation to the organization's strategy and vision.
- Helps to prioritize projects according to the timeframe and other priority factors.

As the name denotes, balanced scorecard creates a right balance between the components of organization's objectives and vision. It's a mechanism that helps the management to track down the performance of the organization and can be used as a management strategy. It provides an extensive overview of a company's objectives rather than limiting itself only to financial values. This creates a strong brand name amongst its existing and potential customers and a reputation amongst the organization's workforce.

STRATEGIC CHANGE MANAGEMENT

Organisations are always involved in a variety of change, and this is not just confined to internal projects. For example, it could also encompass interaction with suppliers and customers. The change being undertaken by organizations now is inherently complex and often impacts diverse stakeholder groups both internally and externally. As the change portfolio grows the level of complexity grows with it. With many organizations now find it difficult to understand and track the plethora of change initiatives underway. An added complexity is a reduction in manpower and the availability of skilled resources.

Strategic change management is the process of delivering the strategy of an organisation in a controlled, efficient and effective manner. It is not about the delivery of a single project or monitoring business as usual activities. It is basically the process of governing a portfolio of programmes, projects and initiatives within the context of a wider strategy for the organisation. The purpose of the whole exercise is to deliver value to the organization.

The term change refers to an alteration in a system whether physical, biological or social. Thus organization change is the alternation of work environment in the organization. It implies a new equilibrium between different components of the organization i.e., technology, structural arrangement, job design, and people. An organization change may have following features:

- (i) Any change may effect the whole organization;
- (ii) When change occurs in any part of the organization, it disturbs the old equilibrium necessitating development of a new equilibrium;
- (iii) Organization change is a continuous process.

A strategic change is the movement of the company away from its present state towards some desired future state to increase its competitive advantage. There are three kinds of strategic changes that most of the companies pursue:

- (i) Re-engineering
- (ii) Restructuring; and
- (iii) Innovation.

Business process re-engineering is the redesign of the business processes and the associated systems and organizational structures to achieve a dramatic improvement in business performance. The business reasons for making such changes could include poor financial performance, external competition, and erosion of market share of emerging market opportunities. Business process re-engineering is the examination and change of the business components such as: strategy, processes, technology, organization culture etc. Strategic managers may need to develop a new strategy and structure to revise the level of their performance in the light of sudden changes taking place in the environment. They focus on business process, which is an activity that is vital to delivering goods and services to the customers.

Restructuring is another kind of change that strategic management use to implement strategic change to improve the performance. It may be: (i) reducing the level of differentiation and integration by reducing divisions, departments or hierarchy levels; (ii) by reducing the number of employees to bring the operating cost. Restructuring also involves changes in relationships between divisions or functions. Restructuring and downsizing becomes necessary due to:

- Unforeseen changes in business environment;
- New technological development;
- Reduction in demand;
- Excess production capacity;
- High bureaucratic and operating costs;
- Improving the competitive advantage;

Innovation is the process by which organizations use their skills and resources to create new technologies or goods and services so that they can change and better respond to the needs of their customers. Innovation can lead organizations to change that they want, it can also lead to the kind of change, they do not want. Organizations that depend on innovation as the way to achieve competitive advantage should adopt adjustable structures such as matrix or cross-functional team-structures that give people freedom to experiment and be creative.

MANAGING STRATEGIC CHANGES

The basic problem in managing change is to overcome people resistance successfully. Problems of overcoming resistance to change can be managed in the following ways:

- (i) *Education and Communication*: If misinformation and lack of information create barriers to managing change, education and communication might be appropriate. It requires an atmosphere of mutual trust and confidence and respect between managers and employees.
- (ii) *Participation*: Participation helps to give people in organizational change a feeling of importance. It creates the feelings among the employees that the decision is their own. They realise that the change process is a must. Those people who are directly affected by the change should be given opportunity to participate in that change before the final decisions are reached.
- (iii) *Obtaining commitment*: Commitment to take part in changed programme can be obtained in private from each individual. However, getting a person to commit himself in private to a changed programme may yield fewer results than if he voluntarily and publicly gives his commitment to an idea of change.
- (iv) *Leadership*: A transformational leader can use personal reasons for change without arousing resistance. An effective leader tries to change the psychological needs of his followers.
- (v) *Training and Psychological Counselling*: Management can change the basic values of the people by training and psychological counseling. People should be educated to become familiar with change, its

process, and working. They must be taught new skills, helped to change attitudes and indoctrinated in new relationships.

- (vi) *Coercion or Edict*: Coercion or edict is the imposition of change or the issuing of directives about change. It is the explicit use of power. Coercion is the least successful style of managing change except in a state of crisis or confusion.

Leadership and its forms

- **Classical leadership styles**

Leadership research has been long. One of the in-depth research in this field has been carried out by Kurt Lewin, a social researcher who carried out research on leadership styles. Lewin uncovered three key leadership styles: autocratic, democratic, and laissez-faire.

Visionary	Coaching	Affiliative	Democratic	Pace Setting	Commanding
open to new information	open communication	positive feedback system	invite discussions and opinions	set high performance standards	driven and focused autocratic in style
good communication skills	good listeners	improve morale	encourage ideas from others	quick response	quick response
big-picture focus	flexible with making strategies/decisions	promote team building	Communal decision-making	more micromanagement	more micromanagement
forward-looking	instructional in style	strong loyalty bonds	increase equality	complete work on schedule	

- **Modern leadership-style categories**

In more recent times, psychologist Daniel Goleman identified six key types of leadership styles that work because they draw upon experience, inference, and instinct rather than quantitative data. According to Goleman, who explores these six types in depth in his book *Primal Leadership*, effective leaders move across these styles in a situational manner and uses the style that works best for the context.

Visionary	Coaching	Affiliative	Democratic	Pace Setting	Commanding
open to new information	open communication	positive feedback system	invite discussions and opinions	set high performance standards	driven and focused
good communication skills	good listeners	improve morale	encourage ideas from others	quick response	autocratic in style
big-picture focus	flexible with making strategies/decisions	promote team building	Communal decision-making	more micro-management	quick response
forward-looking	instructional in style	strong loyalty bonds	increase equality	complete work on schedule	more micromanagement

Lesson 16

Analysing Strategic Edge

LESSON OUTLINE

- Introduction to Business Process Reengineering
- Concept of Benchmarking
- Introduction to Total Quality Management
- Six Sigma
- Enterprise Resource Planning
- Industry 4.0
- FinTech
- Block Chain Technology
- Artificial Intelligence
- LESSON ROUND UP
- TEST YOURSELF

LEARNING OBJECTIVES

In order to boost effectiveness and produce higher quality products for end customer, it is important to analyse strategic edge. This is also important for enabling new business growth and expansion and also to save cost by improving efficiency in the production process.

BPR is certainly a 'Change Management' approach that aims at bringing in fundamental improvements in the business performance of any organisation. It is a detailed blueprint of how the new processes are tested, the plan of redeployment of employees, the re-arrangement of resources and controlling and monitoring of its implementation plan.

Similarly, managers use the tool called benchmarking to identify the best practices in other companies and apply those practices to their own processes in order to improve the company's performance.

The objective of this chapter is to assist the students to understand:

- Introduction to Business Process Reengineering
- Concept of Benchmarking
- Total Quality Management
- Six Sigma

BUSINESS PROCESS RE-ENGINEERING (BPR)

Also known as Business Process Redesign, Business Transformation, or Business Process Change Management, Business Process Reengineering (BPR) is an endeavour to fabricate the operations of the business on an extensive scale and the act of recreating a core business process with the goal of improving product output, quality, or reducing costs.

Adopting BPR as a change management tool requires the organizations to make an introspection about the fundamentals of the company itself i.e. 'What they do?', 'Why they do things?' and 'Why do we do things the way we do it?'

The primary objective of BPR is to:

- Eliminate redundancies or futile layers in the whole process
- Eliminate enterprise costs.

BPR: Definition

As per Hammer and Champy (1993): "Business Process Re-Engineering (BPR) is the fundamental rethinking and radical redesign of business processes aimed at achieving radical improvements in essential contemporary measures of performance, such as cost, quality, service and speed."

Hammer and Champy (1993) further stress "Reengineering is about business reinvention- not business improvement, business enhancement, or business modification. "Business process is another core concept in BPR which discards Adam Smith's notion of division of labour and specialization as applied in the form of breaking work into its simplest tasks and assigning each task to a specialist. Instead Hammer and Champy (1993) define business process as "a collection of activities that takes one or more kinds of input and creates an output that is of value to the customer".

Thus, reengineering should not be about making marginal changes but ensuring quantum leaps in performance. In other words, BPR is another form of process innovation because it attempts to re-create processes.

Origin

Business process reengineering became popular in the business world in the 1990s, inspired by an article called Reengineering Work: Don't Automate, Obliterate, an article in Harvard Business Review (in July–August 1990) which was published in the Harvard Business review by Michael Hammer, the then professor of Computer Science at MIT. Hammer tested BPR as an examination of the manner Information Technology was having an impact on business processes (the Economist, 2009).

The underlying principle of BPR is that the managers must demolish such components of work that do not make any value addition and further automating it if possible. At the core of BPR was viewed as a revolutionary, fast-track and drastic change process (rather than incremental one) that could trigger fundamental changes in the business process itself such as job design, organizational structures, or management systems (Hammer and Champy, 1993).

After evolution of the concept, BPR was successfully implemented by a few high-profile organisations such as Hallmark, a famous greeting card company. Hallmark completely re-engineered its new product process. Similarly, the popular company Kodak also re-engineered its black-and-white film manufacturing process and cut the firm's response time of new orders to the tune of fifty per cent. Furthermore, with the advent of enterprise resource planning (ERP) which enabled electronic communications across company business processes, BPR got more popularity (The Economist, 2009).

Objectives of Business Process Reengineering

The following are the objectives for entities to opt for BPR:

- Boost effectiveness and produce higher quality products for end customer
- Improve efficiency in the production processes
- Cost saving in the long run
- Providing more meaningful work to employees
- To be more adaptable and flexible towards future changes.
- Enable new business growth and expansion

Typology of BPR Projects

Earl (1994) provides a four-strand typology of BPR projects which can be applied across any organization irrespective of what business it is involved in. These are:

- **Core Processes:** Core processes are central to business functioning and represent the primary value-chain activities which relate directly to external customers. Examples being order fulfillment processes.
- **Support Processes:** Support processes are back office processes which reinforce the core processes. These are typically secondary value-chain activities and relate more to internal customers. Typical examples being information technology, financial systems, and human resources systems.
- **Business Network Processes:** Business network processes are the processes which extend beyond the boundaries of the organization into other organizations such as suppliers and customers.
- **Management Processes:** those processes through which firms plan, organize and control resources. Examples include strategy development, direction setting, and managing the organization.

Factors for Successful Implementation of BPR

As per Hammer and Champy (1993), "BPR is certainly a 'Change Management' approach that aims at bringing in fundamental improvements in the business performance of any organisation. It is a detailed blueprint of how the new processes are tested, the plan of redeployment of employees, the re-arrangement of resources and controlling and monitoring of its implementation plan." Al-Mashari and Zairi (1999) have identified five factors for a successful implementation of BPR i.e.

- Change in management
- Management competencies
- Organizational structure
- BPR project management
- IT sub-structures

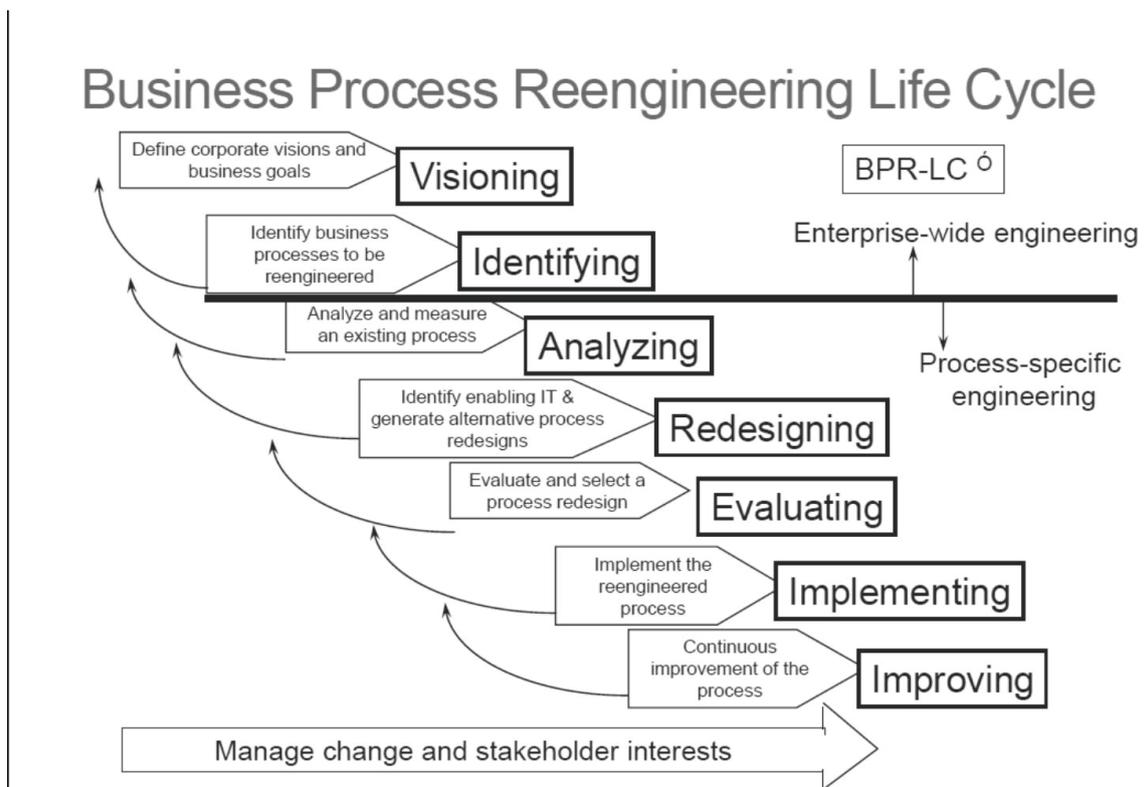
BPR is commonly termed as a bi-fold challenge viz. technical and socio-cultural (Reijersa and Mansarb, 2005). The technical challenge consists of creating radical process design to improve existing systems. The socio-cultural challenge stems from reaction against change from organisational employees. (CIPS: Achieving results through BPR and BPO). Therefore, the reasons for failure of BPR (Crowe et al., 2002 and Kotter, 1996) may be:

- Employees' resistance against change
- Communication breakdown

- Personnel turnover during transition

Business Process Reengineering	
<p>Business Process Reengineering (BPR) refers to an attempt to improvise the operation of the business on a broad scale. The primary aim of BPR is to cut down process redundancies and enterprise costs.</p>	
<p>Tools</p> <ul style="list-style-type: none"> • Customer and Process Focus • Visualization for End Process and Benchmarking • Change Management • Business Process Mapping 	<p>Steps</p> <ol style="list-style-type: none"> 1. Define Objectives and Framework 2. Identify Customer Needs 3. Study the Existing Process 4. Formulate a Redesign Business Plan 5. Implement the Redesign

Steps for Business Process Reengineering



A well-conducted execution of Business Process Reengineering can prove to be a game-changer for an organization. BPR can revive a failing entity and lead it to the path of profit maximization. However, executing BPR may not be easy as it involves enforcing a change in the entire organization. BPR comprises the following steps:

- Define : Objectives and Framework

There must be a clear definition of the objectives of choosing BPR. Such objectives must be clearly laid out in qualitative and quantitative terms. After defining such objectives, the requirement for change must be communicated to the employees to apprise them about the upcoming processes. This becomes important as the willingness of the employees to adopt the change is a key for the success of BPR.

- Identify : Customer Needs

The requirements and feedback of the customers must be given due importance while designing the BPR. It must be ensured that the new process are able to deliver the added value to the customer.

- Study: the Existing Process

In order to re-engineer, the company must has to analyze its existing business process. A SWOT should be carried out to have a clear view of the strengths and weaknesses of the existing processes.

- Formulate: a Redesigned Business Plan

After an analysis of the prevailing business process, the modifications to be made are chalked down. These modifications form a base for the re-designing of process. Then, a plan is laid down by selecting the best alternative.

- Implement: the Redesign

The last step is to implement the redesigned plan. Management should make sure that the new process is operational and adopted by the team. Such a support from the team is indeed critical to the success of BPR.

Case Study

Infosys :Business process re-engineering for the commissions process

The client

An Australian corporation, which is among the top ten banking institutions and top five general insurers, has one of the highest cross-sell rates in the financial sector. The insurance activities of the company cover personal insurance, corporate coverage, and workers' compensation.

Business need

Alliances and intermediaries were key growth drivers in the long-term strategy of the client. In order to better manage the channel behavior and meet the organization's objectives, the ability to pay accurate and timely commissions was an important element. This was considered a critical competitive edge and a weak link in the client's back office capabilities.

Challenges and requirements

The following challenges were faced during implementation:

- The existing operations comprised of manual processes using band aid systems which were high-cost and presented serious risks.
- This organization paid about AUS\$90 million per year in commissions, which was approximately 20 percent of its profits before goodwill and taxes. At the same time, it lost significant amount on overpayments and commission leakage.

Infosys role

Infosys studied the processes and identified improvement initiatives that would benefit the client. Infosys recommended a centralized commission management organization and articulated the desired business capabilities for a group commissions solution with the following objectives:

- Coverage of
 - Multiple businesses – insurance, wealth management, banking
 - Multiple brands
 - Different distribution models – multiple intermediary types
 - Consolidation of several existing legacy systems
 - Integration with product (Hogan, Cogen), payment (PeopleSoft), and CRM (Enterprise) systems
 - Scalability – large number of intermediaries (>5000) across BUs and 400,000 transactions per month

Infosys assessed vendors in the enterprise incentive management space based on multiple criteria. The vendors included Callidus, Synogy, Centive, Trilogy, and Siebel. Infosys evaluated and selected a vendor as a recommended integrated commissions platform. At the same time, Infosys also built the business case for the investment as well the implementation plan for all initiatives.

Benefits

The benefits of the solution include:

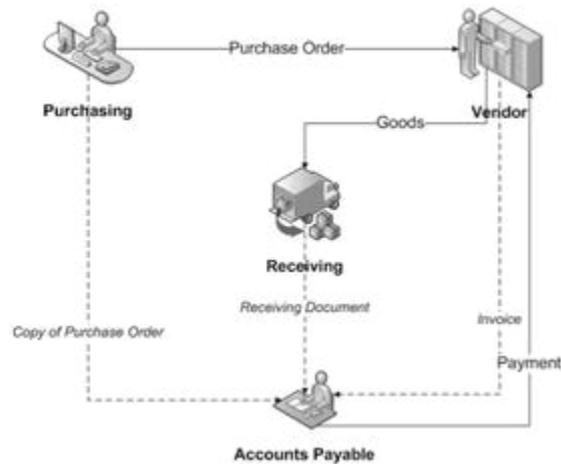
- Identification of the most suitable solution based on a list of quantifiable criteria (cost, project risk / ease of implementation timelines, functionality fit), and a complex evaluation process.
- Creation and articulation to the executive team of the business benefits arising from various initiatives including implementation of an integrated commissions platform.

Source: <https://www.infosys.com/industries/insurance/case-studies/Pages/business-process-reengineering.aspx>

Business Process Reengineering – Ford’s Accounts Payable Case Study

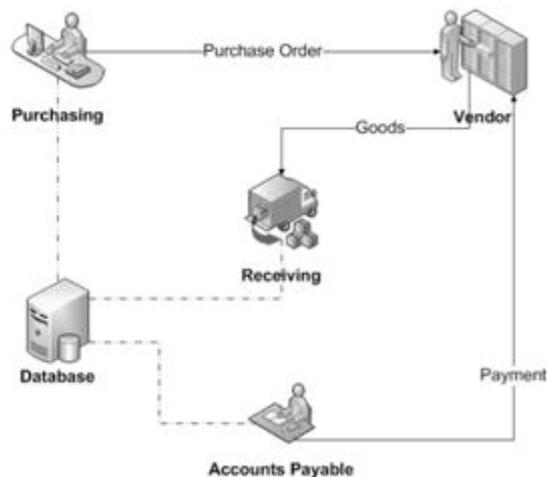
One of the companies that successfully utilised BPR in the initial years is Ford, for its accounts payables system. Before implementation, Ford used the accounts payable as shown in the figure below. Ford’s purchasing department initially sends a purchase order for raw materials. It also sends a copy of the purchase order to the accounts payable department. After sending the raw materials, the vendor raises an invoice to the accounts payable department. The accounts payable department tallies the purchase order, received materials and invoices and makes payments to the supplier. Ford employed about 500 people to handle the entire process, whereas its competitor, Mazda, a Japanese car manufacturer has managed the same process with 100 people, a remarkably low number of employees even if the size is taken into consideration.

Ford Accounts Payable Process – Before Business Process Reengineering



Instead of making minor changes to the business processes, Ford has decided to use BPR and information technology to radically change its accounts payable process. It has implemented an invoice-less process. The purchasing order will be raised by the purchasing departments and updated in the database. As soon the materials have been received a warehouse man would update the materials received and the payment will be automatically be made without waiting for the invoice to be received from the vendor.

Ford Accounts Payable Process – After Business Process Reengineering



Through these changes in the business process, Ford had achieved a 75% reduction in employees in the administration department.

BENCHMARKING

Benchmarking : Definition

According to Camp, benchmarking is simply "Finding and implementing the best business practices".

Benchmarking is a strategy tool of comparison. It is used to compare the performance of the business processes and products of a company with that of the best performances of other companies inside and outside the industry which the company is a part of. Managers use the tool to identify the best practices in other companies

and apply those practices to their own processes in order to improve the company's performance. Improving company's performance is, without a doubt, the most important goal of benchmarking.

Understanding the tool

In order to know the standing of one's business, it needs to be compared with the competitors. For example, your top management may be pleased with the fact that the rate of customer satisfaction for your company till they come to know that industry average for this variable is 95 per cent. In this situation, though the rate of 85 per cent seemed too brilliant initially, yet, they will look dull when compared to industry. Therefore, use of 'benchmarking' becomes obvious.

Such a type of comparison as mentioned above was not considered important management tool until late 1980s and 1990s. Then, Xerox introduced the process benchmarking technique. Such a comparison proved very valuable and Xerox, AT&T and other companies started to compare the performance of their processes with that of the best standards in the industry. The following table shows how benchmarking evolved into a modern strategy tool:

Benchmarking history	
1950-1975	Reverse engineering
1976-1986	Competitive benchmarking
1982-1986	Process benchmarking
1988+	Strategic benchmarking
1993+	Global benchmarking

Source: J. Blakeman, University of Wisconsin-Milwaukee[3]

Types of Benchmarking

Three major types of benchmarking were identified by Tuominen and Bogan and English:

- **Strategic benchmarking:** This type of benchmarking is used to identify the best way to compete in the market. In this type of benchmarking, the companies identify the winning strategies (typically outside the boundaries of their own industry) used by successful companies and thereafter adopt them in their own strategic processes.
- **Performance benchmarking:** Performance benchmarking determines how strong a company's products and services are when compared to competition. According to Bogan and English, the tool mainly focuses on product and service quality, features, price, speed, reliability, design and customer satisfaction, but it can measure anything that has the measurable metrics, including processes.
- **Process benchmarking:** It requires to look at other companies that engage in similar activities and to identify the best practices that can be applied to your own processes in order to improve them. It usually derives from performance benchmarking. This is because companies first identify the weak competing points of their products or services and then focus on the key processes to eliminate those weaknesses.

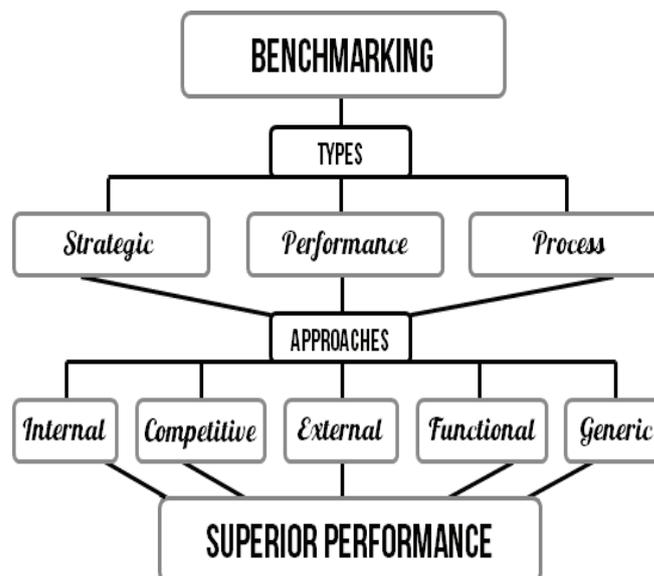
Approaches

- **Internal benchmarking:** In large organizations that have operations in multiple geographic locations within or outside national and regional boundaries, or organisations managing plentiful products and services, duplicating functions and processes are usually performed among different teams, business units or divisions of the same organisation. Internal benchmarking is used to compare the work of

such teams, units or divisions to identify the ones that are best performing and share the knowledge throughout the company to other teams to achieve higher performance.

- External or competitive benchmarking: Competitive benchmarking refers to a process when a company compares itself with the competitors inside its industry itself. External benchmarking looks both inside and outside the industry to find the best practices, thus, including competitive benchmarking.
- Functional benchmarking: Managers of functional departments find it useful to analyze how well their functional area performs compared to functional areas of other companies. It is quite easy to identify the best marketing, finance, human resources or operations departments, in other companies, that excel in what they do and to apply their practices to one's own functional area.
- Generic benchmarking: General benchmarking refers to comparisons which "focus on excellent work processes rather than on the business practices of a particular organization". For example, a company tries to improve its marketing capabilities and benchmarks itself against company 'X'. While observing company's 'X's' marketing processes, it also notices the efficiency in management of its human resources by using 'big data' analytics. This gives it an idea to implement such analytics in its own HR department to significantly improve its overall performance.

The following diagram summarizes the types and approaches to benchmarking:



Advantages

- Easy to understand and use.
- If done properly, it's a low cost activity that offers huge gains.
- Brings innovative ideas to the company.
- Provides with insight of how other companies organize their operations and processes.
- Increases the awareness of costs and level of performance compared to rivals.
- Facilitates cooperation between teams, units and divisions.

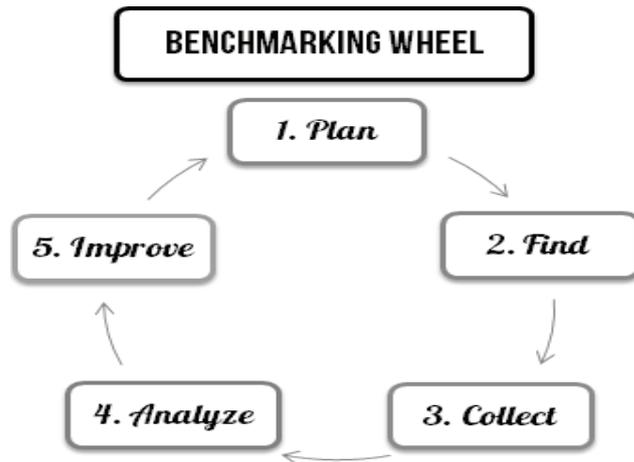
Disadvantages

- Requires identification of a benchmarking partner.

- Sometimes impossible to assign a metric to measure a process.
- Might need to hire a consultant.
- The initial costs could be huge.
- Managers often resist the changes.

Benchmarking Wheel

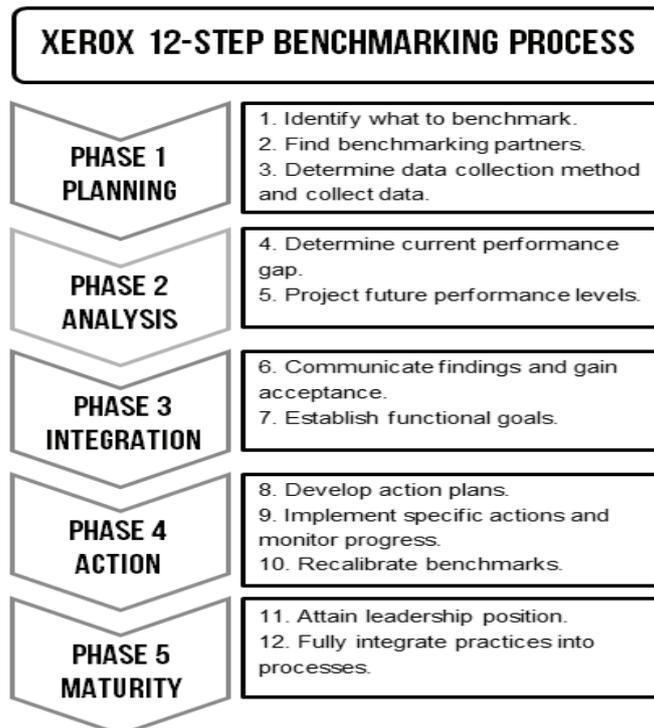
The benchmarking wheel model was first brought out in an article “Benchmarking for Quality”. This is a five stage process that was created by analyzing more than 20 other models.



1. **Plan:** Clearly define what you want to compare and assign metrics to it.
2. **Find:** Identify benchmarking partners or sources of information.
3. **Collect:** Choose the methods and gather the data for the metrics defined.
4. **Analyze:** Compare the metrics to identify the gap in performance between your company and the benchmarking partner. Provide the results and recommendations.
5. **Improve:** Implement the changes to your own products, services, processes or strategy.

Case study in Benchmarking: Xerox Process

Xerox has popularized benchmarking and was one of the first companies to introduce the process of doing it. This 5-phase and 12-step process was created by Camp, R. the manager of Xerox responsible for benchmarking.



Total Quality Management

Total Quality Management (TQM) is a concept given by W. Edwards Deming. Total Quality Management is a management approach that originated in the 1950s and has steadily become more popular since the early 1980s. It was originally introduced in Japan after World War II to assist the Japanese companies to re-build their economy. The main focus of TQM was and is continuous quality improvement in the areas of product or service, employer-employee relations and consumer-business relations. Total Quality is a description of the culture, attitude and organization of a company that strives to provide customers with products and services that satisfy their needs. The culture requires quality in all aspects of the company's operations, with processes being done right for the first time to eradicate defects waste from operations.

TQM Defined

"Quality" is "a degree of excellence", it is a degree to which a product lives up to its performance, endurance, maintainability, and other attributes expected by a customer while buying that specific product. For meeting such expectations of the customer, one must instil the concept of TQM in product development process. The word "total" means the sum total of every process, every job, every resource, every output, every person, every time and every place.

American Society for Quality Control (ASQC) defines Total Quality Management (TQM) as "a management approach to long-term success through customer satisfaction. TQM is based on the participation of all members of an organization to improving processes, products, services, and the culture they work in. TQM benefits all organization members and society. The methods for implementing this approach are found in the teachings of such quality leaders as Philip B. Crosby, W. Edwards Deming, Armand V. Feigenbaum, Kaoru Ishikawa, and J.M. Juran."

TQM is a management philosophy that views an organization as a collection of processes such as marketing, finance, design, engineering, and production, customer service, etc, thereby, focussing on meeting customer needs and organizational objectives.

The simple objective of TQM is "Do the right things, right the first time, every time." Although originally applied

to manufacturing operations, TQM is now becoming recognized as a Generic Management tool and is being widely applied in a number of service and public sector organizations all over the world.

ISO defined TQM as “A management approach of an organization centered on quality, based on participation of all its members and aiming at long term benefits to all members of the organization and society.”

Brockman, J. R. (1992) has defined that “TQM is a management philosophy, embracing all activities through which the need of customer, the community and the objectives of the organization are satisfied in the most effective and potential of all employees in continuing drive for improvement.”

Some examples of the companies who have implemented TQM include Ford Motor Company, Phillips Semiconductor, SGL Carbon, Motorola and Toyota Motor Company.

There are a number of evolutionary strands, with different sectors creating their own versions from the common ancestor. TQM is the foundation for activities, which include:

- Commitment by senior management and all employees
- Meeting customer requirements
- Reducing development cycle times
- Just in time/demand flow manufacturing
- Improvement teams
- Reducing product and service costs
- Systems to facilitate improvement
- Line management ownership
- Employee involvement and empowerment
- Recognition and celebration
- Challenging quantified goals and benchmarking
- Focus on processes / improvement plans
- Specific incorporation in strategic planning

This shows that TQM must be practiced in all activities, by all personnel, in manufacturing, marketing, engineering, R&D, sales, purchasing, HR, etc.

Principles of TQM

The key principles of TQM are as following:

Management Commitment

- Plan (drive, direct)
- Do (deploy, support, participate)
- Check (review)
- Act (recognize, communicate, revise)

Employee Empowerment

- Training

- Suggestion scheme
- Measurement and recognition
- Excellence teams

Fact Based Decision Making

- SPC (statistical process control)
- DOE, FMEA
- The 7 statistical tools
- TOPS (Ford 8D – team-oriented problem solving)

Continuous Improvement

- Systematic measurement and focus on CONQ
- Excellence teams
- Cross-functional process management
- Attain, maintain, improve standards

Customer Focus

- Supplier partnership
- Service relationship with internal customers
- Never compromise quality
- Customer driven standards

Characteristics of Total Quality Management

The most practical implementations of Total Quality Management involve the following most widely principles:

- Total involvement of employees: The most fundamental characteristic of TQM is total employee involvement. Only empowered and valiant employees who can take a stand for their work and understand the mechanism of operations of their organization operates as a whole can achieve desired level of performance by improving their efficiency. Further, employee involvement can also be attained by adopting a culture of continuous improvement and team empowerment.
- Customer focus: TQM views end customers as the sole measure of quality and success. Any effort, including employee training, infrastructure upgrades, software investments, or product releases, is worthwhile only if it aims at benefitting customers.
- Continual improvement: Organizations who practice TQM believe that merely maintaining the same level of quality and customer satisfaction is not enough to outperform competition. Rather, top management has the responsibility for promotion of culture of innovation and creativity to customers' expectations and maintain competitiveness.
- Process approach: it calls for breaking all processes into a series of steps, be it internal or external. The rationale of this is that each such step can be analyzed, measured and improved upon to attain desired results.
- System Approach to Management: All inter-related processes should be managed as a system to ensure that improvement efforts are focused on 'key' processes and integrated to achieve the desired results.

- Fact-based decisions: TQM requires organizations to collect data to improve decision-making, reach agreements on key business directions and make predictions based on historical data.
- Leadership/strategy definition: a strategic plan should be developed to achieve organization's vision, objectives and goals with 'quality' as a key component. Leadership is a key attribute as it establishes the direction of the organization. TQM advocates that leaders create an enabling environment for achieving business objectives.
- Mutually beneficial relationship with suppliers: An organization depends on its suppliers and this relationship should be strengthened to ensure that a mutually beneficial relationship is sustained.

Principles of Total Quality Management

There are the 8 principles of Total Quality Management:

- Customer-focused

The customer ultimately determines the level of quality. No matter what an organization does to foster quality improvement – training employees, integrating quality into the design process, upgrading computers or software, or buying new measuring tools – the customer determines whether the efforts were worthwhile.
- Total Employee Involvement

All employees participate in working toward common goals. Total employee commitment can only be obtained after fear has been driven from the workplace, when empowerment has occurred, and management has provided the proper environment. High-performance work systems integrate continuous improvement efforts with normal business operations. Self-managed work teams are one form of empowerment.
- Process-centered

A fundamental part of TQM is a focus on process thinking. A process is a series of steps that take inputs from suppliers (internal or external) and transforms them into outputs that are delivered to customers (again, either internal or external). The steps required to carry out the process are defined, and performance measures are continuously monitored in order to detect unexpected variation.
- Integrated System

Although an organization may consist of many different functional specialties often organized into vertically structured departments, it is the horizontal processes interconnecting these functions that are the focus of TQM.
- Strategic and Systematic Approach

A critical part of the management of quality is the strategic and systematic approach to achieving an organization's vision, mission, and goals. This process, called strategic planning or strategic management, includes the formulation of a strategic plan that integrates quality as a core component.
- Continual Improvement

A major thrust of TQM is continual process improvement. Continual improvement drives an organization to be both analytical and creative in finding ways to become more competitive and more effective at meeting stakeholder expectations.
- Fact-based Decision Making

In order to know how well an organization is performing, data on performance measures are necessary.

TQM requires that an organization continually collect and analyze data in order to improve decision making accuracy, achieve consensus, and allow prediction based on past history.

- Communications

During times of organizational change, as well as part of day-to-day operation, effective communications plays a large part in maintaining morale and in motivating employees at all levels. Communications involve strategies, method, and timeliness.

The Concept of Continuous Improvement by TQM

TQM is mainly concerned with continuous improvement in all work, from high level strategic planning and decision-making, to detailed execution of work elements on the shop floor. It stems from the belief that mistakes can be avoided and defects can be prevented. It leads to continuously improving results, in all aspects of work, as a result of continuously improving capabilities, people, processes, technology and machine capabilities.

Continuous improvement must deal not only with improving results, but more importantly with improving capabilities to produce better results in the future. The five major areas of focus for capability improvement are

- Demand generation
- Supply generation
- Technology
- Operations and
- People capability

Implementation Principles and Processes

Assess the organization's current reality: A preliminary step in TQM implementation is to assess an organization's current reality. Relevant preconditions have to do with the organization's history, its current needs, precipitating events leading to TQM, and the existing employee quality of working life. If an organization has a track record of effective responsiveness to the environment, TQM will be easier to implement.

However, if there is no track-record of responsiveness, there will be both employee skepticism and a lack of skilled change agents. If this condition prevails, a comprehensive program of management and leadership development may be instituted. A management audit is a good assessment tool to identify current levels of organizational functioning and areas in need of change.

An organization should be basically healthy before beginning TQM. If it has significant problems such as a very unstable funding base, weak administrative systems, lack of managerial skill, or poor employee morale, TQM would not be appropriate. However, a certain level of stress is probably desirable to initiate TQM.

A crisis, if it is not too disabling, can also help create a sense of urgency which can mobilize people to act. In the case of TQM, this may be a funding cut or threat, or demands from consumers or other stakeholders for improved quality of service. After a crisis, a leader may intervene strategically by articulating a new vision of the future to help the organization deal with it. A plan to implement TQM may be such a strategic decision. Such a leader may then become a prime mover, who takes charge in championing the new idea and showing others how it will help them get where they want to go. Finally, action vehicles are needed and mechanisms or structures to enable the change to occur and become institutionalized.

Conclusion

TQM encourages participation amongst shop floor workers and managers. There is no single theoretical formalization of total quality, but Deming, Juran and Ishikawa provide the core assumptions, as a "discipline

and philosophy of management which institutionalizes planned and continuous improvement and assumes that quality is the outcome of all activities that take place within an organization; that all functions and all employees have to participate in the improvement process; that organizations need both quality systems and a quality culture.”

FORD MOTOR COMPANY TOTAL QUALITY MANAGEMENT

Ford Motor Company total quality management or TQM practices started in the 1980s when “Quality Is Job 1” was their slogan. How did TQM work at Ford and are they still standing behind this process? Jean Scheid, a Ford Dealer talks with Ford management along with some insights of her own.

When an invasion of Japanese imports threatened the American automobile industry, the Ford Motor Company led a quality revival based on the management philosophy of W. Edwards Deming, who was controversial then and is out of fashion now.

The results of the movement, known as Total Quality Management, were stunning at Ford. After racking up \$3 billion in losses between 1979 and 1982, Ford hit a series of home runs, including the aerodynamic Taurus-Sable cars, and by 1986 had become the most profitable American auto company.

Now, though, Ford’s hard-won reputation for quality is being tarnished by a series of setbacks, from the controversy over deadly rollovers of Ford Explorers equipped with Firestone tires to costly recalls of several models and delays on the introductions of others. Indeed, according to recent surveys by Consumer Reports and J. D. Power & Associates, overall quality and customer satisfaction for Ford cars now lag the competition.

And so, once again, the company is embracing quality as the answer to its problems. This time, it has seized on Six Sigma, a management tool that is sweeping corporate America. “It was a good way to get a common language around innovation and marketing,” said Jacques Nasser, Ford’s chief executive, who started the Six Sigma program in 1999.

Six Sigma was popularized by John F. Welch Jr. of General Electric in the 1990’s. Adopting it does, however, point to a management problem. Too often, when it comes to management tools for improving efficiency and worker productivity, companies have to reinvent the wheel.

SIX SIGMA

Six Sigma is a disciplined, statistical-based, data-driven quality control program. It is a methodology for continuous cycle time improvement (the reduction of manufacturing defects to a level of no more than 3.4 per million) by eliminating defects in any product, process or service. Developed by Motorola in middle 1980’s, Six Sigma is based on quality management fundamentals. Due to its accuracy and merits, the approach became popular at General Electric (GE) in the early 1990’s. Today, thousands of organisations across the globe have adopted Six Sigma. Six Sigma is:

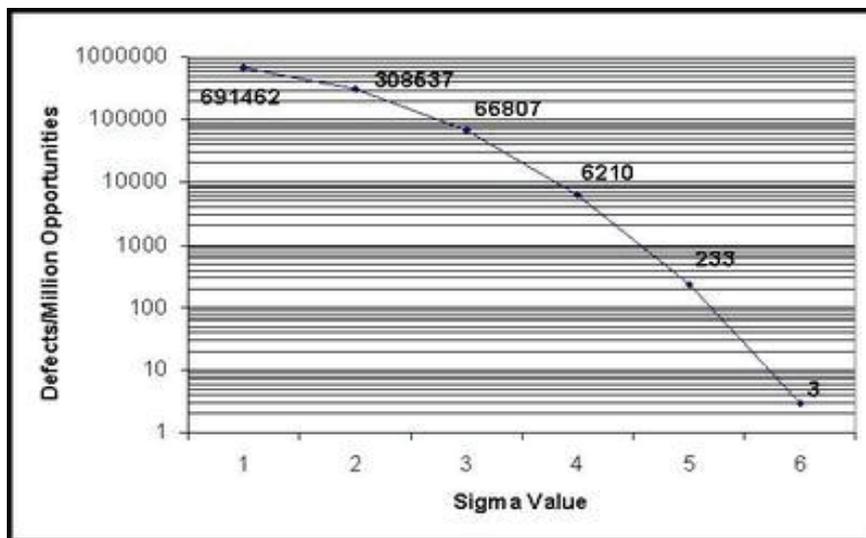
- A Business Strategy: Using Six Sigma Methodology, a business can strategize its plan of action and drive revenue increase, cost reduction and process improvements in all parts of the organization.
- A Vision: Six Sigma Methodology helps the Senior Management create a vision to provide defect free, positive environment to the organization.
- A Benchmark: Six Sigma Methodology helps in improving process metrics. Once the improved process metrics achieve stability; we can use Six Sigma methodology again to improve the newly stabilized process metrics. For example: The Cycle Time of Pizza Delivery is improved from 60 minutes to 45 minutes in a Pizza Delivery process by using Six Sigma methodology. Once the Pizza Delivery process stabilizes at 45 minutes, we could carry out another Six Sigma project to improve its cycle time from 45 minutes to 30 minutes. Thus, it is a benchmark.

- A Goal: Using Six Sigma methodology, organizations can keep a stringent goal for themselves and work towards achieving them during the course of the year. Right use of the methodology often leads these organizations to achieve these goals.
- A Statistical Measure: Six Sigma is a data driven methodology. Statistical Analysis is used to identify root-causes of the problem. Additionally, Six Sigma methodology calculates the process performance using its own unit known as Sigma unit.
- A Robust Methodology: Six Sigma is the only methodology available in the market today which is a documented methodology for problem solving. If used in the right manner, Six Sigma improvements are bullet-proof and they give high yielding returns.

PROCESS SIGMA TABLE

SIGMA LEVEL	DEFECT RATE	YIELD
2σ	308,770 dpmo	69.10000%
3σ	66,811 dpmo	93.33000%
4σ	6,210 dpmo	99.38000%
5σ	233 dpmo	99.97700%
6σ	3.44 dpmo	99.99966%

The Six Sigma conversion graph illustrating the relationship between sigma values and defects/million opportunities is given below:



This graph is on a logarithmic scale. Notice the increasing rate of improvement. For example, 1 sigma to 3 sigma is only 10 times improvement; 3 sigma to 4 sigma is a big 10 times improvement; whereas 5 sigma to 6 sigma is a whopping 1825 times change. That is why it is essential to achieve breakthrough improvements to reach such a level of maturity. Six Sigma provides a methodology to achieve this.

Six Sigma can also be thought of as a measure of process performance. Once the current performance of the process is measured, the goal is to continually improve the sigma level striving towards 6 sigma. Even if the improvements do not reach 6 sigma, the improvements made from one sigma level to other will still diminish

costs and augment customer satisfaction.



Why Six Sigma

With the budding costs cost of resources and rise in other factors such as competition, the organizations are forced to look around for alternative methods which add to efficiency. Adoption of Six Sigma methodology helps in improving efficiency in any organization as it meticulously identifies defects and minimizes the variations within a process. This is because, each Six Sigma project is supposed to follow a defined sequence of steps and includes specific improvement targets. Some examples could include:

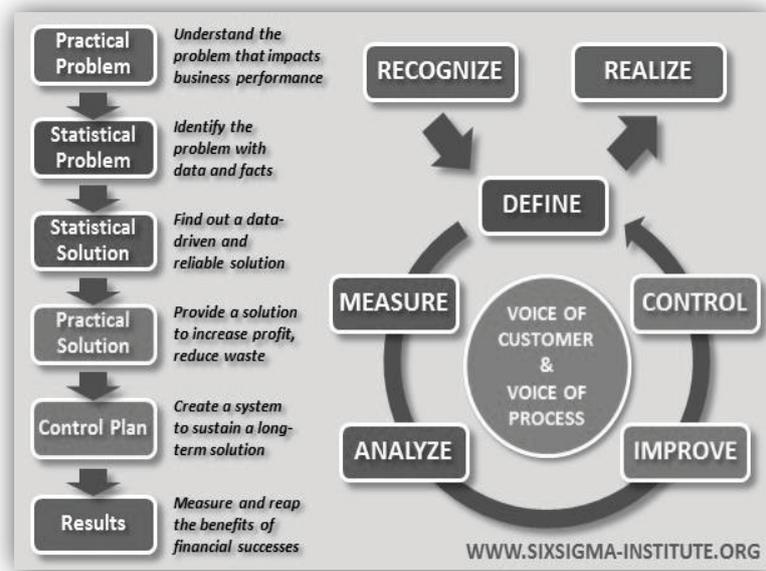
- Decrease in process cycle time
- Decrease of scrap generated by a process
- Growing customer satisfaction
- Decline in the number of factory defects
- Decrease or elimination of costly reworks

The scope of Six Sigma is not curtailed to the manufacturing industry rather the tools and techniques of Six Sigma are presently being used to improve processes in all type of business organizations, routine office operations, business processes and customer service processes.

How does 6 Sigma work?

A typical Six Sigma project determines the existing state and enhances the performance of the business process to a new and statistically significant improved state with the use of statistical tools. There can be two situations: First, the process already existing but it is not working “reasonably” well; second, there is no process in existence at all.

Situation 1: The process already existing but it is not working “reasonably” well. This scenario focuses on use of DMAIC (which stands for Define, Measure, Analyze, Improve and Control):



1. Define problem statement process goals in terms of key critical parameters on the basis of customer requirements or Voice Of Customer (VOC) and setting project boundaries.
2. Measure a complete picture of the current state of the process and establishes a baseline through measurement of the existing system in context of goals and collecting the data regarding possible causal factors.
3. Analyze the current scenario in terms of causes of variations and defects and determining the root cause.
4. Improve the process by systematically reducing variation and eliminating defects and root causes.
5. Control future performance of the process and support and maintain the gains realized.

Situation 2: This is the situation when there is no process in existence at all and it has to be designed using Design For Six Sigma (DFSS) approach. DFSS approach typically requires IDOV:

1. Identify process goals in terms of critical parameters, industry & competitor benchmarks, Voice Of Customer (VOC)
2. Design involves enumeration of potential solutions and selection of the best
3. Optimize performance by using advanced statistical modeling and simulation techniques and design refinements
4. Validate that design works in accordance to the process goals

Note, sometimes a DMAIC project may turn into a DFSS project because the existing process may require complete re-design making room for a new process due to lack of effectiveness of existing system. Such a development may be discovered during 'improvement phase' of DMAIC.

It is extremely important to remember that Six Sigma is not just about quality of the product but has also to take in account the customers and the market. For instance, in the year 1988, Polaroid had a sale of over US\$ 2 billion, and was an excellent player in stock exchange. In the year 1997, it became a Six Sigma company. However, in late 2001, it had to file bankruptcy because it just kept on focussing on improvement of quality of their products and completely failed to assess the customer needs.

Illustration

Consider a pizza delivery shop that guarantees the order delivery within 30 minutes from the time of accepting an order. In the event of a delivery time miss, the customer is refunded 100% money. It implies that such pizza shop will have to make 99.9997% deliveries within 30 minutes to be called a six sigma shop. There are certain parameters called a Critical To Quality (CTQ) and its example with reference to pizza shop will be:

- CTQ Name: Timely Pizza delivery
- CTQ Measure: Time in Minutes
- CTQ Specification: Delivery within 30 minutes from the order acceptance time

Defect: Delivery that takes longer than 30 minutes

The Six Sigma Training and Certification Levels

The Six Sigma training and certification levels are emulated from the martial arts. “Six Sigma” management has several levels of certification i.e. Champion, Yellow Belt, Green Belt, Black Belt, and Master Black Belt. Each level of certification is described below.

Champion

A Six Sigma Champion is the most basic form of Six Sigma certification. A Champion understands the theory of Six Sigma management, but does not yet have the quantitative skills to function as an active Six Sigma project team member.

A Yellow Belt

A Six Sigma Yellow Belt is an individual who has passed the Green Belt certification examination but has not yet completed a Six Sigma project. A Yellow Belt should have a basic understanding of Six Sigma, statistical tools and DMAIC methodology. However, executives in Six Sigma organizations function as champions of Six Sigma projects.

Green Belt

A Six Sigma Green Belt is an individual who works on projects part-time either as a team member for complex projects, or as a project leader for simpler projects. Green belts are the “work horses” of Six Sigma projects. Green Belts receive training on DMAIC methodology, statistical tools, proper data collection and analysis of the data collected. Most managers in a mature Six Sigma organization are green belts.

Black Belt

A Black Belt receives the highest level of training in the statistical tools of Six Sigma. Black Belts, as a rule, develop the plans for Six Sigma project implementation. Their responsibilities include creating project plans, leading cross-functional projects and directing team members, including Green and Yellow Belts. Black Belts usually train other team members on the proper use of Six Sigma tools and techniques, such as control charts, histograms and Root Cause Analysis (RCA).

Master Black Belt

A Master Black Belt is classically trained in statistical tools, Six Sigma methodology and management processes. Master Black Belts mentor and direct groups of Black Belts and Six Sigma teams through various problems that need to be reviewed.

Six Sigma Implementation in Ford Motor Company

Ford Motor Company, an American Multinational automaker considered as the world's, largest and most successful automakers is famous for introducing revolutionary products. The company is known for its innovative and dynamic approach to manufacturing by using Total Quality Management approach to achieve its vision "Quality Is Job 1". It has employed such manufacturing concepts as standardization, assembly lines, which came to be known as Fordism. Ford was ranked 'seventh' in terms of quality in automobile world in 2001, the position which was soon elevated to third in the year 2003, which was viewed as a remarkable improvement over this two-year period. The credit of such improvement was awarded to quality initiatives taken by Ford in 1999, significant among which was the Six Sigma techniques such as a data-driven problem-solving process, to devise solutions to waste issues. Six Sigma saved Ford from its deep-rooted problems. These issues include inadequate productivity, poor use of resources, low customer satisfaction, and environmental unfriendliness.

Carrying Out the Six Sigma Approach

To actualize the vision of becoming a consumer products company, Ford Motor Company implemented Six Sigma in late 1990s with the twin goals of enhancing vehicle quality and improving the level of customer satisfaction. The initiative was called 'Consumer-driven Six Sigma'. Ford was the first major automobile company in the world to go for Six Sigma initiative in a big way. In Ford's view, there existed about 20,000 opportunities for defects in manufacturing a car. Through Six Sigma, Ford aimed at attaining its defect rate to just one for every 14.8 vehicles.

Reasons to adopt Six Sigma in Ford Motor Company

- Cost Reduction
- Quality Improvement
- Improve Customer Satisfaction
- Reduce solvent consumption to lower the environment impact

Roadblocks in Implementing Six Sigma

- Employee Commitment
- Resource challenge (time, money and productivity)
- Infrastructure to fully run the Six Sigma Initiative as it required enormous data and internal measures.

FORD's improvement after implementation of Six Sigma

- Elimination of more than \$2.19 billion of wastage of resources since 2001.
- An increasingly dramatic impact on operations of the enterprise. After adopting six sigma, Ford has completed more than 9,500 projects savings \$1.7 billion worldwide, including \$731 million in 2003.
- Increase in customer satisfaction to five percentage points as disclosed by company's internal customer satisfaction survey.

A Comparison of Business Process Reengineering vs. Six Sigma

Features	BPR	Six Sigma
General Tendency	Radical redesign	Align and maintain

Business drivers	Recession and changing market needs	Service bundling and internet
Goals	Streamlining	Process alignment
Tools	Process maps	Statistical analysis
Method	Challenge process fundamentals	Prioritize by COPQ (Cost of Poor Quality) and Capability
Deployment	Top-down	Top-Bottom-middle
Key feature	Outside consultants	Internal experts
Impact	Short and medium term	Short, medium and long term
Role of technology	Enabler	Enabler
Risk/return	High-low	Medium-high

Source: www.sixsigma-institute.org

Enterprise Resource Planning

ERP, or enterprise resource planning, is a modular software system designed to integrate the main functional areas of an organization's business processes into a unified system.

An ERP system includes core software components, often called modules, that focus on essential business areas, such as finance and accounting, HR, production and materials management, customer relationship management (CRM) and supply chain management. Organizations choose which core modules to use based on which are most important to their particular business.

What primarily distinguishes ERP software from stand-alone targeted software -- which many vendors and industry analysts refer to as best-of-breed solutions -- is a common central database from which the various ERP software modules access information, some of which is shared with the other modules involved in a given business process. This means that companies using ERP are largely saved from having to make double entries to update information because the system shares the data, in turn enabling greater accuracy and collaboration between the organization's departments.

ERP implementation options include on premises, cloud and a mix of the two, called hybrid, such as with platform as a service (PaaS) and infrastructure as a service (IaaS). Although ERP has historically been associated with expensive, monolithic, end-to-end implementations, cloud versions now enable easier deployments, which SMBs are taking advantage of in greater numbers.

Some ERP systems also offer next-generation capabilities, such as AI, IoT and advanced analytics, to foster digital transformation. Businesses typically turn to an ERP system when they outgrow spreadsheets and disparate, often siloed software systems and need the unifying capabilities of an ERP system to enable growth. As with many technology products, the specific definition of what constitutes ERP can vary widely from vendor to vendor.

History of ERP

Gartner coined the term "enterprise resource planning" in 1990. ERP is preceded by Material Requirements Planning (MRP), developed by IBM engineer Joseph Orlicky as a system for calculating the materials and components needed to manufacture a product

In 1983, management expert Oliver Wight developed an extension of MRP called MRP II, which broadened

the planning process using a method that integrated operational and financial planning. MRP II added other production processes, such as product design and capacity planning.

ERP emerged as an expansion of MRP II, extending its scope beyond manufacturing to cover business processes such as accounting, human resources and supply chain management, all managed from a single, centralized database.

ERP has expanded to encompass a growing set of business-critical applications, such as business intelligence, sales force automation (SFA) and marketing automation. While MRP and MRP II applied to the manufacturing industry, ERP is used by a wide range of industries today.

How ERP works

ERP systems rely on a centralized relational database, which collects business information and stores them in tables. Having the data stored centrally allows end users, such as from finance, sales and other departments, to quickly access the desired information for analysis.

Instead of employees in different departments managing their own spreadsheets and reports, ERP systems allow for reporting to be generated from a single, centralized system. Information updated in one ERP module, such as CRM, HR and finance, is sent to a central, shared database. The appropriate information in the central database is then shared with the other modules.

Importance of ERP

Experts list four important business benefits of ERP:

- IT cost savings
- Business process efficiency
- A business process platform for process standardization
- A catalyst for business innovation

While businesses often focus on the first two areas because they're easy to quantify, the latter two areas can create greater impact for businesses.

ERP makes real-time business data available throughout the organization, which enables businesses to adapt quickly and respond to changes. The business data available in ERP systems provides for more informed decision making within an enterprise. ERP systems can also share data with third party partners and vendors to improve efficiencies in the supply chain.

Benefits of ERP systems

ERP offers a plethora of benefits, most of which come from information sharing and standardization. Because ERP components can share data more easily than disparate systems, they can make cross-departmental business processes easier to manage on a daily basis. They can also enable better insights from data, especially with the newer technologies that many ERP systems are including, such as powerful analytics, machine learning and industrial IoT capabilities.

In addition, ERP software:

- boosts efficiencies by automating data collection;
- enables business growth by managing increasingly complex business processes;
- helps lower risk by enabling better compliance;
- fosters collaboration using data sharing and integrated information;

- provides better business intelligence and customer service capabilities; and
- improves supply chain management.

Advantages and disadvantages

Many consider ERP software to be a requirement for enterprises -- especially for core business functions such as finance -- and the same is arguably true for growing SMBs. The sheer volume of data that companies generate, along with the complexity of the global business landscape and modern consumer demands, has made streamlining business processes and managing and optimizing data increasingly critical. An ERP software system is typically at the core of such capabilities.

That said, there are advantages and disadvantages to implementing ERP.

Advantages:

- Can save money over the long run by streamlining processes.
- Provides a unified system that can lower IT-related expenses and end-user training costs.
- Enables greater visibility into myriad areas of the business, such as inventory, that are critical for meeting customer needs.
- Enables better reporting and planning due to better data.
- Offers better compliance and data security, along with improved data, backup and the ability to control user rights.

Disadvantages:

- Can have a high upfront cost.
- Can be difficult to implement.
- Requires change management during and after implementation.
- Basic, core ERP modules may be less sophisticated compared to targeted, stand-alone software. Companies may require additional modules for more control and better management of specific areas, such as the supply chain or customer relationship capabilities.

Industry 4.0

McKinsey defines Industry 4.0 as the “digitization of the manufacturing sector, with embedded sensors in virtually all product components and manufacturing equipment, ubiquitous cyber physical systems and analysis of all relevant data.” It is driven by four clusters of disruptive technologies:

1. Data, computational power and connectivity – i.e., low-power, wide-area networks, for example
2. Analytics and intelligence
3. Human-machine interaction – i.e., touch interfaces and augmented reality
4. Digital-to-physical conversion – i.e., advanced robotics and 3-D printing

With these clusters currently at a tipping point, the time is now for manufacturing companies to figure out a response to them. As Industry 4.0 influences mission-critical applications in business processes, the digital transformation is extensive, but it will come at a slower pace than the digital disruption of the Internet. Because of their long investment cycles, companies are often conservative when deciding on how to address fundamental

disruption. However, manufacturing companies that take the risk and are early adopters of new technology will be rewarded for their progressive decision-making. Digitization helps to ensure product quality and safety, as well as faster service delivery, which goes a long way with customers.

For a manufacturing company to be considered Industry 4.0, it must include:

- **Interoperability** – Having machines, devices, sensors and people that connect and communicate with one another.
- **Information transparency** – Having systems that create a virtual copy of physical things through sensor data in order to put information in context.
- **Technical assistance** – Having systems with the ability to help people in decision-making and problem-solving, and to assist people with tasks that are too difficult or unsafe for humans to do.
- **Decentralized decision-making** – Having cyber-physical systems (i.e., smart grid, autonomous automobile systems, medical monitoring, process control systems, robotics systems, etc.) with the ability to directly make simple decisions and become as autonomous as possible.

While many manufacturers may continue to be in denial about Industry 4.0 and its impact on their businesses, or are having difficulty in finding the talent or knowledge to know the best ways to adopt it, many others are already implementing changes now and preparing for a future where smart machines improve their businesses.

Indeed, Industry 4.0 is still evolving, and we may not know the complete picture for a while. However, companies that are adopting the technologies understand Industry 4.0's potential and want to harness it.

Artificial Intelligence

Artificial Intelligence (AI), or machine intelligence, is the field developing computers and robots capable of parsing data contextually to provide requested information, supply analysis, or trigger events based on findings. Through techniques like machine learning and neural networks, companies globally are investing in teaching machines to 'think' more like humans.

Artificial Intelligence, or simply AI, is the term used to describe a machine's ability to simulate human intelligence. Actions like learning, logic, reasoning, perception, creativity, that were once considered unique to humans, is now being replicated by technology and used in every industry. A common example of AI in today's world is chatbots, specifically the "live chat" versions that handle basic customer service requests on company websites. As technology evolves, so does our benchmark for what constitutes AI.

The Artificial Intelligence and Business Strategy initiative explores the growing use of artificial intelligence in the business landscape. The exploration looks specifically at how AI is affecting the development and execution of strategy in organizations. The initiative researches and reports on how AI is spurring workforce change, data management, privacy, cross-entity collaboration, and generating new ethical challenges for business. It looks at new risks and threats in dependency, job loss, and security. And it seeks to help managers understand and act on the tremendous opportunity from the combination of human and machine intelligence.

Nine Areas for developing AI Business Strategy:

1. Business strategy

Creating an AI strategy for the sake of it won't produce great results. To get the most out of AI, it must be tied to your business strategy and your big-picture strategic goals. That's why the first step in any AI strategy is to review your business strategy. (After all, you don't want to go to all this trouble and apply AI to an outdated strategy or irrelevant business goals.)

In this step, ask yourself questions such as:

- Is our business strategy still right for us?
- Is our strategy still current in this world of smarter products and services?
- Have our business priorities changed?

2. Strategic AI priorities

Now that you're absolutely clear on where your business is headed, you can begin to identify how AI can help you get there.

In other words:

- What are our top business priorities?
- What problems do we want or need to solve?
- How can AI help us deliver our strategic goals?

The AI priorities that you identify in this phase are your use cases. To ensure your AI strategy is focused and achievable, I'd stick to no more than 3–5 AI use cases.

Examples of AI priorities or use cases include:

- Developing smarter products and services
- Making business processes and functions (such as accounts, sales and HR) more intelligent
- Automating repetitive or mundane tasks to free people up for more value-adding activities
- Automating manufacturing processes

3. Short-term AI adoption priorities

Transforming products, services or processes is never going to be an overnight task. It may take some time to deliver the use cases you've identified. For that reason, I find it helps to also identify a few (as in, no more than three) AI quick wins – short-term AI priorities that will help you demonstrate value and gain buy-in for bigger AI projects.

Ask yourself:

- Are there any opportunities to optimise processes in a quick, relatively inexpensive way?
- What smaller steps and projects could help us gather information or lay the groundwork for our bigger AI priorities?

4. Data strategy

AI needs data to work. Lots and lots of data. Therefore, you need to review your data strategy in relation to each AI use case and pinpoint the key data issues.

This includes:

- Do we have the right sort of data to achieve our AI priorities?
- Do we have enough of that data?
- If we don't have the right type or volume of data, how will we get the data we need?
- Do we have to set up new data collection methods, or will we use third-party data?
- Going forward, how can we begin to acquire data in a more strategic way?

5. Ethical and legal issues

Let's not beat around the bush: the idea of super-intelligent machines freaks people out. It's therefore crucial that you apply AI in a way that's ethical and above board.

Here, you'll need to ask yourself questions like:

- How can we avoid invading people's privacy?
- Are there any legal implications of using AI in this way?
- What sort of consent do we need from customers/users/employees?
- How can we ensure our AI is free of bias and discrimination?

The ethical implications of AI is a huge topic right now. Notably, tech giants including Google, Microsoft, IBM, Facebook and Amazon have formed the Partnership on AI, a group that's dedicated to researching and advocating for the ethical use of AI.

6. Technology issues

Here you identify the technology and infrastructure implications of the decisions you've made so far.

Consider:

- What technology is required to achieve our AI priorities (for example, machine learning, deep learning, reinforcement learning, etc.)?
- Do we have the right technology in place already?
- If not, what systems do we need to put in place?

7. Skills and capacity

For those companies who aren't Facebook or Google, accessing AI skills can be a real challenge. Therefore, this step is about reviewing your in-house AI skills and capabilities, and working out where you need a skills injection.

For example:

- Where are our skills gaps?
- To fill those gaps, do we need to hire new talent, train existing staff, work with an external AI provider or acquire a new business?
- Do we have awareness and buy-in for AI from leadership and at other levels in the business?
- What can we do to raise awareness and promote buy-in?

8. Implementation

Here you need to think about how you'll turn your AI strategy into reality.

This might surface questions such as:

- How will we deliver our AI projects?
- What are the key next steps?
- Who is responsible for delivering each action?
- Which actions or projects will need to be outsourced?

9. Change management issues

Because people are so wary of AI, particularly what it might mean for their jobs, change management is a really important part of any AI project.

Example questions include:

- Which employees and teams will be impacted by this AI project?
- How can we communicate effectively with those people about the change?
- How should the change process be managed?
- How will AI change our company culture, and how will we manage that culture change?

In conclusion, Artificial intelligence (AI) has the potential to transform every business – in the same way (and possibly more) as the internet has utterly transformed the way we do business. From smarter products and services to better business decisions and optimised (or even automated) business processes, AI has the power to change almost everything. Those businesses that don't capitalise on the transformative power of AI risk being left behind.

Fintech

Financial technology (Fintech) is used to describe new tech that seeks to improve and automate the delivery and use of financial services. At its core, fintech is utilized to help companies, business owners and consumers better manage their financial operations, processes, and lives by utilizing specialized software and algorithms that are used on computers and, increasingly, smartphones. Fintech, the word, is a combination of “financial technology”.

Broadly, the term “financial technology” can apply to any innovation in how people transact business, from the invention of digital money to double-entry bookkeeping. Since the internet revolution and the mobile internet/smartphone revolution, however, financial technology has grown explosively, and fintech, which originally referred to computer technology applied to the back office of banks or trading firms, now describes a broad variety of technological interventions into personal and commercial finance.

History

When fintech emerged in the 21st Century, the term was initially applied to the technology employed at the back-end systems of established financial institutions. Since then, however, there has been a shift to more consumer-oriented services and therefore a more consumer-oriented definition. Fintech now includes different sectors and industries such as education, retail banking, fundraising and nonprofit, and investment management to name a few.

Fintech now describes a variety of financial activities, such as money transfers, depositing a check with your smartphone, bypassing a bank branch to apply for credit, raising money for a business startup, or managing your investments, generally without the assistance of a person. According to EY's 2017 Fintech Adoption Index, one-third of consumers utilize at least two or more fintech services and those consumers are also increasingly aware of fintech as a part of their daily lives. Fintech also includes the development and use of crypto-currencies such as bitcoin. That segment of fintech may see the most headlines, the big money still lies in the traditional global banking industry and its multi-trillion-dollar market capitalization.

Some of the most active areas of fintech innovation include or revolve around the following areas:

- Cryptocurrency and digital cash.
- Blockchain technology, including Ethereum, a distributed ledger technology (DLT) that maintain records on a network of computers, but has no central ledger.

- Smart contracts, which utilize computer programs (often utilizing the blockchain) to automatically execute contracts between buyers and sellers.
- Open banking, a concept that leans on the blockchain and posits that third-parties should have access to bank data to build applications that create a connected network of financial institutions and third-party providers. An example is the all-in-one money management tool Mint.
- Insurtech, which seeks to use technology to simplify and streamline the insurance industry.
- Regtech, which seeks to help financial service firms meet industry compliance rules, especially those covering Anti-Money Laundering and Know Your Customer protocols which fight fraud.
- Robo-advisors, such as Betterment, utilize algorithms to automate investment advice to lower its cost and increase accessibility.
- Unbanked/underbanked, services that seek to serve disadvantaged or low-income individuals who are ignored or underserved by traditional banks or mainstream financial services companies.
- Cybersecurity, given the proliferation of cybercrime and the decentralized storage of data, cybersecurity and fintech are intertwined.

Fintech Users

There are four broad categories of users for fintech:

- 1) B2B for banks,
- 2) their business clients,
- 3) B2C for small businesses, and
- 4) consumers.

Trends toward mobile banking, increased information, data, and more accurate analytics and decentralization of access will create opportunities for all four groups to interact in heretofore unprecedented ways. As for consumers, as with most technology, the younger you are the more likely it will be that you are aware of and can accurately describe what fintech is. The fact is that consumer-oriented fintech is mostly targeted toward millennials given the huge size and rising earning (and inheritance) potential of that much-talked-about segment. Some fintech watchers believe that this focus on millennials has more to do with the size of that marketplace than the ability and interest of Gen Xers and Baby Boomers in using fintech. Rather, fintech tends to offer little to older consumers because it fails to address their problems. When it comes to businesses, before the advent and adoption of fintech, a business owner or startup would have gone to a bank to secure financing or startup capital. If they intended to accept credit card payments they would have to establish a relationship with a credit provider and even install infrastructure, such as a landline-connected card reader. Now, with mobile technology, those hurdles are a thing of the past.

Regulation and Fintech

Financial services are among the most heavily regulated sectors in the world. Not surprisingly, regulation has emerged as the number one concern among governments as fintech companies take off.

As technology is integrated into financial services processes, regulatory problems for such companies have multiplied. In some instances, the problems are a function of technology. In others, they are a reflection of the tech industry's impatience to disrupt finance.

For example, automation of processes and digitization of data makes fintech systems vulnerable to attacks from hackers.

Recent instances of hacks at credit card companies and banks are illustrations of the ease with which bad actors can gain access to systems and cause irreparable damage. The most important questions for consumers in such cases will pertain to the responsibility for such attacks as well as misuse of personal information and important financial data.

There have also been instances where the collision of a technology culture that believes in a “Move fast and break things” philosophy with the conservative and risk-averse world of finance has produced undesirable results.

Regulation is also a problem in the emerging world of cryptocurrencies. Initial coin offerings (ICOs) are a new form of fundraising that allows startups to raise capital directly from lay investors. In most countries, they are unregulated and have become fertile ground for scams and frauds. Regulatory uncertainty for ICOs has also allowed entrepreneurs to slip security tokens disguised as utility tokens past the SEC to avoid fees and compliance costs.

Because of the diversity of offerings in fintech and the disparate industries it touches, it is difficult to formulate a single and comprehensive approach to these problems. For the most part, governments have used existing regulations and, in some cases, customized them to regulate fintech. They have established fintech sandboxes to evaluate the implications of technology in the sector. The passing of General Data Protection Regulation, a framework for collecting and using personal data, in the EU is another attempt to limit the amount of personal data available to banks. Several countries where ICOs are popular, such as Japan and South Korea, have also taken the lead in developing regulations for such offerings to protect investors.

Blockchain Technology

Blockchain is a series of data linked together. Every single transaction is linked to the chain using cryptographic principles in batches, making blocks. The blocks are connected to each other and have unique identifier codes (called hashes) that connect them to the previous and the subsequent blocks. This forms a blockchain, usually in the form of a continuous ledger of transactions. It isn't owned by any one individual. The series is managed and stored across several computer systems. Each ledger is shared, copied and stored on every computer connected in the system.

This decentralised nature of storage provides security, since changing the details of one record will cause the hash of that block to change, disconnecting it from the next one and causing the latter's hash to change, and further such disruptions. Since the data is stored on multiple systems, any person looking to change the details on one system will have to do it for every other system as well.

Importance of Blockchain

Blockchain technology has been the backbone of bitcoin and other cryptocurrencies. The transparency and the security offered by the technology are some of the main reasons why cryptocurrency has become so popular. This technology is increasingly being adopted in the retail, manufacturing and banking sectors due to its benefits, like eliminating middlemen, providing data security, reducing corruption and improving the speed of service delivery. It can be particularly useful in maintaining government data related to public transactions. For instance, if all land records are moved on a blockchain, with each subsequent buying and selling of a property being recorded as a block that can be publicly accessed, corruption can be arrested and governing will be made so much easier. Similarly, hallmarked gold jewellery can be moved on an open-source blockchain ledger, which can be maintained by jewellers and viewed by consumers.

However, blockchain technology must be adopted in a gradual manner. Bitcoin and other cryptocurrencies have seen wild fluctuations in value, due to the lack of regulatory supervision. The open nature of the technology implies that anyone can adopt it, which is partly why the government is hesitant to go ahead and use it. Scalability, transaction speed and data protection are key technological hurdles, along with the difficulty of integrating the

technology into existing financial systems. Many legal and regulatory challenges are also involved.

Blockchain is a developing field and its practical uses are being explored in many areas. You may want to adopt this technology in your business, if you are a B2C company and want to improve user experience or enhance transparency. There is a possibility of some data, such as banking transactions, land records and vehicle registration details, moving on the blockchain platform in the future. Example: Even recent entrants like Uber and Airbnb are threatened by blockchain technology. All you need to do is encode the transactional information for a car ride or an overnight stay, and again you have a perfectly safe way that disrupts the business model of the companies which have just begun to challenge the traditional economy. We are not just cutting out the fee-processing middle man, we are also eliminating the need for the match-making platform.

The Three Pillars of Blockchain Technology

The three main properties of Blockchain Technology which have helped it gain widespread acclaim are as follows:

- Decentralization
- Transparency
- Immutability

Pillar #1: Decentralization

Before Bitcoin and BitTorrent came along, we were more used to centralized services. The idea is very simple. You have a centralized entity that stored all the data and you'd have to interact solely with this entity to get whatever information you required.

Another example of a centralized system is the banks. They store all your money, and the only way that you can pay someone is by going through the bank.

In a decentralized system, the information is not stored by one single entity. In fact, everyone in the network owns the information. In a decentralized network, if you wanted to interact with your friend then you can do so directly without going through a third party. That was the main ideology behind Bitcoins. You and only you alone are in charge of your money. You can send your money to anyone you want without having to go through a bank.

Pillar #2: Transparency

One of the most interesting and misunderstood concepts in blockchain technology is "transparency." Some people say that blockchain gives you privacy while some say that it is transparent.

A person's identity is hidden via complex cryptography and represented only by their public address. So, if you were to look up a person's transaction history, you will not see "Bob sent 1 BTC" instead you will see "1MF1bhsFLkBzzz9vpFYEmvWT2TbyCt7NZJ sent 1 BTC". So, while the person's real identity is secure, you will still see all the transactions that were done by their public address. This level of transparency has never existed before within a financial system. It adds that extra, and much needed, level of accountability which is required by some of these biggest institutions.

Pillar #3: Immutability

Immutability, in the context of the blockchain, means that once something has been entered into the blockchain, it cannot be tampered with.

The reason why the blockchain gets this property is that of the cryptographic hash function.

In simple terms, hashing means taking an input string of any length and giving out an output of a fixed length.

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In the context of cryptocurrencies like bitcoin, the transactions are taken as input and run through a hashing algorithm (Bitcoin uses SHA-256) which gives an output of a fixed length. So basically, instead of remembering the input data which could be huge, you can just remember the hash and keep track.

The blockchain gives internet users the ability to create value and authenticates digital information. Following new business applications will result from this:

- 1 Smart contracts
- 2 The sharing economy
- 3 Crowdfunding
- 4 Governance
- 5 Supply chain auditing
- 6 Decentralizing file storage
- 7 Prediction markets
- 8 Protection of intellectual property
- 9 Internet of Things (IoT)
- 10 Neighbourhood Microgrids
- 11 Identity management
- 12 Anti-money laundering (AML) and know your customer (KYC)
- 13 Data management
- 14 Land title registration
- 15 Stock trading

As revolutionary as it sounds, Blockchain truly is a mechanism to bring everyone to the highest degree of accountability. No more missed transactions, human or machine errors, or even an exchange that was not done with the consent of the parties involved. Above anything else, the most critical area where Blockchain helps is to guarantee the validity of a transaction by recording it not only on the main register but a connected distributed system of registers, all of which are connected through a secure validation mechanism.

References

- Bain & Company (2013). Benchmarking. Available at: <http://www.bain.com/publications/articles/management-tools-benchmarking.aspx>
- Blakeman, J. (2002). Benchmarking: Definitions and Overview. University of Wisconsin - Milwaukee . Available at: <https://www4.uwm.edu/cuts/bench/bm-desc.htm>
- Bogan, C. E., & English, M. J. (1994). Benchmarking for best practices: Winning through innovative adaptation. McGraw-Hill
- Camp, R.C. (1989). Benchmarking. The Search for Industry Best Practices That Lead to Superior Performance. ASQC Quality Press
- Gilbert, G. (1992). "Quality Improvement in a Defense Organization." Public Productivity and Management Review, 16(1), 65-75.
- Hyde, A. (1992). "The Proverbs of Total Quality Management: Recharting the Path to Quality Improvement in the Public Sector." Public Productivity and Management Review, 16(1), 25-37.
- Global Benchmarking Network (2010). Global Survey on Business Improvement and Benchmarking.

Available at: http://www.globalbenchmarking.ipk.fraunhofer.de/fileadmin/user_upload/GBN/PDF/2010_gbn_survey_business_improvement_and_benchmarking_web.pdf

- Hill Stephen, 1991. "Why Quality Circles Failed but Total Quality Management Might Succeed." British Journal of Industrial Relations, 29(4), 541-568.
- Hyde, A. (1992). "The Proverbs of Total Quality Management: Recharting the Path to Quality Improvement in the Public Sector." Public Productivity and Management Review, 16(1), 25-37.
- Ishikawa, K, 1985. What Is Total Quality Control? The Japanese Way. Englewood Cliffs, New Jersey, Prentice- Hall.
- Kulmala, J. (ND). Approaches to Benchmarking
- Martin, L. (1993). "Total Quality Management in the Public Sector," National Productivity Review, 10, 195-213.
- Rigby, D. & Bilodeau, B. (2013). Management Tools & Trends 2013. Available at: <http://www.bain.com/publications/articles/management-tools-and-trends-2013.aspx>
- Shah, D. and Kleiner, B. H. (2011). Benchmarking for Quality. Industrial Management, pp. 22-25
- Smith, AK, 1993. "Total Quality Management in the Public Sector." Quality Progress, June 1993, 45-48.
- Spendolini, M. (1992). The Benchmarking Book. American Management Association
- Swiss, J. (1992). "Adapting TQM to Government." Public Administration Review, 52, 356-362.
- Tichey, N. (1983). Managing Strategic Change. New York: John Wiley & Sons.
- Tuominen, K. (1997). Muutoshallinnan mestari. Kuinka toteuttaa strategiset suunnitelmat kilpailijoita nopeammin? Suomen Laatuyhdistys ry.

LESSON ROUND UP

- BPR is another form of process innovation because it attempts to re-create processes.
- The underlying principle of BPR is that the managers must demolish such components of work that do not make any value addition and further automating it if possible.
- Benchmarking is used to compare the performance of the business processes and products of a company with that of the best performances of other companies inside and outside the industry which the company is a part of.
- TQM is a management philosophy that views an organization as a collection of processes such as marketing, finance, design, engineering, and production, customer service, etc, thereby, focussing on meeting customer needs and organizational objectives.
- TQM is mainly concerned with continuous improvement in all work, from high level strategic planning and decision-making, to detailed execution of work elements on the shop floor.

TEST YOURSELF

1. Define Business Process Re-engineering (BPR). What are its objectives.
2. Discuss typology of BPR.
3. What factors are responsible for Successful Implementation of BPR
4. What is benchmarking? discuss its types.

**EXECUTIVE PROGRAMME
FINANCIAL AND STRATEGIC MANAGEMENT**

EP-F&SM

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EXECUTIVE PROGRAMME
FINANCIAL AND STRATEGIC MANAGEMENT

Practice Test Paper

(This test paper is for practice and self study only and not to be sent to the Institute)

Time allowed: 3 hours

Maximum Mark: 100

Part – A Financial Management (60 Questions -1 mark each)

1. **'Shareholder wealth' in a firm is represented by**
 - a) the number of people employed in the firm.
 - b) the book value of the firm's assets less the book value of its liabilities
 - c) the amount of salary paid to its employees.
 - d) the market price per share of the firm's common stock.
2. **Which one of the following is not the duty of Finance Manager?**
 - a) Forecasting of cash flow
 - b) Forecasting of business future
 - c) Raising Fund
 - d) Forecasting of Profits
3. **_____ and _____ are the two versions of goals of the financial management of the firm.**
 - a) Production maximisation, Sales maximisation
 - b) Profit maximisation, Wealth maximisation
 - c) Sales maximisation, Profit maximization
 - d) Value maximisation, Wealth maximisation
4. **Which one of the following is not a discounted cash flow technique of Capital Budgeting?**
 - a) Net Present Value method
 - b) Internal rate of return
 - c) Profitability Index
 - d) Average Rate of Return
5. **Which of the following statements is correct?**
 - a) If the NPV of a project is greater than 0, its PI will equal 0.
 - b) If the IRR of a project is 0%, its NPV, using a discount rate, k, greater than 0, will be 0.
 - c) If the PI of a project is less than 1, its NPV should be less than 0.
 - d) If the IRR of a project is greater than the discount rate, k, its PI will be less than 1 and its NPV will be greater than 0.

6. What is the earning per share (EPS) for a company that earned ₹ 100,000 last year in after-tax profits, has 200,000 common shares outstanding and ₹ 1.2 million in retained earning at the year end?
- ₹ 100,000
 - ₹ 0.50
 - ₹ 6.00
 - ₹ 6.50

7. Indicate the cost of equity capital, based on capital asset pricing model, with the following information:

Beta coefficient – 1.40

Risk-free rate of interest – 9%

Expected Rate of Return on equity in the market – 16%

- 18.8%
 - 9.8%
 - 18%
 - 16%
8. The degree of super-leverage/combined leverage would be calculated by:
- Adding DOL (Degree of Operating Leverage) and DFL (Degree of Financial Leverage)
 - Dividing DOL with DFL
 - Subtracting DOL from DFL
 - Multiplying DOL and DFL
9. Who formulated the following model for estimating the market price of equity share ?

$$P = D + R_a/R_c (E - D)/R_c$$

Where, P = Market price of equity share

D = DPS

E = EPS

E – D = Retained earning per share

R_a = Internal rate of return on investment

R_c = Cost of capital

- Modigliani-Miller
 - Myron-Gordon
 - James E. Walter
 - Clarkson and Elliot
10. Which one of the following is not a assumption of the Modigliani-Miller model ?
- Perfect capital market

- b) Equivalent risk classes
 - c) Unity for dividend payout ratio
 - d) Absence of taxes
11. Which one of the following is most suitable coverage ratio for deciding the debt capacity of a firm ?
- a) Interest Coverage Ratio
 - b) Cash Flow Coverage Ratio
 - c) Debt Service Coverage Ratio
 - d) Fixed Assets Coverage Ratio
12. Which one of the following is the most popular method for estimating the cost of equity ?
- a) Capital asset pricing model
 - b) Dividend yield method
 - c) Gordon's dividend discount model
 - d) Earnings yield method
13. Which one of the following is not the internal factor affecting the weighted average cost of capital of a firm?
- a) Investment policy of the firm
 - b) Capital structure of the firm
 - c) Dividend policy followed
 - d) Market risk premium for the firm
14. Most common approach for analysing the capital structure of a firm is
- a) Ratio Analysis
 - b) Cash Flow Analysis
 - c) Comparative Analysis
 - d) Leverage Analysis
15. Financial leverage in a firm is positively affected by which of the following?
- a) Intensity of tangible assets
 - b) Operating leverage
 - c) Profitability
 - d) Tax Rate
16. Which combination of the following two statements (A) and (R) is correct ?
- Assertion (A) :** The IRR of a project is the discount rate which reduces its NPV to zero.
- Reason (R) :** A project is worth accepting if the IRR exceeds the cost of capital.
- Codes**
- a) (A) is right, but (R) is wrong.

- b) Both (A) and (R) are correct.
- c) (A) is wrong, but (R) is correct.
- d) Both (A) and (R) are wrong.

17. Which combination of the following two statements (A) and (R) is correct ?

Assertion (A) : A company should pay minimum dividend to its shareholders.

Reason (R) : Dividends are heavily taxed than capital gains.

Codes:

- a) Both (A) and (R) are correct.
- b) Both (A) and (R) are incorrect.
- c) (A) is not correct, but (R) is correct.
- d) (A) is correct, but (R) is wrong.

18. Dividend irrelevance hypothesis is implied in the

- a) Traditional Model
- b) Walter Model
- c) Gordon Model
- d) M.M. Model

19. Palo Alto Industries has a debt-to-equity ratio of 1.6 compared with the industry average of 1.4. This means that the company

- a) will not experience any difficulty with its creditors.
- b) has less liquidity than other firms in the industry.
- c) will be viewed as having high creditworthiness.
- d) has greater than average financial risk when compared to other firms in its industry.

20. To increase a given present value, the discount rate should be adjusted

- a) Upward
- b) Downward
- c) Either downward or upward, doesn't matter
- d) Constant

21. If a company issues bonus shares, the debt equity ratio

- a) Remain unaffected
- b) Will be affected
- c) Will improve
- d) None of the above

22. The following information is given in Suryansh Limited, calculate the operating cycle period

- Average stock of raw material ₹ 2,00,000

- Average stock of work in progress ₹ 3,00,000
 - Average stock of finished goods inventory ₹ 180000
 - Average receivable ₹ 3,00,000
 - Average payable ₹ 1,80,000
 - Average raw material store purchase on credit and consumed per day ₹ 10,000
 - Average work in progress value of raw material committed per day ₹ 12,500
 - Average cost of goods sold per day ₹ 18000
 - Average sale per day ₹ 20000
- a) 69 days
b) 54 days
c) 57 days
d) 51 days
23. Risk of two securities with different expected return can be compared with
- a) Coefficient of variation
b) Standard deviation of securities
c) Variance of Securities
d) None of the above
24. A portfolio having two risky securities can be turned risk less if
- a) The securities are completely positively correlated
b) If the correlation ranges between zero and one
c) The securities are completely negatively correlated
d) None of the above.
25. Capital Asset Pricing Model (CAPM) accounts for:
- a) Unsystematic risk
b) Systematic risk
c) Both a and b
d) None of the above
26. A portfolio comprises two securities A and B. The expected return from both securities 12% and 16% respectively. Determine return of portfolio if security A constitutes 40% of total portfolio.
- a) 12.4%
b) 13.4%
c) 14.4%
d) 15.4%
27. Net income available to common stockholders divided by common equity is used to calculate

- a) return on earning power
 - b) return on investment
 - c) return on common equity
 - d) return on interest
- 28. In weighted average cost of capital, a company can affect its capital cost through**
- a) policy of capital structure
 - b) policy of dividends
 - c) policy of investment
 - d) all of the above
- 29. A risk associated with project and way considered by well diversified stockholder is classified as**
- a) expected risk
 - b) beta risk
 - c) industry risk
 - d) returning risk
- 30. If future return on common stock is 14% and rate on T-bonds is 5% then current market risk premium will be**
- a) 0.19
 - b) 0.09
 - c) 9
 - d) 19
- 31. If payout ratio is 0.45 then retention ratio will be**
- a) 0.55
 - b) 1.45
 - c) 1.82
 - d) 0.45
- 32. What is the payback period (in years) for a project that costs ₹ 1,20,000 and would yield after tax cash flows of Rs. 20,000 the first year, Rs. 22,000 the second year, ₹ 25,000 the third year, ₹ 27,000 the fourth year, ₹ 48,000 the fifth year and ₹ 50,000 the sixth year.**
- a) 3.93
 - b) 4.08
 - c) 4.50
 - d) 4.84
- 33. What is the net present value of the project (in ₹) with a 3 year life and a cost of ₹ 32,000 generates revenues of ₹ 8,000 in year 1, ₹ 12,000 in year 2 and ₹ 17,000 in year 2. If the discount rate is 5 %**
- a) 1288

- b) 1118
c) 1188
d) 1818
- 34. Calculate the breakeven point for a company with sales of 1,00,000 units @ ₹ 10/- per unit, Variable costs are ₹ 5,00,000/-, Contribution is ₹ 5,00,000, Fixed Cost is ₹ 3,00,000 and Net Profit is ₹ 2,00,000**
- a) 2,00,000
b) 4,00,000
c) 6,00,000
d) 8,00,000
- 35. A firm with high operating leverage is characterized by _____ while one with high financial leverage is characterized by _____.**
- a) low fixed cost of production; low fixed financial costs
b) high variable cost of production; high variable financial costs
c) high fixed costs of production; high fixed financial costs
d) low costs of production; high fixed financial costs
- 36. Flotation costs should:**
- a) Be ignored when analyzing a project because flotation costs are not an actual cost of the project.
b) Be averaged over the life of the project thereby reducing the cash flows for each year of the project.
c) Only be considered when two projects have the same net present value.
d) Be included in the initial cost of a project before the net present value of the project is computed
- 37. Mr. Verma is evaluating two conventional, independent capital budgeting projects (X and Y) by making use of the risk-adjusted discount rate (RADR) method of analysis. Projects X and Y have internal rates of return of 16 percent and 12 percent, respectively. The RADR appropriate to Project X is 18 percent, while Project Y's RADR is only 10 percent. The company's overall, weighted-average cost of capital is 14 percent. Mr. Verma should**
- a) Accept Project X and accept Project Y
b) Accept Project X and reject Project Y. [IRR of pro X(16%) is less than RADR (18%)so, reject the IRR of pro Y is greater than RADR(10%)so accept]
c) Reject Project X and accept Project Y
d) Reject Project X and reject Project Y
- 38. A firm's degree of operating leverage (DOL) depends primarily upon its**
- a) Sales variability
b) Level of fixed operating costs
c) Closeness to its operating break-even point
d) Debt-to-equity ratio

39. An EBIT-EPS indifference analysis chart is used for
- Evaluating the effects of business risk on EPS
 - Examining EPS results for alternative financing plans at varying EBIT levels
 - Determining the impact of a change in sales on EBIT
 - Showing the changes in EPS quality over time
40. In the context of operating leverage break-even analysis, if selling price per unit rises and all other variables remain constant, the operating break-even point in units will:
- Fall
 - Rise
 - Stay the same
 - Still be indeterminate until interest and preferred dividends paid are known
41. ABC Ltd. has cash of Rs. 100,000 that will be invested in an equity investment that has a beta of 2.25. The current risk-free rate in the market is 2.5%, and the market requires an 8% risk premium for equity securities. What return should ABC Ltd. expect to earn?
- ₹ 8,000
 - ₹ 18,000
 - ₹ 23,625
 - ₹ 20,500
42. Retained earnings are
- An indication of a company's liquidity.
 - The same as cash in the bank.
 - Not important when determining dividends.
 - The cumulative earnings of the company after dividends
43. Given the following two stocks A and B
- | | Expected rate of return | Beta |
|---|-------------------------|------|
| A | 0.12 | 1.2 |
| B | 0.14 | 1.8 |
- If the expected market rate of return is 0.09 and the risk-free rate is 0.05, which security would be considered the better buy and why?
- A because it offers an expected excess return of 1.2%.
 - B because it offers an expected excess return of 1.8%.
 - A because it offers an expected excess return of 2.2%.
 - B because it offers an expected return of 14%.
44. Which of the following statements is consistent with dividend irrelevance theory?
- Investment decisions are the sole determinant of shareholder wealth

- b) Making homemade dividends causes investors to incur transaction costs
- c) Companies with stable dividend policies build up shareholder clienteles
- d) Investors like to maintain the real value of their dividend payments.

45. The _____ is the proportion of earnings that are paid to common shareholders in the form of a cash dividend.

- a) retention rate
- b) Marginal rate
- c) growth rate
- d) dividend payout ratio

46. Chand Communications' CFO has provided the following information:

- The company's capital budget is expected to be ₹ 5,000,000
- The company's target capital structure is 70 percent debt and 30 percent equity
- The company's net income is ₹ 4,500,000

If the company follows a residual dividend policy, what portion of its net income should it pay out as dividends this year?

- a) 33.33%
- b) 40.00%
- c) 60.00%
- d) 66.67%

47. Which of the following statements are TRUE?

- I. The beta of a stock is primarily determined by its correlation with the market
- II. Securities that fall above the SML are undervalued
- III. Securities that fall below the SML are undervalued
- IV. Securities that fall on the SML have no intrinsic value to the investor.
- V. The risk-free rate defines where the SML intersects the Y axis.

- a) I and III only
- b) I, III and V only
- c) I, II, and V only
- d) I, II, IV, and V only

48. The expected market return is 15% next year and the risk-free rate is 7%. If the expected return on a stock is 17.40%, what is the beta of the stock?

- a) 1.40
- b) 1.74
- c) 1.71.
- d) 1.30

49. The covariance of the market's returns with the stock's returns is .008. The standard deviation of the market's returns is 8% and the standard deviation of the stock's returns is 11%. What is the correlation coefficient between the stock and market's returns?
- +0.50
 - + 0.91
 - + 1
 - +1.25
50. As you increase the number of stocks in a portfolio, the systematic risk will:
- Remain constant.
 - Increase at a decreasing rate.
 - Decrease at a decreasing rate.
 - Decrease at an increasing rate
51. Current ratio is 4:1. Net Working Capital is ₹ 30,000. Find the amount of Current Assets.
- ₹ 10,000
 - ₹ 40,000
 - ₹ 24,000
 - ₹ 6,000
52. Which of the following would not be financed from working capital?
- Cash float
 - Accounts receivable
 - Credit sales
 - A new personal computer for the office
53. When total current assets exceeds total current liabilities it refers to.
- Gross Working Capital
 - Temporary Working Capital
 - Both a and b
 - Working Capital
54. In the balance sheet amount of total assets is Rs.10 lakhs, current liabilities Rs.5 lakhs & capital & reserves are Rs.2 lakhs. What is the debt equity ratio?
- 1:1
 - 1.5:1
 - 2:1
 - none of the above

55. A project has an up-front cost of ₹100,000. The project's WACC is 12 percent and its net present value is ₹ 10,000. Which of the following statements is most correct?
- The project should be rejected since its return is less than the WACC.
 - The project's internal rate of return is greater than 12 percent.
 - The project's modified internal rate of return is less than 12 percent.
 - All of the statements above are correct

Information: Use the following to answer question 56:

The following data are available relating to the performance of High Variance Stock Fund and the market portfolio:

High Variance Market Portfolio

Average Return 19% ; 12%

Standard Deviation of Returns 35% ; 15%

Beta 1.5 ; 1.0

Residual standard deviation 3.0% ; 0.0%

The risk-free return during the sample period was 6%.

56. What is the Sharpe measure of performance evaluation for High Variance Stock Fund?
- 1.33%
 - 8.67%
 - 31.43%
 - 37.14%
57. Suppose you own two stocks, A and B. In year 1, stock A earns a 2% return and stock B earns a 9% return. In year 2, stock A earns an 18% return and stock B earns an 11% return. Which stock has the higher geometric average return?
- stock A
 - stock B
 - the two stocks have the same geometric average return
 - at least three periods are needed to calculate the geometric average return.
58. Investors may be willing to pay a premium for stable dividends because of the informational content of _____, the desire of investors for _____, and certain _____.
- Institutional considerations; dividends; current income
 - Dividends; current income; institutional considerations
 - Current income; dividends; institutional considerations
 - Institutional considerations; current income; dividends
59. Which of the following factors is most likely to explain why a company decides to increase its annual dividend?
- A firm belief by management that dividends represent a residual payment

- b) A large number of desirable projects.
- c) A large proportion of its shares are owned by institutional investors
- d) Pecking order theory

60. Project Financing is appropriate for which kind of projects?

- a) Labour Intensive Projects
- b) Capital Intensive Projects
- c) Both of them
- d) None of these

Part –B Strategic Management (40 Questions -1 mark each)

61. Which of the following statements best describes strategic management?

- a) A process consisting of determining objectives, strategic actions to achieve those objectives, the implementation of desired strategy, and the monitoring of that strategy
- b) A process consisting of the determination of direction, strategic actions to achieve objectives, the implementation of desired strategy, and monitoring of that strategy
- c) A process for determining direction, strategic actions to achieve objectives, and the implementation of desired strategy
- d) A process consisting of determining objectives and strategic actions to achieve those objectives

62. Which of the following is not a purpose of strategic thinking?

- a) To allocate scarce resources
- b) To realize what needs to change
- c) To clarify future direction
- d) To establish the agenda for managing strategic change

63. Which of the following answers the question: 'Where does the organisation aspire to be in the future?'

- a) Mission statement
- b) Vision statement
- c) Objectives
- d) Core values

64. Porter's generic strategies are:

- a) Low price, differentiation, focus
- b) Cost leadership, differentiation, cost focus, focus differentiation
- c) Price leadership, differentiation, focus
- d) Low cost, differentiation, focus differentiation

65. What does Cash Cow symbolize in BCG Matrix?

- a) Remain Diversified

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- b) Invest
- c) Stable
- d) Liquidate

66. The BCG matrix is based on

- a) Industry attractiveness and business strength
- b) Industry growth rate and business strength
- c) Industry attractiveness and relative market share
- d) Industry growth and market share

67. What are the guide to decision making?

- a) Rules
- b) Procedure
- c) Goals
- d) Policies

68. Which of the following is the Strategy of TOWS ?

- a) Business Strategy
- b) Corporate Strategy
- c) Defensive Strategy
- d) Functional Strategy

69. What is synergy?

- a) When the parts of an organization are combined and managed in such a way to reduce costs
- b) When the parts of an organization are combined and managed in such a way that the drawbacks exceed those which would result if the parts were operating separately
- c) When the parts of an organization are combined and managed in such a way that the benefits exceed those which would result if the parts were operating separately
- d) When the organization is providing a product to the customer that perfectly suits their requirements

70. Which of the following is a force in the Porter's five forces model of industry attractiveness?

- a) bargaining power of suppliers
- b) Competitive market
- c) Low cost for customer
- d) opportunity for substitutes

71. Which of the following statements best describe scenario planning?

- a) Considering three likely scenarios for future developments, and devising a strategy according to the likeliest outcome
- b) Helping managers come to terms with the threats and opportunities within the company by devising a possible scenario to eliminate the threats and capitalize on the opportunities

- c) Exploring future possibilities by looking at potential outcomes from particular causes and seeking to explain why things might occur
- d) Planning the best way to secure the scenario outcome that would benefit the company most

72. How is an origination most likely to secure and sustain a position of strength in its associate environment?

- a) By seeking to restrict changes within their environment
- b) By seeking to influence their competitors' environment
- c) By seeking to influence and manage their internal environment
- d) By seeking to influence and manage their external environment

73. As indicated in the strategic management model, a clear.....is needed before alternate strategies can be formulated and implemented.

- a) Vision statement
- b) Long term objective
- c) Mission statement
- d) None of the above

74. Innovation and quality can be seen as which form of Management?

- a) Financial Management
- b) Operations Management
- c) Human Resource Management
- d) Service Management

75. What are focus strategies?

- a) When a company focuses on supplying differentiated products which appeal to different market segments
- b) Where a company chooses to concentrate on only one market segment or a limited range of segments
- c) Where a company focuses on achieving lower costs than its rivals so as to compete across a broad range of market segments
- d) When a company conducts market research through focus groups to determine how their strategy should be shaped

76. The five forces model developed by.....has been the most commonly used analytical tool for examining competitive environment.

- a) Lewis E Porter
- b) Michnal E Porter
- c) Barrywell
- d) Schwiz

77.is a widely used framework to summarize a company's situation or current position.

- a) TWOS Analysis

- b) SWOT matrix
- c) BCG matrix
- d) Ansoff matrix

78. Which of the following is the key element is essential for successful strategic planning?

- a) Understanding the need and expectations of stakeholders.
- b) Understanding competencies
- c) Understanding the processes of strategic change
- d) Understanding how to plan

79. Under the BCG growth-share matrix, low-share, high-growth businesses or products are called

- a) Stars
- b) Cash cows
- c) Question marks
- d) Dogs

80. What is the advantage of PERT?

- a) Provides management a tool for forecasting the impact of schedule changes. The likely trouble spots are located early enough to take preventive measures or corrective action.
- b) The cost may be higher than the conventional methods of planning and as it need a high degree of planning skill and minute details resulting in rise in time and manpower resources.
- c) Not suitable for relatively simple and repetitive processes such as assembly line work which are fixed sequence jobs.
- d) Uncertainty about the estimate of time and resource due to being based on assumptions.

81. Ansoff's matrix is useful for

- a) Joining a business's marketing strategy with general strategic direction
- b) Establishing an editorial calendar for staff to follow
- c) Understanding buyer personas and buyer behaviors
- d) Hiring new staff and training them on marketing tactics

82. What is the term used in Ansoff's matrix for increasing market share with existing products in existing markets?

- a) Market development
- b) Market penetration
- c) Product development
- d) Diversification

83. Which "S" is not part of MCKINSEYS 7-S FRAMEWORK?

- a) Shared Value
- b) System

- c) Staff
- d) Synergy

84. What is not an advantage of a hierarchical structure?

- a) Small span of control
- b) Quick response to change
- c) Discipline and stability
- d) Clear chain of command

85. What is a virtual organisation?

- a) An organisation that uses internet technologies to sell products to customers
- b) An organisation that coordinates the workforce via video conferencing
- c) An organisation that uses information and communications technologies (ICT's) to coordinate activities without physical boundaries between different functions
- d) An organisation that manages the supply chain using digital technologies

86. Designs of systems are included in organization structure to ensure

- a) Communication
- b) Integration
- c) Coordination
- d) All of the Above

87. Restricted view of organizational goals is represented by deploying a

- a) Divisional Structure
- b) Functional Structure
- c) Divisional Structure
- d) Vertical Structure

88. Which of these are characteristic of matrix structure?

- a) Decentralization and co-ordination
- b) Centralization and control
- c) Centralization and co-ordination
- d) Decentralization and control

89. Which category of benchmarking, involves multi-site comparison of process and performance?

- a) Internal
- b) Generic
- c) Competitive
- d) Functional

90. The principles of the business process re-engineering (BPR) approach do NOT include:

- a) Rethinking business processes cross-functionally to organise work around natural information flows.
- b) Striving for improvements in performance by radical rethinking and redesigning the process.
- c) Checking that all internal customers act as their own suppliers to identify problems.
- d) Scrapping any process line over two years old and starting again from scratch.

91. What approach is used to compare organisation operations with those of other companies?

- a) SWOT analysis
- b) Competitor performance assessment
- c) PERT analysis
- d) Benchmarking

92. Match The Following

A. TQM promotes	1. Small change
B. Kaizen is	2. Continuous improvement
C. Quality circle can solve problem related to	3. Employee participation
D. Quality circle benefit to	4. Employee

The correct order is

- a) A-1, B-3, C-2, D-4
- b) A-3, B-1, C-4, D-2
- c) A-3, B-1, C-2, D-4
- d) A-3, B-2, C-1, D-4

93. A fundamental attribute of TQM is.....

- a) Top management's direct involvement
- b) Having team meetings
- c) Drawing control charts
- d) All of the above

94. Where was Total Quality Management first developed?

- a) Korea
- b) Japan
- c) UK
- d) USA

95. Which of the following are key components of a Total Quality Management system?

- a) Collective responsibility, continual improvement, use of raw data
- b) Involves everyone, continual improvement, use of data and knowledge

- c) Group responsibility, staged improvement, knowledge
- d) Individual responsibility, incremental improvement, use of raw data

96. What is Six sigma risk/return level?

- a) High-Low
- b) Medium-High
- c) Low-Low
- d) High-High

97. The business unit strategy has three major components.

- a) mission, business unit goals, and competencies
- b) business mission, department mission, and daily plans
- c) marketing, advertising and pricing objectives
- d) mission, business, and SBU goals

98. TQM is a strategy that is designed to change the quality of a product to satisfy customer need by using the concept of

- a) reverse brainstorming
- b) product maintenance
- c) brainstorming
- d) benchmarking

99. How often should strategic management activities be performed?

- a) Annually
- b) Quarterly
- c) Monthly
- d) Continuously

100. Strategy implementation activities include

- a) Conducting research
- b) Preparing a TOWS matrix
- c) Establishing annual objectives
- d) Measuring performance

Answer Key

1.	d
2.	b
3.	b
4.	d
5.	c
6.	b
7.	a
8.	d
9.	c
10.	c
11.	b
12.	a
13.	d
14.	c
15.	a
16.	b
17.	a
18.	d
19.	d
20.	b
21.	c
22.	d
23.	a
24.	c
25.	b
26.	c
27.	c
28.	d
29.	b
30.	b
31.	a
32.	c
33.	c
34.	c

35.	c
36.	d
37.	c
38.	c
39.	b
40.	a
41.	d
42.	d
43.	c
44.	a
45.	d
46.	d
47.	c
48.	d
49.	b
50.	a
51.	b
52.	d
53.	d
54.	d
55.	b
56.	d
57.	b
58.	b
59.	c
60.	b
61.	b
62.	b
63.	b
64.	b
65.	c
66.	d
67.	d
68.	c

69.	c
70.	a
71.	c
72.	d
73.	c
74.	b
75.	b
76.	b
77.	a
78.	c
79.	c
80.	a
81.	a
82.	b
83.	d
84.	b
85.	c
86.	d
87.	b
88.	a
89.	b
90.	d
91.	d
92.	c
93.	a
94.	b
95.	b
96.	b
97.	a
98.	d
99.	d
100.	c

